

International Explorations in Outdoor
and Environmental Education

Annette Gough
John Chi-Kin Lee
Eric Po Keung Tsang *Editors*

Green Schools Globally

Stories of Impact on Education
for Sustainable Development

 Springer

International Explorations in Outdoor and Environmental Education

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Editors

Annette Gough
School of Education
RMIT University
Melbourne, VIC, Australia

John Chi-Kin Lee
Offices of the President
The Education University of Hong Kong
Hong Kong, New Territories, Hong Kong

Eric Po Keung Tsang
Department of Science and
Environmental Studies
The Education University of Hong Kong
Hong Kong, New Territories, Hong Kong

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*This book is dedicated to the families of
Annette Gough, John Chi-Kin Lee and Eric
Po Keung Tsang*

Series Editors' Foreword

The ancestry of this book, the fifth in our series, lies in large part in a long-standing history of conversations and collaborations among the co-editors of this series and this book's co-editors, with Annette Gough being a common element.

In the early 1990s, John Chi-Kin Lee, who was then teaching at The Chinese University of Hong Kong (CUHK) while working on his PhD thesis (researching environmental education in Hong Kong primary schools), initiated a paper-based (snail mail) correspondence with each of us to seek our publications and advice, a correspondence we have happily continued beyond John's roles at CUHK into his current position as Vice-President (Academic) at The Education University of Hong Kong (EdUHK). Prior to taking up his vice-presidency at what was then known as The Hong Kong Institute of Education (HKIE), we had been collaborating with Eric Po Keung Tsang on research projects sponsored by the Hong Kong Environmental Campaign Committee. Eric also led the development of the Institute's Master of Arts (Education for Sustainability) – MA (EfS) – programme, within which we designed, developed and delivered two subjects (Research Methods and Thesis Writing) and supervised a number of the students' research projects between 2014 and 2019.

As discussed elsewhere in this book (see Chapter 1), an early stimulus for a global green schools movement can be found in Agenda 21 (1993, p. 25), the outcomes document from the United Nations (1993) Conference on Environment and Development (UNCED, aka Earth Summit) held in Rio de Janeiro, Brazil, 3 to 14 June 1992, which frequently refers to the desirability of youth participation in environmental protection and promoting economic and social development. However, as discussed in Chapter 3, the seeds for such a movement had already been planted by the Foundation for Environmental Education in Europe (FEEE), which was already offering a Blue Flag program which promoted sound environmental education and sustainable management of beaches, marinas and boating operators worldwide.

With this focus on the desirability of youth participation in mind, we have been very pleased to witness the recent emergence of XR (Extinction Rebellion) and Greta Thunberg's 'School Strike for the Climate' as global movements (see Extinction Rebellion 2019; Greta Thunberg 2019), and we are confident that few

readers of this series will need to look very far beyond current headlines to apprehend the growing acceptance of a widespread view that humanity is on the cusp of natural, cultural and historical crises that involve complexities for which we are poorly prepared. However, acceptance of this view does not guarantee support for sociopolitical actions that could ameliorate the effects of these crises. Some see a conservative and controlled state of affairs to be the best action strategy, whereas others are exploring and innovating and experimenting and experiencing and reflecting and laying down many differing paths for knowing and learning and doing and...and...and....

We align ourselves with the latter position and, although we initially located our understanding of the conjunction “and...and...and....” in Gilles Deleuze and Félix Guattari’s (1987, p. 25) work, we are also attracted to Guattari’s (1984, pp. 11–23) prior notion of *transversality*. In geometry, a transversal is a line that passes through two lines in the same plane at two distinct points, which Guattari (1984, p. 13) deploys metaphorically in his critique of the politics of institutional psychotherapy:

The idea of transversality is opposed to:

- (a) Verticality, as described in the organogrammes of a pyramidal structure (leaders, assistants, etc.)
- (b) Horizontality, as it exists in the disturbed wards of a hospital or, even more, in the senile wards; in other words a state of affairs in which things and people fit in as best they can with the situations in which they find themselves

We also interpret transversality as carrying connotations of intellectual mobility across disciplinary boundaries, including the establishment of a continuum throughout theory, practice and militant action.

Anja Kanngieser (2012) extends Guattari’s work to map out a movement that destabilises categorical dualisms between activists and non-activists, artists and non-artists, through a creative and ambiguous form of political intervention that she characterises as ‘the performative encounter’. Kanngieser (2012, p. 267) adapts the term ‘performative encounter’ from Mireille Rosello (2005) who draws upon fictional literary and filmic texts connected to the North African region of the Maghreb, to identify a new potential emerging in Franco-Algerian relations that stands to counterbalance a violent history of colonisation. Characterising a performative encounter as ‘a multidimensional event that creates subjects’, Rosello (2005, p. 2) argues that this potential is linked to the transformations that performative encounters effect on subjectivity.

We are disposed to distance ourselves from any categorical dualisms that pervade political debates about climate change and other environmental issues, and we therefore welcome Kanngieser’s (2012, p. 265) provocations to extend Guattari’s (1984) concept of *transversality* in order to open spaces for the emergence of new subjectivities, relations and worlds. In doing so it critically extends Guattari’s conceptualisations of political organisation, group subjectivation and aesthetics into radical political terrains that are antagonistic of the nation-state and capital at the same time as being affirmative of possible present and future conditions.

We suggest that being open to the concept of *transversality* might also be generative for readers of this volume. We suspect that many readers will be tempted to be very selective in their choices/priorities about which chapters they prioritise, but being open to transversal connections across chapters might be more rewarding.

The country stories of various green school movements in Part II describe a wide range of experiences – successful and not necessarily so – with an enthusiasm for environmental education and providing opportunities for students and schools to engage with their local environments and develop sustainable lifestyles that are consistent with the intentions of the recommendations from the 1992 Earth Summit. Although not all schools in the countries are participating in the green school movements available to them, and not all governments are making (environmental) education for sustainable development mandatory in their school curricula, there is still much to learn from the experiences reported in the stories.

This is an important book for starting, and continuing, conversations around green school movements, their impact on education for sustainable development and the enablers and barriers encountered by the movements. We are confident that educators around the world will find this volume of interest to their practice at all levels.

RMIT University, Melbourne, VIC, Australia
La Trobe University, Melbourne, VIC, Australia

Annette Gough
Noel Gough

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We have endeavoured to obtain permission for the illustrative materials where needed, but please contact us if we have missed anyone.

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Contributors

Nicole Andreou is the International Eco-Schools Coordinator at the Foundation for Environmental Education (FEE), based in Copenhagen, Denmark. She holds an MSc in Research in Political Science from Universitat Pompeu Fabra, Spain, and a BA Politics from University of Essex, UK. Nicole previously worked as a researcher for a private consultancy in Cyprus, under education and awareness campaigns on asylum, migration and integration. Nicole is currently coordinating a STEM project on behalf of FEE as well as the implementation of the Eco-Schools programme in international schools. Her research interests include education and public policy, sustainability education and social movements.

Lindsay Bunce is the Executive Director of Ontario EcoSchools. She started her career in outdoor and environmental education and has been involved with the EcoSchools programme for over a decade – as a participant, staff member and steering committee contributor. With undergraduate degrees in Environmental Studies and Biology and a Master of Education in Sustainability Education, she has previously worked with organisations such as Toronto and Region Conservation and Earth Day Canada to embed environmental learning, facilitate community action projects and build successful cross-sectoral collaborations. Lindsay currently serves as the Board Chair of the p.i.n.e. project, contributes to several advisory groups and mentors new sustainability professionals. She is based in Toronto, Ontario, Canada.

Anne Calvet was a professor of history and geography in secondary school from 1980 to 2011. She has taught didactics of history and geography and EESD in the higher school of teaching and education, for secondary school future teachers and teachers in-service, from 2003 to 2011. Anne was in charge of ESD for the local education authority from 2003 to 2018 and a member of the eco-school labelling regional committee. She is involved in research projects in EESD with the co-authors of the French chapter.

Raphaël Chalmeau is a professor of life sciences and has been involved in environmental education and sustainable development (EESD) training since 2000. He

teaches didactics of life sciences at the higher school of teaching and education (ESPE), Jean Jaurès University, Toulouse, France, for primary school future teachers. The professional training of teachers in France takes place over 2 years with students enrolled in master's degrees. Raphaël is involved in research projects in educational sciences on the challenges of EESD with Marie-Pierre Julien and Jean-Yves Léna. In this context, he is interested in how children grasp complexity to understand contemporary issues in EESD.

Angela Colliver is an Education for Sustainability specialist who designs educational programmes and curriculum resources. Angela began as a teacher in South Australia (1981) before moving into State Government as School and Community Educator in the Environment Department and designed a Watercare programme. She has designed a number of sustainable schools related programmes including the Great Barrier Reef Marine Park Authority's Reef Guardian Schools and CSIRO's CarbonKids programmes. From 2006 to 2008, Angela managed the Australian Sustainable Schools Initiative within the Australian Government ensuring its expansion from a pilot in NSW and Victoria to Australia-wide. Angela has written over 100 curriculum resources for schools incorporating twenty-first century pedagogical innovation and Australian Curriculum and Sustainability focus. She is currently a Director of two consultancies, Angela Colliver Consulting Services and FutureGen Education.

Olivia Copsey is an Education for Sustainable Development (ESD) specialist with an MSc in Education for Sustainability. Olivia started her career in 2002 as an education officer working in conservation NGOs, before moving into Education for Sustainable Development policy. She has worked on sustainable schools strategies in the Channel Island of Jersey and the Indian Ocean Islands of Madagascar, Comoros, Mauritius and Zanzibar where she designed and introduced the regional Eco-Schools Indian Ocean programme. Olivia is currently coordinating the Eco-Schools African Network, a community of practice for ESD involving 11 African countries on behalf of the Foundation for Environmental Education, and technical associate with 'Community Efforts for Conservation and Development' (CECOD) in Uganda. She is based in Cornwall, UK.

Kevin J. Coyle is Vice President for Education at the National Wildlife Federation in the USA. He oversees its Eco-Schools USA programme and Schoolyard Habitats® for 14,000 K-12 schools along with the Federation's higher education Eco Leaders programme, RecycleMania and climate change education. For 9 years, he supervised editorial for NWF's award-winning educational publications, Ranger Rick® Magazines. He has been President and CEO of the National Environmental Education Foundation and was also head of American Rivers USA's principal river conservation organisation. He has held posts at US Department of the Interior and has received the White House's 'Reinventing Government' award and an Award of Honor from the US EPA for support of the field of environmental education. He has a Juris Doctor degree from Temple University.

Lorraine Dixon is a Business, Environment and Sustainability Specialist with an MSc in Sustainability (Business, Environment and Corporate Responsibility). Lorraine started her career in 2008 as a Programmes Officer working in community development NGOs before moving into Corporate Sustainability in the UK. She has worked on Eco-schools and community projects in Kenya where she designed and introduced the concept of Green Enterprise Development, as well as co-edited a Teacher's Guide on the same. Lorraine is currently spearheading the establishment of The Green Key eco-certification for the tourism industry in Kenya – under the umbrella of the Foundation for Environmental Education – with linkages to Eco-schools as a strategy for Corporate Social Responsibility within the tourism sector. She is based in Nairobi, Kenya.

Chris Eames is an Associate Professor in environmental and sustainability education (ESE) at the University of Waikato in Hamilton, New Zealand. He works with pre-service and in-service teachers, and with many postgraduate students, with a particular focus on education practice. Chris has been a director of numerous research contracts exploring aspects of teaching and learning in ESE in schools. He also advocates at national level for ESE as a National Executive member for the New Zealand Association for Environmental Education and works at a local level to promote ESE and to protect and restore the natural environments in his country. He is Associate Editor of the *Australian Journal of Environmental Education*.

Doris Elster is a researcher and educator in the Institute of Science Education (IDN) at the University of Bremen, Germany. She is a full professor and the head of the Department of Biology Education. Doris's core fields of research are about teachers' professional development and inquiry-based learning in the context of Education for Sustainable Development (ESD) and she supervises PhD projects in these and other areas. In Germany she undertook a qualitative evaluation of the implementation of National Educational Standards in biology. Doris was partner in the international comparative studies ROSE (The Relevance of Science Education) and IRIS (Interests and Recruitment in Science) and is partner in the European project INQUIRE (Inquiry Based Teacher Training for a Sustainable Future) and the Horizon 2020 project STARBIOS2 (Structural Change to Attain Responsible Research and Innovation in Biosciences).

Ann Finlayson is a specialist in Education for Sustainability (ESD) and has been researching, testing and training specifically in the field for 20 years. She is currently the Executive Chair of SEEd, the leading ESD NGO in England, having revived the 40-year-old Council for Environmental Education (CEE) in 2008. Previously Ann was the Education and Capability Commissioner on the UK Government's Sustainable Development Commission. She was Head of Education/Social Change at WWF-UK which was the pioneer organisation on ESD starting in the late 1980s. Ann's current interests are whole institution approaches, pedagogy for real change and action, understanding how social change happens and understanding competencies for young people that allow them to experiment and learn from sustainability projects.

Niklas Gericke is professor of science education in the Department of Environmental and Life Sciences, Karlstad University, Sweden. He is the director and research leader of the Center for Science, Mathematics and Engineering Education Research (SMEER) at Karlstad University, Sweden, and visiting professor at the Norwegian University of Science and Technology (NTNU) in Trondheim, Norway. Gericke is a certified teacher and actively involved in teacher education. His research interests span environmental, sustainability and science education. Gericke has been the principal investigator in a Swedish Research Council financed project examining the effects and success factors of implementing sustainability education in Sweden. Currently, he is the principal investigator in a longitudinal research project studying how teacher professional development and school development can facilitate teaching practices in line with sustainability education.

Edgar J. González-Gaudio is Senior Research Fellow in the Institute of Research in Education at the Universidad Veracruzana, Mexico, where he leads the research line of environmental education for sustainability. He has written/collaborated in 22 books and more than 100 articles in specialised journals in the field of environmental education. He is a Latin American liaison person and has received a number of awards: The National Award to Ecological Merit (2004) in the scholar category, the UANL Award of Research in Humanities (2007), the Medal to Environmental Merit 'Dr. Gonzalo Halffter' (2012). His current research focus is on education and communication related to climate change, vulnerability, social resilience and risk of coastal communities.

Annette Gough is Professor Emerita of Science and Environmental Education in the School of Education at RMIT University, Melbourne, Australia, and previously Head of the School of Education. She has been an adjunct/visiting professor at universities in Canada, South Africa and Hong Kong, and is a Life Fellow of the Australian Association for Environmental Education (since 1992). Annette has led research and development projects funded by the Australian and Victorian governments and non-government bodies, worked with UNESCO, UNEP and UNESCO-UNEVOC, and has been co-editor of the *Australian Journal of Environmental Education*. She has over 130 publications (books, chapters and articles and curriculum materials) and is an editorial board member for the *Australian Journal of Environmental Education*, *Environmental Education Research* and the *Journal of Biological Education*. Annette's research interests span environmental, sustainability and science education, research methodologies, posthuman and gender studies.

José M. Gutiérrez-Bastida is a secondary school teacher (Spain), University Specialist in Environmental Education by UNED (National University of Distance Education), has a master's degree in Environmental Education from the Institute of Ecological Research, and special mention in the 1st Premi Francesc Xavier Gil (Institut de Ciències de l'Educació of the University of Barcelona). He has worked in several schools and institutes and has been pedagogic director for 8 years in the

Pedernales School Experimentation Center. Now, in Ingurugela (Service of Environmental Education of the Basque Autonomous Government) developing teacher training, advice and research. José has more than 50 publications (articles, papers, books, etc.) on constructivism, evaluation, self-regulation of learning, previous ideas and processes of Environmental Education, eco-social education.

Sin-Jia Ho is a trans-disciplinary researcher and practitioner currently working at General Education Center, National Taichung University of Science and Technology. He majored in architecture with fine arts as minor in college, completed a Master's degree course in architecture and urban planning, and earned a PhD in environmental education. The main field of his research is connecting the environmental space on campus with teaching. At the same time, he is dedicated to connecting general education with environmental education. Outdoor education and SDGs for School (Education for Sustainable Development) is not only the important medium to connect students' learning to the real environment but also the key pathway to create students' peak experience in learning.

Yu Huang is associate professor in the Institute of International and Comparative Education at Beijing Normal University. He was a visiting scholar in Strathclyde University, King's College London, Chinese University of Hong Kong and Hokkaido University. Dr. Huang's research interests cover fields like environmental education and education for sustainable development, higher education and science education. He has over 100 publications (articles, chapters and books). Dr. Huang's professional career outside of academia includes writing and editing textbooks and popular science books for a variety of publishers. He has also served consultancy to NGOs in China. Dr. Huang is member of Chinese Society of Geography, Chinese Society of Education, Council for Geographical Teaching and Chinese Society of Comparative Education Research.

Marie-Pierre Julien is a lecturer in ecology. She teaches plant biology and ecology to future secondary teachers of life and Earth sciences, at the ESPE. Marie-Pierre conducts research on environmental education and sustainable development at the GEODE (Environmental Geography) laboratory, a joint CNRS (National Centre for Scientific Research)/Jean Jaurès University laboratory. In this context, she is interested in future thinking in education for sustainable development (ESD). Marie-Pierre researches and writes with Raphaël Chalmeau and Jean-Yves Léna.

Preeti Rawat Kanaujia is a Senior Programme Director for the northern regional office and Himalaya initiative based in Lucknow of the Centre for Environment Education (CEE) in India. She is a practitioner involved in various formal and non-formal school EE and ESD education initiatives. Preeti has published widely in the fields of teachers' educational materials and in school improvement and educational evaluation. She has coordinated national level EE and ESD initiatives. She facilitates and participates in international ESD network Regional Centres of Expertise anchored by United Nations University – Institute of Advanced Studies. Her recent

international publication for Easter Springer is *Reorienting Educational Efforts for Sustainable Development – Experiences from South Asia* (co-authored) (2016). She received her Master's degree in environmental sciences from University of Lucknow, India.

Lorraine Larri is a researcher and programme evaluation expert specialising in environmental adult education and environmental citizenship. Lorraine has over 40 years' experience in public and private sector education, training and employment organisations. Since 2000, she has been at the forefront of evaluating innovative sustainability climate change programmes in Australia with projects such as: the Australian Sustainable Schools Initiative (for the Australian Government and five States), CarbonKids/Sustainable Futures(CSIRO Education), Global Communities for Sustainability (Centre for Environmental Education India and Australia), The Archibull Prize (Picture You in Agriculture), and Water in The Landscape Program (Western Sydney Regional Organisation of Councils). Lorraine is principal consultant for Renshaw-Hitchen and Associates, and is undertaking PhD (Education) with James Cook University researching Social Movement Learning in informal transformational learning for sustainability through environmental activism.

Elsa Lee is an educationalist with expertise in environmental issues and sustainability education. She has been a researcher and supervisor at the Faculty of Education, University of Cambridge, since 2013, and is a bye-fellow at Homerton College, a founding member of EERA's Environmental and Sustainability Education Research network and a National Association of Environmental Education trustee and deputy. She holds a doctorate from the University of Bath and has taught secondary school science in the UK and abroad. Elsa collaborates with researchers in other national and international institutions to develop her knowledge and influence in relation to her topics of interest within the field of environmental and sustainability education, including place, nature affiliation, and global and environmental citizenship. She is committed to working in interdisciplinary contexts and in crossing the North/South divide.

John Chi-Kin Lee is the Chair Professor of Curriculum and Instruction, Vice President (Academic) and Provost, Director of the Centre for Religious and Spirituality Education and Co-Director of the Centre for Education in Environmental Sustainability at The Education University of Hong Kong (EdUHK). He has been appointed as the UNESCO Chair in Regional Education Development and Lifelong Learning at the EdUHK. John has been the Changjiang Scholar Chair Professor conferred by the Ministry of Education, the People's Republic of China. He has served as the Editor-in-Chief of *Cogent Education*, Editor of *International Journal of Children's Spirituality*, Regional Editor (Asia-Pacific) of *Educational Research and Evaluation* and Executive Editor of *Teachers and Teaching* as well as advisory editor of *Journal of Environmental Education Research* (Taiwan). John is also a

prolific writer who has edited and written more than 25 books and published over 100 journal articles and book chapters.

Jean-Yves Léna is a lecturer of life sciences and is in charge of sustainable development and ESD at the ESPE, Jean Jaurès University, Toulouse, France. He is involved in developing the eco-responsibility of the establishment (training, information, process, etc.). Jean-Yves teaches didactics of life sciences for primary school future teachers and trains students to implement ESD project. He is part of a research team in educational sciences on the challenges of EESD (GEODE laboratory) with Marie-Pierre Julien. In this context, he is interested in how children grasp complexity and uncertainty, especially through the use of mental maps, to understand contemporary issues in EESD.

Annika Manni is senior lecturer at Umeå University, Sweden, in the Department of Applied Educational Sciences. Her research has a focus on environmental and sustainability education, and especially aspects of learning from a child and student's perspective. Her doctoral thesis is titled 'Emotions, understandings, and values: students' meaning-making in school activities regarding environmental and sustainability issues'. Besides research, she teaches courses in teacher education programmes at Umeå University, Sweden, mainly focusing on sustainability issues and outdoor educational approaches. She is also currently involved as a co-researcher in the development of the local Eco-school programs in Umeå.

Heidi Mardon is Chief Executive of Toimata Foundation. Heidi grew up in Hamilton, New Zealand, and developed a life-long passion for sustainable design and environmental education. Over 25 years she has led many ecological building and community empowerment projects including designing her own sustainable urban house as a living educational model for architects, planners and home builders. In the 1990s she co-founded Enviroschools. She has worked for 20 years as part of a small creative team to develop Toimata Foundation, working in both English and Maori language settings through Te Aho Tū Roa and the Enviroschools Programme. The nationwide network has grown to include over 1200 schools, communities and 100 partner organisations. In 2019 Heidi received a New Zealand Order of Merit for her services to Environmental Education.

Nancy McGee is the Senior Manager, Education, Training and Outreach, with the Toronto and Region Conservation Authority (TRCA). She has spent the majority of her teaching career engaging students at overnight, outdoor education field centres but in her present role she explores evaluation and assessment, funding opportunities, programme development, and teacher engagement as they relate to non-formal education. Central to her role are the challenges and opportunities of integrating and sustaining authentic outdoor experiential learning experienced while considering stakeholder and formal education system expectations. Nancy has completed a Master of Education and is currently pursuing her PhD in Education at York University, exploring her interests in how educators' life paths intersect with their

praxis, as well as how one measures the impact of environmental and outdoor experiential education (OEE) activities.

Pablo Á. Meira-Cartea is Professor of Environmental Education (EE) at the University of Santiago de Compostela, Spain. Member of the Research Group on Social Pedagogy and Environmental Education (SEPA). His research focuses on the study of the theoretical basis of EE, the evaluation and design of public policies of EE, in the social representations of the environment, and in education and communication for mitigation and adaptation to climate change. Pablo received the María Barbeito Award for Pedagogical Research (2009). He is Director of the Resclima Project, co-founder and former president of the Sociedade Galega de Educación Ambiental, and promoter and member of the Rede Lusófona de Educação Ambiental and the Rede de Pesquisadores Internacionais em Educação Ambiental e Justiça Climática (REAJA). Pablo is author and co-author of more than 200 publications in books and journals.

Dorcas Otieno is the founder and Executive Director of the Kenya Organisation for Environmental Education (KOEE), which promotes education for sustainability in learning institutions, natural resource management and environmental governance. Notable recent projects include: providing training to journalists on climate change reporting, which led to the development of a guide book by the same, and developing a guidebook on Green Enterprise Development for use in primary schools. She is the UNESCO Chair for Higher Education Development for a Green Economy and Sustainability (HEDGES) at Kenyatta University focusing on Agriculture and Renewable Energy. She is also a senior lecturer in the School of Environmental Studies at Kenyatta University. Dorcas has authored several publications including Education for Sustainable Development (ESD) strategies/guidelines, papers, books, and toolkits for use in local, regional and international Education and Training institutions. In 2008 Dorcas received a Presidential Order of the Grand Warrior Award in recognition of her work in improving environmental management in the public sector.

Günther Pfaffenwimmer is the retired head of the former Sub-Department for Environmental Education in the Austrian Federal Ministry of Education, Science and Research. He holds a master's degree in Biology and Environmental Sciences (teaching certification) and a PhD in Limnology from the University of Vienna. In his ministerial function he was responsible for the development of all EE projects and programmes in the Austrian education system since 1986. Guenther has served as the Austrian representative at the ENSI International board, co-ordinated the Austrian ENSI-Team and was involved in programmes of OECD/CERI, UNECE-ESD and UNESCO.

Christina Phillips-MacNeil is a Sessional Lecturer at the Ontario Institute for Studies in Education at the University of Toronto, Canada, with a PhD in science education and a master's degree in forest conservation. She was previously

seconded to the Faculty of Education at York University from her school board where she worked with pre-service teachers and taught courses such as ‘Educating for a Sustainable Future’. Christina’s interest in sustainable practices and the linkage with education has stemmed from her background in science, forest conservation and work as an educator at both the K-12 and university levels. She recently travelled to Beijing, China, to facilitate a series of workshops on outdoor education with in-service Chinese teachers. Christina’s current research interests focus on science education, the nature of collaborations and environmental education.

Franz Rauch is a professor and currently head of the Institute of Instructional and School Development (IUS) at the Alpen-Adria University Klagenfurt (Austria). He holds a master’s degree in Natural Sciences (teaching certification) and a PhD in Education and Habilitation in Education (with a focus in Environmental Education). Franz has been a research fellow at the University of Northumbria in Newcastle upon Tyne, England, and a Fulbright Scholar at the University of Missouri–St. Louis, USA. He has been involved in research and development projects internationally and nationally (including EC Projects like CoDeS, PROFILES, PARRISE). Franz is one of the editors of *Educational Action Research Journal* and serves on editorial boards of other journals. His areas of research, teaching and publication are environmental education and education for sustainable development, networks in education, school development, science education, continuing education for teachers and action research.

Eureta Rosenberg is Professor and the Chair of Environment and Sustainability Education at Rhodes University in Grahamstown, South Africa. Her career in environmental education started in the early 1990s with doctoral research into transformative research methodology. Building on this methodological work, she has been designing, implementing and supporting evaluations for environmental education practice and policy. This includes an evaluation of the Eco-Schools programme and other environmental education programmes in South Africa, Namibia, Zimbabwe and Zanzibar. In 2018 Prof Rosenberg was awarded a Chair in Monitoring and Evaluation in a Sector Education and Training Environment. Her work in the schools’ context also includes research and research supervision, professional development programmes and teacher materials development.

Pramod Kumar Sharma is Senior Director of Education with the Foundation for Environmental Education, based in Copenhagen, Denmark. An Education for Sustainable Development professional with broad experience of over 20 years, he has worked with wide range of stakeholders that include schools, universities, corporate, programmes focusing on school systems, rural development issues of tribal communities and has mentored grassroots NGOs for projects in the area of sustainable development. His doctoral research is in the area of assessment of Environmental Literacy. Pramod’s current interest includes the role of Positive Actions in Educations particularly to achieve Sustainable Development Goals.

Ulrica Stagell is currently a doctoral student in Environmental and Sustainability Education (ESE) at the School of Communication and Education, Jönköping University, Sweden. Her thesis project in ESE centres on sustainability-promoting action as teaching content in Eco-Schools, addressing how teachers view such actions in terms of appropriateness, and how their views can be discussed from the perspective of Action Competence, as well as in relation to norms in the private and public spheres. She has a Master's degree in Biology and is a trained teacher with many years of experience teaching Science, Environmental and Sustainability Studies in upper secondary education as well as teacher education courses at in-service teacher training at Jönköping University.

Tali Tal is a professor of science and environmental education in the Faculty of Education in Science and Technology of the Technion, Israel Institute of Technology. She is the current president of *NARST* (North American Association for Research in Science Teaching). Her research focuses on learning science in informal settings, inquiry-based learning, environmental education and learning with socioscientific issues. Tal has published over 60 papers in journals such as *The Journal of Research in Science Teaching*, *Science Education*, *Environmental Education Research* and the *International Journal of Science Education* and numerous book chapters. Tal is the chair of the Israeli Ministry of Education Professional Committee of Teaching Environmental Sciences and one of the PIs of TCSS – Taking Citizen Science to School research center funded by the Israel Science Foundation and the Ministry of Education.

Mehmet Fatih Taşar is a faculty member in the Department of Mathematics and Science Education, Gazi University, Ankara, Turkey. He earned his PhD from The Pennsylvania State University in 2001 in curriculum and instruction with emphasis on science education. His research focuses on qualitative methodologies, learning process studies and science teacher education. So far, he has supervised 12 doctoral students and 8 master's students to the successful completion of their degrees. He has published numerous journal articles, delivered keynote speeches and presented scholarly works at the conferences of professional organizations around the world. Mehmet has served as editor, editorial board member and reviewer for international journals, and he is currently the co-editor of *International Journal of Physics & Chemistry Education* and *Action Research and Innovation in Science Education*.

Eric Po Keung Tsang is a Professor, Associate Dean of the Faculty of Liberal Arts and Social Sciences, Head of the Department of Science and Environmental Studies, and Associate Director of the UNESCO-UNEVOC Centre at The Education University of Hong Kong. He is an environmental scientist by training, but he also specialises in environmental education research, and was one of the pioneers of the Green School initiative. He has been appointed visiting professor by Northeast Normal University and South China Normal University and is founding director of the Hong Kong and Guangzhou Centre for Environmental and Science Education in South China Normal University. Eric is active in the community as chairman/

member of numerous high-level government committees; chairman of Green Power, a major NGO in Hong Kong; and member (outreach panel) of the International Year of Global Understanding, launched by the International Geographical Union and UNESCO.

Paul Vare is Postgraduate Research Lead for the School of Education at the University of Gloucestershire, UK. Following a brief spell as a teacher and illustrator in the mid-1980s, he turned to environmental education. He has since worked in five continents – chiefly in Africa – focusing on public engagement around protected areas and stakeholder dialogue among communities impacted by extractive industry. For over a decade Paul represented the NGO coalition, European ECO Forum, at the United Nations Economic Commission for Europe (UNECE) where he helped draft the UNECE Strategy for Education for Sustainable Development (ESD). Currently Paul is leading the second phase of A Rounder Sense of Purpose, a European Union funded project that is developing competence-based qualifications in ESD.

David Wandabi is a holder of a Bachelor of Science Degree in Environmental Education, and has a wealth of experience in working with schools and communities on Education for Sustainable Development. David started his career in 2012 as an intern in ESD before progressing up to programmes management and capacity development not only in ESD but also in natural resource management (NRM), climate change, governance, community development and ESD resource material development. David has great knowledge and expertise in teachers and community training on wide areas around ESD, NRM and climate change as well as carrying out monitoring, evaluation and reporting of community projects. Currently, David is the National Operator of the Eco-schools Programme in Kenya.

Shun-Mei Wang is Associate Professor at the Graduate Institution of Environmental Education of National Taiwan Normal University in Taiwan. She was the main initiator to promote the Green School Partnership Network Project in Taiwan from 1999 to 2006. Later, she served as a consultant for this project. Her research interests are broad and focused on outdoor education, animal welfare, community education and higher education for teacher training.

Sai Kit Eddie Yip is a research associate at The Education University of Hong Kong. He has worked on many Green School Award and related projects in Hong Kong over the past 10 years. He is currently working on a STEM education for sustainability project.

Abbreviations

AAEE	Australian Association for Environmental Education
AGSI	Adiwiyata Green School Indonesia
ARPEGE	Appui Régional à la Promotion d'une Education pour la Gestion de l'Environnement
AuSSI	The Australian Sustainable Schools Initiative
CBO	Community-based Organisation
CDC	Curriculum Development Centre (Australia); Curriculum Development Council (Hong Kong)
CECOD	Conservation Efforts for Community Development
DESD	United Nations Decade of Education for Sustainable Development (2005–2014)
DFAT	Department of Foreign Affairs and Trade (Australia)
ECC	Environmental Campaign Committee (Hong Kong)
ECOLOG	Ecologisation of Schools (Austria)
EE	Environmental Education
ENSI	The OECD Environment and School Initiative
EfS	Education for Sustainability
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ESD	Education for Sustainable Development
ESE	Environmental and Sustainability Education
FEE	Foundation for Environmental Education
GAP	UNESCO Global Action Programme on Education for Sustainable Development
GCE/GCED	Global Citizenship Education
GDP	Gross Domestic Product
GESIP	Kenya Green Economy Strategy Implementation Plan
GLP	Global Learning Programme (UK)
HKAEE	Hong Kong Awards for Environmental Excellence
HKGSA	Hong Kong Green School Award
IO	Indian Ocean

IOC	Indian Ocean Commission
ISLANDS	Implementation of the SIDS Mauritius Strategy in the Eastern Southern African-Indian Ocean Region
KOEE	Kenya Organisation for Environmental Education
LEAF	Learning about Forests
LEED	Leadership in Energy and Environmental Design (USA)
LOGSE	Organic General Law of the Education System (Spain)
MAEECHA	Mouvement Associatif pour l'Éducation et l'Égalité de Chance, Comoros
MCEETYA	Ministerial Council on Education, Employment, Training and Youth Affairs (Australia)
MEP	Ministry of Environmental Protection
MHRD	Ministry of Human Resource Development (India)
MNE	Ministry of National Education
MoE	Ministry of Education
MoEFCC	Ministry of Environment, Forest and Climate Change (India)
MoU	Memorandum of Understanding
NCERT	National Council for Educational Research and Training (India)
NEEN	National Environmental Education Network
NESC	National Eco-Schools Committees
NFSS	National Framework for Sustainable Schools (UK)
NGO	Non-Government Organisation
NWF	National Wildlife Federation (USA)
PBL	Project Based Learning
RESION	Regional Eco-Schools Indian Ocean Network
RTE	Right to Free and Compulsory Education Act (India)
SD	Sustainable Development
SDGs	Sustainable Development Goals
SEMP	School Environment Management Plan
SEWG	School Education Working Group
SIDS	Small Island Developing States
SMART	Specific, Measurable, Attainable, Relevant and Time-Bound
STARS	Sustainability Tracking, Assessment and Rating System (USA)
TÜRÇEV	Environmental Education Foundation of Turkey
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
WESSA	Wildlife and Environment Society of South Africa
WIA	Whole Institution Approach
YRE	Young Reporters for the Environment
ZAYEDESAA	The Zanzibar Youth Education Environment Development Support Association
ZWI	Zero Waste Initiative (Turkey)

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Chapter 1

Green School Movements: An Introduction



Annette Gough, John Chi-Kin Lee, and Eric Po Keung Tsang

Abstract This chapter introduces the edited collection of stories of green school movements around the world and the impacts they have had on the development of environmental education and education for sustainable development in their respective countries.

1.1 The Origins of Green School Movements and This Book

Green schools movements, under various names (Eco Schools, Enviroschools, Green Schools, Sustainable Schools, ResourceSmart Schools etc.) in many countries, can trace their origins to being a response to needs identified at the 1992 United Nations (UN) Conference on Environment and Development for the involvement of youth in environmental protection and the promotion of economic and social development (United Nations 1993). The first discussions around establishing green school movements were in 1992, immediately following this conference and, within a few months, discussions were underway in various places to develop pilot green school programs. Many of these are discussed in this volume. Other examples include that, in 2012, UNESCO Jakarta (2017) launched a Green School (Adiwiyata) pilot project in Indonesia. UNESCO has also reoriented its long established (in 1953) Associated School Network towards Sustainable Development Goal target 4.7 (United Nations 2016) on global citizenship education (GCED) and education for sustainable development (ESD) (UNESCO n.d.). Target 4.7 states that,

A. Gough (✉)
School of Education, RMIT University, Melbourne, VIC, Australia
e-mail: annette.gough@rmit.edu.au

J. C.-K. Lee · E. P. K. Tsang
The Education University of Hong Kong, New Territories, Hong Kong SAR, China
e-mail: jcklee@eduhk.hk; etsang@eduhk.hk

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

According to UNESCO (n.d.), “the global indicator for Target 4.7 measures the extent to which GCED and ESD, including gender equality and human rights, are mainstreamed in national education policies, curricula, teacher education and, student assessments”. This target potentially greatly broadens the focus of green schools beyond environmental protection and sustainable lifestyles. The extent to which this is happening is discussed through the various country stories in this volume and the conclusion.

Green school movements focus on a whole school approach which aims to include everyone (students, teachers and the local community), to improve school environments (including resource usage and the environmental footprint of the school), to motivate students to take on environmental problems and seek resolutions particularly at a local level but also thinking globally, and to improve students' attitudes and behaviours as part of developing a sustainable mind set. There have been a number of evaluations of these school movements at a national or more local level, and numerous articles and chapters have been published on aspects of these schools' activities, but to date these have not been brought together in a single volume that focuses attention on the impact of the movement on education for sustainable development in each country. This is the purpose of this volume.

In particular, this book focuses on the ways that practices through the various green school movements influence theory and policy in education for sustainable development. Much research in this area examines the reverse, and this can lead to the conceptualisation of a body of knowledge that is divorced from how it is embodied in practice. By adopting this position we hope that this book will make a significant contribution across policy, practice and theory related to green schools.

This book brings together stories of the impact of the green school movement in a number of countries around the world, with a focus on the impact of the movement on the development and implementation of education for sustainable development in each of the countries. In particular, each country story explains the history of the movement there, its current status, achievements, obstacles and broader impact. In inviting country stories we endeavoured to sample the world, choosing countries where the green schools movement has been taken up as a movement, rather than looking for stories of the experiences of individual schools. We recognised there are blank spots in our mapping of active locations, and we hope that stories from other locations will have the opportunity to be told in other fora. For example, Eco-Schools is being implemented in many other countries, and a particular example is Adiwiyata Green School Indonesia (AGSI) which integrated the localised theme of sustainable development with extra-curricular activities (UNESCO Jakarta, Regional Science Bureau for Asia and the Pacific 2017; Warju et al. 2017).

This edited collection has its origins in overlapping alliances and friendships that can be traced back into the last century when most of us were in other places and other roles, but with a shared passion for environmental education in schools.

Annette Gough had worked with the Australian sustainable schools initiative since its early days (Gough 2004, 2005, 2006). John Chi-Kin Lee had written on green schools in Hong Kong (Lee 2009) and in Hong Kong and China (Tsang and Lee 2014), and included chapters on green schools in China and Taiwan in his edited collection (Lee and Williams 2009). Eric Po Keung Tsang has worked with the Hong Kong Environment Campaign Committee and their green school awards for many years (Tsang 2001), including evaluating with program with Annette Gough and others (Tsang et al. 2010). He has also written with John Chi-Kin Lee on environmental education programs in Hong Kong and China (Tsang and Lee 2014).

1.2 About This Book

The book is divided into three parts. Part I provides a history of green school movements in general by Annette Gough and then a specific chapter on Eco-Schools, the first international green school movement, by Nicole Andreou from the Foundation for Environmental Education.

Chapter 2 traces the association between ‘green’ and education, noting the similarities in concerns with the four pillars of green political parties and the principles developed by the World Commission on Environment and Development (1987). Annette Gough discusses the emergence of notions of greening education in the late 1980s, and green school movements in the mid/late 1990s. The characteristics of the green school movements in different countries are compared within a broadly shared philosophy of green schools needing to adopt a whole school approach. This is followed by a discussion of the relationship between green schools and the United Nations (2016) Sustainable Development Goals and concerns to develop global citizenship and the challenges and opportunities faced by green school programs.

In Chapter 3, Nicole Andreou describes Eco-Schools, a global Education for Sustainable Development (ESD) programme, developed in 1992 as a response to the UN Conference on Environment and Development by the Foundation for Environmental Education. The chapter outlines the history of the Eco-Schools programme, its current status, and the challenges and responses it faces. The chapter explains the transformative nature of Eco-Schools and how this has helped to build a mechanism to shape attitudes and behaviour. The Eco-Schools’ network illustrates not only that issues are global, but also that they can be tackled by using the same Seven Steps framework as a pedagogy, which drives the programme and works as a quality education assurance mechanism.

Part II includes stories of the green school movements in more than 20 countries. Here we read of the various movements and their impact on the development of education for sustainable development (ESD) in each country:

- E3D Schools (France)
- ECOLOG schools (Austria)
- Eco-schools (France, Germany, India, Kenya, Mexico, South Africa, Turkey, United Kingdom, Western Indian Ocean)

- Ecoschools (Canada)
- Enviroschools (Aotearoa New Zealand)
- Escoles + Sostenibles (Spain)
- Green Flag Schools (Sweden)
- Green Schools (China, Hong Kong, Israel, Mexico, Taiwan, USA)
- ResourceSmart Schools (Victoria, Australia)
- School Agenda 21 (Basque region, Spain)
- Sustainable Schools (Australia, Mexico, United Kingdom)
- Umwetschule (Germany)

While many of the country stories concern the implementation of the Foundation for Environmental Education's Eco-Schools, as discussed by Annette Gough in Chapter 2, other countries have developed their own green school movement, not always inspired by or derivative of Eco-Schools, but for their own reasons and inspirations.

In Chapter 4, Chris Eames and Heidi Mardon discuss the development of Enviroschools in Aotearoa New Zealand since 1992 and how the program is underpinned by a *kaupapa* (purpose/philosophy) of action-learning, a cultural responsiveness which particularly draws on perspectives from the indigenous Māori world, and which sees whole schools as connecting to communities and the environment. About one third of all schools are Enviroschools. Being an Enviroschool means acknowledging the five principles of the *kaupapa*, and focusing on people and participation, programs, practices and place, and each school creates its own journey through the interests and needs of its community.

Lorraine Larri and Angela Colliver explain the impact of the Sustainable Schools initiative in Australia in Chapter 5. Inspiration for Sustainable Schools came in the late 1990s from the local Waste Wise Schools program as well as from Eco-Schools and ENSI (the OECD Environment and School Initiative). Around a third of Australian schools are registered as Sustainable Schools.

The green school program in Austria is called ECOLOG, which is a key action programme and network for the greening of schools and education for sustainability. In Chapter 6 Franz Rauch and Günther Pfaffenwimmer relate how the program was developed in 1996 by an Austrian team of teachers working on the international OECD ENSI project. It is based upon an action research approach. Schools analyse the ecological, technical, and social conditions of their environment and, resultingly, define objectives, targets, concrete activities and quality criteria to be implemented and evaluated. Students as well as all the other stakeholders of a school should be involved in a participatory way, and collaboration with authorities, businesses, and other interested parties is encouraged. The ECOLOG-school network contributed to the development of pedagogical criteria for "The Austrian Eco-label for Schools and Teacher Training Colleges" which has been awarded by the government since 2002.

In Chapter 7, Lindsay Bunce, Nancy McGee and Christina Phillips-MacNeil describe Ontario Canada's EcoSchools, a provincial environmental education and certification program for grades K-12 that supports school communities develop ecological literacy and sustainable practices. It is voluntary, bilingual and free. This is also a

different chapter from the others in this book as it is about a provincial not a national green schools education program, however EcoSchools Canada is beginning a national expansion. Canada also has a Canada Coalition for Green Schools, organised through the Canada Green Building Council, which is comprised of members of the green building industry contributing their time and expertise to support communities in the transformation of their schools. It runs the Greenest School in Canada competition.

In Chapter 8, Huang Yu and John Chi-kin Lee explain the evolution of green schools in China and the parallel development of the Foundation for Environmental Education's Eco-Schools program since 2009. The Green Schools concept was initiated in China in 1996 in the "National Environmental Publicity and Education Action Plan (1996–2010)", and in 2000 105 national Green Schools were commended by the Ministry of Education and the Ministry of Ecology and Environment. As of 2008, the total number of green schools was more than 42,000, covering 31 provinces, autonomous regions, and municipalities. However, in 2009, the Eco-School Project was introduced to China, and schools began to actively develop eco-schools as a new form of green school programmes, and as of 2016, more than 3000 schools across the country had participated in the training and exchange activities of the project. To avoid confusion, the Ministry of the Environment and the Ministry of Education have prohibited the recognition of green schools since 2009, but district green school programs continue.

In Chapter 9, Raphael Chalmeau, Jean-Yves Lena, Marie-Pierre Julien and Anne Calvet describe how, in France, a Schools Agenda 21 was introduced after the 1992 United Nations Conference on Environment and Development, and ESD became a national education policy priority in 2003, with all students to receive at least 60 hours of EE for SD during their schooling. A French version of FEE's Eco-Schools was launched in 2005 and in 2017 FEE signed an agreement with the Ministry of National Education (MNE), and 2500 schools (about 4%) are now registered. Overall, around a third of schools are engaged in ESD related projects.

In Chapter 10, Doris Elster discusses the issues and challenges of the Eco-Schools movement in Germany in relation to the implementation of educational reforms at global and national levels. In Germany, the Eco-Schools movement started in 1994/95 with eight participating schools. Over the next ten years the program developed to the largest environmental program in German schools. In 2005/2006 the programme was given the title *International Agenda-21 Schools*. The award was given to schools with special achievements regarding environmental activities in the schools as well as at out-of-school sites. In 2018, more than 960 schools from eight federal states participated in the programme. In 2019, the campaign was enlarged and the award changed to *Eco-School in Europe – International Sustainability School* which showed the important shift from environmental literacy to sustainability literacy. Elster argues that the current discussion about ESD curriculum development leads to a new vision of the promotion of sustainability literacy for teacher education.

The development of the Green School Award in Hong Kong and its impact on ESD in the school sector is the focus of Chapter 11. Here Po Keung Eric Tsang, John Chi-kin Lee & Eddie Sai Kit Yip describe how the Environmental Campaign Committee (ECC) has hosted the Hong Kong Green School Award (HKGSA) as a

core school award scheme since 2000, to encourage schools to promote environmental awareness and to develop an environmentally-friendly lifestyle. Based on the results of their tracking study HKGAS has now become a well-received accreditation scheme which can also act as a driving force to promote sustainable development in the school sector, which is adly ending in 2020.

Pramod Kumar Sharma and Preeti Rawat Kanaujia discuss the very complicated situation in India in Chapter 12. There are over 1.5 million schools, and not all children of school age are enrolled in schools. Environmental education (EE) has mainly been an initiative of the Environment Ministry since 1984, but non-government organisations (NGOs) play important roles in EE. There are many programs related to the environment: Eco-clubs, National Nature Camping Program, National Environmental Awareness Campaign, Global Learning and Observations to Benefit the Environment, etc. For example, over 120,000 Eco-clubs have been established through the National Green Corps program, and the Centre for Environmental Education runs the FEE Eco-Schools program, which was introduced in 2014–2015.

The Green Schools program in Israel is discussed by Tali Tal in Chapter 13. Green Schools are recognized as such by the Ministry of Environmental Protection (MEP) according to a list of criteria which relate to the management of the school – e.g., reducing material consumption, recycling, energy efficiency – and to its EE curriculum (United Nations 1993). However, despite Ministry of Education (MoE) strong recommendations that EE be taught in primary and middle schools, it is still marginal in Israeli schools. According to the MEP, there have been about 1000 schools certified as Green Schools by the ministry since 2004. Certification is a joint project between the MEP and the MoE. Schools certified as Green Schools receive small government grants to support the “greening process”.

In Chapter 14, Dorcas Otieno, David Wandabi and Lorraine Dixon describes the situation in Kenya where there is a national ESD policy, spearheaded by the Ministry of Environment and Natural Resources, which provides mechanisms for engaging all stakeholders in addressing sustainable development challenges through education. In this policy, the Eco-schools programme is highlighted as being an effective whole-institution approach to mainstreaming sustainability into all aspects of the learning environment. The Eco-Schools program was piloted in 2003 and now there are over 1000 schools participating.

Edgar Gonzalez-Gaudiano, Pablo Meira and Jose Manuel Gutierrez take a different approach in Chapter 15 and look at the green school movements in Mexico and Spain. In Mexico, the first department of Environmental Education in the federal government was established in 1983, although within the area of environmental management. There have been a number of green schools related programs including Clean Schools, Green Schools, NGO supported Network of Schools for Education and Environmental Awareness which has 300 schools, the Safe, Healthy and Sustainable School program, the Sustainable Schools Network, the Eco-Schools program, and the UNESCO Associated Schools Network which has more than 600 members from 27 states. In Spain, environmental education was institutionalized in the national school system through the Spanish Organic General Law of the Education System in 1990 as a ‘cross-cutting’ issue, but this was deleted in the 2006

version. There are a number of different green school programs in Spain: Eco-Schools since 1996 (mainly in Andalusia), School Agenda 21 (Basque region), Escoles + Sostenibles (Barcelona area), and the national Schools towards Sustainability Network.

The development of Eco-Schools in South Africa, described by Eureka Rosenberg in Chapter 16, is undertaken in partnerships. The Eco-Schools program is implemented by the Wildlife and Environment Society of South Africa (WESSA), and it is popular in urban and rural areas, and both affluent and marginalised areas. To run the schools' programme, WESSA partners with FEE, the Foundation of Environmental Education in Europe, who provides the Green Flag accreditation, and with a range of local partners, including government agencies like the Department of Water & Sanitation and Department of Environmental Affairs; local governments like the City of Cape Town; businesses who provide small-scale funding; and a variety of civil society organisations, non-governmental organisations (NGOs) and community-based organisations (CBOs). These local partners use the Eco-Schools framework and process to engage with schools around environment, development and sustainability.

Niklas Gericke, Annika Manni and Ulrica Stagell discuss the green school movement in Sweden in Chapter 17. Here the movement is rooted in strong traditions of outdoor activities and interest in both nature and its conservation. The FEE Eco-Schools program was introduced in 1996 by the Keep Sweden Tidy Foundation as the Green Flag program and numbers receiving the award have increased over the years. The National School Agency in Sweden shifted to promote ESD, and introduced *National Sustainable School Awards* to support and inspire schools in 2005. The number of schools that received these awards has increased from 50 schools in 2005 to 191 pre-schools, 108 primary and secondary schools, and 15 upper secondary schools in 2018.

As discussed in Chapter 18 by Shun-Mei Wang, John Chi-Kin Lee and Sin-Jia Ho, Taiwan's Greenschools program is a school-based environmental education approach, launched in 2006 and supported by National Taiwan Normal University and the Ministry of Education. It adopts a whole-school approach and a unique "hope tree mechanism" for rewarding school who participate.

In Chapter 19, Mehmet Fatih Taşar describes how TÜRÇEV (Environmental Education Foundation of Turkey) has been running the Eco-Schools program in Turkey since 1995. TÜRÇEV complies with the regulations of the Foundation for Environmental Education (FEE). The Eco-Schools program aims at pre, elementary, and middle schools in order to educate the children about environmental consciousness, environmental management, and sustainable development. Studies conducted on eco-schools since 2005 report that, both in Eco-Schools and non-program schools, children are learning about the elements of Education for Sustainable Development through a variety of approaches but there are problems in reflecting their knowledge in their behaviours.

Elsa Lee, Paul Vare and Ann Finlayson discuss the various green school movements in the United Kingdom (England, Northern Ireland, Scotland and Wales) in Chapter 20, with various developments in each country. Around two thirds of schools in England have registered with the FEE Eco-Schools program, which is

run by Keep Britain Tidy. In Scotland, two thirds of schools have registered with the Eco-Schools program through Keep Scotland Beautiful, and there are also Eco-Schools in Wales and Northern Ireland. In addition, there are also Sustainable Schools, promoted by NGOs after government funding ended in 2010. Government funding is now being directed towards The Government is now funding a Global Learning Programme and Forest Schools and Nature Schools.

Chapter 21 focuses on the United States of America, and here Kevin Coyle explains how the U.S. green school movement has had multiple origins – particularly the National Wildlife Federation’s Eco Schools USA, Project Learning Tree Green Schools and the Green Schools Alliance. While a majority of schools take measures to reduce their energy use, recycle and conserve water, the growing green school movement in the United States is helping achieve three important public purposes:

- helping America’s schools to reduce their environmental footprints and costs of operation and be more sustainable,
- helping students developed knowledge and skills needed for a more challenging and complex environmental future, and
- helping students and faculty to stay healthy in body, mind and spirit.

In Chapter 22, the last chapter in this section, Olivia Copesey describes the different approach taken in five Western Indian Ocean countries (Comoros, Madagascar, Mauritius, Seychelles and Zanzibar) due to the local conditions and the FEE requirements to work with an NGO, not a government body, to establish Eco-Schools. Eco-Schools was launched in 2015, with an NGO national operator in each country, and 72 schools in a pilot program. Responsibility for the Eco-Schools Indian Ocean programme was handed over to the national operating NGOs who had meanwhile become officially FEE members in each country at the end of 2017. The regional collaboration is continuing with the creation of a Regional Eco-Schools Indian Ocean Network (RESION). A shared website allows schools across the region to share their projects and ideas on shared themes, regional meetings when funds allow for peer to peer support and learning, and collaboration on funding proposals.

Part III concludes the book with a reflection on the book contents and a looking forward for green school movements.

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Part I
Background to Green School Movements

Chapter 2

Seeking a Green Future Through Education

Annette Gough

Abstract This chapter traces the association between *green* and education, noting the similarities in concerns with the four pillars of green political parties and the principles developed by the World Commission on Environment and Development (1987). It discusses the emergence of notions of greening education in the late 1980s, and green schools' movements in the mid/late 1990s. The characteristics of the green schools' movements in different countries are compared within a broadly shared philosophy of green schools needing to adopt a whole school approach. This is followed by a discussion of the relationship between green schools, the United Nations (2016) Sustainable Development Goals and concerns to develop global citizenship.

2.1 Background

The association of *green* with schools, education and curriculum can be traced back to the 1980s, as can a desire to see a whole school approach to green educational reform. While there is no clear origin for the first use of green in the context of education, what was intended by greening education was very much in accord with the four pillars of the green political parties:

- Ecological wisdom
- Social justice
- Grassroots democracy
- Nonviolence.

These pillars came from the founding of the German Green Party (Die Grünen) in 1980, but this party built on the work of the first green political group, the United

A. Gough (✉)
School of Education, RMIT University, Melbourne, VIC, Australia
e-mail: annette.gough@rmit.edu.au

Tasmanian Group which was founded in 1972 in Australia to fight the creation of the Lake Pedder dam and “inspired the creation of Green parties all over the world” (Wall 2010, p. 14). Nowadays Green parties around the world follow these four pillars (The Greens n.d.).

Although the environment usually is seen as the most characteristic (and most often caricatured) green issue, green politics is also concerned with social issues such as industrial development, peace, racism, social justice, feminism and health - as well as with the environmental, economic and educational implications of these issues. In the 1980s the *greening* of society was seen as part of a ‘global mind change’ (Harman 1988) that many writers and commentators had identified as signalling a paradigm shift towards a more holistic worldview (see, for example, Birch 1990; Capra 1983; Ferguson 1982; Gough 1987, 1989; Michael and Anderson 1986). The need for a global mind change overlaps with the United Nations’ (2016) Sustainable Development Goals, albeit frequently from a different philosophical position.

How green is interpreted in various green schools movements and in different countries needs to be understood within the context of how the association of green with politics and schooling has evolved over the decades.

2.2 Environmentalisms and Green Politics

As a background to developments in the greening of education since the 1980s it is important to acknowledge the philosophical and political positionings that were being discussed at this time and beyond. The frameworks developed by people such as G. Tyler Miller (1990), Timothy O’Riordan (1989), Andrew Dobson (1990) and Graham Dunkley (1992) can help us to understand the types of environmentalism being advocated within the various green schools’ movements of the twenty first century.

For example, G. Tyler Miller (1990, p. 609) quoted E.F. Schumacher (author of *Small is Beautiful*) as saying: “Environmental deterioration does not stem from science or technology, or from a lack of information, trained people, or money for research. It stems from the lifestyle of the modern world, which in turn arises from its basic beliefs”. In his argument, that we therefore each need to look at our lifestyle, Miller went on to describe and contrast the throwaway worldview with a sustainable-earth worldview, with each view leading to a particular kind of society. In a throwaway society the commonly held beliefs include: humans are apart from nature and superior to other species, our role is to conquer and subdue nature, and resources are unlimited because of our ingenuity in making them available or in finding substitutes. In contrast, in a sustainable-earth society the general beliefs are that humans are part of nature and, while valuable, he argues that we are not superior to other species. Our role is to understand and work with the rest of nature, not conquer it. Miller argued (1990, p. 611) that the challenge is to relearn a sustainable-earth worldview where we distinguish between our unlimited wants and our true needs.

O’Riordan (1989, p. 80) also analysed the world views held by various individuals and discusses the changing meaning of environmentalism, which he defines as

“a collage of values and views of the world, a general patterning of predispositions, being first and foremost a social movement, though one with political overtones”. He described four strands of thought in environmentalism - intervention, accommodation, communalism and Gaianism - and stressed that all four groups do see themselves as environmentalists. Intervention and accommodation are credos of technocentrism (managerial systems where nothing is designed to be left to chance), communalism and Gaianism are credos of ecocentrism (greenness).

While all groups see the quality of life as important, “the difference lies in the emphasis given to the meaning of that term and the method of achieving the objective” (O’Riordan 1989, p. 87). Interventionists see environmental considerations as incidental to economic and social advance whereas greens see such considerations as central to their concerns and as the prime objective. According to O’Riordan (1989, p. 88), the majority of people feel comfortable with the accommodation view: it is popular because it is a safe haven for the cautious and the anxious; it provides succour for liberal environmental academics and consultants and “is the whirlpool of contemporary environmentalism into which much intellectual debris is sucked”. He believed that accommodation is a manipulative and technocentric position which survives because it has led to superficially attractive reforms, not just in scientific methodology but also in institutional change. However, he saw the tide of opinion shifting from accommodation to communalism and the challenge for environmentalism being in mobilising a coalition of accommodation and communalism. He described communalism in terms of its concern with the socialist principles of sharing and caring, including reform to social justice principles such as wages and the status of women, and with the possibility of a renaissance of spirit, mind, body, community, and environment.

Others developed similar ways of describing various forms of environmentalism. For example, whereas O’Riordan (1989, p. 85) saw environmentalism as seeking to embrace both technocentrism and ecocentrism (the heartland of being green), Dobson (1990) saw environmentalism and ecologism as two different ideologies. The sustainable-earth worldview described by Miller (1990) is similar to the “ecologism” described by Dobson. However, Dobson (1990, p. 13) contrasted ecologism with environmentalism, the latter of which he then viewed as more akin to a *technological fix*:

The principal difference between the two is that ecologism argues that care for the environment (a fundamental characteristic of the ideology in its own right, of course) presupposes radical changes in our relationship with it, and thus in our mode of social and political life. Environmentalism, on the other hand, would argue for a ‘managerial’ approach to environmental problems, secure in the belief that they can be solved without fundamental changes in present values or patterns of production and consumption.

Dobson (1990, p. 36) went on to argue, from his green political ideology perspective, that environmentalists “typically believe that technology can solve the problems it creates” whereas ecologists “argue for the intrinsic value of the non-human environment”. He saw the Green political movement not as what most people understand it as, that is a managerial approach to the environment within the context of present political and economic practices, but as concerned with dismantling *industrialism*.

Like O’Riordan, Graham Dunkley (1992) saw political environmentalism as having many forms. He provided yet another perspective on the various theoretical approaches to environmental problems and solutions - from blue to red to light green to dark green to green/red - and argued for a mix of red and green concepts as providing the most suitable basis for sustainable socio-economic systems.

Sadly, despite the hopes of the late 1980s/early 1990s that a greening of society was imminent, we still seem to be a throwaway society (Miller 1990) as we have not been able to relearn to distinguish between our unlimited wants and our true needs and learn to live responsibly and sustainably. This is very evident in a recent report from the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (2019, p. IX) on the lack of progress towards the SDGs in the Asia Pacific region, particularly Goal 12 but also 10 other SDGs:

Little progress has been [made] towards ending hunger (Goal 2), supporting industry, innovation and infrastructure (Goal 9), reducing inequalities (Goal 10), building sustainable cities and communities (Goal 11), combating climate change (Goal 13), protecting life below water (Goal 14) and life on land (Goal 15), or towards supporting peace, justice and strong institutions (Goal 16). For three Goals, the situation has deteriorated. Negative trends have been registered when it comes to providing clean water and sanitation (Goal 6), ensuring decent work and economic growth (Goal 8), and supporting responsible consumption and production (Goal 12).

Thus, 30 years on, we are still operating within O’Riordan’s (1989) accommodationist view, or Dobson’s (1990) environmentalism because society has continued to adopt a managerial approach to environmental problems while playing lip service to working towards sustainable socio-economic systems.

2.3 The Emergence of “Greening Education”

The late 1980s/early 1990s saw much discussion about the greening of education (Greenall Gough 1990, 1991a, b). What was apparent was that the green being referred to was not just about the natural environment but took a broader view of issues, consistent with the preamble and one of the guiding principles for environmental education from the Tbilisi conference recommendations:

Recognizing that environmental education should promote the strengthening of peace, the further relaxation of international tensions and mutual understanding among States and be a real instrument for international solidarity and for elimination of all forms of racial, political and economic discrimination ...environmental education should consider the environment in its totality - natural and built, technological and social (economic, political, technological, cultural-historical, moral, aesthetic) (UNESCO 1978, p. 26, 27).

In one of the earliest articles on greening education, Noel Gough (1987) commented that, up to that time, the attention of the Green movement in education had tended to focus on getting relevant content into the curriculum and the devolution of educational administration. In addition to this chapter, he also wrote about an ecological paradigm for education that was grounded in ecopolitics (Gough 1989) and *Blueprints for Greening Schools* (Gough 1992). This book was a practical guide to

principles, policies and practices for environmental education in Australian secondary schools. Another important book was *Greenprints for Changing Schools* (Grieg et al. 1989) because, like Gough (1992), its text wove together green content, calls for a new paradigm for education, and the need for more participatory and democratic classroom practices.

Around this time, in October 1986, Damian Randle launched *Green Teacher*, as an “international, cross-curricular, radical and practical” journal with an ecological consciousness and emphasising “approaches to education which are *evolutionary, exploratory and participatory*” (Gough 1987, p. 175). The publication of *Green Teacher* moved from Wales to Canada in 1991 where it continues to be published to support educators working with school students.

David Hicks’ (1988) edited collection, *Education for Peace* goes beyond the topic of peace as such and discusses a number of green issues. According to Hicks in the Introduction to the collection, education for peace involves developing the knowledge, attitudes and skills needed in order to explore concepts of peace to enquire into the obstacles of peace (such as violence and war, inequality, injustice, environmental damage and alienation), and to resolve conflicts and explore a range of different alternative futures, particularly ways of building a more just and sustainable world society. Thus, peace is seen as an all-encompassing term which covers numerous green issues.

Many authors argued for a different worldview to inform the curriculum and the whole school. For example, Chet Bowers (1990, p. 72), questioned curriculum priorities in the light of the ecological crisis and the nature of the culture that is contained in the curriculum:

formal education involves transmitting culture to the next generation, the question of whether the culture that is to become the basis of thought and behaviour contributes to a further deterioration of critical life-sustaining natural systems should be basic to any discussion of curriculum policy and practice.

The education in these discussions was seen as more holistic, more human, more socially critical, more participatory and more democratic - that is, the content as well as the learning processes and the school organization should be greener. This education was consistent with the tenets of green politics.

2.4 The Growth of Green Schools’ Movements

While the exact origins of the term “green schools” is elusive, the key ideas underlying what we now recognise as green schools come from the report of the World Commission on Environment and Development (Brundtland 1987) which promoted the principles of

- Maintaining biodiversity
- The precautionary principle
- Intergenerational equity
- Environmental cost accounting (Smith 2006; Iwan and Rao 2017).

These ideas were expanded upon at the 1992 United Nations Conference on Environment and Development, also known as the Earth Summit, from which *Agenda 21* (United Nations 1993) was the program of action.

As discussed in Chapter 1, the first green schools' programs were inspired by the recommendations from the 1992 Earth Summit. Nicole Andreou (in this volume, Chapter 3) explains the history of Eco-Schools and how the program was inspired by Chapter 25 of *Agenda 21* which made specific reference to the involvement of youth in environmental protection and the promotion of economic and social development. The Eco-Schools program was developed by the Foundation for Environmental Education as the tool for long-term implementation of youth and educator engagement and active participation in decision making, mobilisation and awareness raising related to the environment. The program was piloted in Denmark for 2 years, then launched in 1994 in Denmark, Germany, Greece and the United Kingdom. The program is now present in 68 countries. Many of the stories included in this volume are about or include Eco-Schools programs such as Turkey who joined in 1995 (Taşar in this volume, Chapter 19), Kenya who joined in 2003 (Otieno et al. in this volume, Chapter 14) as did South Africa (Rosenberg in this volume, Chapter 16), and the Western Indian Ocean project (Copsey in this volume, Chapter 22) commenced in 2015.

Chris Eames and Heidi Mardon (in this volume, Chapter 4) discuss how the development of the EnviroSchools program in Aotearoa New Zealand was also a response to calls at the 1992 Earth Summit for education towards sustainability. Inspired by notions of “think globally, act locally” a local government council worked with the local university and three schools to develop a whole school approach which integrated environmental education into all aspects of school life.

The ECOLOG school network in Austria has its origins in the OECD-CERI Environment and School Initiatives (ENSI) project, which commenced in 1986 (Rauch and Pfaffenwimmer in this volume, Chapter 6) and is an international network concerned with educational developments, environmental understanding, and active approaches to teaching and learning, through research and the exchange of experiences internationally (ENSI n.d.). The Austrian ENSI teacher team was commissioned by the Austrian Ministry of Education to design the ECOLOG school network in 1995.

In France, School Agendas 21 was initiated in 1992 as part of the national response to the Earth Summit (Chalmeau et al. in this volume, Chapter 9). Here, like in the Eco-Schools program, emphasis was placed on cooperative approaches, with action plans responding to social, environmental and economic problems identified at the individual school level (transport, consumption, canteen, etc.). France and Germany (Elster in this volume, Chapter 10) also joined the FEE Eco-Schools program in 1994. Turkey joined the Eco-Schools program in 1995 (Taşar in this volume, Chapter 19), as did England (though Northern Ireland, Scotland and Wales joined in 1994) (Lee et al. in this volume, Chapter 20).

The establishment of green schools in China was first mentioned in the “National Environmental Publicity and Education Action Plan (1996–2010) of December 1996”, stating that green schools would be established throughout the country by

2000 (Yu and Lee in this volume, Chapter 8). The Spanish Eco-Schools commenced in 1996 (González-Gaudiano et al. in this volume, Chapter 15), and the Swedish Green Flags Award was introduced in 1996 by Keep Sweden Tidy as a local variation of Eco-Schools (Andreou in this volume, Chapter 3; Gericke et al. in this volume, Chapter 17). The Ontario, Canada Ecoschools program began in 1999 (Bunce et al. in this volume, Chapter 7).

Many other country's green schools' programs started in the early 2000s or later. For example, the Hong Kong Green Schools Award began in 2000 (Tsang et al. in this volume, Chapter 11), and the Australian Sustainable Schools initiative, which commenced in trial form in 2001, was inspired by the ENSI project, Eco-Schools and the Swedish Green Flags program (Larri and Colliver in this volume, Chapter 5). Israel introduced its Green Schools program in 2004 (Tal in this volume, Chapter 13), and Taiwan's Greenschools program was launched in 2006, but this developed from a Sustainable Campus project which commenced in 1999 (Wang et al. in this volume, Chapter 18). In Mexico, there have been several different green schools schemes over the years (González-Gaudiano et al. in this volume, Chapter 15), and the same is the case in the United States of America (Coyle in this volume, Chapter 21) and India where different states and different organisations launched different programs over the years (Sharma and Kanaujia in this volume, Chapter 12).

2.5 Characteristics of Green School Programs

Green school programs in most countries share a philosophy that the program should adopt a whole school approach:

... whole-school approaches are advocated as best supporting the implementation of Environmental Education in a way that reflects the goals, aims, and purposes of this area ... Whole school approaches also appear to be most successful when they build on the existing culture, priorities, and values of schools and their communities. (Bolstad et al. 2004, p. 95)

This approach is a key characteristic of the Eco-Schools program. As Nicole Andreou (in this volume, Chapter 3) explains, Eco-Schools provides the framework for schools to become models for sustainability in their communities. The framework includes reorienting schools towards sustainability, developing environmental policies and strategies, action planning, in-service teacher education, and stakeholder involvement in sustainability decision making. This then involves enhancing green design and encouraging sustainable solutions in the buildings, promoting energy and water saving and the development of waste management systems, promoting green procurement, green transport and healthy living. It also promotes teaching and learning about sustainable development and climate change, as well as the teaching of critical, creative and futures thinking. The aim of Eco-Schools is to empower students to take positive action, develop action competences and enhance their engagement in sustainability initiatives. The Eco-Schools program also aims to help bring together schools, governmental and non-governmental actors and enhance community learning.

However, beyond the Eco-Schools model, what constitutes a whole school approach seems to be interpreted differently in different countries. One of the major differences is whether or not the school community is included in the whole school approach. In Australia, for example, the Sustainable Schools initiative integrates changes to the practical operations of the school, introduces sustainability issues in the curriculum, and helps to build links to local communities as part of an overall school policy on sustainability (Gough 2005, 2006, 2016).

In Taiwan the focus of Greenschools includes protecting the spiritual environment and collective actions by both teachers and students in administration, facilities (greening of school buildings and campuses), curriculum and school life (which includes parents). The emphasis is on ecological thought, humanistic concern, partnership relationship, action learning and resources sharing to develop teachers' and students' environmental literacy (Wang 2009).

Green Schools in China have sustainability as the foundation for implementing their basic education functions including school management, resource usage and developing the environmental literacy of both students and teachers (Centre for Environmental Education and Communications of Ministry of Environmental Protection 2003) using the local environment as a resource. The aim is to create a green culture including developing a green school environment, combining in-class and extra-curricular activities to create a green culture, and fostering students' environmental awareness, resources values and attitudes, and sustainable development concepts through environmental education (Zeng 2004). According to He et al. (2017) schools also play a role in the community to cultivate green culture.

Also common across the various green schools' movements is a concern with water, energy and waste. For example, Eco-Schools promote energy and water saving and the development of waste management systems, and in Australia the four theme areas that are implemented as part of the Sustainable Schools initiative are:

- Waste (waste and litter minimisation, green purchasing, recycling, and composting);
- Energy (energy efficiency, renewable energy, and reduction in greenhouse gas emissions);
- Water (water conservation, stormwater control, and freshwater ecology); and
- School Grounds/Biodiversity (developing a whole school Masterplan which may include Indigenous gardens that attract native butterflies and birds, and special theme gardens and habitats). (Gough 2016)

Several programs, including Eco-Schools, and Green Schools in China (He et al. 2017), are also concerned to promote green living and green consumption – and this aspect complements concern at the international level as reflected in Goal 12 on Sustainable Consumption and Production of the United Nations (2016) Sustainable Development Goals and the UNESCO (2019) *Framework for the implementation of Education for Sustainable Development (ESD) beyond 2019*.

As will be discussed further in Sections 2.6 and 2.7, even though the origins are often in *Agenda 21* and its call for the involvement of youth in environmental protection and the promotion of economic and social development, many, if not most, of the green schools programs, even when labelled “sustainable schools” are mainly

concerned about human relationships with the environment and reducing human impact on the environment, with less consideration of economic and social impacts. This is encapsulated by Syd Smith (2006, p. 12): “An essential component of sustainability is the social or human component that entrusts the responsibility of the care for nature to people. Built into this is the need for a participatory approach that is focused on the social benefits and continuous improvement in quality of life.” That is, they are not engaging with all of the Sustainable Development Goals, but are more aligned with traditional conceptions of environmental education, as espoused in the Tbilisi Declaration (UNESCO 1978), albeit even engaging these in a limited way.

2.6 Green Schools’ Relationship to SDGs and Global Citizenship

Environmental education had been part of the education agenda since the 1970s, through conferences such as the 1972 United Nations Conference on the Human Environment and the 1977 UNESCO Intergovernmental Conference on Environmental Education, and programs such as the UNESCO-UNEP International Environmental Education Programme. However, this all changed in 1992 when the emphasis changed to reorienting environmental education towards sustainable development in *Agenda 21* (United Nations 1993).

Education, including formal education, public awareness and training should be recognized as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. While basic education provides the underpinning for any environmental and development education, the latter needs to be incorporated as an essential part of learning. Both formal and non-formal education are indispensable to changing people’s attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making. To be effective, environment and development education should deal with the dynamics of both the physical/biological and socio-economic environment and human (which may include spiritual) development, should be integrated in all disciplines, and should employ formal and non-formal methods and effective means of communication. (Paragraph 36.3, my italics)

Interestingly, the words they used to describe education for sustainable development in the above paragraph were not very different from the description of environmental education developed by an International Working Meeting on Environmental Education in the School Curriculum of the International Union for the Conservation of Nature and Natural Resources (IUCN) in 1970:

Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision-making and self-formulating of a code of behaviour about issues concerning environmental quality. (cited in Martin 1975, p. 21)

During the 1990s there was much discussion about how environmental education could reorient itself which in many ways has never been resolved, but by the time of the 2002 World Summit on Sustainable Development (United Nations 2002) education for sustainable development was being seen as seeking “to engage people in critical reflection of [sic] current lifestyles and actions and to be able to make informed decisions and changes towards a more sustainable world” (Henderson and Tilbury 2004, p. 8). This change in orientation was seen as redefining the role of schools from being concerned with what to teach children and how they behave to focusing on being a place “where children, adults and the community interact and learn together” and implementing a pedagogy “which sees learners develop skills and competencies for partnerships, participation and action” (Henderson and Tilbury 2004, p. 8).

There were also concerns expressed about the shift from environmental education to education for sustainable development. For example, Helen Kopnina (2014, p. 73) argues that,

In an educational context, ESD replaces a problem orientation associated with environmental education and shifts the focus to the inclusion of social issues and economic development. ESD masks its anthropocentric agenda and may in fact be counterproductive to the efficacy of environmental education in fostering a citizenry that is prepared to address the anthropogenic causes of environmental problem.

Bob Jickling (2005) questions the apparent instrumentalist and deterministic nature of education for sustainable development rather than engaging students in a participatory and metacognitive manner with the meaning of sustainable development. According to Richard Kahn (2008, p. 7),

The next decade will ultimately decide whether education for sustainable development is little more than the latest educational fad, or worse yet, that it turns out to be nothing other than a seductive pedagogical “greenwash” developed by and for big business-as-usual in the name of combating social and ecological disasters.

Stephen Sterling (2016) provided a response. His review of high-level sustainable development reports associated with the post-2015 development agenda indicated that most of them almost invariably underplayed the role of education as a vehicle of social change. He also commented on “the worrying appropriation of education by the managerialist, technocratic and marketization trends of the ‘Global Education Industry’ ... whose priorities hardly align to planetary urgencies” (p. 212). More recently, the Mahatma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP) (2017), has reviewed documents related to SDG 4.7 across 22 Asian countries and concluded that “The countries reviewed generally emphasise the instrumental role of education in fostering national identity and developing human resources for economic development” (p. xviii), so Jickling’s concerns have substance.

The United Nations Decade of Education for Sustainable Development (2005–2014) had as its overall goal “to integrate the principles, values, and practices of sustainable development into all aspects of education and learning” (UNESCO 2005, p. 6). As a result of discussions at the World Summit on Sustainable

Development (United Nations 2002), the notion of sustainable development was much expanded from that in Agenda 21 (United Nations 1993). Sustainability issues were now seen as coming from the three spheres of sustainable development – environment, society and economy.

Environmental issues like water and waste affect every nation, as do social issues like employment, human rights, gender equity, peace and human security. Every country also has to address economic issues such as poverty reduction and corporate responsibility and accountability. Major issues that have grabbed global attention such as HIV/AIDS, migration, climate change and urbanization involve more than one sphere of sustainability. (UNESCO 2005, p. 7)

These concerns were then reflected in the Millennium Development Goals, which were endorsed at the United Nations 2012 Conference on Sustainable Development and then continued into the 2030 Agenda for Sustainable Development (United Nations 2015) and the associated Sustainable Development Goals (United Nations 2016). The most recent education response to this agenda is the UNESCO (2019) *Framework for the Implementation of Education for Sustainable Development Beyond 2019*. The 2030 Agenda resolves “to end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of the planet and its natural resources” (United Nations 2015, p. 4) and offers a philosophical and analytical framework for educational enquiries in which the “5 Ps” (people, planet, prosperity, peace, and partnership) are the important principles, and must be considered in relation to one another. In many ways these principles are very similar to pillars of the Green Party discussed earlier in this chapter.

Sustainable Development Goal (SDG) 4 is concerned with education: “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (United Nations 2016), and target 4.7 is concerned with education for sustainable development – which is seen as having the ultimate aim of reorienting societies towards sustainable development. Education is also explicitly linked with other goals in one way or another, including SDG 3 on Health and Well-being, SDG 5 on Gender Equality, SDG 8 on Decent Work and Economic Growth, SDG12 on Responsible Consumption and Production, and SDG 13 on Climate Change Mitigation (Hopkins and Kuhl 2019). Interestingly, from an environmental education perspective, there are no explicit links between education and either SDG 14 on Life below Water or SDG 15 on Life on Land, which would have been high on an environmental education agenda concerned with caring for the environment, and a green schools’ agenda. Sterling (2016, p. 210) made a similar observation: ‘education’ as a means of implementation “was largely absent or seen as having least importance in reports and literature preceding the launch of the SDGs”. Yet what is needed is an education for these extraordinary times which “can manifest a culture of critical commitment—engaged enough to make a real difference to social–ecological resilience and sustainability but reflexively critical enough to learn from experience and to keep options open into the future” (Sterling 2016, p. 212).

What green school movements do share with the SDGs is a desire for a more sustainable future and to transform education through a whole school approach – changing both the content and pedagogy as well as school operations and community involvement. Both SDG 4 and green school movements are concerned with implementing quality education, which some would see as just good environmental education. In particular, in the Eco-Schools program, SDGs are seen as a key tool for the implementation of the program and Eco-Schools are a key vehicle for the achievement of the SDGs (Andreou in this volume, Chapter 3).

Green school movements also share a concern with developing global citizenship. As I have discussed elsewhere (Gough 2018), global citizenship has been part of environmental education since its earliest formulations – as reflected in “Think globally, act locally”, the mantra that came from the first Earth Day, 22 April 1970. Global citizenship, sustainable development and education reform were integral to the Belgrade Charter Framework for Environmental Education (UNESCO 1975, pp. 1–2), as reflected in the statements that “It is absolutely vital that the world’s citizens insist upon measures that will support the kind of economic growth which will not have harmful repercussions on people – that will not in any way diminish their environment and their living conditions” and “The reform of educational processes and systems is central to the building of this new development ethic and world economic order.” Global citizenship was also mentioned in the Johannesburg Declaration on Sustainable Development (United Nations 2002, p.1), which states “[w]e commit ourselves to building a humane, equitable and caring global society, cognizant of the need for human dignity for all”. More recently, the UNESCO (2019) *Framework for the Implementation of Education for Sustainable Development Beyond 2019* brought together ESD and global citizenship education:

ESD and Global Citizenship Education (GCED) are at the core of SDG 4 Target 4.7, which aims to ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development. (Annex II, p. 3)

The global citizenship goals that are encompassed by most green school movements at the moment are, however, only sampling some of the aspects quoted above. The Eco-Schools framework does emphasise the development of social skills that help understand rights and responsibility, and teaching and learning includes integrating conservation, social justice, development, democracy and social change (Andreou in this volume, Chapter 3). Indeed, the Kenyan Eco-School examples provided by Otieno et al. (in this volume, Chapter 14) clearly demonstrate engagement with sustainable lifestyles, human rights, gender equality and appreciation of cultural diversity.

A great opportunity that green school programs afford to students is the potential to contribute to them developing a disposition to be active citizens, by getting the opportunity to be, even on a small scale, agents of change and thus work towards becoming global citizens. The overall philosophy of a whole school approach to sustainability has the potential to reform and transform education in schools, but

there are many challenges, the greatest of which may be whether to continue to align with the SDGs, or accept that they are about environmental education - adopting emancipatory goals, providing opportunities for people to be empowered to continuously explore their environment, circumstances, and their own identities in order to confront the uncertainty and complexity of environmental issues they will encounter in the future (Wals and Dillon 2013).

2.7 Conclusion

As discussed in this chapter, there is political support for the greening of education in its broadest sense from the Sustainable Development Goals (United Nations 2016) but this is not necessarily followed through by national governments who do not make education for sustainable development a priority, which can marginalise the activities of green school programs in many places. Despite this, green school programs continue to proliferate and expand, and students continue to be keen to relate to their environments. There is much potential for transforming education through the green school programs, and for transforming society.

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Chapter 3

Towards a Generation of Sustainability Leaders: Eco-Schools as a Global Green Schools Movement for Transformative Education



Nicole Andreou

Abstract Eco-Schools is a global Education for Sustainable Development (ESD) programme, developed in 1992 as a response to the UN Conference on Environment and Development. Adopting the Seven Steps Methodology and the Whole Institution Approach (WIA), students embark on a journey towards sustainability, where environmental concerns addressed in the school curriculum are also reflected in everyday non-formal learning practices (Shallcross 2003). In 2003, the United Nations Environment Programme (UNEP) identified Eco-Schools as a model initiative for ESD, recognising the impact of its methodology on building sustainable communities.

This chapter explains the transformative nature of Eco-Schools and how this has helped to build a mechanism to shape attitudes and behaviour. The Eco-Schools' network illustrates not only that issues are global, but also that they can be tackled by using the same Seven Steps framework as a pedagogy, which drives the programme and works as a quality education assurance mechanism. The chapter outlines the history of the Eco-Schools programme, its current status, including challenges and responses. Notwithstanding, it will most importantly touch upon the foundations of its framework to describe how multi-stakeholder engagement, reorienting school curricula, participation and critical thinking, experiential learning and empowerment are the key components in developing a global green schools movement.

N. Andreou (✉)

Foundation for Environmental Education, Copenhagen, Denmark

e-mail: nicole@fee.global

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3.1 The Era of Education for Sustainability

In the climate change age, where short-term human activity has a long-term impact on society and the environment, education is intrinsically important – more than ever. There is a need for educational and academic processes to move away from unsustainable practices and learning methods, towards transformative, quality education. Students and teachers need to be able to deal with changes and complexity, as well as be confronted with uncertainty (Peters and Wals 2016). Only then we can ensure the long-term capacity of our societies to turn around the most threatening sustainability challenges of our time.

Stephen Sterling (2004), in identifying the main responses to sustainability – denial, bolt-on, built-in and whole system redesign – suggests that the latter implies a very strong sustainability transition and a “deep, conscious reordering of assumptions which leads to paradigm change” (Sterling 2004, p.58). Transgressive learning reflects this paradigm shift and suggests a need to critically assess and challenge concepts related to environmental education, as well as the way educators discuss new knowledge that is adapted to local settings with an eye on global issues.

3.1.1 *A Global Green Education Movement*

Eco-Schools, a global Education for Sustainable Development programme owned by the Foundation for Environmental Education (FEE), has since its launch brought forward a new way to deal with learning inside and outside the classroom. It has brought environmental problems closer to students in a very simple way – it has encouraged them to identify them themselves. Through experiential learning and a curriculum that includes such issues, behaviour change among Eco-Schools students towards sustainable practices is reported to be high (Litter Less Campaign Report 2017).

Transformative and transgressive learning are integral parts of the Eco-Schools framework. Developing different student initiatives as a result of their own effort instils the feeling of ownership and belonging among students. By allowing a deep understanding of environmental and social issues on the school grounds and surrounding school community, students are able to critically assess their current footprint and make informed decisions about their course of action to minimise it. The knowledge introduced in the formal curriculum on environmental challenges, be it the concept description or the historical and philosophical background (Wals and Benavot 2017) or the sociopolitical relevance, equips students to act. Through Eco-Schools, this knowledge is applied and observed in real-life situations and helps identify solutions.

3.2 History of Eco-Schools

FEE is a non-profit NGO, born in 1981 in Leiden, Netherlands. Its first programme, Blue Flag, came about in 1987 and is currently an eco-label for beaches, marinas and sustainable boating tourism operators. In 1994, FEE launched Eco-Schools and Young Reporters for the Environment (YRE). YRE is the second largest ESD programme of FEE, encouraging youth from 11 to 26 years old to research environmental and social issues and propose and disseminate solutions through investigative journalism. Learning about Forests (LEAF) was born in 1996 as a Swedish initiative which was later adopted by FEE as an international programme. It promotes outdoor learning and helps reconnect children with nature through hands-on experiences. In 2003, FEE adopted Green Key, an eco-label developed by the Danish Outdoor Council for sustainable accommodation in the tourism and business industry. FEE is currently present through member organisations implementing its five programmes in over 77 countries globally.

For 25 years, Eco-Schools, starting in Europe and expanding to all six continents, has encouraged students around the world to contribute every day to improving their local communities and our global sustainability challenges. Eco-Schools was developed in 1992 as a response to the UN Conference on Environment and Development in Rio de Janeiro. Chapter 25 of the United Nations Agenda 21 document, which was an outcome of this conference, made specific reference to the involvement of youth in environmental protection and the promotion of economic and social development (United Nations 1992). In response, FEE developed the Eco-Schools programme as the tool for long-term implementation of youth and educator engagement in the active participation in decision making, mobilisation and awareness raising on the environment (Pirrie et al. 2006). The Eco-Schools programme was piloted for 2 years in Denmark and was thereafter officially launched in Denmark, Germany, Greece and the United Kingdom in 1994, becoming the second FEE programme, after Blue Flag.

In 2003, UNEP identified Eco-Schools as a model initiative for ESD, through a Memorandum of Understanding (MoU) with FEE. The MoU recognises the impact of the Eco-Schools' Seven Step methodology on learning for sustainability. Boeve-de Pauw and Van Petegem (Boeve-de and Van Petegem 2017) also report that participating in the programme has an educational impact on students. Celebrating Eco-Schools' 25th anniversary in 2019, the programme is currently present in 68 countries, involving 19 million students and 1.3 million teachers in over 60,000 schools globally (Table 3.1) (Fig. 3.1).

The Eco-Schools programme international coordination was for most of the time located in Portugal, until the FEE unification in 2012, when all FEE programmes moved to Copenhagen, Denmark for more effective collaboration and administration.

In September 2010, FEE was admitted as 'NGO in official relations with UNESCO, on the basis of its operation within Education for Sustainable Development', and in 2015 the organisation was invited by UNESCO to become a

Table 3.1 When country member organisations joined Eco-Schools (Sharma et al. 2019)

Launch year	Country
1992	Denmark (pilot in 1992, launch in 1994)
1994	France, Germany, Northern Ireland, Scotland, Wales
1995	England, Greece, Turkey
1996	Bulgaria, Portugal, Slovenia, Spain, Sweden
1997	Ireland
1998	Croatia, Cyprus, Finland, Italy, Norway
1999	Romania
2001	Iceland
2002	Malta, Russia
2003	Kenya, Latvia, Netherlands, South Africa
2004	Lithuania, Slovakia
2005	Czech Republic
2006	Morocco
2007	FYR Macedonia
2008	Belgium, Brazil, Dominican Republic, Japan
2009	Bahamas, China, Jordan, Uganda, USA
2010	Iran
2011	Malaysia, Mongolia
2012	Serbia, UAE
2013	Singapore
2014	Australia, Bermuda, Ghana, India, Poland
2015	Tanzania
2016	Estonia, Montenegro, Switzerland, Thailand, Ukraine, US Virgin Islands
2017	Comoros, Madagascar, Mauritius, South Korea, Zanzibar
2018	Qatar
2019	Canada, Chile, Bosnia & Herzegovina
2020	Burundi, Georgia

member of “Priority Action Area 2: Transforming learning and training environments” Partner Network of the Global Action Programme (GAP) on ESD. Also in 2015, Eco-Schools was launched in six Indian Ocean States through a European Union funded project entitled ISLANDS. Madagascar, Comoros, Mauritius, Rodrigues, Seychelles and Zanzibar participated in the Eco-Schools programme as Small Island Developing States, represented by one coordinator in the Indian Ocean Commission based in Mauritius.

In 2017, Eco-Schools England on behalf of Eco-Schools International started twinning Eco-Schools around the world to be able to share experiences and develop joint initiatives on the Sustainable Development Goals. Due to limited resources the project currently runs between Eco-Schools in the UK and Ireland and other interested schools around the world through the National Operators. To date, it involves 440 schools, able to twin with 8000 Green Flag schools in the UK and Ireland.

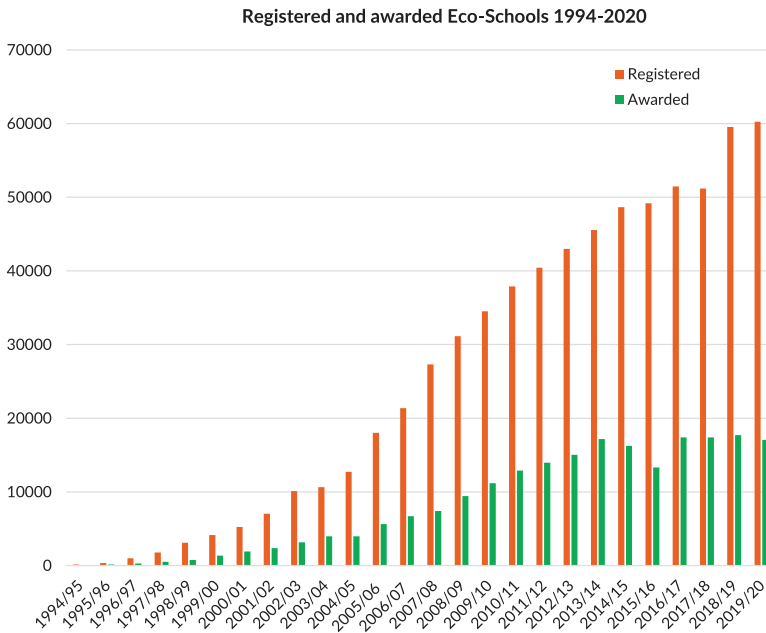


Fig. 3.1 The growth of registered and awarded Eco-Schools

3.2.1 The Story of the Eco-Schools Logo

When the programme was launched in 1994, it ran a logo competition for Eco-Schools, for an image that would visualise environmental school education and student involvement. The winning entry formed today’s logo with people as the centre of the programme, who are responsible for greening the future. This is symbolised by the flowers growing from the central person’s arms. The flowers symbolise both the environment that shelters and protects humans, as well as the knowledge gained by students who participate in the programme and whose actions help develop values, attitudes and behaviour towards the environment (Fig. 3.2).

The book in the logo represents schools and knowledge, with two different pages; the blue page represents the past, the history that one needs to familiarise with and the problems in society already created and need to be dealt with. The white page represents the future, a blank page to be filled with new knowledge and innovative experiences (adapted from National Wildlife Federation 2016).

Fig. 3.2 The Eco-Schools logo



3.3 Eco-Schools Methodology as a Tool for Transformative Education

To understand the Eco-Schools Methodology, one first needs to understand the FEE structure (FEE 2017). FEE is an umbrella of member organisations that are non-profit. As per FEE's rule, only one Associate/Full member organisation is admitted per country and, as part of the application supporting documentation, all members need an endorsement from their national Ministry of Education/Environment. Member organisations have full license to run any of FEE's ESD programmes – Blue Flag, Eco-Schools, Green Key, Learning about Forests and Young Reporters for the Environment.

Once an organisation is admitted and expresses interest in running Eco-Schools, they need to submit a 3-year and a 1-year implementation plan, as proof of implementation feasibility. When a member organisation is ready to launch the programme, a National Operator is assigned to lead the programme nationally. Teacher training workshops take place for interested schools, and following that, schools can register and receive more support and the necessary resources to get started with the programme. There is continuous communication between school coordinators and the National Operator, who simultaneously reports to the international coordination. After 2 years of implementing the programme, schools can apply for the Green Flag award, which would certify a high level of performance and compliance with the Seven Step framework. Schools are assessed by the means of a visit, which determines whether certain standards are met.

Based on a Project Based Learning (PBL) structure and a whole school approach, the Eco-Schools Methodology was developed as a learning cycle and a framework for students. It does not dictate actions but guides youth through a learning process where they become agents of change. The Seven Step framework is proved to be flexible and adaptable to different country contexts, and it provides the means for a grassroots approach on learning of and for the Sustainable Development Goals (SDGs) (United Nations 2016); it equips students with the structure, themes,



Fig. 3.3 Eco-Schools seven step framework

timeline and indicators to work with and achieve SDG targets. Students are, through positive actions, inspired to work collaboratively and involve communities in sustainable solutions through deep learning opportunities. “These opportunities help in the development of the skill of problem-solving that is an amalgamated outcome of being able to do an enquiry or ask critical questions, critical analysis, reflection and having a vision for a future shaped through individual and collective action” (Sharma and Andreou 2018). The SDGs, encouraging positive action at all stakeholder levels, are a key tool for the implementation of Eco-Schools; and vice-versa, Eco-Schools are a key vehicle for the achievement of the SDGs (Fig. 3.3).

The cycle, aligned with Bloom’s taxonomy, starts with the formation of an Eco Committee, that comes together democratically to lead and govern the process. The Eco Committee members are at least 50% students, and the rest is a combination of teachers, parents, school management staff, catering and procurement staff, cleaning staff or other volunteers from the school community. This ensures a small scale multi-stakeholder involvement in the Eco-Schools activities, as well as the opportunity for students to consult with adults and immediately secure resources to carry out their plans. This approach is consistent with Wals and Benavot’s (2017)

argument that, for education to better support sustainability, people in different positions who embrace the idea of transformation are encouraged to act.

The first activity taken up by the Eco Committee is carrying out an Environmental Review, which creates knowledge on the current status of school activity across a number of environmental and social themes provided by National Operators. These themes may vary in different countries, however, they all follow the general list provided by the Foundation for Environmental Education.

This helps to identify the key areas that the Eco Committee will have to focus on, by choosing the themes on which the school underperforms and there is most space for improvement. They then address the key areas in a Specific, Measurable, Attainable, Relevant and Time-Bound (SMART) Action Plan, where they have to describe the topic area, define indicators of success, the action points or activities to achieve them, as well as a clear timeframe. This step helps understand problems and the ways to tackle salient issues both related to the school building performance and the school community, which can be adjusted along their implementation. The 2015 UNEP report on sustainable production and consumption supports the view that transformational skills and a 'trial and error' approach are vital in educational contexts. The Eco Committee is also responsible for monitoring the progress of action plan target activities, which enhances their analysing skills. This allows for an evaluation of the project overall and allows space for adaptation and reconsideration.

Linking Eco-Schools to the school curriculum is not only about curriculum ESD content, but a reflection of a whole school project incorporated in all levels of school functions (Wals 2012). Outdoor learning is an integral part of the programme's approach. It helps students better understand their surroundings and nature, as well as enter an experiential learning vicious circle, where class lessons are observed in nature, and nature encounters are discussed and explained back in class. Once students are able to understand sustainability – because they have seen it with their own eyes – they are able to lead a process for redesigning school activities (be it towards energy efficiency, sustainable procurement, etc.) or curricula with issue salience at the centre.

The lessons of Eco-Schools also highlight that those who create the ecological footprint need to have opportunities to reflect and understand what it means to be part of the environment, the effects one has in all the different interconnected cycles and biomes of life and to be involved in and in control of remedial action or proactive measures.

Ultimately, Eco-Schools are a process that becomes a way of life, a cultural paradigm for school administrators to master through delegation and a belief in their teachers' and students' capacity to change the school from the ground up. (Wals 2012, p.72)

In developing their communication skills, Eco Committee members should also ensure the continuous Informing & Involving of the rest of the student community, their parents, teachers, school management, the local authorities and press when possible.

The seventh step, producing an Eco Code, involves the creation of a statement that reflects the school's commitment, not only to the environment but also to the effort put in the project. The aim of developing an Eco Code is to produce a message

for sustaining the Eco-Schools activities and improvement plans, and it is adopted by everyone in the school community. The Seven Steps order outlined above is the most common one and the one provided by the international coordination. Going back to Bloom's taxonomy, one can argue that only when students understand, apply, analyse and evaluate their Eco-Schools projects are able to create something, based on the new knowledge they gained through experience and first-hand exposure to an environmental issue.

3.3.1 Whole Institution Approach

The uniqueness of the Eco-Schools programme, compared to other sustainable/green school programmes, will always be the fact that its success is deeply rooted in a whole school approach. Wals (2010) describes it as a 'hybridity' of actors that create space for transformative learning. The ability of the programme to involve different stakeholders allows for sustainability infusion in different layers of a school system; student behaviour at school and at home, the curriculum, school management, infrastructure, catering, the involvement of the surrounding community, etc. In 'Can we meet the sustainability challenges? The role of education and lifelong learning', under the chapter 'Transforming Schools to Meet Environmental Challenges: The Whole Institution Approach', Wals and Benavot (2017) recognise Eco-Schools as a programme that "supports the quality of 'whole-of-institution' approaches to sustainability in primary and secondary schools by providing a programme of resources and certification standards" (p.410).

Eco-Schools includes a number of whole-institutional approach components, as identified by UNESCO's guide for schools on climate action (UNESCO 2015). For instance, when it comes to school governance, Eco-Schools provides the framework for setting up a sustainability team, developing environmental policies and strategies, action planning, in-service training on ESD through teacher training, reorienting schools towards sustainability, and stakeholder involvement in sustainability decision making. In reference to facilities and operations, Eco-Schools become models for sustainability in their communities, enhance green design and encourage sustainable solutions in the buildings, promote energy and water saving and the development of waste management systems, promote green procurement, green transport and healthy living. As regards teaching and learning, sustainable development and climate change are promoted and supported by Eco-Schools, as well as the teaching of critical, creative and futures thinking. Eco-Schools empower students to take positive action, development action competences and enhancing engagement in sustainability initiatives. As to community partnerships, Eco-Schools help bring together schools between them, governmental and non-governmental actors and enhance community learning (UNESCO 2015).

3.4 The Impact of Eco-Schools on Education for Sustainable Development

The great added value of the Eco-Schools programme and the fact it has become a large global school movement is that it can be used as a vehicle for Education of Sustainable Development and for Sustainable Development.

Through the different interpretations of and activities around the Eco-Schools Themes, students participating in the programme are already contributing to the Sustainable Development Goals targets – be it through water or energy savings, anti-waste or biodiversity projects. Looking at these themes through a global citizenship lens, they also develop a number of social skills that help understand rights and responsibility. Teaching, but most importantly learning that takes place through integrating conservation, social justice, development, democracy and social change helps implement ESD in schools (Gough 2006), and Eco-Schools helps facilitate this.

The Eco-Schools programme addresses ESD key focus areas (UNESCO 2011) through the promotion quality of education – by improving teaching/learning processes, methods and materials and providing an opportunity for all to benefit from context-specific learning. It helps develop public awareness and understanding sustainability through experiential learning and sensitisation about one's surroundings. Through community participation, community and school partnerships are formed that support further stakeholder involvement. The programme helps reorient education to include sustainable development across all curriculum areas and supports capacity building of educators in ESD through training in policy and curriculum and resource development, sustainability project management and partnership building for establishing and strengthening government and civil society involvement.

3.4.1 *Quality Benchmarks for a Growing Movement*

A continuous exercise for the global Eco-Schools network is to consolidate and expand quality assurance, which will ultimately ensure more sustainability standards for all Green Flag awarded Eco-Schools across the implementing countries. Some of the standards currently in place include (Table 3.2):

The above mentioned are benchmarks for each and every school participating in the network. The need for these standards stems from the need to understand ESD and identify practical ways to implement it. Behind every standard, there is a student involvement element that connects to experiential learning, engagement, critical thinking, rethinking and a reorientation of curricula. Such educational impact is crucial for the Eco-Schools green movement to grow.

Following the *Eco-Schools Handbook for National Operators* (FEE 2017), the Eco-Schools programme is meant to enhance the school curriculum to better integrate sustainable development education, help schools link to their local

Table 3.2 Green Flag application performance indicators

Seven steps	Standard performance indicators
Step 1: Eco Committee	Students make up more than 50% of the Eco Committee members.
Step 2: Environmental review	Initial surveys are carried out to establish accurate baselines.
Step 3: Action plan	The Action Plan lists specific goals for the reduction of environmental impacts as identified in the Environmental Review and includes goals which are SMART.
Step 4: Monitor & evaluate	The school demonstrates progress in several large-scale projects, addressing at least three Eco-Schools Themes. For each Theme, the school understands the issues, recognises the value of sustainable development and has implemented change.
Step 5: Link to the curriculum	Students develop knowledge, skills (e.g. decision-making) and attitudes through real-life, engaging activities in the curriculum. They are empowered to be change agents for the solving of environmental issues in school or the community.
Step 6: Inform & involve	The whole school is informed about and participates in school-wide Eco-Schools activities which are held at least once per term.
Step 7: Eco Code	The Eco Code is reviewed annually to ensure that it remains relevant. The whole school is involved in this review.

communities, improve school finances by improving efficiency, provide a framework for a multi-stakeholder collaboration and increase student leadership. According to an Ofsted (2008) sustainability report referring to Eco-Schools England, the programme implementation had an overall positive impact on students' environmental attitudes and behaviour and led to practical improvements, such as a decrease of litter, which reflected "increasing care for the environment" (p.12).

In the City of Edinburgh Council's report (2009), the Transport, Infrastructure & Environment Committee highlights that the Eco-Schools programme 'raises awareness in schools and the wider community of the need to respect the environment. It also highlights the increasing contribution schools make to Edinburgh becoming a cleaner, greener, safer and more sustainable city' (p. 4).

Turning the lens on a different continent and context, the Danish Outdoor Council (2017) report on the performance of the Eco-Schools programme in Malawi, Uganda and Tanzania underline the impacts on the programme on a number of issues. Firstly, parents of students in Eco-Schools projects seem to actively engage with the programme by adopting and embracing school micro-projects at home. Since the introduction of Eco-Schools parent and teacher training on children's rights have improved both student attendance and performance. Although not always common among all implementing countries, Eco-Schools in Uganda receive technical and financial support from CECOD, the implementing organisation in Uganda. This facilitates teacher and student training on school projects. School farming and kitchen installations as a result of Eco-Schools projects have provided

an opportunity for free school lunches, and ultimately better performance and higher quality of learning. In addition, the installation of water tanks allows for harvesting rainwater, and the use of energy saving stoves has already reduced the amount of firewood by approximately 50% in Ugandan schools. Finally, a decrease in dropout rates and a boost on teacher knowledge have been observed, along with a stronger connection with the community and government officials have been observed in Eco-Schools in Malawi, Uganda and Tanzania (Danish Outdoor Council 2017).

Some of the challenges for the Eco-Schools programme globally is their institutionalisation (also identified in Danish Outdoor Council's (2017) report). 57% of the implementing organisations of the Eco-Schools programme receive institutional support from their national governments. In a few cases, the support extends to finances. However, there is still a significant number of national Eco-Schools programmes that, although endorsed by government, still have not created direct links and do not utilise the opportunity to collaborate on the implementation of SDGs targets.

Programme management at the school level has been raised as a context criticism by Lysgaard et al. (2015), and it is an acknowledged challenge. More often than not, the Eco-Schools programme is introduced to the school by a Science teacher, as part of the syllabus on ecology. Lysgaard et al. suggest that the programme becomes "disintegrated" from other disciplines, as well as the teaching staff within them (Lysgaard et al. 2015). However, the more the student-led Eco Committee works on involving the different layers of the school community, the more this issue is being tackled with and more disciplines are invited to join in; and they develop the programme to extend in all directions.

3.4.2 A Landmark General Assembly

Capacity building, monitoring and evaluation as well as research on impact assessment are other areas that need strengthening within the programme. FEE structures currently in place, as well as ones in progress, are attempting to deal with such issues in all five programmes, e.g. FEE's mentoring scheme, annual membership evaluation, online resource centre, etc. FEE is also launching the FEE University tool, which aims to better equip member organisation staff with operational knowledge and provide professional development opportunities through the means of technology.

At the FEE General Assembly 2018 in Riga, Latvia, Eco-Schools Global reported on the progress of the strategic objectives and planned activities for 2018–2020. Since its launch in 1994, the Eco-Schools programme has evolved to progressively embed the concept of sustainability into school life. Strategically, the programme is entering a new era, with a lot of the focus on the development of regional networks between organisations implementing it, stronger positioning within ESD, the further expansion and development of its third-level education section – FEE

We, the National Operators of the FEE Eco-Schools Programme participating in the National Operators Meeting gathered here in Cork, Ireland in November 2018 at the launch of its 25th year are:

Determined to

- a. Ensure the Eco-Schools programme continues to develop and grow in every country around the world, and helps them to address the Sustainable Development Goals through positive actions
- b. Ensure the programme continues to develop in all educational settings, (at the primary, secondary as well as at the tertiary level as the Eco-Campus programme, and also to develop with the transition to, and needs of, life-long learning)
- c. Ensure that every National Operator has the support and mentorship to make these happen

We Recognise That

- a. Climate change and associated climate breakdown is the biggest existential crisis for all humanity
- b. The over-exploitation of our land resources, seas, and particularly plastic pollution, is in itself at a crisis point
- c. The loss of biodiversity is at mass extinction levels and is severely threatening the ecosystem services that support life on earth
- d. The environmental issues are closely linked to the social, economic and cultural aspects of our society

We Acknowledge That

- a. Education, and particularly the Eco-Schools programme, is a key hope to meeting, mitigating and adapting to these challenges as well as many others
- b. The Sustainable Development Goals provide an excellent framework and context to this education
- c. It is never too late to learn and affect positive change

We Reaffirm Our Commitment To

- a. Supporting and mentoring all educators everywhere to undertake the Eco-Schools programme
- b. Working with any and all applicable stakeholders to increase the reach and impact of the Eco-Schools programme at a local, regional, national, and global level
- c. Support each other as National Operators through the sharing of experiences, research, exchange of best practices, evidence of educational outcomes, and peer-to-peer learning

We Are Convinced That

- a. The Eco-Schools programme has a meaningful and sustained impact, both in Quality Education as well as environmental engagement and outcomes
- b. Due to its bespoke structure and nature, the Eco-Schools programme allows for and delivers this impact in every setting and context
- c. The Eco-Schools programme plays an essential role in developing 21st century skills
- d. The Eco-Schools programme is one of the most essential elements of a sustainable future for all

So Declared, This 22nd Day of November 2018

Fig. 3.4 Eco-Schools 25th anniversary declaration (FEE 2018)

EcoCampus, and a solid framework for the implementation of the Sustainable Development Goals.

3.5 Conclusion

This chapter has outlined the foundations of the Eco-Schools; its historical origins, methodology, connections and impacts on the implementation of ESD on a global scale. The mechanism that drives Eco-Schools, as well as its main component – students, teachers and schools around the world – have certainly created a platform for sustainability education from below. For the programme’s 25th anniversary, Eco-Schools is looking at past challenges as well as innovative developments to help strengthen a global green youth movement.

At the 2018 Eco-Schools National Operators Meeting in Cork, Ireland, a 25th anniversary declaration was signed as a commitment to growth and empowering young people to take positive actions for a sustainable future (Fig. 3.4).

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Part II
Country Stories

Chapter 4

The Enviroschools Programme in Aotearoa New Zealand: Action-Orientated, Culturally Responsive, Holistic Learning



Chris Eames and Heidi Mardon

Abstract The Enviroschools Programme has been operating in Aotearoa New Zealand schools since the late 1990s (Enviroschools 2016). Responding to calls at the 1992 Earth Summit for education towards sustainability, it began as a local government and community partnership initiative focused on empowering young people to be capable of thinking and acting for a sustainable future. Its distributed leadership model of central direction with local delivery has both enhanced its survival through political change, and provided scope for local contexts to guide delivery and interpretation. Underpinning the Programme has been a kaupapa (purpose/philosophy) of action-learning, a cultural responsiveness which particularly draws on perspectives from the indigenous Māori world, and which sees whole schools as connecting to communities and the environment.

There are currently 1200 schools and kindergartens involved in the programme throughout the country. Programme evaluation suggests outcomes in citizenship, environmental and educational enhancement, social and cultural development and integration of sustainability into economic planning. Enviroschools also report substantial positive influence on interaction with families and the wider community, as well as improvements in the sustainability of the physical environment. The Programme continues to grow within the constraints of fluctuating political support and funding. This chapter discusses how a strong kaupapa has contributed to the success of Enviroschools and the range of outcomes in community and environment.

C. Eames (✉)

Waikato University, Hamilton, New Zealand
e-mail: c.eames@waikato.ac.nz

H. Mardon

Toimata Foundation, Hamilton, New Zealand
e-mail: Heidi.mardon@toimata.org.nz

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4.1 Kōrero Whakataki/Introduction

In Aotearoa New Zealand, all things, including people, *whakapapa* (relate) back to Ranginui (the sky father) and Papatūānuku (the Earth Mother) (see Fig. 4.1) and have relationships with the environment in a deep and meaningful way, such as in the *whakatauki* (proverb), *Ko au te whenua, ko te whenua ko au* (I am the land, the land is me)!

This worldview, held by Māori, the indigenous people of Aotearoa New Zealand, understands humans as an intrinsic part of the environment, in which people live in harmony with their ecosystems. For hundreds of years, indigenous peoples in many lands have done just that, and being an intrinsic part of the environment they had *tikanga* (protocols) that honoured all aspects of the environment. Resources such as clean water, food and materials for shelter were harvested for the survival of all species and health of the whole environment. The *tikanga* reflected the connection with the environment and were therefore sustainable. However, the onset of colonisation, industrialisation and new urbanised ways of living began to sever that connection with the natural world and as the human population grew, our impacts on ecosystems became obvious.

In the 1960s, a globally awakening consciousness of what indigenous peoples already knew, led to calls internationally to reduce these impacts (Carson 1962), and in Aotearoa New Zealand, the first environmental protest in the early 1970s led to the prevention of a hydroelectric project that would have drowned a lake and its surrounding native forest (Wilson 1982). By this time, significant ecosystem degradation in this country had included slaughter of marine mammals, clearance of vast swathes of native forest and drainage of 90% of existing wetlands.



Fig. 4.1 Ranginui and Papatūānuku. (Reproduced with permission from Toimata Foundation)

The Earth Summit of 1992 in Rio de Janeiro provided a key opportunity to address these challenges, and government and community representatives promulgated *Agenda 21*, a blueprint for a more sustainable world (UNCED 1992). A critical response to these challenges was claimed to be education, education for how we might regain our connection to the Earth! Amongst the delegates at the Earth Summit was a group of Hamilton City Councillors who upon their return to Aotearoa New Zealand began a pilot eco-school programme with the help of the University of Waikato in Hamilton. This pilot developed into the Enviroschools Programme.

4.2 Nō hea Enviroschools? Where Did the Enviroschools Programme Come from?

The initial collaboration of Hamilton City Council, the University of Waikato and three schools prepared the ground to pursue *Agenda 21*'s call to "think globally and act locally". Considering the multidimensional and holistic nature of what was called environmental education (EE) (Tilbury 1995), the collaborators focused on developing a whole school approach (Henderson and Tilbury 2004) in which EE could be integrated into all of school life. Heidi Mardon was appointed as Environmental Education Officer at the Hamilton City Council in 1997 and she began working with interested schools whose passionate and innovative teachers were already engaging their students in native planting and waste reduction projects. Heidi and the teachers began trialling school mapping, experiential activities and student-centred design and decision-making tools. These latter tools helped EE move away from being adult-led to empowering students to address problems of their own interest, guided by creative and motivated teachers who could facilitate students to design projects and carry out actions. The schools involved became the first 'Enviroschools' in the Enviroschools Programme.

The importance of integrating indigenous perspectives into EE was recognised early on by the Enviroschools Programme developers. This integration was a response to the domination of a European colonial history in the 1800s which subjugated Māori culture and language, and the belief that indigenous perspectives and wisdoms could help reconnect humans to their environment in this industrial, urbanised world. It was also a practical realisation of the Treaty of Waitangi of 1840, which created a founding document between the colonising English and indigenous Māori people.

The Programme developers began working with Te Mauri Tau, a Māori educational, environmental and health organisation based in Whaingaroa/Raglan, near Hamilton. Te Mauri Tau offered a window into Māori perspectives that responded culturally to the *mana* (authority) of the indigenous people of the land. The process of weaving Māori and Western perspectives into Enviroschools was carefully navigated with respect over time and the evolving relationship brought Māori knowledge and wisdom to sit alongside western theories and practices to create a strong

kaupapa (philosophy) for Enviroschools and environmental education in Aotearoa New Zealand.

A second vital partnership that has endured in the Programme has been with local government. While the Programme began in local government, it soon became apparent that establishing an independent entity (a non-government organisation) would provide greater flexibility and autonomy for development. In 2003 The Enviroschools Foundation (now called Toimata Foundation) was set up as a charitable trust with a governance board. This move permitted it to apply for and gain funding from philanthropic organisations to further develop the Programme. However, the importance of local connection was obvious, and the Programme continued to partner with regional and local government to draw support from a multitude of partners. This has created resilience but also challenges for the programme as further discussed below.

With this autonomy, The Enviroschools Foundation was able to grow its partnership with Te Mauri Tau and, in addition to integrating Māori perspectives into Enviroschools in English medium, committed to the development of a kaupapa Māori programme in the Māori language. Te Aho Tū Roa was the result and this programme works with all age groups in kura Māori (schools) and hāpori (communities) and focuses on empowerment through learning the Māori language and connecting people to people and people to place (Toimata Foundation 2018). Te Aho Tū Roa embodies Māori worldviews of intergenerational learning, whakapapa (relationship to place) and innate oneness with the environment. Kura Māori education initiatives emerged in the 1980s in response to grave concerns for the health and survival of Māori language, culture and therefore identity (Hohepa 1990). They were underpinned by a developing Kaupapa Māori Theory which recognised the importance of te reo (language) and tikanga (customs) to the reassertion of tino rangatiratanga (self-determination) for Māori (Pihama 2015).

As a result of Te Aho Tū Roa, The Enviroschools Foundation evolved and grew and was later renamed Toimata Foundation to better support the wide diversity of participants in both English speaking and Māori communities. The concept of Toimata evokes ideas of creativity and craft, sustainability and vision, providing an innovative and expansive space for Te Aho Tū Roa and the Enviroschools Programme to develop individually and alongside each other in mutually-informing, co-constructing ways and being open to other emergent kaupapa.

4.3 *Kaupapa/Philosophy of the Enviroschools Programme*

The Programme is guided by its kaupapa or philosophy. This kaupapa is about creating a healthy, peaceful and sustainable world in which all people learn and act through, with, and for the natural environment (Enviroschools 2016).

Within this kaupapa, five main principles are emphasised and underpin the work in the Programme. These are:

- *Empowered Students* are enabled to participate in a meaningful way in the life of their early childhood centre or school. Their unique perspectives are valued for the knowledge and insight that they bring, and they are supported to take action for real change.
- *Learning for Sustainability* recognises the types of teaching and learning that foster student empowerment, decision-making, action and sustainable outcomes.
- *Māori Perspectives* honours the status of tangata whenua (indigenous people) in this land and the value of indigenous knowledge and wisdom in enriching and guiding learning and action.
- *Respect for the Diversity of People and Cultures* acknowledges the unique gifts, contributions and perspectives of individuals and groups, reinforcing the need for participatory decision-making in Enviroschools
- *Sustainable Communities* act in ways that nurture people and nature, now and in the future, to maintain the health and viability of our environment, society, culture and economy. (Enviroschools 2016)

4.3.1 *Becoming an Enviroschool*

All schools and kindergartens in Aotearoa New Zealand can apply to be part of the Enviroschools Programme. The Programme is supported by Toimata Foundation which “manages the programme nationally and provides the regional networks with facilitator training, professional development, mentoring, networking opportunities, resources and evaluation” (Toimata Foundation 2018). The Programme is implemented along regional council boundaries through a Regional Coordinator and a team of facilitators who work directly with schools and kindergartens in their regions. This structure of national ‘hub’ and regional implementation provides a coherent framework for drawing together the supportive aspects of national policies, local innovation, school/centre best practice, research and evaluation to share across the Enviroschools network and create a cohesive nationwide programme.

Toimata Foundation gains funding for its national operations from diverse sources, a feature that has both challenged and enabled the organisation over time as funding partners waxed and waned in their support. Currently the majority of Toimata funding comes from central government and a small number of business and philanthropic organisations. A strength of the Enviroschools Programme has been the involvement of regional and local government authorities (councils), and more latterly the Kindergarten Associations, in funding the coordination and facilitation of Enviroschools in the regions. This feature has both spread the cost of the Programme across many funding sources, providing resilience when some sources diminish, but also challenged the Programme to continually maintain a wide range of relationships to ensure the continued support. A strength of this process is that local authorities are able to decide how and when they invest in the Programme to meet the needs of their communities, but a challenge is that a change in the elected

representation of the decision-makers on these local authorities can threaten the viability and growth of the Programme in the regions.

Schools and centres apply to join the Enviroschools Programme through their region. Acceptance into the Programme is predicated on the readiness of the school/centre to engage in the Programme and available funding at the regional level for facilitation. Insufficient funding is the more likely barrier, often resulting in waiting lists of schools/centres ready to join. Once accepted into the Programme, the new Enviroschool is allocated a facilitator whose role is to guide a long-term journey through working mainly with adults rather than students. This enables adults such as leaders, teachers, and caretakers to work with students and the school/kindergarten community to adopt a whole ‘school’ approach to being an Enviroschool. Schools/centres invest their own resources through staff time, project costs and resources, often gaining financial support from their communities.

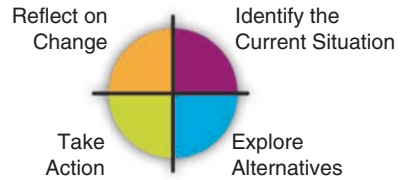
4.3.2 Being an Enviroschool

Acknowledging the five principles of the kaupapa clearly indicates that a holistic approach to an Enviroschool’s journey is required. This includes, but goes beyond, a focus on formal curriculum to encompass four dimensions representing the key areas of school life. These are:

- *People and participation* – this emphasises involvement of students, staff, parents and the wider community in a democratic decision-making process that respects equity and diversity and creates a sense of ownership and belonging. This creates a stronger school/centre community and fosters intergenerational learning.
- *Programmes* – this emphasises integration of learning for sustainability that enables students and teachers to develop knowledge and to critically reflect on their personal and community values and behaviours towards sustainability issues in their school/kindergarten.
- *Practices* – this emphasises policies and practices that promote sustainable use of resources, which both creates a healthy environment for learning and models sustainable living. Aspects include waste management, energy and water use, sustainable transport and product choices.
- *Place* – this emphasises the role that school/centre buildings and grounds can play in learning for sustainability, through designing that is ecologically, socially, culturally and economically sound. Schools/centres become sites for food production, biodiversity habitat and cultural expression.

Each Enviroschool creates their own journey through the interests and needs of their community. This journey typically begins by creating a school map that reflects on the current school/centre environment. A collective vision map is then created to guide the Enviroschools journey. An envirogroup is often formed which brings together students to provide leadership and coordination for their school/centre. The

Fig. 4.2 The action learning cycle. (Reproduced with permission from Toimata Foundation)



Enviroschool’s journey is rarely a linear process because rather than simply ticking off boxes it is a learning process that is student-led, organic and transformative. Whilst being more sustainable is a key goal for an Enviroschool and its community, the learning process that accompanies this is more important.

The learning process for an Enviroschool is supported by resources such as the *Enviroschools Kit and Theme Areas* (Enviroschools Foundation 2018) This unpacks concepts, suggests processes and provides activities that Enviroschools can utilise at appropriate stages of their journey. A key aspect of the learning process is the Action Learning Cycle. This tool has connections to Experiential Learning theory (Kolb 1984) and aims to empower students to inquire into sustainability issues, develop solutions, action them and reflect on the outcome. The Cycle has four parts (see Fig. 4.2):

- *Identifying the current situation* – which emphasises immersion in the environment, engagement and experience with the issue, finding out how things came to be as they are.
- *Explore alternatives* – which emphasises critical thinking, values consideration and creativity to consider how change could be achieved to move beyond the current situation.
- *Take action* – which emphasises planning and enacting solutions which are manageable and achievable in ways that empower students to experience making a difference.
- *Reflect on change* – which emphasises celebrating learning and the effectiveness of action, critiquing, planning and deciding what steps to take next.

As the learning journey of an Enviroschool unfolds, a process of constant reflection is encouraged. It is intended that after 3 years in the Programme, and after each subsequent 3 years, a formal reflection process takes place in each Enviroschool, which “identifies and celebrates the unique progress, achievements and shifts that each Enviroschool has made on its journey and identifies opportunities and needs that inform the next steps” (Enviroschools 2016). As part of the Action Learning Cycle Enviroschools are encouraged to explore three broad stages, which are described as Bronze, Silver and Green-Gold. These stages support each Enviroschool to consider their progress and depth of practice.

This process of reflection has also involved internal (Enviroschools 2014, 2018) and external evaluations (Eames et al. 2010) of the Enviroschools Programme, which have identified its progress and opportunities for further improvement.

4.4 Nga huanga (the Fruits): Impacts and Outcomes of Enviroschools

The Enviroschools Programme has grown from the original three pilot schools in 1993 to now include nearly 1200 schools and kindergartens, supported by 120 facilitators and 16 regional coordinators, and over 100 partner organisations.

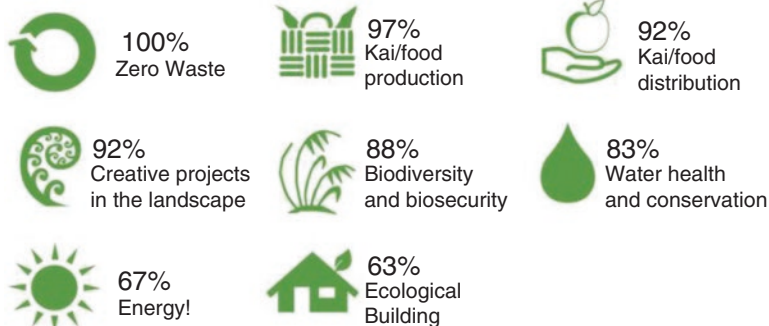
Understanding of the programme's impacts and outcomes has developed through a range of different mechanisms. Information gathering and sharing has occurred through visits to and between Enviroschools, regional hui (gatherings) to celebrate student work and national hui involving facilitators and coordinators fostering consistent and collective knowledge and practice. In the early years of the programme, Enviroschools shared their stories through contributing to an annual Enviroschools Scrapbook which showcased the range of work being done by these Enviroschools to other schools and funders. This story-telling was an important aspect of building confidence and community within the network of Enviroschools.

As part of initial central government funding, a comprehensive external evaluation was conducted by the Ministry of Education in 2008–2009 (Eames et al. 2010), and after a lull in this funding source, a more stable funding stream from central government has allowed Toimata Foundation to conduct two significant, independently-run census projects, in 2014 (Enviroschools 2014) and 2017 (Enviroschools 2018).

The Ministry of Education evaluation drew on international conceptions and local considerations of EE using ideas of transformational learning, systems thinking (Jickling and Wals 2007, Sterling 2001), cultural inclusiveness, participatory action taking (Blanchet-Cohen 2006, Jensen 2002) and professional learning. Using a mix of survey and in-depth case studies, the evaluation showed the programme aligned well with national and international conceptions of EE through its distributed model of leadership, its focuses on empowering students to think critically and carry out informed action, and the development of whole school approaches. In the evaluation (Eames et al. 2010), there “was evidence in the findings for impacts on organisational change in schools in development of more sustainable practices, in particular waste, energy and water use, more sustainability content in the curriculum, and improvements to the physical surroundings of the school” (p. iii). Student outcomes such as knowledge development, action-taking, increased engagement in learning, as well as transfer of learning from school to the home environment were reported by the schools.

Participation in the Enviroschools Programme was reported in the 2014 Census report as including 31% of all schools in Aotearoa New Zealand and this rose to 34% in the 2017 Census report. Nearly 90% of Enviroschools that participated in the 2017 Census reported connecting with their communities through organisations such as local authorities, government agencies, ecological restoration groups, iwi (Māori tribes) and businesses. Nearly three-quarters (72%) of the Enviroschools felt that the programme was having a substantial positive influence on the families/whanau in the local community.

Environmental sustainability actions:



Cultural, Social and Economic sustainability actions:



Fig. 4.3 Actions for sustainability reported by EnviroSchools. (Reproduced with permission from Toimata Foundation)

In both 2014 and 2017, EnviroSchools reported being involved in a wide range of actions that could contribute to environmental, social, cultural and economic sustainability (see Fig. 4.3). In environmental areas, 100% of responding EnviroSchools indicated that they were engaged in sustainable waste management. Over 90% reported being engaged in kai (food) production and distribution, while approximately 90% were involved in protecting/restoring biodiversity and 80% in water health and conservation. EnviroSchools appeared to be finding engaging in energy conservation and ecological building – two EnviroSchool Programme themes – more challenging, however two-thirds still reported involvement in these.

Educationally, development of citizenship was seen as an important outcome in these actions, with three-quarters of respondents (74%) noting that children and young people were initiating and taking action on sustainability issues that were important to them. Involvement with the EnviroSchools Programme was seen to be motivating students to learn, and increasing teacher collaboration.

Key outcomes were also identified in social aspects, such as using ethics in decision-making and adopting healthy eating and physical activity, cultural aspects such as integrating Māori perspectives and showing respect for differing beliefs, and some integration of sustainability thinking into strategic and operational planning.

The two Census projects have highlighted that the long-term nature of an EnviroSchool's journey and the support of a facilitator are key aspects. The development of a school vision, and inclusion of community involvement and student-led action are also important to securing the outcomes described above. The long-term nature of the journey enables the depth of sustainable practice and EE and links to

community to increase with time. As might be expected, staff and leadership support for the Enviroschools Programme within a school or centre is strongly correlated to better outcomes.

Qualitative data from both censuses, as well as anecdotal evidence, points to the importance of the Enviroschools' kaupapa in this range of outcomes. Rather than being a technical checklist or an environmental management tool, the Enviroschools kaupapa is a holistic and inclusive vision for health, peace and sustainability that fosters care, love and deep inter-personal relationships. Enviroschools has been called a programme with a heart, and programme developers believe that is what is drawing many people and schools to it.

4.5 Me Ahu Pehea? What Are the Possibilities?

The Enviroschools Programme has grown out of a global political process at the 1992 Earth Summit into a local organic development, which has established the school/centre and its students as the heart of the process. A complex interplay of grass-roots work and political support/non-support has been underpinned by the kaupapa (philosophy) of action for change, inclusion, and relationships. The Enviroschools Programme is an Aotearoa New Zealand programme with a strong integration of Māori perspectives that are helping to contribute to a revitalisation of Māori culture and language and a more holistic and inclusive form of EE. Enviroschools is also shaped by international work in EE, drawing upon theoretical positions developed around the world to enhance its work.

The growth in numbers of Enviroschools and the waiting lists of those who wish to join the programme are testament to the successful outcomes of the programme and the demand for this type of education. Unsurprisingly, this success and demand has been particularly evident in the early childhood and primary sectors. Perhaps less so in the secondary education sector, although 25% of secondary schools are currently participating in Enviroschools, with a range of success stories being shared – success at secondary level simply looks different. The challenges of implementing EE in secondary schools have been documented in other countries and revolve at least around the siloing of subjects and the focus on assessment for credentials (Bolstad 2003, Uitto et al. 2011).

The Enviroschools Programme must be understood as a journey. While western science and mātauranga Māori (Māori knowledges) have highlighted problems in people's thinking and acting on this planet, and politicians have provided frameworks for change, ultimately, it is people in communities who must bring this change about. We are re-learning ways of being in the world and the possibilities of how the Programme develops from here lie in the potential of the journey and communities undertaking it. In this sense, the Enviroschools Programme continues to grow and develop deeper understandings of how this can be achieved through education. This is an organic process, which is drawing on multiple perspectives and support structures. It is about enabling autonomy within a collectivity that

empowers communities to bring about informed, consensual change. A key to this process is conscious decision-making through regular reflection that is both critical and creative. Whether this reflection is at the school/centre level to enable next steps, or at the regional level to focus support, or at the national level to strengthen the kaupapa, it reinforces that the journey towards a sustainable future is non-linear, negotiated and emergent.

What is clear is that the kaupapa lies at the heart of the journey. This kaupapa has grounded the Enviroschools Programme and helped chart its course since its humble beginnings in 1993. The development of Te Aho Tū Roa has shown the possibilities of reaching back into the past to re-learn ways of living with each other and the environment. This in turn is helping to shift western constructions of education by questioning the current industrial model that privileges individual achievement and putting a focus back on learning and being as communities.

While the growth in numbers of Enviroschools is an important marker of success, we recognise that simple quantitative expansion is a vague proxy for sustainable change. What is more critical are the qualitative shifts in manaakitanga (care for each other), tiaki te taiao (care for the environment) and aroha (love) which the Enviroschools Programme is fostering in our young people, and this provides hope for a sustainable future here on Earth!

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Chapter 5

Moving Green to Mainstream: Schools as Models of Sustainability for Their Communities – The Australian Sustainable Schools Initiative (AuSSI)



Lorraine Larri and Angela Colliver

Abstract This chapter traces the development of the Australian Sustainable Schools Initiative (AuSSI).

With agreement of State and Territory educational bureaucracies, AuSSI was an Australian Government policy focus in the early 2000s aiming to build systemic change integrating education for sustainability (EfS) through a whole-school approach. AuSSI enabled schools to adopt strategic planning frameworks managing resources (energy consumption, water use, biodiversity management and waste management), and integrating EfS across curricula.

Systems thinking and school community capacity building are at the heart of AuSSI. The pedagogy of active environmental citizenship was embedded in its program logic. Schools were not only to be models of sustainability but to inspire sustainability initiatives in their communities.

Much has been achieved in integrating EfS across a federated system of eight educational bureaucracies; and multiple education sectors (Government, faith-based and independent schools). Commonalities of approach, case studies of customisation, significant effort in program evaluation provide insights into implementation, ongoing viability and impacts on education for sustainable development (ESD). The advent of the Australian Curriculum – Cross-Curriculum Priority – Sustainability has been a valuable addition.

Finally, this chapter identifies ongoing challenges for ESD within mainstream educational agendas and where educational and environmental policies remain separated. We see it as a systemic policy priority to link both.

L. Larri (✉)

James Cook University, Manyana, NSW, Australia
e-mail: lorraine.larri@my.jcu.edu.au

A. Colliver

Angela Colliver Consulting Services, Wamboin, NSW, Australia
e-mail: angela@colliver.com.au

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5.1 Introduction

The Australian Sustainable Schools Initiative (AuSSI), 2002 onwards, is Australia's contribution to the global Green Schools movement. In this chapter we describe the context leading to the development of AuSSI; ways in which each State or Territory customised and implemented a basic template; achievements and legacies. We also critically reflect on the current context, particularly how active AuSSI and related whole school approaches to sustainability education are today; and the relevance to current ESD and climate change education agendas.

AuSSI came about within Australia's federated system of government, significant because successful intra and inter-governmental collaboration is challenging. In Australia there is a central Commonwealth government and six state governments in a federation formed in 1901. The states are: New South Wales (NSW), Queensland (Qld), South Australia (SA), Tasmania (Tas), Victoria (Vic) and Western Australia (WA). States and the Commonwealth have their own constitution with government divided into legislature, executive, and judiciary. Territories are areas within Australia's borders that are not claimed by the states. Unlike the states, whose powers are defined through the Constitution, the powers of these territories are defined in Commonwealth law granting them self-government. On the mainland there are two – the Australian Capital Territory (ACT) and the Northern Territory (NT). Jurisdictions negotiate agreements and collaborate with the Commonwealth within and across portfolios. An example of this is the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA). Each State and Territory also has three education systems – government, Catholic and independent.

To write this chapter we developed a timeline of key events, policies, educational resources, research and evaluation reports and published articles based on a comprehensive literature review. Our purpose was to identify the sequence from conception to Australia-wide dissemination of AuSSI. We also contacted champions and advocates of the initiative to gain first-hand accounts of events and insights about the AuSSI legacy and implications for the future of ESD in Australia. Personal accounts added detail to existing documentation and were necessary to fill the gaps particularly post-2010 when national coordination ceased.

5.2 Context – The Rise of Environmental Education Pre-AuSSI

AuSSI has its roots in the environmental education movement in Australia established in the early 1970s when public concern here and internationally about environmental issues was strong (Greenall Gough 1992). Since then, political and public interest in environmental issues waxed and waned (Taylor 2015). However, it is not clear how much this impacted on the motivation for stimulating EE and the emergent Green Schools Movement. Many of the pivotal policies that were catalysts for

the movement occurred during this period despite times when interest was low, such as the late 1990s. Greenall (1980a, p. i) highlights the nature of early developments "... as a sequence of events in time and space; as a response to social, economic and educational pressures; and as a product of individual initiative and action." Our analysis shows that this continues to be true. The early characteristics of school curriculum for EE showed a concern for critical social analysis coupled with action somewhat more than simply increasing environmental content in courses. Greenall (1980a, p. i) says "Proponents of environmental education were out to change the legitimate knowledge or common sense of the schools. However they failed to analyse the way that school knowledge is socially constructed and validated. What they were implying was 'counter-hegemonic' to the action of Australian schools." It is our contention that AuSSI has overcome the instrumentalist constraints that undermined early EE and, in many schools, has succeeded in building a culture of active environmental citizenship in order to transition to low-carbon futures in the face of a changing climate.

Departments of Education around Australia were investing in EE policy, curriculum, resources and expertise from the early 1970s as was the Curriculum Development Centre's (CDC) Environmental Education Project (Greenall 1980b). The Australian Association for Environmental Education (AAEE) was established and played a significant role in networking and supporting processes of professional adult learning for members who work in government agencies (Federal and State); education sectors (schools, vocational education, universities); local government; businesses and community organisations (AAEE 2015). AAEE members have been instrumental in developing, implementing and researching AuSSI through being representatives (on national, state and territory consultative bodies); and in schools (as principals, teachers or external sustainability educators) ensuring its longevity.

Activities such as the CDC Project and the establishment of AAEE show national collaboration and the emergence of a community of practice amongst environmental educators that paved the way for what was to become a green schools movement. Critical to the story of whole-school approaches to sustainability education has been an ongoing interplay between individuals in Education and Environment government portfolios supported by members of AAEE and non-government environmental advocacy groups, often acting as the 'brains trust' and connective tissue determined to maintain the momentum (J. Pearson, personal communication, January 31, 2019). This work resulted in a number of key reports and policies from either Education or Environment Commonwealth portfolios setting the foundations for environmental educators to have the imprimatur to work within their jurisdictions developing policies, programs and teaching resources.

By the late 1990s the Commonwealth Environment portfolio positioned itself as the driver of a lifelong approach to EE in which school education is a component, reflected in *Today Shapes Tomorrow: Environmental Education for a Sustainable Future – A discussion paper* (Environment Australia 1999). Much of this positioning was due to specific individuals both in environment portfolios federally and from States and Territories in environment, education or research capacities. During the 1990s there were also significant State-based initiatives that were precursors to

AuSSI and the shift towards EfS through whole school engagement in EE; teacher professional development; and practical educational resources. In particular,

- the *Waste Wise Schools* program (begun in 1997) in Victoria through the Gould League was the first Australian whole school EE program integrating teacher professional development and learning, practical tools and resources, and a structure and process for creating a waste reduction culture across the whole school from classroom to operations and administration. Focussed on the three “R’s – Reduce, Reuse, Recycle” this program set a new standard in EE program development and delivery.
- *Kids for Landcare* (1990) in South Australia distributed to all schools promoted a whole school framework for EE through professional learning mapping the concepts of Ecosystems, Resources, Growth, Heritage, Aesthetics, Environmental Ethics, Decision Making and Participation. The introductory kit included four posters, songbook and tape for junior primary; and book “Kids for Landcare. Ecosystems” (Education Department of South Australia 1991). A Landcare Officer position supported implementation, jointly funded by Education and Environment departments.
- In the late 1990s the *Learnsapes* program in NSW engaged whole school communities in planning changes to school grounds making them ecologically sustainable and spaces for learning beyond traditional classroom walls.

Out of these experiences and armed with knowledge from links with the Organisation for Economic Co-operation and Development’s Environment and School Initiatives network (ENSI) about European Eco Schools and Sweden’s Green Flag Programs, two trials of a “Sustainable Schools” concept aimed at greater local coordination and cooperation bringing disparate programs and initiatives together. One trial with “a small number of schools” was in collaboration between the Gould League and CERES in Victoria (Gould League/CERES 2001, p. 6). The other was in the Southern Sydney area by School Communities Recycling All Paper (SCRAP) Ltd. “in ten schools (both government and non-government) incorporating three focus areas from the NSW Environmental Education Policy for Schools” i.e. curriculum, resources, and school grounds (S. Smith, personal communication, August 23, 2018, p. 7). Meanwhile, SA was undertaking a stakeholder consultation process to develop guiding principles (H. Kneebone, personal communication, May 31, 2019).

At around the same time, the 1999 *Today Shapes Tomorrow* discussion paper led to the *Environmental Education for a Sustainable Future: National Action Plan* (Environment Australia 2000) provided a mandate for environmental education, harnessing capacity and mobilising energy, commitment, coordination resulting in a level of sophistication not previously possible and measurable outcomes for the sector (J Cornish, personal communication, February 26, 2019). The Sustainable Schools initiative (which became AuSSI) was one of a suite of interrelated actions in the plan. This was followed in 2009 by a second national plan – *Living Sustainably: the Australian Government’s National Action Plan for Education for Sustainability* (DEWHA 2009). Reading back over these critical policies reminds us that Australia

was positioning itself for a fundamental whole of society systemic shift by engaging EfS. Included with the AuSSI in the 2000 National Action Plan were the:

- *National Environmental Education Council (NEEC)* in 2000, expert advisory group across school, tertiary, and industry; with sub-group the *School Education Working Group (SEWG)*;
- *National Environmental Education Network (NEEN)* in 2001, a schools focussed strategic planning group with representatives from government (federal and state/territory) departments of environment and education;
- *Australian Research Institute in Education for Sustainability (ARIES)* in 2002, EfS research centre, at Macquarie University funded for applied EE research into Triple Bottom Line reporting by industry, sustainability learning in the major Business Schools and a general review of EE in Australia including schools, post-secondary and tertiary education, business and industry;
- *National Environmental Education Statement (NEES)* in 2004, a collaboration between the Commonwealth departments of Environment and Education in developing and supporting implementation of curriculum policy framework that focused on building capacity of schools to implement education for sustainability;
- “*Industry Toolbox*” – business and industry focussed strategy aimed at developing an to support business and industry sector in working towards sustainability (Lang 2005, p. 252).

In 2001, NEEC SEWG began exploring ways of working “...with the formal education system, through appropriate bodies, to determine how EE may be given a higher priority in the curriculum frameworks of States and Territories.” (“School Education Working Group” 2007). The group commissioned a review of State and Territory curriculum documents assessing the representation of EE and identifying national priorities. Findings identified, wide variation across and even within States and Territories in the references to environmental education within curriculum documents. Important topics such as biodiversity, sustainability, greenhouse effect and endangered species were under-represented or missing. (Environmental Education Review 2007).

The report recommended development of a national EE policy; development of teaching and learning resources; professional development to support teachers; recognition of activities outside the formal curriculum (e.g. excursions, competitions) and their contribution to EE; and finally that, “environmental education activities undertaken in schools should be holistic in nature and implemented school wide, as whole-school initiatives have proved to be more successful in shaping student skills, values, actions and have measurable outcomes.” (Sharpley 2003, p. 5).

In its initial meetings NEEN identified that most State and Territory documents placed EE as a cross-curricular perspective in schools. One state, NSW, promoted a ‘whole-school approach’ to EE and learning for sustainability through its mandatory “Environmental education policy for schools” (NSW Department of Education and Training 2001), taking it beyond the school curriculum boundaries to also consider school management and the management of resources. (Tilbury et al. 2005, pp. 3, 4)

5.3 AuSSI Implementation and Customisation

Thus the scene was set for AuSSI. National consultative committees began proving their worth by enabling program initiatives. Research in curriculum complemented initiatives on the ground to promote a whole school approach.

At the same time as structures and policies were being established nationally, in 2001, the community-based organisations in Victoria and NSW that had been trialling the “Sustainable Schools” concept mentioned earlier, proposed to their NEEN colleagues, “Towards a National Sustainable Schools Initiative” (Gould League/CERES 2001). Through agreement at NEEN (in 2002) and approval from Environment Minister David Kemp who had come from the Education portfolio, the Commonwealth Department of Environment and Heritage (DEH) collaborated with NSW and Victorian counterparts in Environment and Education portfolios to begin a pilot phase over 2 years, 2003–2004 (P. Woods, personal communication, March 19, 2019). The states contributed the majority of funds, AUD\$1.5 million, from government departments or sponsorship. The remaining AUD\$200,000 came from the Australian Government (Tilbury and Wortman 2005, p. 25). A total of 338 (198 NSW and 140 Victorian) schools from all sectors participated in the trial (Larri 2004, Funnell and Larri 2005). Based on the success of these pilots and lessons learned relating to different contexts, a further AUD\$2 million over 4 years of federal funding was provided to the other jurisdictions progressively to implement sustainable schools. As with the pilot, each jurisdiction was required to source the majority of funds from within its structures. The combination of cash and in-kind contributions from States and Territories amounted to approximately 80%. This was described as a modest investment from the Australian Government given the significant impact on EfS that was achieved. The name was reframed as the Australian Sustainable Schools Initiative (AuSSI) and officially launched nationally in 2004. By 2007 all jurisdictions were involved (DEWHA 2010a, b).

Our federated system of government affects the way decisions are made. The national government has agreements with States and Territories regarding roles and responsibilities. In relation to schooling jurisdictions have responsibility for registration, regulation, and delivery of all schooling within their jurisdiction. A Ministerial Council of the Commonwealth with States and Territories shares decisions on funding and policy. The fate of “Sustainability” as a curriculum area has often been tenuous dependent on politics played out between States, Territories, Commonwealth ministerial and departmental decision-makers not only in education portfolios but also through direction from Environment portfolios. The establishment of inter-departmental collaboration during this period created synergies between education and environment that was unusual and a significant feature. Consistency of approach between jurisdictions was achieved early on through an agreed understanding of the concept of sustainability.

5.3.1 *Features of AuSSI – Systems and Template*

From its inception, AuSSI was based on a template of common elements able to be customised to suit each jurisdiction's context. Guiding principles and implications for diffusion of the model were distilled from the experience of the two state pilots. Each state's historical and policy contexts and approaches to school level decision-making around curriculum integration and baseline data were major points of difference (Larri 2006, p. 2). Consequently jurisdictions went on to describe their model with different variations and specialisations. This was considered a strength of the program as it recognised their different histories and stages of adoption (DEWHA 2010a, p. 7).

Implementation required two parallel management processes. These were systemic adoption (i.e. the governance structures at both national and State and Territory levels including the way in which support and resources to schools were to be provided by each system); and school level adoption (involving school community learning and agreement about the nature of a whole-school approach to sustainability management and education).

The following description (Box 5.1) outlines how systemic adoption was achieved through collaboration and partnership between Commonwealth and State and Territory stakeholders (DEWHA 2010a, p. 1, 2).

Box 5.1: Systemic Adoption of AuSSI – Management Structures

The Department of the Environment, Water, Heritage and the Arts (DEWHA) facilitates the national coordination of AuSSI, through a working group of the National Education for Sustainability Network (the Network). The Department has the following role:

- national coordination of the AuSSI Working Group (which reports to the Network)
- developing nationally relevant events and resources
- funding to assist the coordination, promotion and expansion of the initiative in each state and territory and Catholic and Independent School sectors
- coordinating activities of other Australian Government agencies to ensure that relevant environmental programs for schools are appropriately linked to AuSSI
- brokering national level partnerships and sponsorships
- developing international partnerships to share and promote Australia's experience.

The role of state and territory governments is to implement, monitor and evaluate the initiative in their jurisdiction, working with each other and the Australian Government. This involves the development of resources, linking AuSSI to relevant environmental programs for schools (for example, Energy Smart Schools, WasteWise, Waterwatch, Waterwise and Landcare), aligning AuSSI with initiatives within and between their government departments, and brokering state-level partnerships and sponsorships.

The template for school level adoption involved conceptualisation of AuSSI as an umbrella program for each school – a canopy for existing environmental and often disconnected activities linking them into a coherent framework. Focus areas of energy, waste, water, biodiversity, landscapes, products and materials became integrated with teaching and learning across the curriculum. In this way, school infrastructure and teaching and learning processes become one and the same system (Larri 2015). Ultimately, the program aimed for active citizenship through environmental stewardship as the following description states.

By participating in a learning by doing process, students achieve a better understanding of the world in which they live, and have opportunities to help create a more sustainable future.

AuSSI helps to build sustainability knowledge, skills and motivation by supporting training of school staff, whole school planning, development of teaching materials and use of tools for measuring and reporting on sustainability outcomes. (Australian Government Department of the Environment n.d., para. 2 & 3).

Right from the start, a critical first step for school level adoption was professional development conducted by external specialist facilitators. This ensured acceptance by staff for implementing the initiative and reaching shared agreement on what it means to be a sustainable school. The next step was strategic planning through developing a School Environment Management Plan (SEMP). The Victorian pilot model insisted that the SEMP was grounded in a “State of the School Report” of baseline data for resources and curriculum. This was called the “Core Module”. Once this was done, schools progressed through annual action plans integrating activities in “Resource” modules i.e. water, waste, energy, biodiversity. The NSW pilot model advocated an iterative process to SEMP implementation with the duration of the planning cycle determined by the school using an action research approach (action, reflection, continuous improvement). Three focal areas were stressed – Resources (use and management of waste, water, energy, and biodiversity); Grounds (including the natural environment) and Curriculum. Annual reviews of SEMPs were encouraged in both models to establish a culture of monitoring, evaluation, continuous improvement and celebration of achievements (Larri 2006, pp. 19, 50, 51).

The processes were envisaged as participative, holistic, and inclusive. For example, the SEMP was to be developed through consultation involving the whole school community – students, staff and parents (Larri 2015, p. 9).

Student empowerment and leadership through valuing inclusivity of student voice were seen as essential to developing environmental stewardship. Teachers were asked to engage students in forming environmental decision-making groups (i.e. “Green Groups”) and taking up public speaking opportunities to explain their ideas (i.e. presentations to school assemblies; participation on youth forums; and peer-to-peer learning events).

Program Theory was used in early evaluations of AuSSI to show *how it was meant to work*, i.e. its theory of action. Evaluators worked with program managers and key stakeholders in participative processes to elicit the logic, called outcomes

hierarchies (see Larri 2006, pp. 22-23; Larri 2010a, 2010b, 2015). In this way it was confirmed that the ultimate goals (or visions) for AuSSI were for:

- Schools to be working models of sustainability in their communities;
- Students to demonstrate environmental citizenship being empowered to work towards sustainability;
- Schools to reduce their ecological footprint by managing resources efficiently, taking action to protect biodiversity and enhancing social responsibility; and
- The community to be involved with schools in the journey so that the impacts would stretch beyond each school.

The ARTD Consultants Evaluation (DEWHA 2010a, p. 9) identified four key mechanisms used by all States and Territories:

- *Products, funding and resources.* Development and dissemination of products, funding and resources to support schools in becoming more sustainable e.g. sustainability websites, audit tools, examples of best practice and templates for SEMP or Sustainability Action Plans (SAP).
- *Direct working with schools.* AuSSI facilitators providing direct support for schools in implementing sustainability activities e.g. assisting schools developing and implementing the SEMP or SAP; the provision of professional development for teachers and learning opportunities for students.
- *Building partnerships and networks across schools and communities.* Building and strengthening partnerships within and across schools, communities and other sustainability programs.
- *Rewards and recognition.* Recognising and rewarding success, through showcasing and accreditation.

Using the National Monitoring and Evaluation Framework goals agreed by the AuSSI Working Group the evaluation also found significant educational, environmental, social and economic outcomes Below is the list of goals mapped against the outcome domains used by the evaluators (DEWHA 2010a, pp. 14–30). It is included as a useful tool for future researchers. Successive summative evaluations and research continue to find the same positive outcomes. (Larri 2010a, b; Rickinson et al. 2014; AESA 2014).

- Learning and teaching for sustainability as an integral component of school curricula (Education, Environment);
- Schools actively engaged in continuous planning, implementing and reviewing their approach to sustainability as part of their everyday operations (Education, Environment);
- Schools using natural resources, including energy, water, waste and biodiversity in more sustainable ways. (Education, Environment, Economic);
- Schools and school authorities reporting on changes towards sustainability (Environment, Economic);
- Young people sharing ownership of sustainability initiatives and decision-making (Education, Environment, Social);

- Schools working towards sustainability in partnership with their local communities (Environment, Economic, Social);
- Schools and school authorities implementing governance practices that support effective environmental EfS (Education, Environment, Economic, Social);
- Individuals supported to make effective sustainability decisions and choices (Education, Social);
- Schools and communities developing values that support a sustainability ethos (Education, Environment, Social).

Typical barriers to adoption cited were teachers not having enough time, resources, or professional development; competing priorities; and lack of enabling leadership (AESA 2014, p. 91; Larri 2006, p. 28; Larri 2010a, p. 28).

5.4 Features of Recent Practice

The story of implementation in each State, Territory and school sector is detailed and nuanced in relation to the agreed template. For example, the SA approach was different from the national trials with AuSSI-SA supporting schools and preschools identify how they could establish EfS across their sites by developing a culture of sustainability. Greater information on each jurisdiction's implementation strategies can be found in the Evaluation of Operational Effectiveness of the Australian Sustainable Schools Initiative (DEWHA 2010a) and Education for Sustainability and the Australian Curriculum Project: Final Report for Research Phases 1 to 3 (AESA 2014, pp. 50–67).

Early 2010, the Australian Government withdrew its involvement from the implementation of the first and second National Action Plans. The NEEC and NEEN were disbanded and effective over-arching national coordination role that has not yet been recovered. No replacement or explanation was offered (C. Mackenzie, personal communication, February 22, 2019) leaving States and Territories to develop their own mechanisms for systemic coordination supporting school-based initiatives. Critical to the ongoing sustainable schools movement has been capacity for adaptive management responsive to contextual changes. Variations have occurred in response to shifts in political agendas and dependent on the strength of collaboration amongst champions and experts – proving yet again, that individuals matter.

In response, most jurisdictions moved from AuSSI branding to different titles however the original model remains intact. Additionally, the Eco-Schools global network entered Australia in 2014, co-sponsored by Keep Australia Beautiful, Wrigley, and the Australian Government Department of the Environment and Energy. They offer the same whole school EfS framework with the incentive of an internationally recognised awards system. AuSSI schools are encouraged to join the network and seek award status for steps already achieved. Each school pays \$100

annual fee to be registered which entitles access to all online resources supporting the stages of implementation. AuSSI has always been free.

Catholic Education embraced the concept of whole-school approaches to EfS integrating it with their faith-based perspective derived from successive papal Encyclicals culminating in *Laudato Si*. The spiritual and moral dimensions of ecological problems called for an “ecological conversion to avoid planetary catastrophe” and “radical changes in lifestyle and unsustainable patterns of consumption and production” (Lucas et al. 2010. pp. 3,15). The result was “On Holy Ground: an Ecological Vision for Catholic Schools” (Paul Lucas et al. 2006, revised in 2010) for three states – Queensland, NSW and South Australia. The Sandhurst Diocese (Victoria) developed their “Kinship with the Earth” which is directly aligned with ResourceSmart AuSSI Vic (Dullard et al. 2012). Sandhurst catholic schools were instrumental in testing the pilot model of AuSSI. Both documents are closely aligned to *Educating for a Sustainable Future: A National Environmental Education Statement for Schools* (Gough and Sharpley 2005). They provide a rationale and planning framework for Catholic schools and organisations to become more ecologically sustainable. Catholic Earthcare is the organisation that now assists Dioceses to work towards ecological conversion. Catholic school communities and the infrastructure they encompass are seen as a way of leveraging change (B Holland, personal communication, January 31, 2019).

Many Independent schools took advantage of support offered and “enthusiastically embraced the AuSSI approach” (DEWHA 2010a). The Association of Independent Schools NT continues to support teachers to integrate the EfS in the Australian Curriculum (Association of Independent Schools NT 2019).

There has been no national evaluation since 2010 and data collection from States and Territories is piecemeal nevertheless there is evidence of many schools implementing whole-school sustainability actions and education. In Tasmania and the Northern Territory (NT) where AuSSI or its re-branded counterpart no longer exist this does not mean whole school EfS does not occur. In the case of Tasmania, the Department of Education’s Sustainability Learning Centre provides specialist services and the Eco-Schools movement encourages schools through its award system. In the NT there are examples of schools undertaking EfS initiatives and also participating in Eco-Schools. Funding to support schools is dependent on the entrepreneurial skills of teachers to successfully find grants from any available source (e.g. Local Government, Non-Government Organisations, banks, community groups, philanthropic organisations, local businesses). Table 5.1 lists each jurisdiction with the current name and online presence for the AuSSI.

This section now takes a thematic synthesis to highlight similarities and unique contributions evident in the way AuSSI currently works throughout Australia.

Table 5.1 States and territories of Australia whole school sustainability programs, 2019

State/territory	Current name for AuSSI	Auspicng organisation/s	Website link
Australian Capital Territory	Actsmart – Schools	Actsmart, ACT Government	https://www.actsmart.act.gov.au/what-can-i-do/schools/actsmart-schools
New South Wales	Sustainable Schools NSW	AAEE NSW Chapter	https://www.sustainable-schools.nsw.gov.au/
Northern Territory	Individual schools No identifiable program		
Queensland	Queensland Sustainable Schools	Department of Education and Training, Queensland Government	http://www.sustainable-schools.qld.edu.au/
South Australia	AuSSI-SA	South Australia Department for Education, with Natural Resources Adelaide and Mt. Lofty Ranges Government of South Australia	https://www.education.sa.gov.au/sites-and-facilities/environmental-sustainability-programs/auSSI-sa https://www.naturalresources.sa.gov.au/adelaide/mtlofyranges/education/for-educators/education-for-sustainability
Tasmania	Sustainability Learning Centre Tasmanian Sustainable Schools Awards – Eco Schools	Department of Education, Tasmanian Government Keep Australia Beautiful	https://www.education.tas.gov.au/parents-carers/programs-and-initiatives/sustainability-learning-centre/ http://www.kabtas.com/
Victoria	ResourceSmart	Sustainability Victoria, Victoria State Government	https://www.sustainability.vic.gov.au/school
Western Australia	Sustainable Schools – WA	Department of Education, Government of Western Australia	http://det.wa.edu.au/curriculum-support/sustainable-schools/detcms/portal/
Catholic Earthcare	Links with “Sustainable Schools Program”	Catholic Education in all Catholic Dioceses	http://catholicearthcare.org.au/community/schools/ http://catholicearthcare.org.au/project/on-holy-ground-south-australia/ Kinship with the Earth – downloadable from https://www.ceosand.catholic.edu.au/about-us/key-documents
Eco-Schools Australia	Eco-Schools	Keep Australia Beautiful	https://www.eco-schools.org.au/

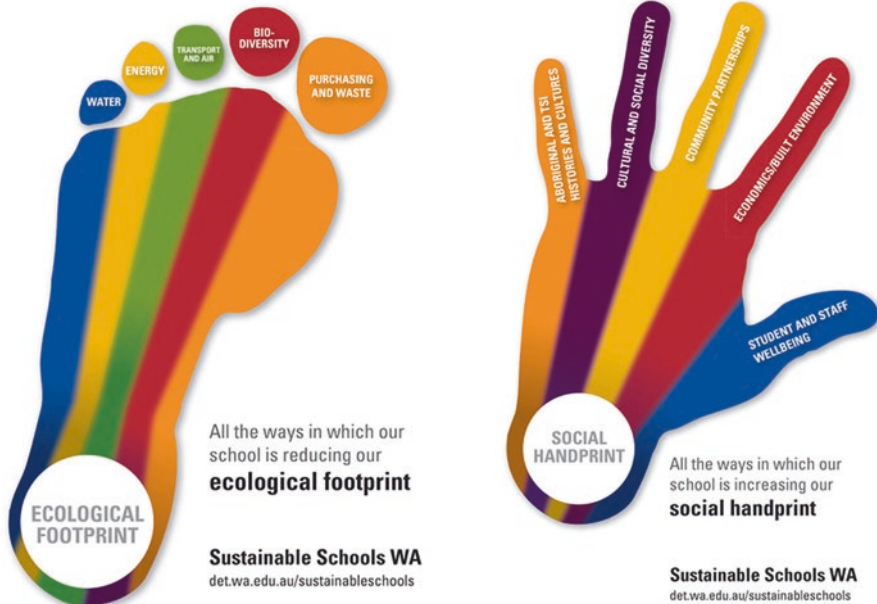


Fig. 5.1 WA Ecological footprint and social handprint. (Reprinted with permission of Department of Education Western Australia 2016)

5.4.1 Rubrics, Curriculum and Resources

Building on what was produced in the years up to 2010, each State and Territory has a significant bank of online resources (accessed using the links in Table 5.1). Rubrics are frameworks for teachers to evaluate student learning. By combining notions of reducing ecological footprint and increasing social handprint, WA developed a conceptually different rubric (see Fig. 5.1) to support teachers and schools in assessing and monitoring “stages in the journey to sustainability”. WA’s model looks at: Leadership, Teaching and Learning, and Community (Department of Education Western Australia 2016). SA and Victoria also developed rubrics. The SA elements include: Culture, Understanding, Learning, Community, and Managing and are linked with four levels of core indicators – “Starting, Challenging, Committing, Transforming” (Natural Resources Adelaide and Mt Lofty Ranges in partnership with the Department for Education and Child Development 2016, p. 2).

Other programs specifically designed to link with AuSSI include:

- the Great Barrier Reef Marine Park Authority’s Reef Guardian Schools Program piloted by 25 schools in 2003 and then incorporated into QESSI. It was based on the NSW Sustainable Schools Program. Reef Guardian required schools to make a commitment to protection and conservation of the Great Barrier Reef through curriculum, management of resources and school grounds, and education of the

community. Schools developed a Reef Education Policy and students developed projects that improved the health of the Reef and their school environment

- Sustainable Futures CSIRO Education (originally “CarbonKids”), is a set of integrated curriculum units for Years 3–9 combining the latest climate science with EfS, designed to complement AuSSI schools’ curriculum. There are currently 450 schools across Australia registered in the program (CSIRO 2018).

Newer programs have also become linked with AuSSI, e.g. the Stephanie Alexander Kitchen Garden Program in 2008 (Stephanie Alexander Kitchen Garden Foundation n.d.); the National Solar Schools Program in 2012 offered schools grants to install solar and other renewable power systems, solar hot water, rainwater tanks and a range of energy efficiency measures; and the Archibull Prize in 2014 (The Archibull Prize n.d.).

In 2012, the Australian Curriculum (ACARA 2018) was introduced as a way of standardising learning content and outcomes nationally. The “Sustainability cross-curriculum priority” (SCCP) is an important component encouraging teachers to incorporate sustainability concepts in all learning areas. Nicholls and Thorne (2017, p. 190) consider the outcomes are “in accord with UNESCO global education initiatives for sustainability and sustainable development” and “its strengths include references to social justice, systems thinking, and a strong connection with the science learning area”. Having the SCCP has meant that curriculum in EfS are now written in ways that help teachers meet the curricula should they choose to do so.

Other online resource portals have also emerged since 2012, such as:

- SCOOTLE: a national repository providing Australian schools with more than 20,000 digital resources aligned to the Australian Curriculum, including the SCCP (Scootle 2018).
- Cool Australia: aims to “empower students to address big social, economic and environmental challenges” and provide “high quality educational content and online professional development courses about contemporary issues” many of which are related to sustainability (Cool Australia n.d.).
- Getting Started with Sustainability: a portal for classroom-ready resources linked to the Australian Curriculum and SCCP (AESA 2015).

During 2013 the Primary Industries Education Foundation Australia developed a suite of educational resources to support the implementation of food and fibre production content in the Australian Curriculum and 17 of these included a strong emphasis on the integration of the SCCP. Developed with funding support from the Australian Government Department of Agriculture, the resources enable a whole school approach through integration Kindergarten to Year 10 (Primezone 2016).

5.4.2 Direct Working with Schools – External Expert Facilitators

AuSSI changed the way agencies worked with schools from delivering sessions to students, while teachers observed, to becoming facilitators of programs and engaging teachers in the processes. Agencies realised they had to build capacity in schools rather than focussing on direct service delivery (N. Davis personal communication, January 29, 2019).

AuSSI-style facilitators who go into schools establishing the approach through professional development work for ResourceSmart (Victoria), the Actsmart Schools (ACT) and the Townsville Catholic Education Diocese (described by P. Lucas, personal communication, February 16, 2019). In other jurisdictions this role has been taken over by the provision of online how-to-guides or hotline guidance by staff in environmental agencies or EECs.

Building Partnerships and Networks Between Schools and Communities

The Sustainable Schools WA (SS-WA) Alliance is an example of the style of networks established to support schools. This has been a feature of SS-WA since inception with 42 organisations currently listed. School communities (teachers, parents, administrators, and students) are linked through eleven Regional Networks to be able to share good practice and access to Alliance regional tours.

Queensland Sustainable Schools (QESSI) had a group of hubs based in its Outdoor and Environmental Education Centres (O&EEC) and other environmental education organisations offering mentoring, resources and coordination of EfS program providers. Each hub had a Regional Action Plan for Sustainability. During 2009–2012, some O&EECs were invited to become QESSI Regional Hubs integrating the Earth Smart Science program into the framework.

Similar networks exist through: ResourceSmart (Vic); SA Natural Resource Management Education Centres; Sustainable Schools NSW; and Actsmart (ACT). Local teacher environment networks are a feature of AAEE Chapters, e.g. the eleven NSW Regional Sustainability Education Networks.

5.4.3 Rewards, Recognition, Accreditation and an Evaluative Culture

Celebration of achievement has been integral to sustainable schools. In particular, relating to achieving efficiency gains and savings by reducing waste and energy; improving biodiversity; and integrating curriculum. Underscoring this is a culture of data collection, monitoring, target setting and evaluation so that there is evidence of success. Awards systems are embedded in the ACT, and Victoria. Eco-Schools award levels are available Australia-wide. Catholic Education encourages their schools to link with either Eco-Schools or the Green Star International systems.

5.4.4 Student Voice, Empowerment, Leadership and Engagement in Learning

Undoubtedly, the insistence on creating opportunities for students to have agency in their school's transition towards being models of sustainable practice has been a challenging and a highly valued feature. Schools were required to establish a student decision-making and action-oriented forum, often referred to as the "Green Group". This created opportunities for student leaders to emerge in new ways such as: managing composting and recycling; maintaining vegetable gardens; monitoring energy consumption and advocating for behaviour change; speaking for the environment and representing their school (e.g. through presentations at school assemblies; participation in youth forums; taking visiting school groups on tours of their school). Students particularly valued the opportunities to show leadership because they felt their ideas were listened to and valued by adults and other children. Their comments indicate that it contributed to their sense of wellbeing (Larri 2010a, p. 10).

Tasmania has held "Kids Teaching Kids" peer to peer learning conferences for over 10 years. Students present their "investigations for, in and about the environment to other students in sessions". An example is the Target Albuera Street Kids Teaching Kids Science and Sustainability Fair (2013) attended by 400 students from Hobart schools (Kids Teaching Kids 2019).

The Youth Environment Council of SA began in 1997 as a result of a state-wide student convention initiated by education and environment government departments. It was incorporated into AuSSI and continues to give opportunities for young South Australians to actively engage in ecological practices in schools/centres and communities. The earliest members are now in their thirties and are leaders in ecological worldviews and actions at local, state and national levels. NRM Education SA lists resources through its website in supporting youth voice in pre-schools and schools.

Millennium Kids (operating since 1999) collaborates with AuSSI-WA helping young people co-design practical action sustainability projects. Their website lists student activities in "Water, Animals, Air and Transport, Waste, Energy, Plants, Climate Change, and Peace and Lifestyle" (Millennium Kids 2018).

Through implementing the AuSSI model of EfS, teachers have recognised the benefits in student engagement in learning and well-being. Students overwhelmingly agree that "doing things for the environment made them feel better" (Larri 2010b, p. 46; Larri 2010a, p. 11). We are confident in claiming these experiences have contributed to development of active citizenship and student contribution to the movement for action on climate change in Australia.

5.4.5 Indigenous Learning

A central role of AuSSI in the States and Territories included valuing Australia's Indigenous peoples and their cultures. This is evidenced by the many AuSSI resources and partnerships developed about the experiences, cultural heritage, beliefs and connections through which Indigenous and non-Indigenous AuSSI students and community members understand and connect with one another and the environment.

Cultural sustainability is related to Indigenous knowledge about EfS and sustainable futures. More recently the "Aboriginal and Torres Strait Islander histories and cultures cross-curriculum priority" (ATSI-CCP) part of the Australian Curriculum (ACARA 2018) was designed to "enrich all learners' ability to participate positively in the ongoing development of Australia through a deepening knowledge and connection with the world's oldest continuous living cultures." Australian teachers have combined it with the SCCP to highlight the belief systems that connect our First Nations People physically and spiritually to country and place. Expanding on this, ACARA developed a new curriculum framework linking Science and Sustainability concepts with the ATSI-CCP. Tasmania has developed "The Orb" online portal for learning about country, and living on country (Department of Education Tasmanian Government n.d.).

5.4.6 Expansion of EfS into Early Childhood

The 2009 National Action Plan for Education for Sustainability (DEWHA 2009, pp. 21, 24) covered all sectors of Australia's formal education system, including early childhood. Lessons learnt from a whole school approach have been researched and developed for early childhood education. There are now many early childhood centres around Australia incorporating EfS through a combination of curriculum, teaching and learning practices; promotion of environmental ethos; and community partnerships (Davis 2010, p. 4). The National Quality Framework sets the benchmark for early childhood and outside school hours care services in Australia (Australian Children's Education and Care Quality Authority n.d.). The SA NRM Education support pre-schools and use the Framework's "Belonging, Being, and Becoming" model. Educators are encouraged to embed sustainability in daily routines and practices in order to promote children's understanding of care for the environment (Stanbridge n.d.; Somerville and Williams 2015, p. 110).

5.4.7 Systems and Adaptive Management – A Dance Between Environment and Education Portfolios

Arrangements for systemic support for AuSSI varied over time within each jurisdiction. Environmental educators in management positions have become adept at adapting to different political and funding contexts. Through networking and creative solutions they have found ways of maintaining and strengthening AuSSI – somewhat of an ongoing dance. WA, Tasmania, Queensland, and NT have all been predominantly managed by Education portfolios, whereas Environment portfolios have been majorly responsible in NSW, and ACT. SA has always been managed by both Education and Environment. Victoria began through Non-Government organisations (NGOs) with oversight by Education and now Environment has taken over with some of the program delivery through an NGO (CERES).

5.4.8 Estimations of Australia-Wide Coverage

AuSSI was offered to all schools in Australia. By 2010 an estimated 33% of Australian schools were engaged in the program at some level. In 2010 Government schools made up 78% of registered schools, Catholic 15% and Independent schools 7%. This was comparable with the size of these sectors at the time (DEWHA 2010a). In 2017 the proportions for these sectors remain comparable – slightly fewer Government schools with slightly more Catholic and Independent schools i.e. 70%, 18%, 11% (Australian Bureau of Statistics 2018).

Unfortunately there is no Australia-wide data for current engagement. The national coordination that ended in 2010 never recovered. We rely on data in the public domain available for only four jurisdictions. Western Australia Sustainable Schools website (2018) documents 47% (or 502 of a total 1072) schools participating – an increase from 26% in 2010. Victoria has also increased from 24% (or 611 of 2520) in 2010 to 58% (or 1300 of 2333) in 2017 (Sustainability Victoria 2018). South Australia (Department of Education 2018) provides an estimate of more than 350 schools and preschools registered with AuSSI-SA (i.e. approximately 49% of a total 714 schools) compared with 23% in 2010 (182 of 787). The ACT reports all of its schools are registered (ACT Government 2018, p. 52) compared with 87% (i.e. 111 of 127) of its schools in 2010 (DEWHA 2010a). If this trend is consistent for all States and Territories there may well be 50% of Australian schools implementing approaches to whole school education for sustainability.

5.4.9 Impacts on School Renewal Through EfS

Our research has validated how far our schools have come in progressing EfS. The whole-school approach required that schools change the way they think, live and work. This has been a big challenge and opportunity. It was not something that schools could do as an extra-curricular activity or fit in when they had time and inclination.

AuSSI made the aspects of deep learning and change that were invisible, visible. Students and their teachers now recognise what constitutes ecological footprints and social handprints. AuSSI established a culture of monitoring and evaluation in schools so that improvements in environment and quality of life became visible. Schools engaged in efficiencies in the management of the resources and school grounds. This was something they had not considered part of their role before AuSSI. It was a tension for them to undertake because it did not seem relevant to educational outcomes for students until AuSSI made the connection that students should manage data collection and analysis as part of the integrated curriculum (where possible). Activities such as: “No Waste Lunches”; kitchen gardens; organic scrap collection and composting; waste stream sorting and recycling; energy student monitors (checking lights, air-conditioning and heating); biodiversity management; and landscape design have become commonplace in many schools. Links with healthy eating and what school canteens sell have been strengthened.

There is no doubt that AuSSI has had an impact on teacher capability for EfS through many professional development sessions and curriculum integration,

One of the key things that AuSSI did, was to provide a pathway to move ‘green’ to mainstream by adding in a whole range of ‘other colours’ that reflect an interconnected, holistic model of education for sustainability. [There are now] opportunities for many more teachers to engage with sustainability as there are significantly more ‘entry points’, particularly within the ‘social handprint’. [In WA] The 12 Action Learning Areas are mapped to the UN’s Sustainable Development Goals, so there is a real consistency in terms of messaging and imprimatur for schools in this regard (H. Flinders, personal communication, December 3, 2018).

AuSSI put the learner in the centre of the inquiry process for transformational change. This has had implications for the design and implementation of curriculum programs e.g. the NSW “Sustainability action process” (NSW Department of Education 2018), School Kitchen Gardens, Solar Schools Program, Climate Clever Program, and Nature Play.

Schools have made stronger connections with their communities and partnered with local or regional organisations to bring in sustainability skills expertise. This has led to increasing the school community’s capacity to work towards creating a sustainable future.

Ultimately, AuSSI has made understanding and knowing regarding sustainability, visible.

5.5 Ongoing Challenges and Opportunities Towards Education for Sustainable Development

Despite significant achievements there is a sense of disappointment and frustration amongst the EE community that more could not have been achieved. It was challenging for the sector to recover from the loss and betrayal that was felt when the Commonwealth withdrew its support in 2010 after such determination and effort to espouse public commitment for environmental objectives equal to social and economic through the 2009 National Action Plan (DEWHA 2009). Yet there has been ongoing determination to build on successes knowing that the AuSSI model when implemented as intended works well. Where this has happened we know that schools have become exemplars of sustainability and “ecological conversion” in their communities.

Numerous evaluations and research projects confirm that the model of a whole-school approach to EfS is not only achievable but results in transformative learning transferable to life beyond the school. We know that primary schools generally make greater progress in achieving whole-school engagement than secondary schools (DEWHA 2010a, p. 16; Rickinson et al. 2016, p. 23; AESA 2014, p. 103). Coordination across curriculum areas is harder for secondary schools to achieve due to separation of key learning areas into faculties. The AuSSI approach has proven to be both educationally sound and ecologically effective. Essentially, sustainability concepts need to be learned through applying systems thinking where schools are working models of sustainability in their communities and students work with their educators in adopting sustainable resource use behaviours; showing leadership; monitoring reductions in ecological footprints; and connecting with their local communities on sustainability action projects (AESA 2014, Rickinson et al. 2016).

Teachers believe in the need for EfS but struggle in their ability to integrate it and are having to prioritise mainstream educational agendas in the form of curriculum and policy pressures such as the National Assessment Program – Literacy and Numeracy, introduced in 2008. Teacher pre-service and inservice professional development is critical and requires systemic change (AESA 2014, pp. 91–92 and 123; Nicholls and Thorne 2017, p. 191). How can we meet the challenges of education for sustainable development (ESD) when our governments continue to separate educational and environmental policy? A fundamental challenge is the need for a permanent ongoing policy priority linking both (Smith 2018, p. 288).

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Chapter 6

The Austrian ECOLOG-Schools Programme – Networking for Environmental and Sustainability Education



Franz Rauch and Günther Pfaffenwimmer

Abstract This chapter describes networking for education for sustainable development within the Austrian ECOLOG (ECOLOG is the abbreviation for the Ecologisation of Schools)-schools network. It discusses theoretical concepts of Education for Sustainable Development and school development from an Austrian perspective, as well as networks in education in general and the organisation of the ECOLOG-network in particular. Furthermore, the international ENSI (Environment and School Initiatives) network is described as an influential stimulus for the development of ECOLOG. Based upon these foundations, the concept and results of evaluation studies of ECOLOG-schools are described and reflected in seven theses. The impact of ECOLOG on the developments in Environmental Education/Education for Sustainable Development (EE/ESD) in Austria are described and reflected. The paper concludes with a summary of the evaluation process and with an outlook for the future development of the network.

6.1 Introduction

The chapter describes and analyses the development of the ECOLOG schools programme as a major project in Austria in the context of Environmental Education/Education for Sustainable Development (EE/ESD) since the 1990s. In order to understand the concept of ECOLOG the chapter discusses theoretical concepts of

F. Rauch (✉)
Alpen-Adria University, Klagenfurt, Austria
e-mail: Franz.Rauch@aau.at

G. Pfaffenwimmer
Sub-Department for Environmental Education, Austrian Federal Ministry of Education,
Science and Research, Vienna, Austria
e-mail: guenther.pfaffenwimmer@aon.at

Education for Sustainable Development and school development from an Austrian perspective, as well as action research and networks in education in general and the organisation of the ECOLOG-network in particular. Furthermore, the international ENSI (Environment and School Initiatives) network is described as an influential stimulus for the development of ECOLOG. Based upon these foundations, the concept and results of evaluation studies of ECOLOG-schools are condensed in lessons learned. As ECOLOG is an influential programme in Austria the impact of ECOLOG on initiatives and other networks in Environmental Education/Education for Sustainable Development (EE/ESD) are described and reflected as well. The paper ends with a summary and an outlook for the future development of the network.

6.2 Education and Sustainable Development

Current discussions around Education for Sustainable Development (ESD) in Austria focus on the notions of sustainable development, on environmental education, on development education (or global learning or global citizenship education) and international peace as well as civic education, which have sparked debates on the nature of education in general (Rauch and Steiner 2013). The current international United Nations programmes like Sustainable Development Goals (especially goal 4 “for Quality Education”) (United Nations 2016) and the 2015 UNESCO Global Action Programme on Education for Sustainable Development are in line with the conceptualisation of ECOLOG.

As with human rights, sustainable development may be regarded as a regulatory idea (Kant 1787/1956). Such ideas do not determine an object but serve as heuristic structures for reflection. They give direction to research and learning processes. In terms of sustainability, this implies that the contradictions, dilemmas, and conflicting goals inherent in this vision need to be constantly re-negotiated in a process of discourse between participants in each and every concrete situation (Minsch 2004). This implies a great challenge but also has considerable potential to enhance learning and innovative developments in education (Rauch 2015). A central goal is the transformation of individuals, organisations and the society. Learning is transformative “when the learners, integrate and reinterpret knowledge into their own frames and put it into practice in their own lives. Learning is also one mechanism for changing the society and for transforming the society” (Reardon 2010, p. 9).

6.3 School Development

Holtappels and Rolff (2004) describe pedagogical school development as a triad made up of teaching development (Unterrichtsentwicklung – UE), personnel development (PE), and organizational development (OE). They emphasize that in a systems context, each of these ways leads to the others. Essential for a comprehensive

understanding of educational work is supplemental expansion of the intra-scholastic system context as shown here through extra-scholastic factors (e.g., school governing entities, school supervisory boards, businesses, universities, cities, regions).

6.3.1 School Development Through Action Research

Engaging in action research can lead to an improvement in current working situations through those involved examining and reflecting on current practices, further developing their own competence for handling work situations (practical theory) and contributing to their knowledge level expansion (production and dissemination of “local knowledge”) (Elliott 1991; Altrichter and Posch 2009). Within an action research context, pedagogical school development can be described with the following characteristics (Elliott 1991):

Development originates from teachers who seek to innovatively further develop their teaching as an answer to challenges from existing circumstances and practice.

- This pedagogical school development focusses on pedagogical interactions between teachers and students as well as among students themselves. The attempt is made to include students in the planning and execution of the teaching process.
- Development targets a connected process between the further development of pedagogical practice and development of conducive organizational structures and support systems.
- Standards for the development work are also derived from professional pedagogical values, which are embedded in the professional school culture.

Thus, action research does the preliminary work for an essential element of school quality development: the development of a feedback culture, in which reflective dialogues between all parties involved in school life (teachers, students, administration, parents) belong to the work and daily culture of the school.

During the 1990s, following the development of Austrian schools’ autonomy, a discussion regarding site-specific quality assurance and quality development was launched. The conception of the school program was the center of the development. Education department funded pilot projects were undertaken and concomitantly investigated (e.g., Krainz-Dürr et al. 2002); however, only a decade later were the resultant findings legally put into place. As of the 2014/2015 school year, all schools have been required to prepare a development plan for their institutions. They are supported during this process by Education Ministry platforms (SQA – Schulqualität Allgemeinbildung, or school quality general education – for the general school sector and QIBB – Qualitäts Initiative Berufsbildung, or career education quality initiatives – for the vocational school system) and offerings from educational universities. A school’s quality ultimately presents itself by whether and to what degree students have learning experiences and meet learning outcomes which allow them to build identity and feelings of self-worth and to develop discipline-specific, interdisciplinary, social and personal competencies for active participation within the community

in both career and private life. The learning and teaching within class and school is the place where these experiences and competencies – supported and guided through the teachers’ professional expertise – should be acquired. However, school is not just a “learning space” but also a “living space”. In a “living space” class and school, the students have social experiences in a larger group with specific rules. This should serve to satisfy basic human needs (e.g., security, recognition), but also facilitates learning about social relationships, work organization and democracy, taking on responsibility, reliability as well as give-and-take in social contexts.

The learning experiences that students acquire in the area of learning and teaching as well as in “living space” class and school form the core of school work which determines school and instructional quality. The individual school works on providing favorable conditions for these core activities. Through personnel development and further professionalization, teachers work on their competencies for productive creation of a learning- and living-space class and school as well as their own reflection competency. Leadership and school management contribute to orientation and beneficial conditions for the work of all involved parties. Through the active creation of school partnerships and outside relationships, the school partner should be integrated, the school environment should be informed and potentials for school support should be identified and cultivated.

But not everything is dependent upon the internal work at the school; external influences also have an effect on the work of schools and the quality of their outcomes. Many of these influence sources are “far away”, quasi outside schools’ range of influence (e.g., legal frameworks, overall development). With others, the school stays in contact or can establish contact with them (e.g., continuing education, community, feeder and receiver schools): therefore, the school itself has a certain influence whether these are beneficial, obstructive or neutral conditions for school work (Rauch et al. 2018).

6.4 Theoretical Background of Networks in Education

In the early 1980s, the notion of “networks” became very popular within society as a whole and within the scientific community in particular. Naisbitt (1984) talked about a “megatrend” of transformation within and of hierarchies, arguing that informal networks of small groups become necessary to optimize organisational problem-solving processes which can no longer be performed by hierarchical structures.

According to Castells’ (2000) notion, networks constitute a new social morphology in society, where dominant functions and processes are increasingly organized around networks. New information technologies provide the material basis for its pervasive expansion throughout the entire social structure. Castells (2000) conceptualises his notion of ‘network’ as a highly dynamic, open system consisting of nodes and flows.

In the wake of these general social trends and this structural transformation, networks in educational contexts have also become increasingly attractive in

educational systems. In the 1990s, systemic school modernization processes were launched by policymakers, prompted by the need for reformatory change in the light of the results of international assessment (like the TIMSS and PISA studies). Having proclaimed “school autonomy” as goal, the central administration in Austria has focused increasingly on contextual steering activities whilst delegating responsibilities to decentralised units (Posch and Altrichter 1993; Fullan 2007; Rauch and Scherz 2009). Less bureaucratic steering generates a need for alternative coordination. Intermediate structures (Czerwanski et al. 2002) such as networks are conceived and expected to fill a structural gap and take over functions traditionally assigned to the hierarchy. Ideally, networks are conceived as an interface and an effective means of pooling competencies and resources (Posch 1995; OECD 2003). As intermediate structures, they manage autonomy and interdependent structures and processes, and try to explore new paths in learning and cooperation between individuals and institutions (Rauch 2013). In this process, authors consider the following aspects paramount:

- Mutual Intention and Goals (Lieberman and Wood 2003)
- Trust Orientation (McLaughlin et al. 2008)
- Voluntary Participation (Boos et al. 2000; McLaughlin et al. 2008)
- Principle of Exchange (Win-Win Relationship) (OECD 2003; McCormick et al. 2011)
- Steering Platform (Dobischat et al. 2006)
- Synergy (Schäffter 2006)
- Learning (Czerwanski et al. 2002; O’Hair and Veugelers 2005)

Per Dalin’s (1999) description of how networks function in education is an important theoretical basis which underlies the formation of regional networks in ECOLOG. Networks in education have an informative function, which becomes visible in a direct exchange of practice and knowledge for teaching and schools, and act as a bridge between practice and knowledge.

Through networking, further opportunities for learning and competence development (professionalization) are encouraged by the members who establish the learning function. Trust is a prerequisite for cooperation within a network. It is the basis for the psychological function of a network, which encourages and strengthens individuals. In the political function of networks, enforceability of educational concerns increases, following the motto “together we achieve more”.

6.5 The Austrian ECOLOG-Schools Programme and Network

ECOLOG, a key action programme and network for the greening of schools and education for sustainability, was developed in 1996 by an Austrian team of teachers working on the international ENSI project (Posch 1999).

6.5.1 *ENSI as Stimulus for ECOLOG*

In December, 1985, the CERI Governing board (CERI is a research department of the OECD Directorate for Education and Skills) accepted the proposal for the ENSI project from Austria. This basic concept, in which the OECD highly esteemed demand for “dynamic qualities” was linked with the promotion of “environmental awareness”, stated, that dynamic qualities could best be developed if students are enabled to take constructive initiatives in their proximate environment (Posch 1990). Action research (AR) was chosen and has proved to be the method to make dynamic qualities observable, to facilitate reflection and observe their enhancement, through, for example, environmental-oriented project teaching.

ENSI was the first project focussing on dynamic qualities and linking them to environmental awareness and environmental education, which is still an ongoing task in the different member states (Rauch and Pfaffenwimmer 2018).

In 1986, in Austria a team of experienced teachers from different regions and types of schools were chosen and formed the ENSI teacher team co-ordinated by staff at the Ministry of Education and scientifically facilitated by academics from Universities. The teacher team received training in action research to be able to document and publish their innovative work as case studies. The ENSI team builds a bridge between practice, policy and research for many years until 2017. This team strongly influenced developments in Austria. In the summer 1995, the Minister of Education commissioned the ENSI teacher team to design the ECOLOG school network, which after a two-year pilot phase developed into a wider school network. The ECOLOG-school network contributed to the development of pedagogical criteria for “The Austrian Eco-label for Schools and Teacher Training Colleges” which has been awarded by the government since 2002.

In 1999, Austria joined the Australian-led ENSI project “Learnscape” (1999–2001) with the involvement of eight Austrian schools. Learnscape has become a focal topic for the ECOLOG school network and was also the starting point for the still on-going collaboration with the Austrian Institute for School and Sport Facilities (ÖISS). One important result of this collaboration are recommendations for the design of school grounds (Mellauner and Clees 2005).

In 2002, Austria submitted the first proposal for an ENSI-EU-project “School Development through Environmental Education SEED” (2002–2005). The proposal was successful, and Austria coordinated the SEED Project from 2002 through to 2005 (www.ensi.org/projects). The most influential publication is *Quality Criteria for ESD-Schools* (Breiting et al. 2005) which is translated into many languages. In order to facilitate understanding and implementation of the Quality Criteria for ESD-Schools the ENSI teacher team designed and piloted an in-service seminar for heads and coordinators of ECOLOG-schools (Lechner and Rauch 2014).

Collaborations between schools and their surrounding communities are crucial for real development and change in society. Therefore the last project of ENSI, CoDeS (School and Community Cooperation for Sustainable Development) focused

on this collaboration by gathering 29 experts and 17 countries. The project ran from 2011 to 2014 and was funded by EU Comenius funds.

6.5.2 Structure of ECOLOG

ECOLOG is based upon an action research approach, which was discussed previously. Schools analyse the ecological, technical, and social conditions of their environment and, resultingly, define objectives, targets, concrete activities and quality criteria to be implemented and evaluated. Students as well as all the other stakeholders of a school should be involved in a participatory way, and collaboration with authorities, businesses, and other interested parties is encouraged. The measures concern, among others, areas like saving resources (energy, water etc.), reduction of emissions (i.e. waste, traffic), spatial arrangement (from the classroom to the campus), the culture of learning (communication, organisational structure), health promotion as well as the opening of the school to the community. All in all, over 550 schools with about 15,000 teachers and approximately 110,000 students are currently part of the network. Many others are reached through the website, teacher in-service-training seminars and newsletters (Rauch and Pfaffenwimmer 2014).

Given the uncertainty of what constitutes adequate action in complex situations, such as networking and the differences in understanding of conceptions like education and sustainable development, there is a need to reflect on one's actions. This helps to nurture an ability and readiness for the further development of one's actions in response to the outcome of the reflection process. Competent, professional action in complex situations, hence, requires concomitant learning processes as a *sine qua non*. Inversely: professional learning requires the experience of acting in complex practical situations. From these perspectives, professional action and professional learning coincide in one stream of action. As professional learning happens in practical situations, which, in turn, are seen to require reflection and further development, knowledge and skill development go hand in hand with practical situational development (Altrichter and Posch 2009). Stern et al. (2014) offered reflections on good action research. They argue that good action research pursues worthwhile practical purposes, connects theory with praxis, and is responsive and collaborative.

ECOLOG is a national support system with the aim of promoting and integrating an ecological approach into the development of individual schools and attempts are being made to embed the programme in Austria's federal states through regional networks (Rauch and Steiner 2006). In order to provide support, a network structure involving ECOLOG regional teams in the nine Austrian provinces has been developed; furthermore, a scientific advisory board has been established. Central support is provided by the Ministry of Education and by the Institute of Instructional and School Development at the Alpen-Adria-University, Klagenfurt. Additional support measures are provided by the FORUM Environmental Education (an NGO) as well as via seminars for heads and coordinators of ECOLOG network schools, the

Education Support Fund for Health Education and Education for Sustainable Development, as well as via the National Environmental Performance Award for Schools and University Colleges of Teacher Education (Rauch and Pfaffenwimmer 2014).

6.5.3 Evaluation Studies of the ECOLOG-Schools Network

Throughout the past twenty years of the ECOLOG-schools network's existence, a series of evaluations, inquiries, and studies have been produced (Thonhauser et al. 1998; Ehgartner 1999; Payer et al. 2000; Schober-Schlatter 2002; Rauch and Schrittmesser 2003; Heinrich and Mayr 2005; Knoll and Szalai 2009; Lechner and Rauch 2014).

Based on these evaluations, the Institute of Instructional and School Development at Alpen-Adria-University, Klagenfurt was commissioned to conduct an evaluation study of those 23 schools that have been part of the ECOLOG programme for the last 10 years (Rauch and Dulle 2012).

The knowledge that teachers gained through their experiences of concrete ecological development processes and its systematic evaluation by way of participatory action research constitutes an invaluable reservoir of practical expertise for everyone involved in the ECOLOG programme and everyone interested in ecological school development processes.

Through guideline-based interviews the Lamnek (2005) study collected and analysed evaluations by heads of schools and ECOLOG coordinators of the effects of the ECOLOG programme in their schools as well as the experiences the interview partners have had with the programme during the last 10 years. The 23 schools which were part of this study came from all nine Austrian states and represent all school types, including primary schools, secondary schools, higher secondary schools, as well as vocational schools and higher vocational schools. At these schools, interviews were conducted with 16 heads and 23 ECOLOG coordinators (a total of 39 interview partners). The emphasis of the questions related to past successes and positive impacts of the implementation of the programme, potential problem areas and general points of criticism.

These interviews were transcribed and analysed according to the model of content analysis (Mayring 2002), and additional material available at the schools (annual ECOLOG reports, annual school reports, teaching materials, the school website, the ECOLOG website, press releases and school folders) were integrated in the analysis.

Prior to the final analysis, a brochure was produced containing summaries of all ECOLOG-related activities in the form of illustrated profiles of the 23 schools as well as of their successes and challenges that were faced (Rauch and Dulle 2011). This brochure as well as a number of theses, formulated from the preliminary results of the interviews, were presented and put forward for discussion in the context of a

workshop with representatives of the schools interviewed and other schools taking part in the ECOLOG programme.

In 2016, a study on the nine regional ECOLOG networks was commissioned. Based on interviews with members of the regional teams and selected teachers as well as the analysis of reports of ECOLOG schools and other documents, the goals, structure and effects of ECOLOG were examined (Ziener 2017).

In the following section, lessons learned generated from all of these studies will be presented based on the studies undertaken.

6.5.4 Lessons Learned Based upon the Studies

- ECOLOG is a highly demanding programme

As a comprehensive concept of school development promoting education for sustainable development, which connects teaching and learning processes, school organisation and the school's collaboration with external partners, ECOLOG is a highly demanding programme. After nearly 20 years, the relevance of ECOLOG varies greatly between different schools. In some instances, it is “merely one project among many others” while other schools have made it their “number one priority”. ECOLOG has been integrated into the day-to-day life of around half of all participating schools, with most of those being primary schools.

- The ECOLOG network supports further development

Schools that were able to build up a sustainable ecological school structure, had often already had experiences with ecological education and school development before they joined ECOLOG. Building upon those experiences, the ECOLOG network supports further development, for example, through regional exchange of experiences and information, the generating of new ideas, the provision of educational materials and through financial resources. This support is seen as very helpful. Further opportunities for support are seen in the creation of a pool of external speakers and advisors, the development of more varied materials depending on different types of schools, as well as a stronger activity in the area of public relations and the provision of material resources.

- The ECOLOG network schools face a number of challenges

Supporting the development of a sustainable school culture depends on taking seriously the different interests of stakeholders and on working collaboratively on common aims. Successful ECOLOG network schools have learned to deal with both internal as well as external changes and to embrace diversity.

- ECOLOG has effects in numerous areas

The effects of ECOLOG are seen in numerous areas. Among them are changes in teaching methods (increased project-based learning and social learning, for example), the increased integration of health-related topics as well as ecological and social topics in the teaching, the design and organisation of the school building (e.g.

the schoolyard, measures of energy optimisation) and changes in school life (e.g. healthy foods for pupils and teachers). Participation in ECOLOG raises the image of the school. More empirical evidence is needed to understand better the middle- and long term effects of ECOLOG especially on students.

- ECOLOG depends on dedicated individuals

On the one hand, ECOLOG lives through the particular dedication of individual members of the teaching staff. On the other hand, a culture of mutual collaboration must be established in order for a sustainable school culture to thrive. This poses challenges for schools. The development of a team culture is crucial for sustainable whole school development. In one third of the ECOLOG schools the responsibility still lies strongly in the hands of individual teachers.

- ECOLOG helps schools meet their legal reporting requirements

ECOLOG network schools commit themselves to principles of quality development and quality assurance. The production of annual reports in accordance with the concepts inherent in the school's development plan may often, especially in the beginning, cause difficulties. Efforts and benefits need to keep a healthy balance. After some years of experience, schools are often much better able to achieve this. At this stage, the annual ECOLOG report is often seen as a helpful tool for reflexion and planning. Thus ECOLOG is able to make a thematic contribution to the practical realisation of legal requirements, such as the establishment of a quality management system as well as of educational standards (especially in the natural sciences).

- Ecologisation needs to be integrated into school processes and identity

Processes of ecologisation at schools are successful in the long-term if they are viewed both as dependent on the build-up of experiences and routines as well as on the development of new ideas. ECOLOG offers a variety of thematic links and a support network that enables school-specific and autonomous developments. Every ECOLOG network school can find and develop its own identity.

6.6 Impact of the ECOLOG-Schools-Programme in Austria

Table 6.1 gives an overview of the EE/ESD-developments in Austria since the 1990s. The overview shows the context of the ECOLOG-schools-programme in Austria. In this section we focus on the contribution and connectedness of ECOLOG to some of these initiatives.

An early impact of ECOLOG was the implementation of the National Environmental Performance Award for Schools and University Colleges of Teacher Education. This is a national government-based award to acknowledge top level performance since 2002. About half of the 120 criteria relate to Environmental Education (EE) and ESD, the school curriculum and school development. The other half refers to technical aspects, such as energy saving. The award is valid for 4 years, after that the compulsory external evaluation has to be renewed (Rauch and

Table 6.1 Overview of the ESD-developments in Austria

	ESD-implementation and relevant legal developments	ECO school network (ECOLOG)	Teacher education	Higher education	International initiatives
1995		Start of ECO-school concept			ENSI decision on focus topics: ECO-schools, teacher education, (IT)-networking and quality assurance.
1996		Start of ECO-school pilot phase (1996–1998)			
1997			ENITE-research project (environmental education in teacher education)		
1998					
1999		Concept for ECO-school network			
2000					
2001		Start of ECO-school network	ENITE-network		
2002	ESD platform in Ministry of Education (2002–2008)	<i>National Environmental Performance Award</i> for schools and teacher training universities			EU-ENSI-SEED-network project (2002–2005)
2003					

(continued)

Table 6.1 (continued)

	ESD-implementation and relevant legal developments	ECO school network (ECOLOG)	Teacher education	Higher education	International initiatives
2004			First national teacher training university course “Innovation in Teacher Education – Education for Sustainable Development” (BINE).		EU-ENSI-CSCT-project (2004–2007)
2005	Vilnius declaration ESD strategy process (2005–2007)			International conference “Committing Universities to Sustainable Development”	UNECE Vilnius declaration
2006	ESD strategy process EU-ESD-conference		Research project “Competences for Education of Sustainable Development” (KOM-BiNE) (2006–2008).		UNECE evaluation
2007	UNESCO award			Sustainability award established	EU-ENSI-SUPPORT network project (2007–2011)
2008	ESD strategy decision Austrian Agency for Education for Sustainable Development (“Dekadenbuero”)		Second National Teacher Training University Course BINE		
2009					UNECE evaluation
2010		300 ECO-schools	ECO-school-network with teacher training universities		

(continued)

Table 6.1 (continued)

	ESD-implementation and relevant legal developments	ECO school network (ECOLOG)	Teacher education	Higher education	International initiatives
2011	Legislation on quality management in schools				EU-ENSI-CoDeS-network project (2011–2014)
2012		400 ECO-schools	Third national teacher training university course BINE	Alliance of sustainable universities	
2013					
2014					
2015	Global Action Programme & Sustainable Development Goals (International initiatives)				
2016			Fourth national teacher training university course BINE		
2017		500 ECO-Schools (ECO-School-Network ECOLOG)			
2018			Project UniNetZ (higher education)		

Pfaffenwimmer 2014). The ECOLOG Programme serves as an important source for the formulation of the pedagogical criteria (Pfaffenwimmer 2004). So far, over 100 school have been awarded this Environmental Performance Award, some of them for the fourth time.

Since the 1990s ECOLOG has been a reference for other thematic networks in Austria focussing ESD, including “climate alliance schools” (<https://www.klimabuendnis.at/english>), “climate schools” (<https://klimaschulen.at>, see below) “nature park schools” (<https://www.naturparke.at/schulen-kindergaerten/schulen/>), UNESCO schools (<https://www.unesco.at/bildung/unesco-schulen/>) and “healthy schools” (<https://www.gesundeschule.at/>). Between 2013 and 2018 the Austrian Ministry of Education, Department of Environmental Education compiled a list of all Austrian schools which are active members in these thematic networks. 1000

schools are listed, some of them active in different networks. As there are 5712 schools in Austria, this means that every sixth school in Austria has a continuous engagement in ESD.

From 1997 to 2004 the ENITE-project (Environmental Education and ESD in Teacher Education) was carried out by the University of Klagenfurt as a research and development network which supported the development and study of initiatives in teacher education and was inspired by ECOLOG especially at Universities of Teacher Education (Posch et al. 2000; Kyburz-Graber et al. 2003). The main outcome of the ENITE-network so far is the National Teacher Training Course “Innovation in Teacher Education – Education for Sustainable Development” (BINE) offered by the Institute of Instructional and School Development at the University of Klagenfurt in cooperation with Universities of Teacher Education. The four semester in-service course has run successfully four times, the fifth course is starting in 2019 (Rauch and Steiner 2015). Since 2006–2007 teacher education is involved in a dynamic reform process based on new legislation for teacher training. A positive result of the ENITE-network and the BINE courses is that communication and collaboration and even participation between University of Teacher Education and the ECO-school network has been stabilised and enhanced (Rauch and Pfaffenwimmer 2014).

In her recent evaluation study Ziener (2017) writes that the annual reports by the participating schools, which are published on the ECOLOG website (<https://www.oekolog.at/welcome.html>), serve as outreach and impact of the programme. Her analysis indicates the wide variety of external partners with whom schools regularly cooperate like parents’ associations, municipalities/mayors, farmers, nature conservation associations, environmental education associations, national parks/nature parks, local universities and colleges, health and social sector, industries, tourism, local media and so on.

Throughout the history of Environmental Education and ESD in Austria and especially since the Ministry’s basic decrees for Environmental Education for Sustainable Development in 1985 and 2014 (Austrian Federal Ministry for Education and Women’s Affairs 2014) the engagement in locally relevant educational activities has been a central focus. Partnerships with external agencies and actors have proved as a valuable approach (Lukesch et al. 2009). In the years 2012–2014 “School-Community-Collaboration” was a focal topic for the ECOLOG-programme, also contributing to the ENSI-EU-Project CODES (2011–2014) (https://ensi.org/Projects/Our_Projects/CoDeS/) (Rauch and Pfaffenwimmer 2014).

In 2006, the Austrian UNESCO-Commission decided to award projects within the UN Decade Education for Sustainable Development (DESD) that meet the international criteria of ESD. From 2007 to 2014 201 projects of 168 organisations were awarded and documented in four publications of the UNESCO commission as well as in the “Bildungslandkarte” (Education Landscape)” of the FORUM Umweltbildung (Environmental Education FORUM) (<https://www.bildungslandkarte.at/>). The “Education Landscape” is an electronic search tool to find Austrian organisations which are active in the field of ESD and offer learning opportunities. Currently 525 organisations (actors) are registered. Since 2016 these institutions

also have had the opportunity to apply for the Award “Education for sustainable development – BEST OF AUSTRIA” within the framework of the UN Global Action Programme.

6.7 Conclusion and Outlook

The ECOLOG programme has been growing for many years, being the oldest network supported by the Ministry of Education. One reason for this is that ESD is always connected with current developments in the Austrian education system, such as quality evaluation and quality assurance. Other factors of success are the support system of the network, which keeps the projects going, as well as an active evaluation culture, which includes action research as well as external, formative evaluations, which provide feedback and confirmation (Rauch and Pfaffenwimmer 2014). The ECOLOG programme influenced other developments in Austria, like the National Environmental Performance Award as well as other thematic school networks like Climate Alliance Schools, UNESCO Schools or Nature Park Schools. All in all, nearly 20% of the Austrian schools participate in one of these networks dealing with ESD issues. Beyond this impact the experiences and evaluation outcomes gained in the ECOLOG programme build foundations and provide orientation for awards like the UNESCO Award on ESD (in the context of UN DESD) and the current award Best of Austria (in context of the UN SDGs).

A challenge is still posed by sustainably anchoring ECOLOG at schools at the interface of innovation and as part of the dynamic every-day culture of these schools. In relation to regional support systems in the federal states, the respective professional and political contexts play a decisive role. The provision of stable and continuous support, which, at the same time, is flexible enough to dynamically respond to change, both makes high demands on all parties involved and, at the same time, also requires adequate resources.

The aim followed by ECOLOG is the implementation of ESD at individual schools in their respective local environment. ESD is conceptualised as the negotiation of conflicting interests. Without this, ESD cannot come to full fruition in the context of current social arrangements. Instead, ECOLOG challenges those conditions and formulates demands towards co-determination.

Hence, the ECOLOG programme is caught between the danger of being instrumentalised by particular interest (e.g. one-sided economisation) and being overburdened (by its claim to formative influence). The creation of spaces for exchange, networking, and reflexion are central elements of the ECOLOG programme, through which it hopes to support ECOLOG network schools in their constructive handling of this area of tension (Rauch 2016).

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Chapter 7

Ontario EcoSchools: A Framework for Environmental Learning and Action in K-12 Schools



Lindsay Bunce, Nancy McGee, and Christina Phillips-MacNeil

Abstract The Ontario EcoSchools program is one of the largest free, bilingual, school-based environmental programs in Canada and reaches approximately 900,000 students each year. Working within a framework that focuses on six key areas, the program seeks to nurture environmental leaders, reduce the ecological impact of schools, and build environmentally responsible school communities. The impacts achieved by participating schools are the result of support and collaboration from all levels of the education sector, including teachers, parents, postsecondary institutions, community organizations, and school board officials. Our chapter speaks to the history of Ontario EcoSchools, strategic partnerships with York University and Toronto and Region Conservation that have helped ensure success, and opportunities and barriers as the program continues to scale.

7.1 Introduction

The Ontario EcoSchools program is one of the largest free, bilingual, school-based environmental programs in Canada and reaches over 900,000 students each year. Working within a framework that focuses on six key areas, the program seeks to nurture environmental leaders, reduce the ecological impact of schools, and build

L. Bunce (✉)

EcoSchools Canada, Toronto, ON, Canada

e-mail: lbunce@ontarioecoschools.org

N. McGee

Ontario EcoSchools, Toronto, ON, Canada

e-mail: Nancy_McGee@edu.yorku.ca; nmcgee@trca.on.ca

C. Phillips-MacNeil

Ontario EcoSchools, Toronto, ON, Canada

University of Toronto, Toronto, ON, Canada

e-mail: c.phillips@mail.utoronto.ca

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environmentally responsible school communities. While there are many environmental education groups achieving significant success and helping to build momentum within the green schools movement across Canada, this chapter will focus exclusively on activities in Ontario, specifically those linked to the Ontario EcoSchools certification program.

The impacts and successes achieved by participating schools are the result of support and collaboration from all levels of the education sector, including students, teachers, school administrators, school support staff, parents, postsecondary institutions, volunteers, community organizations, and school board officials. Each of these groups play a vital role in advancing the green schools movement in Ontario.

To highlight the deeply collaborative nature of the Ontario EcoSchools program, the authors have elected to share perspectives from across all levels of the EcoSchools community. The chapter includes sections from Ontario EcoSchools staff that focus on program history and impact, from preservice teacher educators exploring how to best equip new teachers with the skills required to offer valuable outdoor experiential pedagogical approaches, and from community partners seeking to deepen the impact of their experiential programming while supporting EcoSchools across Ontario. The hope is to emphasize how these partnerships serve to create a common lens through which to approach environmental learning and action in schools. These collaborations bring the Ontario EcoSchools program to life at the school level and support students and teachers as they expand their classroom to include a global context.

7.2 The EcoSchools Program in Ontario

Ontario EcoSchools is an environmental education and certification program for students from kindergarten to grade 12 that supports school communities develop ecological literacy and sustainable practices. The program's mission is to nurture environmental leaders, reduce the ecological impact of schools, and build environmentally responsible school communities. It is currently the only voluntary, bilingual, and free certification program in Ontario that benchmarks, recognizes and celebrates schools for their environmental achievement. With over 900,000 students reached through campaigns and activities (ecoschools.ca), the program seeks to transform the landscape of environmental education across the province through four core activities:

1. *Administering annual certification of schools*

Participating schools are recognized for achievement based on provincial standards of environmental excellence, with an emphasis on student leadership. Certification criteria has been developed and refined by schools and school boards since in the inception of the program. Certification levels range from Bronze to Platinum.

2. *Nurturing a vibrant provincial network*

The program provides year-round support to a diverse network of 58 school boards (81% of school boards in Ontario) and 1899 schools (40% of publicly-funded schools in Ontario). This includes a dedicated Programs Team that engages with school board staff, teachers, and students on a regular basis.

3. *Supporting strong EcoTeams at the school level*

Through workshops, webinars, and conferences, Ontario EcoSchools equips school-based environmental clubs, or EcoTeams, with the tools they need to certify and create environmentally responsible school communities. Across the province, over 50,000 students participate on EcoTeams.

4. *Sharing environmental resources*

Ontario EcoSchools promotes ecological literacy through providing free, bilingual, curriculum-linked resources that support environmental learning and action inside and out of the classroom.

7.3 Ontario EcoSchools Program History

The following program history is largely based on the work of Suzy J. Simonetti (2007), institutional knowledge held by the Ontario EcoSchools staff, and personal communications with Richard Christie, one of the founders of the EcoSchools Program in Ontario.

The development of the Ontario EcoSchools program began in 1999 and was the result of the amalgamation of six smaller municipal school boards forming one large school board currently known as the Toronto District School Board (TDSB). An environment policy was crafted for the newly-formed school board with two major goals: to improve the ecoliteracy of students and to improve the operational practice of the schools (Simonetti 2007).

The EcoSchools program was created as a method of implementing and providing accountability to new environment policy: EcoSchools were to be a living expression of this policy. Richard Christie, who is currently the Senior Manager of Sustainability with the TDSB, suggests that the original EcoSchools concept was inspired by the international Eco-Schools Program, developed and delivered by the Foundation for Environmental Education (FEE). The program, initially only available to schools in the TDSB, was also partially modelled after the ISO 14001, which is focused on environmental management systems and underpins the international FEE program (Simonetti 2007).

At the time, the TDSB knew that their program was ambitious in its scope and the team was very mindful of the need to be accessible to all schools across the Greater Toronto Area.

The TDSB wanted to appeal to the average school: converting mainstream schools into opportunities for students to learn ecological literacy while improving operational practices. TDSB students do participate in outdoor ecological education programs;

however, educators were not sure that these programs, as powerful and important as they are, are enough to teach students how to live sustainably and whether the lessons are transferred back to the school and to students' lives (Simonetti 2007, p. 6).

Based on the initial success of the program, Richard Christie approached the York Environmental Education Consortium (YEEC) in 2005 about the possibility of expanding the initiative to other school boards in Ontario. The YEEC was made up of like-minded school boards that has created a regional learning community through sharing environmental education resources and troubleshooting challenges. Under the guidance of Catherine Mahler, who was working with the TDSB at the time, the consortium was able to secure funding to begin a province-wide initiative that was incubated within York University's Faculty of Environmental Studies.

The consortium then transitioned to become the Ontario EcoSchools Steering Committee comprised of seven school boards and two community partners who championed uptake of the program in new regions. The school boards included: Durham District School Board, Halton District School Board, Halton Catholic District School Board, Thames Valley District School Board, Toronto District School Board, Waterloo Region District School Board, York Region District School Board, Toronto Region Conservation Authority and York University.

Since the first 13 schools piloted the program, Ontario EcoSchools has continued to grow across the province. This speaks to the need for this type of framework as schools and school boards seek to improve their environmental practices (Fig. 7.1).

Throughout all phases of its development, the EcoSchools program was meant to be a powerful method of connecting what is taught in the classroom to how schools operate – all within the context of environmental learning and climate action. While some EcoSchools are further ahead than others on their sustainability journey, since the program is implemented as a framework, it allows school-based EcoTeams the

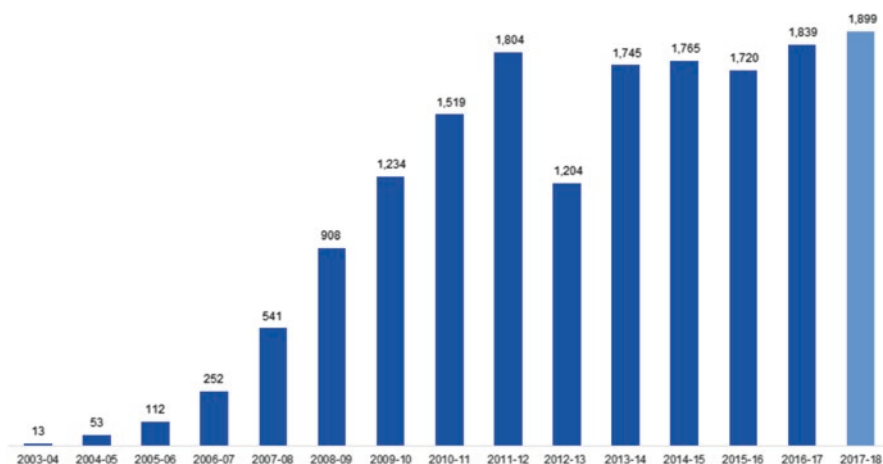


Fig. 7.1 Certified Ontario EcoSchools since 2003. (Note: Participation decreased in 2012–13 due to a provincial labour disruption)

flexibility to focus on issues and actions that are relevant to them and their local community.

7.4 Six Sections of Certification

The Ontario EcoSchools program is a framework based on six sections, each focusing on a different area of engagement. Designed to foster student leadership and support Ontario curriculum, the six sections are Teamwork and Leadership, Energy Conservation, Waste Minimization, School Ground Greening, Curriculum, and Environmental Stewardship. To become a certified Ontario EcoSchool, student EcoTeams are invited to identify and implement actions throughout the year that address gaps and opportunities for the whole school community. As they complete each action, EcoTeams accrue points towards their certification tally. Schools are required to accumulate at least 50 out of 100 possible points in order to be assessed and awarded a certification level from Bronze to Platinum.

In 2007, the Ontario Ministry of Education's then Minister, Kathleen Wynne, called together the first working group tasked with creating recommendations to the government to improve environmental education in Ontario schools. The report generated by the working group, *Shaping our Schools, Shaping our Future*, was the first of its kind in Ontario as it provided a clear vision for environmental learning and action across all levels of the education sector (Ontario et al. 2007). The working group's recommendations were then adopted in 2009 and formalized into an Environmental Education Policy Framework for Ontario called *Acting Today, Shaping Tomorrow* (Ontario 2009). Through its six sections, the EcoSchools program currently aligns with approximately 80–90% of the goals and objectives of the framework and therefore is a key component of school board environmental policies that were created after the framework was released.

7.4.1 Teamwork and Leadership

The first section that participating schools encounter within the EcoSchools certification program is Teamwork and Leadership. This section seeks to support success in the program as it covers many of the foundational needs of an EcoClub or EcoTeam. Through the EcoSchools points system, this section recognizes staff and students for activities such as regular meetings, goal setting, communications throughout the school community, and professional development. 96% of certified EcoSchools in 2018 were recognized for the providing student leadership and team-building support by completing activities in this section (ecoschools.ca).

Some initiatives included in the Teamwork and Leadership section include:

7.4.1.1 Diverse Engagement

Successful EcoTeams include members of all ages. EcoTeams are encouraged to invite students from multiple grades, as well as, adults to the team. This provides a spectrum of perspectives and helps to ensure that the team remains resilient year-over-year. A wonderful example of behind-the-scenes teamwork is how custodians and caretakers work closely with students on recycling, composting, school gardens and more.

7.4.1.2 Support from Administration

School principals and vice-principals can have a significant impact on the success of the EcoSchools program. As part of the certification program, administrators are encouraged to include EcoSchools as part of their school improvement plans, share EcoSchools stories at regular staff meetings, and engage parent councils in ongoing initiatives. This allows for a fully integrated environmental program and demonstrates that senior leadership is committed to the school community's environmental goals.

7.4.2 Energy Conservation and Waste Minimization

Energy Conservation and Waste Minimization are the program's most prescriptive action-oriented sections. They invite EcoTeams to track behaviour, assess performance, develop action plans, and reflect on their achievements. These sections each include a pre and post intervention assessment called the EcoReview. In a series of 18 questions, students are guided through a comprehensive review of activities in their school from turning off lights and monitors when not in use, to tracking contamination in the recycling stream. These sections tend to focus on actions that fall within a student's sphere of influence, meaning areas where students will be able to have a tangible impact on the outcome. While facilities-based improvements, such as solar panels, are important to minimizing a school's overall ecological footprint, this section seeks to emphasize actions that can be taken independently by children and youth.

Environmental impacts in the Energy Conservation and Waste Minimization sections can be significant. In 2018, 95% of certified Ontario EcoSchools were recognized for turning off lights when not required and 75% were recognized for implementing systems to reduce food-related waste during lunch and break times (ecoschools.ca/about/research-and-publications/). Some examples of how EcoSchools are tackling energy and waste behaviour in Ontario include,

7.4.2.1 Energy Hog

An extremely popular campaign for many EcoSchools is called the ‘Energy Hog’. This fun and lively campaign involves students monitoring classroom energy conservation and when one classroom forgets to turn off their lights or screens, they are awarded the Energy Hog. Usually the Energy Hog is a stuffed pig or a picture of a pig that has been made up to be scary or off-putting. Once a classroom discovers that the Energy Hog has landed in their classroom, it’s then their turn to find a classroom with the lights on and pass it along. This type of friendly competition within a school community can support a culture of energy conservation.

7.4.2.2 Celebrating Success

Many EcoSchools have adopted recognition programs to award positive environmental behaviour. Often these programs involve a trophy such as the Golden Lightbulb, for the classroom that has consistently turned off their lights when not in use, or the Golden Lunchbox, for the student that has packed a waste-free lunch. These methods of celebrating success have been quite powerful in incentivising environmental action across the school community.

7.4.2.3 GOOS Bins

91% of participating EcoSchools have implemented a GOOS paper (or Good On One Side paper) system within their classrooms, libraries, and administrative areas. The concept is very simple and requires a school to create a bin system to house paper that is still blank “good” on one side. This encourages staff and students to use the other side of the GOOS paper for quick notes, quizzes, etc. in lieu of reaching for a fresh piece.

7.4.2.4 Sharing Impacts

Because energy and waste are largely data-driven sections, the impacts that come as a result of student actions are generally more easily tracked. Because energy and waste are largely data-driven sections, the impacts that result from student actions are generally more easily tracked, as verified by two independent studies that measured the impact of the EcoSchools program on energy consumption and waste generation. The energy study revealed that that certified EcoSchools (both elementary and secondary) are more energy efficient than non-certified schools, and that the difference in energy efficiency of the two groups of schools is statistically significant (Enerlife Consulting 2016). On the waste side, with a recent third-party study that reveals that Platinum-level certified EcoSchools produce 57% less waste than non-certified schools (Immacutec Systems Technologies Inc 2016).

7.4.3 School Ground Greening

School ground greening is a transformational section of the EcoSchools program as students and staff work together to enhance the out-of-doors, create rich learning environments, and increase ecological biodiversity. This section offers infinite opportunities for students to explore, develop, and care for the nearby nature that lies just steps from their classrooms. As part of the Ontario EcoSchools certification program, schools are recognized for involving students at all stages of a greening project, including planning, fundraising, planting, maintenance, and ongoing use.

Each school can determine the purpose and scope of their school ground greening project. Some examples of projects and activities from across the province include:

7.4.3.1 Theme Gardens

Some schools choose to plant a theme garden, including peace gardens, food gardens, alphabet gardens, sensory gardens, victory gardens, and butterfly gardens. In planning a theme garden, students can be actively involved in the selection of a locally-relevant theme, researching the plants that are best-suited to the area, planting the garden, and ensuring that plants are cared for, especially throughout the summer months.

7.4.3.2 Nature Study Areas or No-mow Zones

For schools that are fortunate to have significant outdoor space, letting a defined section of the school yard naturalize into a nature study area, also known as a no-mow zone, can be an inexpensive way to enhance the school yard. These low-maintenance spaces can provide rich environments for learning and observation.

7.4.3.3 Design Contests and Surveys

Teachers can support student involvement during the design phase a school ground greening project through contests and surveys. Students of all ages can be invited to imagine their “dream school ground” and provide design ideas through a contest. The broader school community can identify needs on the school ground (e.g., shade, seating, nature study areas etc.) and provide feedback on a proposed project.

7.4.3.4 Student-created Outdoor Signage

Regardless of the type of project a school implements, all school ground greening initiatives can benefit from signage. Schools often choose to post colourful, student-created signs, identifying plant species or the type of garden they have designed (e.g., theme gardens). This signage not only recognizes the hard work that went into enhancing the space, it also brings awareness to the wider community.

7.4.3.5 Community Events

Many schools choose to use their school ground greening project as a venue to host a community event. This allows students to share their outdoor space with parents and guardians, as well as request support for ongoing care and maintenance.

7.4.3.6 Curriculum-linked Learning

To encourage ongoing use of their school ground greening projects, many schools have made efforts to leverage their project to provide rich learning opportunities connected to the curriculum.

7.4.4 Curriculum

The Curriculum section brings strength to key parts of a school's Ontario EcoSchools program. It can help to reinforce the importance of regular environmental practices by inviting students and teachers to explore the issues and impacts behind those activities. Borrowing language from the Ontario Ministry of Education, Ontario EcoSchools recognizes schools for supporting learning **IN**, **ABOUT**, and **FOR** the environment. Engaging students in action and advocacy will help them thrive, especially when these opportunities are coordinated with experiential and/or outdoor learning.

7.4.4.1 Learning IN the Environment

Teachers can solidify a student's sense of place and their connection to the environment by getting outside to develop observational skills in as part of a nature study. Stepping out of the classroom and using nearby nature to identify flora and fauna or using the school grounds as inspiration for a poetry unit, can be simple ways to enrich student learning. Innovative schools have supported teachers by offering outdoor education training days for colleagues and 'get outside' classroom kits (that

include items such as magnifying glasses, binoculars, clipboards, sitting mats, etc.) that can be shared with the entire school.

7.4.4.2 Learning ABOUT the Environment

Whole school themes are excellent ways to deepen learning around a specific environmental topic. Many schools choose a theme and invite teachers to each conduct a lesson related the theme. For example, a school might select marshes as a theme and all teachers are encouraged to teach a lesson or unit about marshes during a particular month. The month might culminate with an assembly to share key highlights or school-wide field trip to a marsh.

7.4.4.3 Learning FOR the Environment

Many schools choose to activate environmental citizenship and learning FOR the environment by initiating advocacy campaigns around local, national, and global issues. Students might take action by creating personal pledges, writing letters to a politician or other person of influence, and bringing awareness to the broader community.

7.4.5 Environmental Stewardship

The Environmental Stewardship section of the Ontario EcoSchools program supports schools as they combine environmental learning and action by engaging the whole school in making a difference for the environment. Schools receive recognition in this section for participating in national campaigns and launching local initiatives. Some examples of popular campaigns include:

7.4.5.1 Earth Day

Most schools across Ontario celebrate Earth Day. This is an opportunity to join a global community world in raising awareness of environmental issues and it is a time to invite all staff and students to take action. Many schools choose to commemorate Earth Day by hosting an outdoor environmental fair where students create activity stations to engage and inspire their peers.

7.4.5.2 Walk to School and Bike to School

Active transportation campaigns are great ways to encourage physical activity while reducing a school’s overall ecological footprint. When possible and safe, students can be encouraged to walk or bike to school in lieu of being dropped off by a parent or guardian. These campaigns are most successful when the broader school community is engaged in the planning and implementation. Friendly competition can promote participation. For example, a school might offer the “Golden Shoe Award” to the student or class that walk to school the most days during a particular month.

7.4.5.3 The Great Gulp

School and municipal government partnerships can drive impactful environmental stewardship campaigns. The Great Gulp is an initiative in the Region of Peel, where schools are encouraged to take a coordinated gulp of tap water on World Water Day. The event is coordinated by regional government staff with a goal to raise awareness around access to clean drinking water and reduce the use of bottled water.

7.5 Supporting EcoSchools and the Green Schools Movement in Ontario: Strategic Partnerships

The success of the Ontario EcoSchools program is linked to a collaborative process, one that leverages the innovation and expertise of groups within the organization’s broader community. The next sections are presented by EcoSchools community partners York University and Toronto and Region Conservation Authority. They serve to emphasize the need for a comprehensive approach to deepening the green schools movement across Ontario. It starts with our community of preservice teachers and continues with practicing teachers that are seeking to provide authentic and meaningful learning opportunities for their students in the out-of-doors. Outdoor and experiential learning are at the heart of the EcoSchools program and schools are continually encouraged to think outside their classroom walls.

7.5.1 York University: Outdoor Pedagogies & Preservice Teacher Education

Educating preservice teachers about the environment and various outdoor pedagogies is a critical and important step to set the stage for successes and excellence in environmental education and supporting the green schools movement. This section outlines some perspectives regarding how outdoor pedagogies and education are

approached in a Faculty of Education in the Greater Toronto Area with preservice teachers.

Educating for a Sustainable Future is a course offered through the Faculty of Education, York University designed for primarily preservice teachers. This course intersects with the vision and aims of Ontario EcoSchools such as building environmentally nurturing and responsible school communities, focusing on the infusion of environmental education across all grade levels and subject areas as well as fostering a passion for outdoor education in our preservice teachers.

Professor Don Dippo and myself (Christina – one of the chapter authors) have taught sections of this course over the past few years focusing our efforts on differing contexts. Dr. Dippo's course was offered in a blended format (i.e. offered both online and face-to-face) in a Kenyan refugee camp where my section took place at the York University Keele campus in Toronto, Canada as a face-to-face course. Half of each class at the Keele campus is spent outdoors engaging in outdoor experiential learning activities. We feel that these pedagogical approaches help to dispel common misconceptions associated with outdoor learning such as its disciplinary relegation to the worlds of science or perhaps geography education and also connect with the Ontario EcoSchools mandate to infuse ecoliteracy across the curriculum.

Each class is spent indoors and outdoors with an emphasis placed on student voice, experiences and discussion which connects with one of Ontario EcoSchools' values, "We All Belong." In our face-to-face course offering at York University, we have our students (i.e., mostly comprised of preservice educators) participate in student-led seminars and discussion about various readings pertaining to sustainability. The last iterations of our course focused on the writings of Vandana Shiva and David Orr as well as some additional scholarly articles and video-based online resources (e.g., The Story of Stuff: <http://storyofstuff.org/movies/>; Greening the Ghetto: https://www.ted.com/talks/majora_carter_s_tale_of_urban_renewal). Students prepare for their seminars in groups and deconstruct the readings and lead discussions. After instructor-led debriefing of the seminar, we engage in outdoor learning on the York University campus to facilitate a hands-on and action-oriented pedagogical focus. For the first three classes, I lead my students through various outdoor activities such as a digital scavenger hunt, mathematics in the form of human graph constructions in the snow (i.e., my students would construct bar graphs based on their birth month) and how we might approach poetry writing outdoors (e.g., writing a poem or story about a tree that inspires you). These activities were adapted and inspired from the work of Broda (2007). For the remainder of our classes, my preservice teachers take our class outdoors and led us through various outdoor pedagogical activities (which is one of the assessments in the course). The outdoor activities have encompassed every subject area from English and History to Mathematics and French education and reflect the Ontario EcoSchools focus on infusing ecoliteracy across the curriculum and into everyday pedagogical practices. It was truly inspirational to see my students engage in these activities and to witness their enthusiasm and passion for outdoor learning increase over the duration of this course, especially in the wintertime – a challenge given our Canadian winter weather!

A special activity that I have done with students at both the K-12 and university level is the creation of a human food web (i.e., this activity was modified from a version I originally observed at the Cape Breton Highlands National Park). I take my students outdoors after they are assigned an organism to illustrate (e.g., oak tree, red-tailed hawk). We select a site where we can form a loose circle and then begin with the representation of the Sun. I toss a ball of red string/yarn to this individual and explain that they will form the beginning and basis for our food web. I also instruct the students not to let go of the yarn after they are holding it or to wrap around their fingers. We then find the ecosystem producers, the grasses, trees and other plants. The yarn goes to each producer so that each 'organism' is holding a section of the string (i.e., but note that producers need not stand close together). After the producers have been identified, we then move onto the various types of consumers in the ecosystem until finally the tertiary consumer(s) are holding the string. I then instruct the students to not let go of our string and to take one step backwards so that the string is taut. We can then reflect on the complexity of our 'food web' and explore the complexity of the connections among various organisms. Typically, the food web created is tangled, interwoven, complex and a great starter to many critical conversations (i.e., as aligned with the Ontario EcoSchools focus on critical thinking and actions to elicit change).

After discussions and debriefing about some of the interconnections, I begin to introduce various ecosystem 'disturbances.' This links to the EcoSchools' curriculum section of certification and supports schools as they work to embed ecoliteracy into everyday life and the classroom. For example, a logging company has moved into the area and has begun to harvest the white pine trees. After the 'disturbance' is introduced, I instruct the affected 'organisms' to let go of the string. We then pause and reflect upon how the string feels lax throughout our food web in comparison to before the disturbance was introduced. I ask the students what this might mean for the ecosystem. After this first 'disturbance', I introduce another ecosystem disruption such as a disease impacting either a producer or consumer community. Again, I ask that any 'organisms' impacted by the disturbance to drop the string. I also ask any other organisms that feel affected by this disturbance (i.e., they feel the string go slack) to drop the string. Typically, after a second disturbance is introduced, there is no one left holding the red string. This is a powerful and sometimes very emotional moment. Every time I engage in this demonstration with either adult learners or K-12 students, there are defeated-looking faces. Part of our philosophical approach to this course centres on positivity, resilience and the spirit of hopefulness in the face of environmental challenges. In light of this philosophy, I conclude this demonstration with the introduction of various mitigating efforts. For example, one mitigating factor was the introduction of tree planting initiatives. In response to this action, all of the students previously associated with trees are instructed to pick the string up from the ground to represent the forest revitalizing itself. I then ask the primary consumers that would feed upon plants to re-engage with their previously held portion of the string to represent the reestablishment of their food sources. This is a simplification of these habitat rehabilitations; however, it does present a more tangible way for students to envision a sustainable future built upon hopefulness and positivity.

This activity, and others that are similar, can be modified and adapted for a wide range of grade levels and curriculum expectations to foster and support environmental education and ecoliteracy for all. A critical aspect of both the EcoSchools mandate and advocates of environmental education (EE), is to ensure that EE is infused in all grades and in each curricular strand and that it does not remain siloed and compartmentalized.

7.5.2 Toronto and Region Conservation Authority: Supporting Experiential Education Re-imagined for the Twenty-First Century

Toronto and Region Conservation Authority (TRCA) is one of 36 conservation authorities in Ontario, governed by the Conservation Authorities Act and tasked with the “delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario” (Ontario 1990). It might make one take pause and ask, “What possible connections could there be between a conservation authority and Ontario EcoSchools”? To this question I respond enthusiastically, *there are a great many synergies!* In order to see a clear picture of our current partnership, I offer a brief overview of the alliance between TRCA and Ontario EcoSchools. I then take a step back to create some context with TRCA’s history as it pertains to environmental education (EE), and finally offer an example of one of TRCA’s exemplary education programs, *Environmental Leaders of Tomorrow*, and how it runs parallel to the Ontario EcoSchools program. It is through the reinforcement of the ideals and activities shared by TRCA and Ontario EcoSchools that we create the greatest impact for the education system in Ontario.

TRCA takes great pride being a leader of environmental education but it would be remiss if not unconscionable to omit the impact and influence of like-minded partners in this field. No singular organization can accomplish the work of EE alone. Particularly germane to this conversation is Ontario EcoSchools. TRCA understands that if there is a strong environmental value system within schools that not only recognizes but is adept in taking action to foster sustainability within education, then our ability to sustain and restore the natural systems will also be enhanced. This is why TRCA has been a long-time supporter of the Ontario EcoSchools movement, sitting on its Steering Committee since inception, certifying our centres within their framework, promoting it through our in-school programming, and successfully advocating for recognition of its alignment within municipal objectives by way of *Peel EcoSchools*. The Peel EcoSchools program is unique within the province, merging the values and rigor of Ontario EcoSchools with the sustainability objectives of the Region of Peel, creating and enhanced capacity of two Ontario school boards to reach their Ontario EcoSchools certifications and deepen the environmental values of the region’s citizenry.

Beyond the day-to-day touchpoints TRCA and Ontario EcoSchools share, it is apparent to me how our organizations have not only explicitly influenced each other but tacitly as well. Toronto and Region Conservation Authority has a rich history for being a leader in environmental education (EE) programming, owning and operating multiple day and overnight centres that teach students of all ages about the personal and ecological benefits of supporting a healthy natural environment. TRCA also offers educational and community engagement programming in our communities, visiting schools, libraries, parks, ravines, and more to create learning opportunities that support sustainable living. *So where might one find the alignment between TRCA's and Ontario EcoSchools' approaches to environmental education?* Consider how the objectives and activities of Ontario EcoSchools and providers of EE, like TRCA, are independent yet reinforcing in nature:

- Within the Ontario EcoSchools certification criteria, validation for the environmental education field trips is offered establishing external endorsement of TRCA's experiential education praxis.
- Within the Ontario EcoSchools framework, qualitative and quantitative measurables are recognized, creating warrantable data regarding EE field trips that is collected, analyzed, and made available to a wide range of audiences, reinforcing the sustainability efforts within the entire education community.
- Within the Ontario EcoSchools program student action projects are endorsed and rewarded with certification points that not only school-wide sustainability initiatives, but also programs like TRCA's *Environmental Leaders of Tomorrow Program*.

It is this last bulleted point where I would like to offer a more detailed view of how valuable and vital that *reinforcing influences* are between organizations like TRCA and Ontario EcoSchools. But before I describe in detail the Environmental Leaders of Tomorrow Program, it is worth having some context on its origins.

I consider myself one of the fortunate few who has been embedded within the experiential milieu of outdoor education for over a quarter-century. Within my career, experiential education has always been linked closely if not synonymously with *environmental education* (EE), which at the beginning of my teaching career, referred to *nature education*. Today, EE is the encompassing umbrella where one can situate nature education, outdoor education, and social justice, any and all of which would be hollow without an experiential learning disposition. This is not to say that everything one experiences is experiential education. Dewey (1938), Joplin (1981), and Kolb (1984) agreed that it is in the *processing* of and *reflecting* on an experience that defines experiential learning – there is a personal change in one's understanding. It is this opportunity to influence our *students' re-understanding* of their place in the world which has delighted and challenged myself and many of my colleagues in EE. Environmental education, facilitated in a fulsome manner, cannot exist separate from experiential learning.

In EE, we also experienced the challenges of political will, limited financial capacity, administrative constraints, the measurement conundrum, and a pervasive sense of *never enough time*. These hurdles have forced EE to reflect upon itself and

ask how it fits within our changing communities, changing climate, and changing needs. Is it possible for the experiences offered only through EE to exist in the future landscape of Ontario's education system? Simply put, *of course*, and the groundwork already present environmental education not only honours the tenets of experiential learning but highlights the beneficial influence of cross-organizational visions, in this instance, TRCA and Ontario EcoSchools.

To shift from a rounded view to a personal view of EE, I entered via my post-secondary education and eventual career path. As a student teacher at the Faculty of Education, University of Toronto pursuing an environmental science teachable, I was fortunate to be placed at the Albion Hills Field Centre (AHFC) to gain real world teaching experience within my field. This centre, owned and operated by the Toronto and Region Conservation Authority (TRCA), offered to me my first glimpse of how rich a multi-day, overnight environmental education trip could be for students and teachers alike! While maintaining a close connection to the provincial curriculum, the experiences were also catalysts of team building, cooperative learning, leadership development, and explicit immersion in sustainable living practices. Within these full sensory experiences, the stage was set to maximize the learners' opportunities for participating in deep, transformative learning moments in nature. When done well, not only did one live the experience in real time, but these outdoor education (OE) field trip participants also became invested in re-living the moment, making personal and interpersonal connections between their lives and the world around them.

It was rare for our students to return to our centres as these experiences were often limited to certain grade levels. Many times, I wondered about the enduring nature of the impact these experiences had on our students' lives. I could see the impact while they were with us but did the experiences translate to sustained learning once they returned to their communities? Did they modify behaviours, make different choices, or engage with the world outside their doors in different ways? We needed a way to validate or make visible to others that which we witnessed daily. But how does one merge "away" trip experiences with in-class and in-community life in a meaning way?

In an attempt to better understand how to merge and elevate the learning from this trifecta of learning environments, TRCA embarked on a pilot to re-invent the OE field trip. The *Environmental Leaders of Tomorrow* (ELT) program was designed with three specific intentions:

- To better understand changes/shifts in student learning occurring as a result of the overnight OE experience, and if so, are these changes sustained once students return to their classrooms, homes, and communities;
- To test our theory that if field trips were enhanced with the support of pre- and post-field trip visits to the classroom, the result would be more sustained pro-environmental attitudes and behaviors;
- To close the gap on equity of opportunity for overnight OE field trips.

The first two intentions required a means of measuring learning and impacts, while the final objective focused on financial support, teacher support, and gaining a clearer understanding of the communities to be served by this program.

The ELT program was designed with three central themes or pillars (ecological literacy, environmental leadership, and community action) and three distinct phases: *Phase 1*, the pre-trip, in-class experience; *Phase 2*, the overnight, immersive OE field trip; and *Phase 3*, the post-trip follow-up (in-class/community experience). Phase 1 began with a TRCA educator visiting the participating class at their school. During this visit, a baseline program was facilitated to gain a clearer sense of student understanding of ecological principles, as well as bonding with students and answering questions about the upcoming field trip. Phase 2 was the 2.5-day visit to an overnight field centre where students would participate in three pillar programs and three additional teacher-choice programs. The final phase was a reunion with a TRCA educator at the school where we could celebrate student initiatives occurring since the time together at the field centre and/or deepen the learning and capacity to take action on an environmental issue of the students' choosing. The three phases took place over the span of approximately 2 months.

To understand if our intended outcomes were being realized, a student survey of ten questions was incorporated into each of the three phases. The survey took the form of an age-appropriate *ecofootprint*, focusing on actions that are within the capacity of an 11–12 year old child to manage, such as turning off the water while brushing teeth, or managing waste by recycling, reusing items, or reducing overall consumption via thoughtful purchasing decisions, all elements reinforced through the Ontario EcoSchools program. By comparing student thinking and self-awareness during the three phases, one could determine shifts in their knowledge, behaviour, and intention. Note that we were well aware that these surveys would not be offering *cause and effect* type data – there are simply too many additional influences beyond our control – but it would give a sense of any trends that might exist or may have shifted within the timeframe of the ELT program. In addition to the student surveys, the classroom teacher also completed a questionnaire at the end of Phase 3, noting any changes witnessed in the students, such as increased desire to initiate or participate in environmental themed activities. The final intention, ensuring equitable access to the experience, was achieved through the generous sponsorship of the program by organizations and individuals. One sponsor in particular, *The W. Garfield Weston Foundation*, has continued to support the program for the full duration of the in the GTA, and enabled the pilot of *Environmental Leaders of Tomorrow* at five additional centres across the province.

Date collected is analyzed annually and shared with our municipal supporters. Our 2016 data reveals the following about the impacts of the ELT program:

- 76% of students reduced their ecological footprint with an average reduction of 20%;
- 134 student initiated eco-action projects have been completed with 55% in the arena of biodiversity, 13% focused on waste minimization, 10% in mentoring others, 8% associated with energy conservation, and the remaining projects distributed activities related to stewardship, advocacy and awareness raising;

- 95% of students showed an increased awareness of environmental issues, 76% were more engaged with environmental initiatives, 78% of students actively mentored others on environmental concerns, and 95% of teachers were extremely satisfied with the impacts of the ELT program.

While the ELT program itself has answered some of TRCA's questions about the EE field trips, what can we say about the influence by the Ontario EcoSchools program on this program? I would suggest Ontario EcoSchools has implicitly shaped and continues to support the ELT program in the following ways:

- Ontario EcoSchools' warrantable model of measuring impact *provided the inspiration for both tangible and often intangible success criteria* within the ELT program. By showing the positive impact of the ELT program on students' environmental attitudes and behaviours, gateway habits and considerations towards future decision are made visible;
- Ontario EcoSchools validation of impacts by programs external to Ontario EcoSchools *created reinforcing endorsement of the messaging within environmental and sustainability education*. By having multiple voices—multiple influences—offering a parallel message, each individual voice becomes stronger as the cultural norm is strengthened through unification and the overall message becomes more trustworthy;
- Ontario EcoSchools explicitly validated through their points system the effort and value of student-initiated action projects completed by ELT students. By endorsing the activities of the participating students in accomplishing not just one goal but others at the same time, participants better understand how their actions have far reaching impacts. Students also learn that that actions of a few become powerful collective impacts, a property embedded deeply within the Ontario EcoSchools program.

In considering the future of environmental education and the overnight field trip, I am optimistic that like-mindedness organizations such as TRCA and Ontario EcoSchools, will continue to be able to validate and strengthen outdoor experiential learning for students in this province, while supporting and enhancing the work of each other. As for the future of the Environmental Leaders of Tomorrow program, we will continue to evolve and adapt to the needs of our community as we strive to make overnight, environmental education field trips part of experiential learning profile for generations to come.

7.6 The Impact of the EcoSchools Program in Ontario

The vision that led to the development of Ontario's environmental education policy, *Shaping Our Schools, Shaping Our Future*, and subsequent policy framework, *Acting Today, Shaping Tomorrow*, set the stage for the success and impact of the Ontario EcoSchools program. Prior to the policy, there was little alignment across

the province and no common language for schools and school boards that would facilitate a collective sustainability movement (E. Waslander, personal communication, December 14, 2018). Building off the momentum of the policy, EcoSchools created a certification program that enabled schools and schools to narrow their focus, work within a set of trusted guidelines, and receive public recognition for their hard work.

Ontario EcoSchools currently works with 58 of the 72 English and French school boards in Ontario. At the school board level, the EcoSchools program has served to galvanize system-wide initiatives and support benchmarking around resource conservation and occupant behaviour. School boards such as the Dufferin-Peel Catholic District School Board (DPCDSB) and Upper Grand District School Board (UGDSB) have create board-wide sustainability goals that include a target of 100% of their schools certified as EcoSchools (ontarioecoschools.org).

A number of school boards across Ontario have also leveraged EcoSchools certification guidelines to help them craft their internal school board environmental policies. The program ensures that all participating schools are following similar protocol and tracking their progress in the same way. It enables school board staff to set targets, measure, and report on school-level environmental action as a whole, within a defined set of standardized criteria. While overseeing the EcoSchools program at the school board level requires some investment of capacity and time, it is a simple and straightforward roadmap that provides an accessible path to sustainability.

7.7 Some Concluding Thoughts

For over a decade, Ontario EcoSchools and our partners have been fostering a community of educators, school staff, school board representatives, and students; allowing them to share innovative practices between schools and across the province. Relying on common goals and shared language, they are able to leverage the expertise of the Ontario EcoSchools community to identify opportunities and troubleshoot challenges. As more schools choose to connect with the program, we can continue to deepen student leadership, recognize green achievements, and produce real-world impacts.

While we have been successful in cultivating a green schools movement within Ontario, there are barriers to participation that have been experienced by the community and our partners. Some key challenges and opportunities include:

- Funding for schools
- One of the most common barriers to participation among teachers is access to necessary funding. While the certification program is free for publicly-funded schools, lead teachers have identified gaps in support for professional development, field trips, project materials, etc. Continued growth of the green schools movement in Ontario is reliant on access to stable, long-term funding that is specifically assigned to environmental learning opportunities.

- Improved data management and performance indicators
- While significant efforts have been made to measure and translate the impact of the Ontario EcoSchools program, there is always room to improve. Future plans for the program include identifying more concrete qualitative and quantitative performance indicators that are linked to environmental impact and student-led initiatives. Ontario EcoSchools will continue to measure and assess trends in learning, action, and attitudes in certified and non-certified schools.
- Overcoming eco-fatigue
- While environmental issues are top-of-mind for much of our community, there is always a need to be innovative, hopeful, and relevant in our messaging to avoid eco-fatigue. Because the Ontario EcoSchools program runs on an annual cycle, the opportunities and initiatives presented to schools must continue to inspire students and activate them as changemakers.

As the Ontario EcoSchools program continues to grow, further enriching relationships with like-minded partners such as York University and Toronto and Region Conservation Authority are critical. Although these organizations differ somewhat in their foci, the commonality lies within the dedication and importance of providing meaningful learning opportunities for our students to engage with and learn from their environments in a tangible manner.

Throughout this chapter, our anecdotes and perspectives seem to echo the work of climate change educators, Alsop et al. (2015) where they remind us that, "...Climate Change Education Should Be Imaginative, Exciting, Hopeful and Playful" (p. 10). The more tangible aspects of the activities we have described perhaps speak to an intangible aspect of education; love and emotional connectivity. We hope that these strategies foster an emotional connectivity to our environments such as the one below so eloquently summarized by Stephen Jay Gould: "We cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well—for we will not fight to save what we do not love." (Gould, as quoted in Orr 2004, p. 43).

As educators supporting the green schools movement in Canada, we continue to strive to enhance this tenuous emotional bond between learner and environment to ensure that we create citizens who will save what they love.

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Chapter 8

The Past, Present and Future of Mainland China's Green Schools

Yu Huang and John Chi-Kin Lee

Abstract The development of green schools has been a main feature of environmental education in China. The Centre for Environmental Education and Communications (CEEC) started the green school project at both national, provincial, autonomous regions and city levels from 2000 to 2006. In 2007, the former State Environmental Protection Administration (SEPA) (now named the Ministry of Environmental Protection) registered China as a member of the Foundation for Environmental Education (FEE) and thus, established its connection with international green schools. Since then the CEEC has coordinated the Eco-Schools project which is supported by the FEE.

This chapter, based on the previous work of Zeng et al. (2009) and other literature, provides an updated and critical review of green school (eco-schools) development. The first section reviews the development of green schools and related environmental education curriculum policy changes as well as promotion strategies in the Chinese Mainland since 2000 to now. The second section covers the status and challenges of regional differences in green schools in China as a vast country with diverse ethnic and socio-economic diversity. The third section provides examples of green school in different regions in China and identify successful factors and challenges of implementation. The final section discusses the future prospect of green school development in China.

8.1 The Development of Green Schools in Mainland China

Mainland China's green schools have developed under the influence of environmental education (EE) and the wave of sustainability education overseas. Inspired by the guiding documents of international organizations, Mainland China started the

Y. Huang
Beijing Normal University, Beijing, China
e-mail: huangyu@bnu.edu.cn

J. C.-K. Lee (✉)
The Education University of Hong Kong, New Territories, Hong Kong SAR, China
e-mail: jcklee@eduhk.hk

process of developing EE and green schools in 1973. From 1973 to 1992, conceptions of EE gradually formed and a series of guiding documents, which were under legal protection, had been issued. In addition, the scope of EE was extended from higher education to basic education and gradually became a crucial part of the national education plan. In 1992, the trend of sustainable development education (ESD) further enriched the connotation of EE and laid a solid foundation for the creation of green schools.

After the preparatory stage (1973–1992), EE developed rapidly and provided fertile soil for the growth of domestic green schools. In December 1996, the Ministry of Ecology and Environment, Publicity Department of the Communist Party of China, and the Ministry of Education issued the “National Environmental Publicity and Education Action Plan (1996–2010)”. It mentioned for the first time that “green schools” would be established throughout the country by the year 2000. Also, the characteristics of “green schools” were clearly defined: students’ thorough understanding of environmental protection content included in the teaching materials of various subjects; an increased awareness from the teachers and students of environmental protection; active participation in social supervision and promotion of educational activities; and having a clean and beautiful campus (National Environmental Protection Agency, Publicity Department of the CPC Central Committee, National Education Committee 1996).

In April 2000, the Environmental Protection Propaganda and Education Centre of the State Environmental Protection Administration (SEPA) proposed a concept of “green schools” which was different from the 1996 “Outline”. At a December 2000 meeting, the “Decision on Recognizing the National Advanced Schools and Excellent Organizational Units for Establishing Green School Activities” was issued and 105 national “Green Schools” were commended for the first time. Moreover, a periodic summary of works that had been done by the national green schools was provided and promoted to encourage those schools in making persistent efforts and continuing to improve. Also, through holding such commendation activities, it was hoped to encourage more schools to participate in the development of “green school” activities, and to regard EE as a vital component of quality education in order to effectively raise the environmental awareness of students at both primary and secondary school level (Centre for Environmental Education and Communications of Ministry of Environmental Protection 2000). The development of green schools is believed to serve three purposes:

- nurturing high-quality talents needed for the country’s social development guided by the theories of environmental protection and sustainable development, and improving students’ comprehensive quality and innovative ability through a systematic organization of teaching practices and the use of an interdisciplinary approach in teaching environmental education;
- integrating environmental education with teaching and school management; and
- gradually improving the quality of campus environment, and creating a contemporary campus to construct a civilized and fashionable school.

In 2002, the Centre for Environmental Education and Communications of Ministry of Environmental Protection prepared the “Green School Guide” to clarify the principles, development steps, management guidelines and evaluation criteria, as a guaranteed framework for the creation of green schools. It encourages schools to enact and announce publicly the resolution to develop into green schools. It also coordinates school leaders to develop and implement green school plans, perform regular self-checks and make amendments, and apply for acceptance and naming (Centre for Environmental Education and Communications of Ministry of Environmental Protection 2003). Any school that is interested in joining the Green Schools Programme can be awarded the title of “Green School” after the application process has been approved. After the establishment of “Green School” status, the green school developing activities have flourished. As of December 31, 2002, there were 13,183 green schools across the country, compared with 105 in 2000 (Centre for Environmental Education and Communications of Ministry of Environmental Protection 2003). The greenest schools were in Guangdong Province – 2628 in total.

The Ministry of Education officially promulgated the “Guidelines for the Implementation of Environmental Education in Primary and Secondary Schools (Trial)” in November 2003, positioning EE as “environmental education for sustainable development”. This position not only responded to the 1992 “Agenda 21” sustainable development strategy, but also showed that Mainland China’s understanding of EE was deepening.

In 2005, the “Decision of the State Council on Implementing the Scientific Outlook on Development and Strengthening Environmental Protection” pointed out the need to “carry out various development activities including developing ecological counties (cities and counties), model cities of environmental protection, environmentally friendly enterprises and green communities, green schools, etc.” The Decision provided support for the construction of green schools at the policy level. Since then, the creation of green schools has become a self-initiated action of many schools, and teachers and students eagerly join and engage in environmental protection activities and actively contributing to sustainable development (He et al. 2017).

In 2009, the Centre for Environmental Education and Communications of Ministry of Environmental Protection of China released a new “Green School Guide” which focused on developing an ecologically civilized, environmentally friendly and resource-saving society. On green schools development, it emphasizes people orientation, democratic participation, overall development, adoption to local conditions, environmental benefits, and sustainable improvement. There was further support to promulgate green schools’ development across the country through providing a reference for formulating local green school evaluation standards, and guidance for establishing green schools and EE in schools. It also provided tools for the schools to implement EE and execute environmental management initiatives and the information platform and exchange networks for green school development.

Since 2000, the national green school commendation leading group, led by the former SEPA and the Ministry of Education, has decided to grant national recognition to the green schools and commend the national green school leadership team every 2 years. The office is set up under the former State Environmental Protection

Administration's Center for Environmental Education and Communication (CEEC) which is in charge of the daily management work. Since 2001, CEEC has gradually established a network for project leaders of all provincial and municipal green schools, and a national green school executive conference would be held annually. The network of provincial and municipal project supervisors has been enlarging gradually with the advancement of the scope. Although all participating schools are required to raise funds for carrying out the founding activities, the enthusiasm of the schools remains high and the scale of the founding activities continues to expand. As of 2008, the total number of green schools was more than 42,000, covering 31 provinces, autonomous regions, and municipalities. Green schools could be found in more than 90% of the cities in Mainland China. There were more than 9000 provincial-level green schools, of which 705 primary schools, secondary schools and kindergartens have received joint recognition from the former SEPA and the Ministry of Education.

In 2009, the Foundation for Environmental Education's Eco-Schools Project was introduced into China, and schools began to actively develop Eco-Schools as a new form of green schools programmes. As of 2016, more than 3000 schools across the country had participated in the training and exchange activities of the project and a total of 450 schools had received Green Flags. To avoid confusion, since 2009 the Ministry of the Environment and the Ministry of Education have prohibited the recognition of green schools, and the establishment, selection and recognition activities of national green school have been suspended. In some provinces and regions, such as Guangxi, Hubei, Jiangsu, Shandong, and Shaanxi, green schools have still been developing at the district level. Therefore, "Green Schools" and "Eco-Schools" coexist under the green school project in Mainland China.

From 1996 to 2010, green schools rapidly developed and, in 2011, in order to further strengthen EE, to cultivate a social awareness of prioritizing environmental protection, and to establish a structure of social action of which all citizens would engage in environmental protection, the Ministry of Ecology and Environment, Publicity Department of the Communist Party of China, Ministry of Education, Civilization Office of the Central Communist Party Committee, the All-China Women's Federation and the Communist Youth League of China jointly compiled the "National Action Plan for Environmental Publicity and Education (2011–2015)". This Action Plan provided practical guidance for promoting EE and green school development, with the emphasis on using innovative promotion methods, conducting EE for all citizens and developing environmental cultural industry, etc. Primary and secondary schools are highly encouraged to conduct different types of EE classes with content related to environmental protection. In higher education, EE is a vital component of quality education for college students. Activities are also organised for the development of "Green University". In addition, the local government should make full use of social resources for conducting a series of promotion projects on EE, constructing the social practice base of EE for primary and secondary school students, and actively exploring "environmentally friendly schools". "The National Action Plan for Environmental Publicity and Education (2011–2015)"

extended the development of green schools to higher education and accelerated the process of integrating EE into the national quality education.

In 2016, the Ministry of Ecology and Environment, Ministry of Education, Publicity Department of the Communist Party of China, Civilization Office of the Central Communist Party Committee, the All-China Women's Federation and the Communist Youth League of China jointly compiled the "National Environmental Publicity and Education Work Program (2016–2020)" to expedite the process of implementing the next steps in developing EE in schools and fostering adolescents' ecological awareness. In terms of the guiding documents, the "Syllabus for Environmental Education in Primary and Secondary Schools" (2003) and the "Guidelines for the Implementation of Environmental Education in Primary and Secondary Schools (Trial)" (2003) are revised regularly. For school education, environmental protection elements and knowledge of ecological civilization in classroom teaching and teaching materials would be strengthened. In teacher education, the compilation of environmental education series and the strengthening of teacher training are needed. The implementation of EE extracurricular activities is also suggested. This document provides directional guidance for China's future development in EE and green schools.

On October 18, 2017, President Xi Jinping's reported to the General Assembly at the 19th National Congress of the Communist Party of China. The ninth part of the report: "Accelerating the Reform of Ecological Civilization System and Building a Beautiful China", mentioned promoting "a green, low-carbon lifestyle, against extravagance waste and unreasonable consumption, and the creation of conservation-oriented institutions, green families, green schools, green communities and green travel, etc.", in order to facilitate the construction of ecological civilization and indicate a clear path for green development for China in the future.

In general, the setup of green schools in Mainland China is inseparable from the rise of the international environmental education movement. As a new front for EE, the development of domestic green schools has grown from nothing. They originated from ESD and international environmental education trends. After years of development, a model of setting up green schools in Mainland China have formed gradually, that is led by the environmental protection department from top to bottom and actively cooperated by the education departments in various regions.

8.2 Case Studies of Green Schools in Mainland China

This section discusses two green schools from different regions. These schools were chosen so as to include schools from both urban and rural regions. The Guangdong Province and Xinjiang Province, where the schools are located, have great differences in natural environment, economic development, and cultural level. Over the years, Guangdong Province has achieved the largest number and scale in the development of green schools by its natural, economic and cultural advantages. In

comparison, the green activities in Xinjiang are relatively lagging. The schools in these two regions have certain comparability.

8.2.1 Shenzhen Primary School A

Shenzhen Primary School A is located in the famous ecological community of China – Overseas Chinese Town. The campus is surrounded by mountains and the environment is beautiful. Green work at the school started in 1991. It was rated as “Guangdong Province Green School” in 1991 and was awarded in the first batch of “National Green Schools” in 2000 and the “International Ecological School Green Flag” in 2011.

The school is located at the foot of Shenzhen Bay and Yanshan Mountain. It covers an area of more than 20,000 m². The campus has a beautiful environment and is full of flowers and trees all year round. The campus buildings are built on the hills. Green spaces and various flowers are planted on both sides of the open areas and aisles (Liu 2003). Due to the backing of Yanshan Mountain, the school’s land is quite special. There is a gully in the northeast to southwest of the school land. The campus design breaks through the mode of the previous school environment and tries to set aside the ground for the sports field, combining the mountains and sunshine. The school buildings are organised in a ventilated condition, and each classroom has an open view, a distant sea, and a close-up view (Wang 1992, pp. 28–30). The school attaches great importance to greening: the three-dimensionality of greening is based on the mountain, the levels are distinct, the variety is diverse, and the greening rate is 100%.

For EE, the school has organised the teachers to compile “reference materials on immersing four environmental education subjects of morality, language, nature and society into the teaching in elementary schools” to determine the knowledge points of EE for classroom teaching. Second, the school has included EE into its teaching plan and “Environmental Education Course” is stipulated to be conducted once a month in the nature class using the teaching materials prescribed by the school (Shenzhen Nanshan District OCT Primary School 2004). Third, EE is included in lectures. For example, the activity of “Making A Green Map of Our School” fully reflects the characteristics combined with the curriculum since drawing maps requires knowledge of axes, orientations, etc. Therefore, during Mathematics classes, teachers consciously teach the students relevant knowledge and its application in drawing green maps. In addition, the school’s art society provides students with some basic skills which are useful for drawing green maps. This process also improved their art literacy. On the green map, students mark the distribution of the school’s flora and fauna, infrastructure, cultural landscape, ecological resources, as well as the comprehensive local map that presented the cultural and ecological landscape of the community. The map even reflects the pollution situation – helping students to understand the humanities and ecological environment of the region.

While cultivating students' environmental awareness, it also improves their scientific and cultural literacy.

For environmental management, the school established the "Leading Group for Building a Green, Beautiful and Clean Campus" in 1991, headed by the principal to comprehensively plan the environmental work for the school. In 1997, the "OCT Primary School Environmental Education Leading Group" was established to carry out EE work. In 1999, it was upgraded to the "OCT Primary School Environmental Education Committee" with the participation of parents and academic representatives, and the leaders of the OCT Environmental Protection Division as consultants, to hold regular meetings to study the school's work on EE. President Huang Xuxin (n.d.) said: "One of the highlights of international eco-school is to emphasize the participation of children. With children as the main body, they would be trusted as the discoverers of environmental problems in classes and campuses. Even if the problems they find are trivial or childish, we must encourage them. In the environmental review, we have maximized the initiative of the children and adopted a flexible and diverse mode in holding activities." Each student can write a research report based on the campus' environment issues that s/he observes and pays attention to; an environmental jury is formed in each class to discover the environmental problems in class and campus through team meeting and other means, and to propose constructive assessment report on classroom environment. A school-level environmental jury comprised of representatives from various classes, brigade committees and environmental protection organizations, is then formed to conduct a comprehensive and in-depth review of the school environment, and to write a school-level environmental assessment report. These three levels of environmental assessment reports (individual, class, and school levels) provide first-hand information for the environmental assessment work of OCT Primary School (Liu 2003). In addition, environmental suggestion boxes have been set up on the campus in order to allow more people to participate in environmental management, forming a student-oriented and bottom-up environmental management model.

From the perspective of campus culture, students were organised to create an "OCT Walking Map" with the aim to promote a green lifestyle. The Map covered a circular area of 200-m radius centred at the campus. Walking routes from different directions were planned to encourage teachers and students to walk to the school. Practicing environmental protection through green commuting not only helps to alleviate the traffic pressure, but also helps to reduce energy consumption. In view of delivering low-carbon concepts to students, the school made good use of its geographical advantage and opened up a carbon sink forest on an empty slope of the mountain. Teachers, students, parents and enthusiasts from nearby communities were organised to carry out tree planting activities. In addition, this carbon sink forest has become a "birthday forest". Students plant trees in the woods to celebrate their birthdays and take good care of them. During the process of taking care of the trees, children's love of nature and awareness of environmental protection can be improved. It promotes the development of students' environmental ethics and environmental behaviours through life-centred, problem-oriented and multi-environmental practices.

8.2.2 *Xinjiang Urumqi Middle School B*

The Xinjiang Urumqi Middle School B was founded in 1952. In 1999, it was awarded the title of “Green School” at the municipal and autonomous regional level. In 2005, it was commended by the Ministry of Ecology and Environment in the third batch of national green schools. The campus environment is elegant and the climate is pleasant. With the reputation as a “Garden School”, it provides a good working and learning environment for teachers and students.

The school is located inside a university with an appropriate layout of flower beds, green spaces and billboards. The school has perfect schooling conditions, including a modern laboratory building, standard laboratories for science students, first-class multi-functional academic halls and natural observation rooms equipped with professional video recording equipment. It provides a basic guarantee for the construction of a green school.

For EE, the school combines classroom learning with extracurricular practice to implement EE based on local resources. Visits were organised for the teachers and students to the Institute of Plant Protection of the Chinese Academy of Agricultural Sciences, the Anning Canal Agricultural High-tech Demonstration Base, the Dabancheng Wind Power Station, the Salt Lake Chemical Plant, the Urumqi Nanshan Shuixigou, the “Environmental Education Rural Walk”, etc. Applying the environmental knowledge learnt in the classroom, students were able to develop a deeper understanding of environmental knowledge, and of the importance of EE and activities, through participating in these extracurricular activities. In addition, the school intensively carries out project-based learning, with examples of “research on the impact of water’s pH values on the growth and development of children” and “survey on genetical food and safety”. These encourage students to walk out of the classroom and get to know the nature. Abundant resources of EE were used to improve students’ environmental awareness. In 2007–2009, it joined as the first batch of schools participating in the “Sino-Swiss Environmental Masters” project. Through research studies, group activities, and integrated practices, students have made significant progress in English, computer usage and environmental protection and thus further improved their comprehensive quality.

For environmental management, the school actively responds to the unifying idea of all environmental protection, education and propaganda departments at every level in Xinjiang in regards to the creation of green schools. It actively participates in the planning of activities and leading the team to take part in environmental protection initiatives and training organised by the education department to grasp the overall and fundamental works.

For campus culture, the school regards EE as an important component of school education. It organises various environmental-related hands-on activities to make it the signature of the school. Under the influence of this campus atmosphere, students actively participate in large-scale environmental protection activities, such as “6.5 Environment Day”, “4.22 Earth Day”, “Bird-Loving Week”, etc. Students also participate in various environmental competitions, such as the “Green

Olympics – Writing Competition for the Youth” held by the Ministry of Ecology and Environment in 2008. In addition, the school makes full use of the after-school time and holiday breaks to hold various geographical activities for students of different grades. For example, Winter Astronomy Camp, “No.1 Glacier” activities held by the Xinjiang Autonomous Region Science and Technology Association for the secondary school students, and “Turpan-Dunhuang Science Field Study”, “Asian Geographic Centre Scientific Research Activities” etc. Under the influence of the green campus culture, it is not just the school campus, but the spirits of teachers and students that have been dyed green. The school has cultivated green talents who love the nature and put sustainable development into practice.

8.2.3 Comparison of Green Practices in Two Green Schools

In terms of campus environment construction, all green schools in Guangzhou and Xinjiang are able to construct the school buildings with reasonable planning and arrangement according to the campus' natural topography. Guangzhou and Xinjiang are located in two different climate zones in China: Guangdong is located in the southeastern region closely to the ocean with low latitude, humid climate, and four seasons like spring; Xinjiang, on the other hand, is located at the northwestern border of China, with a high dimension and deep into the hinterland of Asia and Europe. It is a typical desertification province in China with a dry climate. The oasis area which is facing the problems of salinisation and depletion only accounts for 4.2% of the province's total area. In the greening process of the campus, there are significant differences in the natural conditions of the schools in these two places. The climate in Guangzhou is suitable for the growth of plants while the dry climate in Xinjiang is suitable for planting drought-tolerant, high-temperature and cold-resistant plant. It all depends on the actual conditions of the land. Students are allowed to make the campus more beautiful on their own. During the process, it lets the students realize that Xinjiang has a fragile environment. It can cultivate students' awareness of sustainable development and environmental protection since they were young. Creating a green campus environment is a compulsory condition for developing a green school. Meanwhile, the construction of green schools and environmentally friendly schools have a certain significance for improving local greening, especially for those with a fragile ecological environment.

As an important part of building a green school, EE is an indispensable component of developing a green school. Both green schools use immersion education to carry out EE, which is generally based on subject teaching, supplemented by extra-curricular practice and inquiry learning, etc. More importantly, it is necessary to combine classroom knowledge with local conditions and use local environmental resources in teaching in order to help students to understand environmental issues intuitively and stereoscopically. Through these means, students can develop a deep understanding of the importance of environmental protection and a higher awareness of related issues. According to the existing literature, only Shenzhen Primary

School A has tailor-made the teaching materials for EE. Other schools conducted immersive EE through basic education curriculum and relevant learning content. EE has been incorporated into the integrated practice curriculum of primary and secondary schools as an interdisciplinary learning theme. As a result, EE has gradually embarked on a track of standardisation (Xie 2004, p. 65).

For environmental management, both green schools are able to actively respond to the requirements of the propaganda, education and environmental protection departments at all levels. School leadership teams and teachers receive training regularly on unifying principles, raising awareness, and receiving all-around guidance for the development of green schools and thus to incorporating green ideas into daily work. However, when comparing the two green schools, we found that green management in Shenzhen Primary School A is not just about the development direction set by the leaders. It also involves the active participation of the students in making suggestions and proposing strategies on environmental protection issues through inquiry-based learning, and thus forming a bottom-up management style.

In view of green campus culture, the construction of green campus culture is an abstract process, which must be presented through many external forms. From the literature, the practical elements of both schools are quite rich and can be categorised into the following types: first, building on the theme of environmental protection to hold school-wide promotional activities; second, using campus resources to organise activities. For example, constructing a green campus environment under the principles of sustainable development in order to cultivate a green school culture. It is believed that the green school culture would subtly edify and educate the teachers and students to internalize the concepts of sustainable development into their ways of thinking and doing (Jin 2010, p. 9).

In general, no matter whether the green schools are located in a developed area or an underdeveloped area, their green practices are rather comprehensive. Green schools are good at mobilising students' participation through utilising and developing local resources for EE and adopting different education methods including immersion teaching, project-based learning, inquiry-based learning and combining curriculum and practice. Green schools are capable to reach their objectives of cultivating green talents and raising students' awareness of environmental protection and sustainable development. However, since the economic, geographical, cultural conditions of the schools are different, there's a gap in the implementation of green practices. The differences are mainly reflected in environmental management and the development of teaching materials.

For environmental management, schools in developed regions can receive the latest ideas and internalise them into school environmental management, such as building a bottom-up management model. It allows students to participate in the decision-making process; in contrast to green schools in underdeveloped regions, environmental management tend to stay at a macro level. In these green schools, decisions regarding the holistic environmental management are mainly made by the school leaders and teachers. Schools in developed regions lay stress on the development of teaching materials and implement EE with a systematic and curriculum-based approach. However, schools in underdeveloped areas lack expertise to

compile and develop EE teaching materials. Although local environmental resources are abundant, they generally conduct teaching through the use of immersion teaching and practical curriculum.

The development of green schools is affected by the economic, cultural and geographical factors of the locality. China has a vast territory and there are obvious differences between different regions, and thus leading to a development gap between different green schools. Overall, the development level of green schools in the east is relatively higher than those in the west. Also, a certain gap exists between urban and rural areas in the eastern and western regions.

Green schools in the eastern region have formed a relatively complete system. In view of the campus environment, green schools in the eastern region has a unique advantage in the implementation of greening works – an excellent ecological environment with abundant rainfall which is very suitable for the growth of green plants. For the implementation of EE, people in the eastern region tend to accept and promote new education ideas faster than those of the western region. With the high-quality teaching forces, a school-based and curriculum-based EE has been formed and a holistic system developed. In addition, green schools in the eastern region are capable of integrating both on- and off- campus resources, and combining teaching and practice to enrich the implementation of EE. In environmental management, they basically form a “leaders leading, teachers and students participating” management mode which pays attention to students’ opinions and makes learning the main body of environmental management. It should be noted that green schools in the eastern rural areas rarely adopt a student-oriented management style. For the campus culture, a variety of activities on sustainable development have been carried out. These activities not only created a pleasant campus atmosphere but also built connections with the community. It further extended the influence of green culture by bringing it into the community.

In comparison with the eastern region, there are some gaps in the development of green schools in the western region. First, in the construction of the campus environment, there are certain difficulties in carrying out greening works. In general, the natural environmental conditions are relatively harsh and not suitable for growing plants. However, green schools plant in line with the local conditions and cultivate plants that are suitable for the growing environment. These efforts have created a beautiful green scenery for the campus and helped to improve the local ecological environment. Second, immersion teaching is mainly used in the implementation of EE. Although a holistic curriculum system for EE has not yet been formed, green schools actively develop and utilise local resources to enrich the content of EE. Third, environmental management of green schools mainly relies on the instructions of the school management and teachers’ participation in training in order to improve the overall management quality while students’ participation has not been the focus. Fourth, the development of green campus culture is activity-oriented. Comparing with the western rural areas, urban areas perform better in terms of using and developing local resources. They encourage the students to conduct practical activities outside the campus so as to further exerting an imperceptible influence in altering students’ behaviours and enhancing their environmental awareness.

8.3 Societal Improvement and the Development of Green Schools

With the ever-deepening thought and dialogue on sustainable development, people have developed a new understanding of their relationship with the environment. The concepts of living a green life have been transformed from slogans to actual practices. Sustainable development is practised in daily life through water conservation, low-carbon commuting and other actions, and has become a new trend of social development. As a new front for spreading green ideas and green culture, green schools have to achieve their compulsory education objectives while taking a leading role in bringing sustainable development into practice. However, the school itself is a manufacturer of environmental problems which bring adverse effects to the environment. To reduce their negative environmental impacts, schools need to reduce their carbon footprint by applying the concepts of sustainability in daily work. Schools should also value the positive effects of green offices, green procurements and green buildings. To further prevent the wasting of school resources, rules and regulations and the investment into renovating green buildings need to be considered.

Internationalization and enhanced openness have brought inspiration to the development of green schools. Looking at the development of green schools throughout the world, green schools in many developed countries have developed earlier and faster in comparison with China's green schools. We can learn from these advanced experiences abroad, such as from the United Kingdom, Japan, Sweden and other developed countries, including the development mode, curriculum development and teacher training. The suitable parts can be absorbed and used to enrich green schools in Mainland China.

Joining the FEE "International Eco-School" project in 2009 injected vitality into the development of green schools in China. Eco-Schools and green schools are important carriers of EE for adolescents, but there are differences in guiding ideology, educational methods, management models and reporting procedures of the two models. In terms of guiding ideology, green schools focus on the teaching of environmental knowledge and construction of educational management mechanisms while Eco-Schools focus on organizing students to take environmental protection actions. Green schools require the adoption of systematic and comprehensive immersion education while Eco-Schools emphasize conducting in-depth studies on a particular aspect or issue. As required by the government functional department, applications of green schools are to be made from one level to the next (from bottom to the top) and thus, green schools can be divided into different grades. On the other hand, an Eco-School can directly register with the International Eco-School Project (China) Office and apply for certification assessment after completing the "seven-step method". From the perspective of environmental management, green schools encourage the participation of teachers and students under the guidance of the school management. The Eco-Schools Project clearly states the requirement that "the school should establish a holistic system based on the method of ISO14001EMS".

ISO14001 is an internationally accepted series of standards developed by the International Organisation for Standardisation, which requires organisations to achieve continuous improvement in environmental performance by establishing and operating an environmental management system. This concept, which includes the construction of environmental management systems, development of plans, implementation and evaluation of various aspects of the school's management institutions, has not been introduced in China. The replacement of traditional school management with environmental management concepts is a fundamental shift in the understanding and action for management (Chen 2006, pp. 74–75).

Establishing green schools is an effective means for EE of young people in the current situation (Wang and Zhang 2011, p. 54). The introduction of Eco-Schools projects provides useful experience in improving school's teaching methods in EE and mobilising the young people to participate in environmental protection practices. It also provided fresh ideas for the development of EE in primary and secondary schools.

8.3.1 The Construction of Green Schools Is Conducive to the Individual Development of Primary and Secondary School Students

Primary and secondary school students are in a critical period of physical and mental development. They are gradually forming their outlook on life and the world, and are highly malleable and vulnerable to the surrounding environment. Green schools tend to have a beautiful environment, clean air, harmonious people and environment, harmonious relationship between teachers and students, a rich school culture, elegant taste and aesthetics. Everyone has lofty social ideals and a sense of responsibility to protect the environment, the earth, and sustainable society. "Therefore, green schools... [are] conducive to cultivating students' correct outlook on life and values, which is beneficial to the students' development of physical and mental health" (Qiu 2003, p. 124). At the same time, the green school project has become an outstanding platform that can promote students' participation in environmental protection and become a potential guide for building a resource-saving and environmentally friendly society. On the one hand, the Green School Program enables students to understand the basic knowledge of the environment through education, and on the other hand, through participating in practical activities and being in a harmonious campus environment, students can cultivate good environmental ethics and develop civilized environmental behaviours. As He et al. (2017, p. 53) mentioned,

promoting environmental knowledge among students of all ages, allowing environmental knowledge to be penetrated into their lives, establishing a green awareness and fostering environmentally friendly habits, this is beneficial to students' growth into green development talents... The green development of the country has a solid foundation.

Thus, green schools have important and far-reaching significance in terms of personnel training.

8.3.2 The Construction of Green Schools Is Conducive to the Improvement of Chinese Schools

Wu (2014) believes that the focus of developing green schools in various provinces in China, from the perspective of creation, lies on the construction of the campus from the beautification of the environment to the efforts in resource protection and conservation. In terms of campus improvement, building green schools is conducive to the urgent need for the development of the schools. He et al. (2017, p. 53) pointed out that

currently, some schools have... a lot of problems in relation to high consumption of energy and water resources, large discharge of laboratory sewage and domestic sewage, and large occupation of land, which have destroyed the ecological environment to some extent.

This situation needs to be changed. The creation of green schools can be viewed as an urgent need for schools at all levels in accordance to their own development. Therefore, being a green school is beneficial to the school itself. Environmentally friendly development is more conducive for the school to solicit support from different stakeholders of the society and to facilitate its long-term development.

In addition, through holding various activities and students' impacts on the surrounding communities, the construction of green schools can also promote the schools' interaction and inclusion with the local communities. The school also acts as the cultural centre of the community to provide good working, learning and living environment for teachers and students, and to promote universal cultural education. Therefore, schools can also become a base for EE and ESD. Green schools not only improve the environmental quality of teachers and students but also improve the quality of the school environment. They also influence the students' families, and the community where these families live, and further drives the public to participate in environmental protection activities through the community. As a result, the environment of the entire community and the whole society will be improved.

8.3.3 The Construction of Green Schools Is Conducive to the Implementation of Education Reform

Tian Xiaoli (2007, p. 1364) believes that "the environment, life, culture and environmentally friendly management system of 'green schools' have specific educational significance for students to understand the idea of sustainable development and improve the basic quality of students."

Environmental education... focuses on the cultivation of innovation consciousness and creativity in the content and form of education. In classroom teaching, organic environmental education is infiltrated, and various forms of social practice activities are carried out outside the classroom.

Wu Zuqiang (2002, p. 24) also believes that “Environmental awareness of citizens has been one of important symbols of civilization”. The development of EE aims to strengthen the environmental awareness of everyone. In the past, exam-oriented education made teachers and students focus on test scores instead of the quality of the academic study. In 1999, the Ministry of Education of China promulgated the Education Reform Law—that is, the transition from exam-oriented education to quality education, providing a better opportunity for EE and green school development. In recent education reforms, EE has played an important role in changing the concept, content and methods of education. As Li Yunhai (2006, p. 33) said,

green schools can organically combine environmental education with students’ “quality education” and “sustainable development education”, and through the penetration of environmental education, elective courses and activity classes as auxiliary, exploring research-based learning and other forms, effectively fulfilling the needs of curriculum reform.

Thereby helping school education to comply with the development trend of China’s new curriculum reform.

8.3.4 The Construction of Green Schools Is Conducive to the Promotion of Sustainable Social Development

So far, China has initially developed a multi-form, multi-level, professional and complete EE system with Chinese characteristics that meets the needs of human society, which are improving the capacity of environmental relations with humans through EE, the protection of the environment, and the need to implement sustainable development. Therefore, as an important aspect of the EE system, EE in secondary and primary schools is the cornerstone for achieving this grand purpose. Its effectiveness will directly determine the level of environmental awareness of the younger generation, thus greatly affecting the ecological outlook and the progress of human civilization. He et al. (2017, p. 52) pointed out that “the promotion of green development relies on different subjects. Green development and education should be the first priorities”. Therefore, green schools are one of the main players in green development. In the construction of a well-off society, we must take the path of ecological priority development. Socialist ecological civilization requires us to actively explore the green development model. Building green schools is an urgent need to expand the main body of green development. Therefore, the construction of green schools has improved the environmental awareness of teachers and students and the school’s environmental management level, promoted the dissemination of quality education and ESD concepts. It also promoted the development of ESD in China, and further boosted the sustainable development process of society.

8.4 Discussion and Suggestions

8.4.1 Development of Green Schools

The SWOT matrix (Fig. 8.1) analyses relevant measures in line with the development. Through the investigation of green schools, the important factors affecting the construction of green schools can be presented as follows:

China’s green schools, regardless of region and level, have some advantages and disadvantages both internally and externally, and their advantages and disadvantages are not overwhelmingly obvious. There are no obvious advantages that exceed the disadvantages or obvious disadvantages exceed the advantages. This shows that to a certain extent, the key to the healthy and rapid development of green schools in the future lies in how to better use their advantages, and eliminate and avoid disadvantages.

In addition, these advantages and disadvantages are often intertwined in the school from outside to inside. In other words, many internal strengths and weaknesses are often the internal reflections of external strengths and weaknesses in schools. Therefore, for the development of green schools in China, it is much more important to create a suitable policy environment at the national level than to solve individual problems in specific regions or schools.

Moreover, the internal advantages of schools, key schools, secondary schools and kindergartens located in developed regions are relatively higher than those in underdeveloped areas. At the same time, their internal disadvantages are not as prominent as the others. Although more research is needed, it is reasonable to

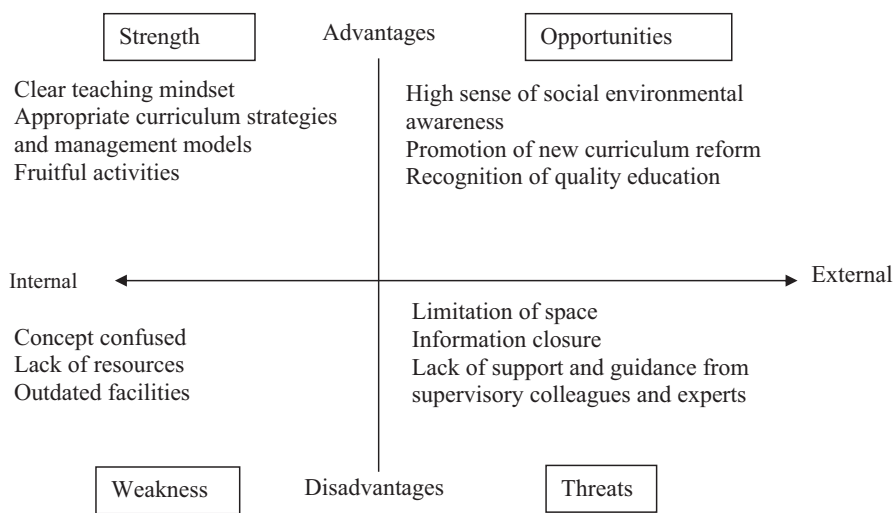


Fig. 8.1 SWOT analysis (Source: Adapted from Huang and Ren (2005))

assume that the construction of green schools may be better carried out in developed areas, key secondary schools and kindergartens as the ordinary primary schools are facing larger difficulties. In addition, the internal strengths and weaknesses of the surveyed and interviewed schools have certain commonalities. It shows that, since 1996, a construction model may have been formed in China after a period of exploration. Potential bottleneck restrictions under the school system have also begun to emerge. This means that we need to summarise the experiences that can be promoted as soon as possible and design targeted strategies to further promote the development of green schools.

By observing the external advantages and disadvantages of the school, we can find that the external advantages (opportunities) are very consistent and that they are policy factors to a large extent. The external disadvantages are not only the common and policy factors of the curriculum, but also include other disadvantages that show more regional and non-policy differences. This proves the necessity of creating a policy environment at the national level. On the other hand, it also reflects the differences in policy support and operation between different places have become the main obstacles of the development of local green schools. It is predictable that the future promotion of the green schools' development should pay special attention to factors such as policy construction, curriculum resources and teachers' qualities.

8.4.2 Suggestions for Promoting the Development of Green Schools

For green schools' development in China, keeping the advantages and avoiding those disadvantages should be the core proposition. We should take corresponding actions in five aspects: policy formulation, theoretical research, personnel training, information exchange and expert guidance, so as to establish a comprehensive and effective external support system created by green schools.

8.4.2.1 Formulate, Improve and Clarify the Relevant Policies of Green Schools at the National Level to Provide a Clear Development Direction and Good Backup Support for the Development

Studies have shown that school teachers, leaders, as well as local supervisors, use national policy documents as an important reference for the construction of green schools. Local policy documents, which serve as specific guiding measures for the establishment of green schools, should be implemented according to local conditions.

Local policies should make reference to relevant national policy documents. Therefore, these documents are the key basis for the school to start its development process. However, at present, China's national policy documents on green schools

cannot meet the local and school requirements in terms of quantity, content, format and availability. Therefore, relevant departments should consider formulating plans and gradually establish a systematic, adequate, practical and accessible policy document system, so as to integrate green schools development into an orderly, stable and continuous track.

8.4.2.2 Conduct Further Research to Strengthen the Theoretical Understanding of the Relationship Between Green Schools and EE, Sustainable Development and New Curriculum Reforms, as Part of Investigating Green School Construction

EE and sustainability education have developed rapidly around the world, just like education reform in China. Various theoretical problems related to green schools are emerging and these urgently need accurate, appropriate and reliable suggestions from theoretical workers to ensure there is no or less bias in actual practice. However, green schools research in China is still in its infancy. There are few researchers in this field, the research content is not wide enough, and the research funding is seriously insufficient. The research results are thus hard to be known. These have become an important factor hindering the in-depth development of green schools. Therefore, relevant departments should organise the professional researchers in a planned and step-by-step manner, invest appropriate funding, sort out systematically and comprehensively the important theoretical issues that are currently being faced and will need to be resolved in the future, and develop continuous research projects at national, local and school levels. These will provide a strong foundation for the development of green schools.

8.4.2.3 Establish a Systematic, Long-Term Green School Teacher and Principal Training System. This Will Eliminate Confusion About the Concept of Green School, Improve Teachers' Capability in EE, and Ensure Sufficient Human Resources for the Construction of Green Schools

Teachers (including school leaders) are a critical factor in the effective development of green schools. The concept, enthusiasm, interest, and ability of teachers directly influence the direction and effect of the development. However, in actual practice, many green school supervisors, school leaders and teachers expressed their concerns about the current "green" teachers' qualities. Research results also show that the problem of teachers' qualities is one of the main internal obstacles to the development of green schools. Therefore, it is necessary to develop a unified and standardised nationwide training for the teachers and leaders of all existing green schools at all levels, schools applying to be green schools and schools that are interested in developing green schools. With the use of all teaching methods, be it traditional and innovative, a differentiated, layered, focused and targeted training should

be developed. It can thus guarantee reliable human resources for the future development of green schools.

8.4.2.4 Strengthen Information Exchange Between Existing Green Schools, Promote Useful Experiences and Eliminate the Geographical Impact of “Separate Politics” in the Construction of Green Schools

There are more than 40,000 green schools in China, many of which could be an effective model for other green schools and general schools. However, there is no unified and classified communication platform for existing green schools. Not only do green schools across the country have difficulties in communicating and connecting with each other, but even green schools in the same region, same provinces and cities rarely communicate or exchange. Therefore, at the national, regional, provincial and municipal levels, we should establish centres for information collection, arrangement and exchange for green schools at different levels. Also, a unified and undifferentiated platform for information dissemination, sharing and interaction should be built so that different green schools and general schools can share useful information conveniently and effectively.

8.4.2.5 Establish a Team of Experts Who Are Close to the School to Provide Individual Guidance on Green School Construction Activities in a Timely, Effective and Practical Manner

The creation of a green school is a complex task. It covers a wide range of aspects of school work and it is an emerging field of education, with insufficient theoretical and practical experience. Therefore, in the process of creation and development, many schools do not know where they are heading. Both research and practice have shown that if the school can get appropriate guidance on EE, education or environmental studies from experts who have a good understanding of green schools during the creation process, the school will take fewer detours. At the same time, experts serve a central role in the construction of the external support system for green schools. Whether it is policy formulation, theoretical research, personnel training or information exchange, it is inseparable from the participation and support of relevant professionals. Therefore, relevant departments should consolidate and expand the existing research team at the national and local levels and form expert pools. They should select a number of experts to form a core team to play the core consulting, research, training and guidance role. In addition, more professionals should be involved in relevant fields, such as education, environment, geography, biology and society, to engage in research activities related to green schools, so that the team of experts can have a rich background, broad vision and good networks.

8.4.2.6 Encourage the Participation of Civil and Social Organisations and Fully Mobilise and Utilise Social Resources to Participate in Green School Founding Activities

Since the 1990s, more and more civil and social organisations have gradually participated in China's environmental protection campaign. Presumably, there are hundreds of thousands of non-governmental organisations registered in the Civil Affairs Department, of which more than two million is grassroots organisations and approximately 7000 is environmental-related organisations, excluding international non-governmental organisations in Mainland China. These organisations have played an active role in advocating environmental protection, raising public awareness of environmental protection, promoting civic action in environmental protection, participating in and promoting environmental protection policies, assisting the public in environmental protection, monitoring the implementation of environmental policies, and promoting corporate environmental responsibility.

Green schools advocate and value the real social environment as a resource for EE. The use of the environment as a resource for education is advocated through "educating through the environment", and the environment which is attached to students the most is their own school and places of their residence. The best and the most comprehensive resource for EE of children comes from their own school, surrounding buildings and the school playgrounds. There are no options better than the school campus for conducting environmental research. In particular, social organisations are indeed important resources for green school engineering that should be fully explored and utilised.

Green schools and society have always been opening up and supporting each other as schools and community are interdependent and mutually supportive. The traditional view of education regards schools as "ivory towers" that are relatively independent and detached from the social environment. This view has indeed taken away the vitality that could be brought by the society to the schools – consisting of the community's support, assistance and supervision that are vital to the implementation of EE. Also, activities held by the schools help to facilitate the progress, development and improvement of the society. In modern education, schools have been increasingly perceived as part of the community to provide services and take responsibility for the community's environment. At the same time, the community should be a resource in supporting the schools' implementation of EE. As both sustainable development and modern education require openness, green schools which act as a representation of the concepts of sustainable development and modern education should undoubtedly serve as an open system. Therefore, civil and social organisations should be encouraged to fully mobilise and utilise social resources to join the development of green schools.

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Chapter 9

French Sustainable Development Schools (E3Ds) to Promote Awareness and Commitment



Raphaël Chalmeau, Marie-Pierre Julien, Anne Calvet, and Jean-Yves Léna

Abstract In this chapter we describe how the introduction of environmental education and education for sustainable development (ESD) has affected the French education system in terms of changes to formal curricula and teaching practices. In France, these two new types of education have disrupted traditional teaching and the relationships between the different disciplines, and triggered the creation of Eco-Schools, School Agendas 21 and Sustainable Development Schools (E3Ds). Posing a challenge to teachers and educational researchers alike, they promote particular educational aims, such as critical thinking, complex thinking or citizen engagement, mainly through project pedagogies and partnerships. In the first part of this chapter, we look at how international issues have influenced the formal curriculum, showing how the French education system has gradually taken these new educational issues on board. In the second part, we describe the debates and studies that have taken place in France on ESD. The third and final part explains how these educational issues translate at the level of individual schools, many of which now have Eco-School or E3D status. We then discuss the levers for implementing these approaches in schools, as well as the obstacles and particular points to bear in mind.

9.1 Introduction

Environmental issues first became international at the Stockholm Conference in 1972. The declaration adopted at the end of this first United Nations Conference on the Human Environment, bringing together 149 states, stressed that “defending and improving the environment for present and future generations has become a primary

R. Chalmeau (✉) · M.-P. Julien · A. Calvet · J.-Y. Léna
Jean Jaurès University, Toulouse, France
e-mail: raphael.chalmeau@univ-tlse2.fr; marie-pierre.julien@univ-tlse2.fr;
annecalvet@laposte.net; jean-yves.lena@univ-tlse2.fr

objective for humanity” (p. 3). The importance of education and teaching was also emphasized at this gathering.

In France, the first environmental education circular (an official text that sets out educational policy for the education community) drafted by the Ministry of National Education (MNE 1977), back in 1977, embedded this concern in the education system, and defined the concept of environment as all the “physical, chemical, biological and social and economic factors likely to have a direct or indirect, immediate or long-term effect on living beings and human activities” (p. 1). This official text stressed the importance of educating pupils from an early age, so that they would understand environmental problems in an intelligent (i.e. structured) way. The objective of this education was to make pupils understand the importance of environmentally friendly behaviour, for example by encouraging environmental school trips to the coast, the countryside or the mountains.

In the first part of this chapter, we describe how, over the past 20 years, the French education system has taken on board the international challenges of environmental education for sustainable development (EESD) and, more recently, education for sustainable development (ESD), with an emphasis on school-led projects. This process has clearly been influenced by the French sociologist and philosopher Edgar Morin, notably through two books: *The Seven Skills Needed for the Education of the Future* (Morin 1999) and *Educating for the Global Age, Complex Thinking as a Method of Learning in Human Error and Uncertainty* (2003). Aspects of his thinking can be found in the French circulars concerning the implementation of E(E)SD, as well as in the wording of UNESCO’s sustainable development goals (SDGs). In the second part, we discuss the pedagogical and didactic implications of ESD, while in the third and final part, we set out the strengths and weaknesses of individual school projects, and the dimensions that need to be developed. The aim of these projects is to encourage student involvement and commitment in the school’s local area, through a steering group that organizes and implements educational actions chosen through a process of participatory democracy (Lange 2015).

9.2 Impact of International Issues on Practices in French Schools

Like a number of other countries, France has long ensured that school curricula have an environmental component. As a result, all schools are now committed to environmental and citizenship issues. Before we describe this curricular component, we briefly describe the organization of the French education system.

9.2.1 *Overview of the French Education System*

In France, children attend school from the age of 3 to 18 years, with 83% going to state schools and just 17% to private schools. Student teachers must pass a competitive examination in the second year of their Masters degree to be able to work in either primary school (i.e. ages 3–10 years) or secondary school (i.e. ages 11–18 years). In primary schools, teachers teach all the disciplines, whereas in secondary schools, they specialize in just one or two. At the end of their compulsory education, most pupils take the baccalaureate examination and can then go on to higher education (universities, engineering schools or *Grandes Ecoles*). At the start of the 2017–2018 school year, 6.783 million pupils were enrolled in primary schools, representing 82% of all schools, and 5.630 million pupils in secondary schools (18% of all schools).

In the French education system, the formal curriculum is based on two main types of official documents: school programmes and circulars. *School programmes* define education by grade and by discipline across primary and secondary schools. *MNE circulars* set out broader educational policy for the education community. They may either support the implementation of existing programmes or introduce new educational perspectives.

9.2.2 *International Issues and Institutional Requirements*

The concept of *sustainable development* (SD) was internationally promoted by the World Commission on Environment and Development (WCED 1987). Moreover, at the Earth Summit in Rio de Janeiro in 1992, Heads of State reaffirmed the findings and principles of the Stockholm Conference. The ambition of this summit was to make SD operational in the twenty-first century, and was reflected in the adoption of the 40 chapters making up the Agenda 21 action plan. These are primarily addressed to local and regional authorities, which are invited to commit themselves to concerted and global approaches to SD.

It was in 2003 that ESD was truly taken on board in the French national education system. This year was marked by the publication of a report by two National Education inspectors, one representing the life and earth sciences, the other geography. The authors talked about the *flawed* implementation of environmental education over the previous 30 years (Bonhoure and Hagnerelle 2003). In particular, they highlighted a lack of political will on the part of the national education system, and recommended compensating for this failure by actively expanding environmental education, tackled from an SD perspective. This perspective gave environmental education a new lease of life, as its combination of “economic, social and environmental factors” made it “much broader and more complex”, allowing it to become part of a “true project for society”. A few months later, the French Government adopted the National Sustainable Development Strategy (Interministerial Committee

on Sustainable Development 2003) in order to implement objectives and action plans in accordance with the commitments made at the Earth Summit in Johannesburg in 2002. The first action illustrating this strategy was entitled “Educating the environment for sustainable development: schools train the citizens of tomorrow”. Its goal was to ensure that children received a minimum of 60 hours of environmental education for SD during their schooling. In September 2003, pilot schemes were launched in some schools.

These two reports triggered a series of three ESD generalization circulars. The first circular, entitled “Generalization of Environmental Education for Sustainable Development”, was published in 2004, and set out instructions enabling teachers to implement this education in their particular school (MNE 2004). According to the Brundtland Report (WCED 1987, p. 16) SD is “the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

The other two circulars, entitled “Second Phase of Generalization of Education for Sustainable Development” (MNE 2007) and “Third Phase of Generalization for ESD” (MNE 2011), pursued the ambitions of the first circular. The 2013 School Reorganization Act introduced environmental education and SD education into the Education Code (Article 42, French Republic 2013). Article L. 312–19 of this act states that environmental and SD education must begin in primary school, and that its objective is to awaken children to environmental issues. This education includes awareness of nature, and the understanding and assessment of the impact of human activities on resources.

In 2015, a fourth circular replaced the three previous ones and set out objectives for the following 4 years (MNE 2015). These included rolling out ESD in all schools by 2020, with an emphasis on its civic objectives (i.e. living together in a world with limited resources, and knowing, understanding, deciding and acting as a citizen). To this end, ESD would be anchored in all disciplines and all levels, rather than being turned into a new discipline, it would benefit from interdisciplinary approaches and transversal mechanisms, and there would be initial and continuing training provision for teachers.

Also in 2015, 17 SDGs were set by the UN. At the Summit on Sustainable Development of 25 September, UN Member States adopted a new agenda that aimed to end poverty, combat inequality and injustice, and address climate change by 2030. These SDGs confirmed the directions set out in the 2015 circular. According to Lange (2015), the MNE circulars gave schools the role of pioneering societal change, with the mission of preparing students as future citizens, decision-makers of citizenship.

From 2008 onwards, SD was gradually included as a subject in primary and secondary school programmes. However, although these programmes cited SD, it was chiefly a question of raising awareness to start with, relying mainly on geography, citizenship or science teaching (Vergnolle Mainar 2008). In primary schools, this initial approach was based on core values such as environmental respect, and ESD was defined by teachers as environmental education (Chalmeau et al. 2016). Regarding secondary schools, several authors (Vergnolle Mainar and Julien 2014,

Zwang and Girault 2012) have looked at how ESD was integrated into the programmes of individual disciplines, particularly those that were supposed to spearhead it, namely geography and the life and Earth sciences. Vergnolle Mainar and Julien (2014) showed that, as a result of the new programmes for middle schools (2005–2009), geography took on SD as a fully-fledged subject (SD concept and its dimensions and challenges), whereas the life and Earth sciences programmes failed to embed this concept, although they clearly signalled the educational dimension of ESD. In secondary schools, for both disciplines, it was mainly a question of teaching SD with a very minor educational dimension. More generally at the level of the teaching content of these two disciplines at all levels, there was a convergence towards an increasingly anthropocentric vision (Zwang and Girault 2012).

9.2.3 Global Approaches in French Schools: From School Agendas 21 to Sustainable Development Schools (E3Ds)

School Agendas 21 are a version of Agenda 21 adopted in 1992 at the Earth Summit in Rio to implement SD on a local level. In France, School Agendas 21, like the Eco-School scheme, or green schools, place the emphasis on cooperative approaches, with action plans responding to social, environmental and economic problems identified at the individual school level (transport, consumption, canteen, etc.). They are about “a process and not a product” (Charron 2005), and involve a range of partners. Schools engaging in this process adopt an ethical approach to their overall functioning, based on the values of responsibility and solidarity advocated in Rio (Serre 2006). Similar global approaches are a feature of the Local Agendas 21 set up on different scales in 1990–2000. Encouraged and supported by local and regional authorities, these were rolled out in several stages, including an initial diagnosis, the establishment of an action plan, and an assessment allowing the action plan to be revised.

In 2005, the French Office of the Foundation for Environmental Education in Europe (FEEE; now known as the Teragir association) introduced a French version of the FEE’s Eco-Schools programme. In January 2017, this association signed a framework cooperation agreement for ESD with the MNE. Today, the Eco-Schools programme has enlisted 2500 schools in France, ranging from kindergarten to secondary school, all of which have integrated SD into their educational projects, management and practices. This means that more than 300,000 teachers and students participate in concrete actions that reflect the realities of their school’s local area. The Eco-School approach is fairly similar to that of the Local Agenda 21, in that it features a diagnostic phase, an action phase and an assessment phase, with pre-defined themes, and specific support tools. Schools can choose from six priority themes: food, biodiversity, waste, water, energy and solidarity.

The 2013 School Reorganization Act was followed by the publication of an MNE memorandum launching a scheme to award schools engaging in a global SD

approach SD E3D status (MNE 2013). This memo was included in the 2015 circular (MNE 2015, p. 18), which described the scheme as reflecting the desire for schools to become “places where pupils experience SD, spaces in which energy and ecological transition, the emergence of new lifestyles, local and international solidarity, become a reality, a common construction and a shared culture”.

E3D has three dimensions: eco-responsibility and teaching content linked in with local problems. The circular states that work can be based on examples, situations, case studies, problems identified in the school’s local area, at the level of the municipality, the *département*, or the region. The pedagogical and eco-responsible practices adopted in schools can mobilize the entire educational community, including teachers, administrative staff, pupils, and even pupils’ parents, around a particular theme, be it energy management, water management, waste management, mobility, relations with the local environment, living well together, or solidarity.

This is a highly innovative approach in the French educational context, particularly at the secondary level, where disciplines are highly compartmentalized and staff are divided, both from the statutory point of view and in the definition of their duties, into managers and employees (administration, catering, accommodation, maintenance), teaching staff and librarians, and those involved in pastoral care (senior educational advisers, careers advisors, nurses and supervisors). Schools seeking E3D status must produce their own methodology and make their own choices, which requires strong teamwork. As we will see in Part 9.4, a number of criteria must be met, although these vary from one local education authority (LEA) to another. Teachers receive continuous on-site training, either at the school’s request, or as part of the LEA’s training programme.

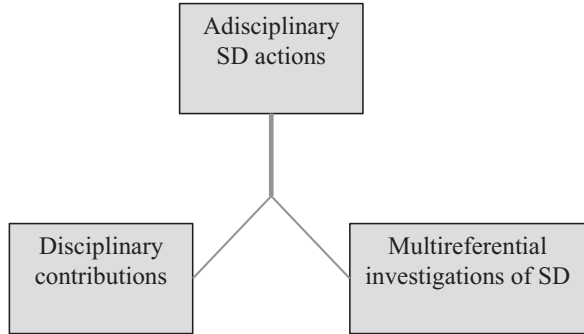
9.3 Pedagogical and Didactic Implications of Environmental Education and Sustainable Development

The presence of SD in curricula as a taught subject can allow pupils to gain a better understanding of its issues, by considering economic, social and cultural aspects that have hitherto been neglected. However, it is not necessarily sufficient to generate the ESD described in the four circulars (2004, 2007, 2011, 2015), as this involves specific teaching practices based on a set of educational values.

9.3.1 New Educational Challenges

All these circulars promoting ESD share the common aim of encouraging schools to adopt the new values of SD, individual and collective responsibility (eco-responsibility and autonomy), participation (multiplicity of debates and willingness to listen to different points of view), and solidarity (teamwork and respect for

Fig. 9.1 Possible building blocks for an ESD curriculum. (Modified from Lange 2013)



others). The goal is to help students understand SD issues so that they can act as informed and responsible citizens (Lange and Victor 2006).

In the classroom, it is not simply a question of teaching pupils how to promote SD. Rather, there is a broader educational aim that implies an education of choice. Although the ESD circulars and recent school curricula have allowed the SD concept to be gradually embedded in school practices, the absence of a genuine ESD curriculum hinders its effective implementation in the classroom. Some researchers have proposed guidelines that could be included in a *possible SD curriculum* (Lange 2013, 2015, 2017; Lange and Martinand 2011; Martinand 2012). In the following paragraphs we examine some of these guidelines, notably those put forward by Lange (2013), illustrated in Fig. 9.1.

9.3.2 *Disciplinary Contributions*

Multi- or transdisciplinarity has been (and still is) viewed as a key feature of *education to* (Brandt-Pomares et al. 2008; Diemer 2014; Fortin-Debart and Girault 2006/2007; Lange 2008, 2017; Lange and Victor 2006). The fact that ESD is essentially transversal and multidisciplinary constitutes a major challenge for which teachers, especially those in secondary schools, have received little or no training (Girault et al. 2007). ESD projects therefore remain highly compartmentalized, even though ESD is not a discipline but an approach (Blanchard 2010).

All of the major contemporary issues (biodiversity, climate change, social reconfigurations) span several areas of disciplinary knowledge. Traditional disciplines, with their conceptual and methodological tools, are necessary but not sufficient. SD not only proposes a *new assemblage* of disciplinary knowledge, but acts as a kind of prism, modifying our relationship to knowledge and the relationships among different areas of knowledge. Going beyond the stable, academic knowledge that schools traditionally dispense, this prism reveals hybrid knowledge, emerging knowledge, uncertain knowledge, stakeholder knowledge, and knowledge from the field (Lange and Barthes 2017). The instability of these new forms of knowledge has been the subject of considerable debate within the scientific community and prompted

discussions about socially sensitive questions (Legardez and Simmoneaux 2006). Traditional disciplines make it easier to situate these new knowledge forms in a broader socioscientific setting. It is not only a question of acquiring new notions, but also of learning to reflect, exercising one's critical thinking, becoming aware of the challenges, and ultimately building an education of choice (Lange and Victor 2006).

9.3.3 *Adisciplinary SD Actions*

This *education to* lies outside traditional forms of teaching, combining knowledge, values and practices (Barthes and Alpe 2012, 2014; Pagoni-Andréani and Tutiaux-Guillon 2012; Barthes and Lange 2017). Education to has a special status, being thematic (environment, health, etc.) rather than disciplinary, which distinguishes it from the standard model of scientific school content.

Giving SD actions a central role within the curriculum reflects a pragmatic approach to learning, as these actions are constructed through the pupils' activity in the classroom. One key advantage is that this activity is determined by the context and by the subject, so the action is immediately situated. For example, the experience of projecting themselves into the future allows pupils to reflect and problematize in different timeframes (Julien et al. 2018).

This makes it possible to pay more attention to the emotional sphere, as it is the cognitive sphere that is traditionally given pride of place in education. Under the pragmatic approach, knowledge is constructed during the action by testing different hypotheses, thus associating the act of learning with the experimental method. Field investigations, data collection and research on their validity limits giving them hypothesis value, what Peirce (1931–1966) called *abduction*, as opposed to induction and deduction. Within this framework, ESD is defined as *both a process and a product*. In other words, as learning by and for action (Lange 2015). The projects' educational approaches fully take on board all these dimensions, and allow students to build their knowledge and skills in a concrete situation.

9.3.4 *Multireferential Investigations of SD*

Educational systems built on ESD allow pupils to encounter a wide range of stakeholders (experts, institutions, nonprofit organizations, witnesses, economic actors), exposing them to many different cultures and perspectives on a particular issue. Underscoring the plethora of reference systems represented by these actors, Lange (2013, 2014) highlighted the plurality of rationalities (technical, ethical, scientific, secular, aesthetic, etc.) involved in a given question or problem. Possible conflicts between these different rationalities or reference systems may, of course, arise. It is this dialogical diversity, if it is properly discussed, argued and situated, that forms the bedrock of democracy and the key to education, according to Dewey (1916). In

concrete terms, this means working in partnership, which is very widespread in France, involving half of all ESD nonprofit organizations (School and Nature network, Eco-Consumption network, etc.) and a third of all local authorities (Leininger-Frézal 2009). At university level, ESD, even more than environmental education, promotes partnerships with local authorities and the voluntary sector, witness the many international research projects undertaken on university campuses (Barthes and Champollion 2012; Barthes and Jeziorski 2012). These partnerships rely on the co-construction of learning, and raise both ethical questions relating to the school institution and concerns about the legitimacy of teaching (Bruxelle 2006; Léna et al. 2016; Sauv  2001).

Environmental education has left a valuable legacy for ESD. By emphasising the sociocritical dimension of education, it averts a behaviourist and prescriptive education limited to the learning of *ecogestures*, still referred to as *small gestures* (Lange and Martinand 2007). Most of the teachers interviewed by Fortin-Debart and Girault (2006/2007) about their perceptions of ESD had a positivist perspective (Robottom and Hart 1993), namely the objective of acquiring knowledge and changing behaviour. In this context, the acquisition of small gestures does not guarantee that students will become more aware and engage in problematization.

This potential EESD curriculum ultimately questions students' academic posture and encourages them to gradually move to a student-author posture based on their background and knowledge, which is key to becoming fully involved in sustainable citizenship.

9.4 Engagement of Schools in a Global Approach to Sustainable Development (E3Ds): A French Specificity?

The 2015 circular (see Section 1.2., MNE 2015) stated that E3D status should be awarded to "any establishment or school engaged in an SD project based on the implementation of a project establishing continuity between teachers, school life, management and maintenance of the school structure while opening up to the outside world through partnership" (p. 155).

9.4.1 E3D Features

Acquiring E3D status involves the following steps: defining implementation priorities after an initial diagnosis and involving the whole educational community, building on lessons and involving school life and educational action projects, engaging school management and working in partnership, developing a school culture and communicating, all the while providing staff training.

Table 9.1 Three E3D levels

Level	Distinctive features
1. Commitment	Awareness Inclusion of the approach in the school project Search for local partners
2. Depth	Continuous staff training Promotion of a common SD culture throughout the school
3. Deployment	Major change in the way the school operates Commitment to the sustainability of the approach

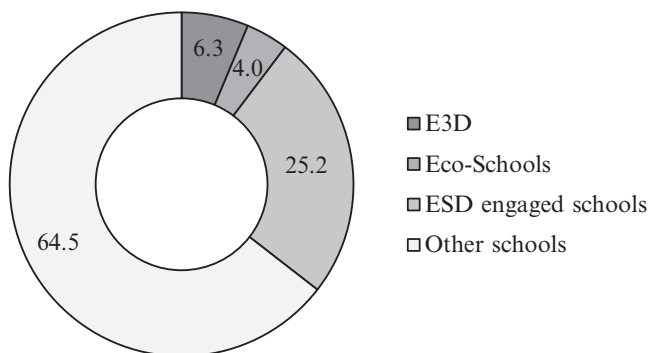


Fig. 9.2 Proportions of schools (including primary and secondary levels) that have achieved E3D or Eco-School status, or are engaged in ESD projects. (Source: MNE, 2017 annual ESD assessment across LEAs)

Schools seeking E3D status must submit an application that includes a description of their ESD approach and the methods used to implement it, its place in the school’s 3-year project, local partnerships (with nonprofit organizations, local authorities, private companies, decentralized government), and the communication strategy.

They must also submit a report on their approach and meet the specific criteria for one of the three possible levels of certification: awareness raising and initial commitment (Level 1); in-depth study (Level 2); and deployment (Level 3) (Table 9.1). The idea is to encourage schools to engage in a process of *continuous improvement* of their management and projects, addressing the themes they have chosen in the order that suits them and according to their particular modalities and timeframes. The priority is to foster links between disciplinary teaching and ESD educational activities, while remaining firmly rooted in the local area and open to partnerships (Boyries and Sirel 2013).

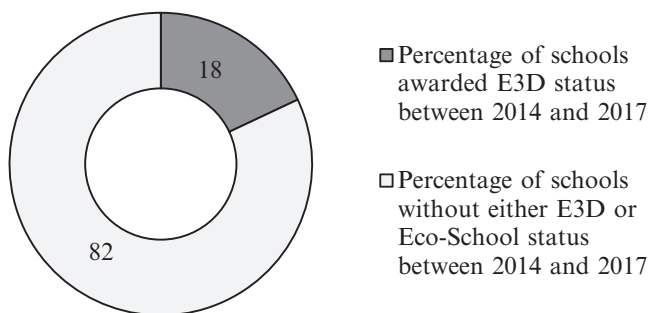


Fig. 9.3 Proportion of schools that gained E3D status between 2014 and 2017. (Source: MNE, annual ESD reports. ESD projects summed across the 2014–2015, 2015–2016 and 2016–2017 school years)

9.4.2 *Inventory of Schools with E3D Status in France*

In 2017, according to MNE figures, more than 10 years after the first circular on the generalization of ESD in France (2004), approximately one third of primary and secondary schools were engaged in ESD actions. Some of them had gone even further, adopting the more global approach that can lead to Eco-School or E3D status (Fig. 9.2). Regional analyses show the gradual implementation of the E3D scheme since 2014, in parallel with the Eco-School scheme that was introduced 10 years earlier, in 2005.

Moreover, 18% of schools were awarded E3D status between 2014 and 2017 (Fig. 9.3), representing a total of 22,246 ESD projects over this 3-year period. When this figure is broken down into elementary, middle and high schools, we find that the proportion of primary schools is relatively low (approx. 1–2%), compared with middle (2–25%) and high (6–22%) schools, the precise proportions varying across LEAs, bearing in mind that 82% of all schools are primary schools. Finally, private schools, whether at primary or secondary level, very rarely engage in an ESD approach and therefore seldom gain E3D or Eco-School status.

From a qualitative point of view, analysis of the projects implemented in the different French regions reveals a number of common features. Most regions distinguish between three or four levels of E3D status (initiation, commitment, depth, and deployment), to reflect the extent of each school's engagement. The presence of a steering committee, eco-representatives and, most often, partners is a constant. The most frequently chosen topics are food, biodiversity, waste, mobility, solidarity and energy. It should be noted that these are similar to the Eco-School ones, and converge with the themes adopted by local authorities.

9.4.3 Awarding of E3D Status: Example of the Toulouse Local Education Authority

9.4.3.1 Assessment Criteria

In the Toulouse LEA, School Agendas 21 in secondary schools were initially promoted by the regional council, via its “Projects for the Future” call for projects launched in 2011. Selected schools received help and support for 3 years from recognized ESD organizations such as the Permanent Centres for Environmental Initiatives (CPIEs), paid for by the council. Through this means, the regional council encouraged secondary schools to adopt global initiatives, and some of these schools have since acquired E3D status.

The E3D scheme was adopted in 2014. Each application had to include a full description of the educational projects and global approaches undertaken, and schools also had to complete a 3-level self-assessment grid containing three items: the project and its management, educational and pedagogical actions, and partnerships and training actions.

A panel made up of school inspectors, teachers and academics meets at the end of the school year and decides which E3D level should be awarded to each successful school. Level 1 is awarded for 1 school year, and Levels 2 and 3 for 3 school years. At an annual ceremony presided over by the chief education officer, the schools receive a diploma and (for Levels 2 and 3) a wall plaque. There are plans to extend E3D Level 3 beyond the current 3 years.

The actions implemented by the schools are assessed by the panel on the basis of the following criteria:

- degree of consistency between the school’s management, its educational and training projects, and the disciplinary programmes;
- number of classes and students involved in the E3D approach;
- degree of multidisciplinary of the educational actions;
- presence of extracurricular educational and cultural action projects;
- continuity of students’ trajectories.

Finally, the schools’ partnerships and training actions are assessed according to their degree of embeddedness in the local environment, the involvement of non-profit organizations, and the number and scope of the training actions undertaken.

The annual number of schools awarded E3D status increased from 13 in 2014 to 149 in 2018. Of these 149 schools, 46 achieved Level 1, 88 Level 2, and 15 Level 3 (Table 9.2). They included 62 primary schools, 59 middle schools, and 28 high schools.

Table 9.2 Increase in the number of schools awarded E3D status in the Toulouse LEA between 2014 and 2018

Schools awarded E3D status in the Toulouse LEA				
E3D	Primary schools	Middle schools	High schools	Total
2014	1	4	8	13
2015	15	21	10	46
2016	31	45	17	93
2017	59	52	24	135
2018	62	59	28	149

9.4.3.2 Impact of E3Ds

The National Strategy for Ecological Transition to Sustainable Development states that schools must be places of learning and experimentation for environmental and SD issues (Ministry of Ecology, Sustainable Development and Energy 2015, p. 91). However, although the E3D scheme was introduced in France in 2014, the Ministry of Education has yet to conduct any research on the impact of these schools on their local communities.

Nonetheless, a team of researchers has recently started studying pupils (mean age: 12 years) enrolled either in regular middle schools or in E3Ds (Amadiou et al. 2017, 2018). The aim is to measure these pupils' prior knowledge and attitudes towards sustainable development, and examine their beliefs and attitudes towards science.

Their first study was based on a questionnaire sent to 638 middle-school pupils, 57% of whom were in E3Ds, and 43% in regular schools (Amadiou et al. 2017). Attitudes towards the environment were assessed by asking participants to rate their agreement or disagreement with 15 statements (e.g. "Human beings are seriously abusing the environment"). A high score (6) indicated a pro-environment attitude, and a low score indicated scepticism about the impact of humans on the environment. Results showed that pupils had a generally favourable attitude towards environmental protection, with a mean score of 4.3. There was no significant difference between pupils enrolled in E3Ds and pupils enrolled in regular schools. Nor were there significant differences in either their representations of science (dogmatic vs. relativist) or their attitudes towards it.

The study also assessed pupils' knowledge of SD, via six multiple-choice questions (MCQs). The overall mean score was 2.8 ± 1.6 (out of 6). The pupils were divided into three groups: 23% scored low to very low (below 2), 44% obtained an average score (between 2 and 4), and 33% scored high (above 4). E3D pupils exhibited a significantly higher level of knowledge about SD than regular middle-school pupils (3.2 vs. 2.6). This high level appeared to be significantly associated with a more favourable attitude towards the environment (Amadiou et al. 2017).

A second study among 601 pupils, 48.3% of whom were enrolled in E3Ds and 51.7% in regular middle schools, assessed their knowledge of organic food and agriculture via 13 MCQs (Amadiou et al. 2018). A significantly higher level of knowledge was observed among the E3D pupils, and this higher level was associated with

more positive initial attitudes towards organic farming. Moreover, compared with the mainstream pupils, the E3D pupils were more interested in the theme of organic farming, felt they knew more about organic farming, and heard more about organic farming through discussions with their friends, in the media, and in the classroom (Lescarret et al. 2018). Regarding subjective norms, E3D pupils felt that their friends and teachers had a more positive view of organic farming than non-E3D pupils did. There was a general effect here, and the authors concluded that E3D pupils feel pressure to view organic farming in a more positive way than non-E3D pupils do. When considered alongside the more specific results, this finding would appear to confirm that there is an effect of school context (Lescarret, pers.com).

The main conclusion of these studies is that E3Ds seem to play a decisive role in building a common culture about SD, made up of a priori knowledge and attitudes.

9.4.4 Levers: Smallscale Initiatives that Make a Difference

In terms of leverage, the report of the Ministry of Ecology, Sustainable Development and Energy (2015) emphasises that school-wide projects (E3D labelling), should sit alongside transversal educational initiatives (school trips, residentials, participatory science projects, etc.) and partnerships with a range of local stakeholders. As the E3D scheme rewards progress, according to the 2013 memorandum (MNE 2013) and 2015 circular (MNE 2015), the difficulties that schools encounter are considered not as failures but as opportunities for inventing tools to overcome these difficulties. Setting funding to one side, the key factors for success highlighted by E3D stakeholders in the annual meetings held between 2015 and 2017 in the Toulouse LEA were the development of interdisciplinary educational actions based on current school programmes, the creation of a steering committee, extensive partnerships with local stakeholders, and a well-considered communication strategy to give the project visibility both in and out of school.

9.4.4.1 Reconciling Interdisciplinary Projects and Disciplinary School Programmes

The French education system, especially at the secondary level, is built around academic subjects, generating a compartmentalization that limits teachers' ambitions and is not conducive to teaching ESD (Tutiaux-Guillon and Considère 2010). Since the introduction of SD-related themes in school curricula (2008 in elementary schools, 2005–2009 in middle schools, and 2010 in high schools), ESD has become a driver for disciplinary change. Teachers are torn between a desire to preserve the identity of their own particular discipline (Orange-Ravachol and Doussot 2013) and the challenge of working together on a common action (Lange 2013). This tension between transdisciplinary objectives and disciplinary programmes is at the core of contemporary curriculum development issues.

Take the example of a secondary school with E3D status where the teaching and nonteaching staff have collectively constructed a mental map of how their programmes and educational projects intersect. Updated every year, this map makes it possible to structure the educational projects and promotes the overall coherence and acceptability of their E3D project. Another example might be a vocational secondary school specializing in the building trades that sets up a non-profit venture, modelled on a real company and managed by the pupils, that responds to calls for tenders from local developers allowing pupils to learn the required disciplinary skills but with an SD approach to materials, waste management and also governance.

9.4.4.2 Sober but Effective Communication

Communicating to the whole educational community about the actions while they are being rolled out, rather than afterwards, is an important factor of success, although school staff are not necessarily trained in the use of communication tools or accustomed to showcasing classwork. Depending on the school, this communication can take a variety of forms:

- a large high school may have its own TV channel to broadcast information;
- in a small middle school, a notice board may be reserved for E3D projects;
- increasingly often in high schools, ESD web radio stations set up by the LEA's ESD team and supported by the Centre for Media and Information Education (CLEMI) are enabling students to exchange views, express themselves, and listen to what other people have to say;
- annual events can be organized, bringing together project leaders and all or some of their students.

9.4.4.3 Building Steering Tools to Facilitate Cooperation and Time Management

Projects in schools are subject to time constraints, as pupils, teaching teams, and partners operate on different timescales. Schools can have several, sometimes conflicting, work rhythms: the time of learning and assessment, the time of advice and meetings that require efficiency and rationality, and are based on a performative logic, and the time of projects and networks that require rigor, continuity and breathing spaces, and are based on an experiential logic. Taking projects one step at a step, with realistic demarcation tools, seems to be a good practice that ought to be developed.

In the Toulouse LEA, interdisciplinary and/or intercategory training sessions in secondary schools help to improve time management. During these sessions lasting 1 or 2 days, teachers work on the construction of the global E3D project. The presence of a trainer helps the teachers to take a step back, to identify the existing, to

associate the categories of non-teaching personnel and to build a steering committee, key element to the conduct of such a project.

Team dynamics are also key to successfully managing and completing an educational project. The pleasure of working together helps to motivate the different actors, especially the students. Moreover, one of the fundamental educational issues is how to *do with* young people, rather than *do in their place*. From this perspective, a cooperative approach (Fortin-Debart and Girault 2006/2007; Robottom and Hart 1993) seems to foster commitment to action, based on a collective dimension of learning (Girault and Sauvé 2008). This cooperative approach, informed by a socio-constructivist conception of learning and reliant upon social interactions between students, as well as among all the other stakeholders, fosters intelligence in general (Perret-Clermont 1979) and collective intelligence in particular.

In this context, it is important to pay proper attention to the steering committee's structure, modus operandi and decision-making process. In one secondary school, for example, pupils were involved in the decisions about the E3D project at a very early stage, and the diagnosis took account of feedback from all members of the educational community. This is how, after initially working on environmental topics, the school shifted its focus to *living together*, helping pupils to build and manage a pupils' house within the school.

9.4.4.4 Working in Partnership with the Local Network

One of the factors favouring the acquisition of E3D status is the degree of support that is forthcoming from local authorities: regional or departmental councils for secondary schools, and local councils for primary schools. Moreover, the work initiated in an E3D can be carried on by local stakeholders. Table 9.3 shows the percentage of schools awarded E3D status in 2017 by the Toulouse LEA, as an illustration of local dynamics at work.

In 2007, the Tarn *département* council launched an Eco-Middle School scheme, as part of its Local Agenda 21, and paid EE nonprofit organizations to help schools

Table 9.3 Percentage of schools in the Toulouse LEA awarded E3D status in 2017

Percentage of schools awarded E3D status in 2017		
<i>Département</i> (and regional capital) within the Toulouse LEA	Primary schools	Secondary schools
Ariège (Foix)	0.0%	13.0%
Aveyron (Rodez)	2.3%	14.0%
Haute Garonne (Toulouse)	0.9%	7.0%
Gers (Auch)	1.3%	25.0%
Lot (Cahors)	3.0%	29.0%
Hautes Pyrénées (Tarbes)	8.0%	26.0%
Tarn (Albi)	1.2%	26.0%
Tarn et Garonne (Montauban)	1.3%	11.0%

engage in the greening process. It also organized annual meetings where they could set out their approaches. By 2017, 26% of middle schools in Tarn had been awarded E3D status (Table 9.3), and by 2018, all 31 had become Eco-Middle Schools, with nine also enjoying E3D status (29%).

Municipalities such as the city of Tarbes (Hautes Pyrénées) have worked closely with local MNE officials to construct EE projects (and more recently ESD projects) with primary-school teachers. As a result, of the 62 primary schools with E3D status in 2018, 22 were in the Hautes Pyrénées *département* (i.e. 35% of all schools with E3D status). While this rather heavy-handed approach slightly goes against the spirit of the circular, which places the emphasis on autonomy and singularity, it does mean that this *département* now boasts the highest number of E3D schools in the LEA (Table 9.3).

Finally, awareness-raising activities for schools can be organized in those *départements* where local bodies are involved in promoting SD (e.g. Regional Natural Parks authorities) or environmental protection (e.g. National Parks). For example, in the Lot (Causses du Quercy Regional Natural Park) and Hautes Pyrénées (Pyrénées National Park) *départements*, these local bodies have fostered commitment to the E3D scheme (Table 9.3).

An example of the relationship between work within the school and the local community concerns the vocational high school of St Girons in Ariège, dedicated to the building trades. An association has been set up within the school, based on the model of a real company and managed by the students. Ariège Sustainable Buildings responds to calls for tenders from local worksites, allowing pupils to gain disciplinary skills, but with an SD approach to materials, waste management and governance. These actions typically adopt the *learning by doing* modality advocated by Dewey (1916).

Another example is an annual forum bringing together project leaders and all or some of the pupils in one of the E3D schools, providing an opportunity to involve parents and promote the work of pupils, who run stands to present their school. In 2017, the tenth Tarn *Département* ESD Forum was attended by 400 pupils, who manned 15 stands exhibiting their work alongside the 21 stands of project partners in the presence of local elected representatives, thus promoting local dynamics.

Whatever the local dynamics, making the step change from problematizing on a local scale to problematizing on a global scale is never easy. In his School Agenda 21 analysis, Prost (2011) noted that most teachers remain focused on the school's local area, so further research needs to be done on the transition to a global and planetary vision (Morin 2003).

More generally in ESD, it is important to promote and encourage changes in existing practices, and a clear commitment to ecological transition requires a shift from awareness to action. Citizens must become *co-actors* and *consumer actors*, driving forward the ecological transition to a sustainable development mode (Ministry of Ecology, Sustainable Development and Energy 2015, p. 95). In this context, pupils enrolled in an E3D school can engage in actions outside their school and take their place as citizens and actors in their local community, as they have already reflected on and understood the issues justifying this commitment.

9.5 Conclusion

Activities on the scale of individual schools seem to allow pupils to engage with the educational community and local partners in SD projects that *empower them to act* on contemporary issues. Institutional support for schools has so far come in the form of programmes, ESD circulars and, more recently, the E3D scheme. But this is not enough. Funding is important, but we also need to identify how best to help teams develop locally appropriate projects. Teams must be prepared to commit themselves to actions on the ground. Effective and cooperative management means that individuals have more time to work together, while regular assessments allow schools to fine-tune their SD projects.

E3Ds appear to promote knowledge and attitudes that are conducive to taking SD seriously (Amadiou et al. 2017, 2018; Lescarret et al. 2018). The work carried out by pupils in St Girons and Tarn reveals a culture of action on the ground that is also being nurtured in E3Ds. This culture, which is associated with SD and requires commitment from local actors and institutions (Simonneaux 2011; Lange 2015), is not present in pre-existing models, and is strongly contextualized. It can only be viable if the pupils and educational institutions concerned demonstrate self-analysis and perspective (self-reflexive complexity).

More generally, some dimensions need to be developed further, if pupils are to be *empowered to act* within the project dynamics, and are not restricted to *small gestures*. We must allow students to ask questions and raise issues, by giving them an opportunity to debate and discuss ongoing controversies. In addition, they must be helped to make the transition from a local to a global scale, at least at the secondary school level. We therefore need to adopt an *education in complexity* approach, given that the knowledge objects of SD are inherently complex (Morin 2003).

We will only meet these educational ambitions if we must turn pupils into the *intelligent citizens* our society so sorely needs (Girault and Sauvé 2008), by giving them a proper political education (Lange 2015).

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Chapter 10

Eco-Schools Movement in Germany in the Light of Educational Reforms



Doris Elster

Abstract In this chapter the issues and challenges of the Eco-Schools Movement in Germany in connection with the implementation of educational reforms at global and national level are reported. The current discussion about ESD curriculum development leads to a new vision of the promotion of sustainability literacy for teacher education.

10.1 Introduction

The great challenges of our age incorporate issues directly and indirectly connected to the environment. Examples of direct challenges are environmental quality and biodiversity changes and the need for responses to global climate change. Other challenges are energy efficiency and the need for adequate responses to a carbon-constrained world, resource use and the limitation of natural resources, natural hazards, earthquakes, fires, and droughts (Bybee 2012). What is it important to know and value, and how to act to overcome the challenges related to the environment? What should teachers teach children and adolescents? Asking these questions opens doorways to reflect about concepts of environmental literacy and sustainability literacy.

In this chapter I firstly provide an overview of the historical development of Education for Sustainable Development (ESD) based on international and national reforms (Section 10.2). This process is strongly connected with the Eco-Schools movement in Germany and based on reform processes in the educational sector (Section 10.3). Next the roots of the German conceptions of ESD based on Environmental Education, Global Education, and Transformative Learning is given (Section 10.4). Based on these considerations the current development (after 2015) and the actual debate on curriculum development (Section 10.5) and the impact of Eco-School movement are reported (Section 10.6). These considerations lead to a new vision of future learning to promote sustainability literacy in schools and teacher education (Section 10.7).

D. Elster (✉)
University of Bremen, Bremen, Germany
e-mail: doris.elster@uni-bremen.de

10.2 ESD in Germany in a Historical Perspective

10.2.1 National Pathway to Promote SD

Discussions of the concept of ESD in Germany were shaped to a large extent by large-scale educational policy reforms. For the implementation of international resolutions on sustainable development, the German federal government has established several boards, commissions and advisory councils:

- Bundestag Enquete Commission on the “Protection of Humanity and the Environment”, which presented its final report in 1998.
- Bundestag Enquete Commission on “Growth, prosperity, quality of life – Ways to sustainable economy and social progress in the social market economy” which presented its final report in 2013.
- Board of Experts for Environmental Matters (SRU, since 1971)
- Scientific Advisory Council on Global Change (WBGU, since 1992)
- Board of Secretaries of State for Sustainable Development (since 2001)
- Advisory Board for Sustainable Development (since 2001)

Associated with these bodies are a number of important resolutions, reports, and declarations regarding ESD:

- German Federal Government
 - National Sustainability Report, 2002 plus progress reports 2008, 2012, 2016
- Federal Ministry of Education and Research
 - Reports on the Federal Government on Education for Sustainable Development 2002, 2005, 2009, 2013, 2017
- Bundestag Advisory Group on Sustainable Development (since 2005).
 - Resolution on the Action Plan on the UN Global Decade Education for Sustainable Development (Bundestag document 15/3472 from 01st July 2006)
 - Resolution on Education for Sustainable Development (Bundestag document 17/9186 from 26th April 2012)
 - Resolution “Education for Sustainable Development – facing the future with the World Action Program” (Bundestag document 18/4188 from 05th March 2015)
- German National Committee for the UN Decade Education for Sustainable Development:
 - National Action Plan for Germany (2011)
 - Position paper “Future Strategy ESD 2015+” (2013)
 - Standing Conference of the German Ministers of Education and Culture (KMK) and the German UNESCO Commission:
 - Recommendations on “Education for Sustainable Development at School” (2007)

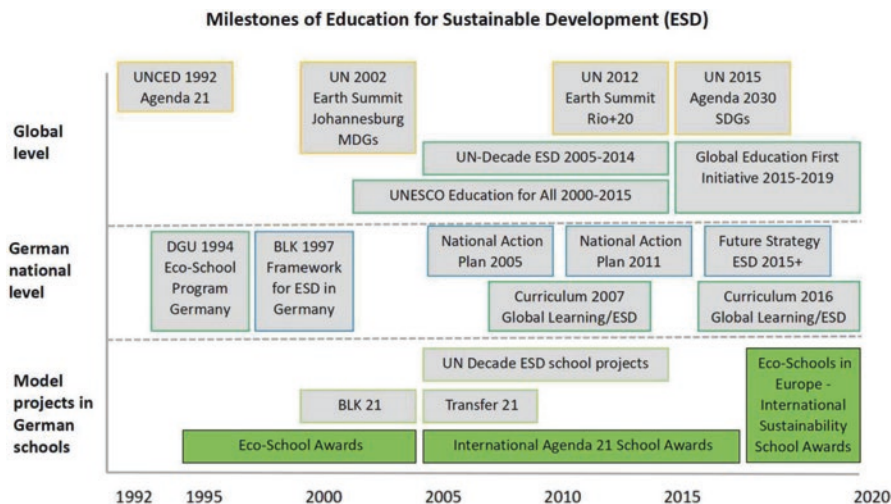


Fig. 10.1 Milestones of Education for Sustainable Development

- Standing Conference of the Ministers of Education and Cultural Affairs (KMK) and the Federal Ministry of economic cooperation and development (BMZ)
 - Curricular Frame for “Global Learning” (2012 and updated 2016)

An overview of political reforms, reports and recommendations on global level as well as on German national level to realize a sustainable development as well as German school initiatives and programs in this context is given in Fig. 10.1. In the following sections these reforms and programs are cited and their connection to an understanding of ESD reported.

10.3 Development of Eco-Schools in Germany

The development of Eco-Schools in Germany is closely connected with the establishment of the Foundation for Environmental Education (FEE) in 1981 and the launching of the Eco-Schools program in 1994. The national coordinator of FEE projects and programs is the German Society for Environmental Education (DGU). It is an umbrella organization with governmental and non-governmental partners like the Federal Ministry of Education and Research (BMBF), the Federal Ministry of Economic Cooperation and Development (BMZ), the Federal Ministry of Environment, Nature Protection and Nuclear Safety (BMU), the German UNESCO Commission, and the Association Development Policy of German Non-Governmental Organizations.

Since its founding in 1983, the DGU has been promoting better understanding of environmental education and communication. It aims to realize these goals primarily through the following measures:

- Arranging or promoting seminars, meetings, information meetings, focusing on the intensification of the immediate environmental experiences of children, adolescents and adults. In particular, this should be achieved by improving cooperation with educational institutions of all kinds, with municipal institutions, with public authorities, with citizens of municipalities, with associations and businesses.
- Publishing or promoting such publications, reports and studies.
- Promotion of education and training in environmental education.
- Promoting international cooperation, especially with the “Foundation for Environmental Education in Europe”.

10.3.1 Program BLK-21 (1999–2004)

The first studies on environmental education (EE) as a contribution to sustainable development (SD) influenced the scene of environmental educators in 1994. In the school system some federal states like Hessen and Baden-Württemberg started Eco-Schools networks with a wider focus on environment and future development (Mathar 2015). The federal government established a national committee on SD which included a wide selection of stakeholders from across society.

In 1997, the Federal Government and the German States to Improve School Development and Research (Bund-Länder-Kommission BLK) published the educational guideline “*Framework for ESD in Germany*” (BLK 1997) which initiated first discussion processes among educational experts. Based on the framework several states developed programs on EE or on ESD. These were Eco-School programs (in six federal states), school development programs with a focus on ESD (in Hessen and North Rhine-Westphalia), as well as networks of regional EE centres (in Bavaria, Lower-Saxony, Hessen, Thuringia and Saxony). But a school development programme with a special focus on ESD was still missing.

A few years later, in 1999, a research team from the Free University of Berlin, headed by Gerd de Haan, published “*Education for Sustainable Development: Expertise on the School Development Program*” (BLK 1999). In the same year, 15 of the 16 states and the Ministry of Education signed off a joint program on ESD for the years 1999–2004. The program was called “*BLK-21*”, in reference to the *Agenda 21* process and was supported with an investment of 12.5 million Euros.

As a result, 56 thematic teaching blocks (“workshop materials”) with regard to the spheres of “Shaping School Day”, “School and Partners”, “School and Living Environment” and “School in One World” were prepared. These primarily focused on *interdisciplinary knowledge, participatory learning and innovative structures*. The idea of “*design competence*” (Gestaltungskompetenz) was developed in a first

version and integrated into the current definition of educational standards in the context of ESD for all subjects (De Haan 2004). Design competence comprised competences for active involvement in future development, including:

- future-oriented thinking and knowledge about future scenarios, planning;
- ability for interdisciplinary work on solutions to problems and innovations
- systemic (connected and combined) thinking and planning competence;
- solidarity;
- ability to co-operate and to communicate;
- ability to motivate oneself and others
- ability to look critically to look at one's on culture and foreign cultures.

Participatory learning opened new ways of co-operation with partners outside the school. Examples were a project of seawater desalination in co-operation with Africa, opening the school as a learning place for the neighborhood, portraits of students' villages of origin, research into fertilization methods conducted by high school students in co-operation with farmers (De Haan 2004).

From a historical perspective, the *BLK-21 program* could be reported as a success story starting with eight schools in six federal states in 1997 and developing to the huge environmental programme with about 200 participating schools in 2004. The schools developed together elements of curricula-based lectures, school plans and school programmes for ESD, the concept of "design competence", and new elements of students' participation.

10.3.2 Program Transfer-21 (2004–2008)

The program "*Transfer-21*" was initiated as a follow-up project to "BLK-21" with the aim to disseminate ESD and the results of BKL-21 in Germany.

In 2005, at the end of the BLK-21 program, the Federal Government and State Ministries of Education (BLK) initiated the follow-up project "*Transfer-21*" on mainstreaming the results of BLK-21 in Germany. The goals were to reach 10% of the schools of Germany (of a total of 43,000 schools), training of 100 multipliers of ESD and establishing of local and regional structures to facilitate ESD in schools (Tranfer-21 2005).

The necessary paradigmatic changes could not be steered through "top-down strategies" as competences to co-create the future and to be actively involved in the future were suggested as crucial criteria for quality ESD (Transfer-21 2007). The multipliers training program with more of 100 hours of training and additional blended learning elements equipped delegates from schools for future school development in ESD.

In total, about 2500 institutions (not only schools) participated in this program. Successful participating schools were given the title "*International Agenda-21 School*" if they reach achievements in respect to the development of sustainability processes within and outside the school sites (Hoffmann 2015).

10.3.3 UN Decade Projects (2005–2014)

In 2002, the United Nations approved resolution 57/254 declaring the ten-year period beginning on the 1st of January 2005, to be the *United Nation Decade of Education for Sustainable Development* (UNESCO 2003). The *International Implementation Scheme* (UNESCO 2005) identifies *environment* as one of the three spheres of sustainability (along with *society* including culture, and *economy*) that should be included in all ESD programs. The UNESCO declaration provided a rationale for including questions about students' responsibility toward resources and the environment.

In Germany the ideas of the UN Decade influenced ESD and led to a new development parallel to the "Transfer-21" program. A new project was launched steered by the Standing Conference of the Ministers of Education of the Federal States (KMK) and the Federal Ministry for Economic Cooperation and Development (BMZ), which published the *Guidelines for the Global Development in Education for Sustainable Development* (KMK 2007). This approach pursued a methodical and subject-related approach to the development of a specific approach to competence differentiated in the domains "recognize", "evaluate" and "action". It offered a conceptual frame for the development of school curricula and lesson plans, inspiration for school profile and day school development, for cooperation with external partners and for teacher education. It also offered concrete recommendations and classroom materials about global development issues.

At the German level, the United Nations Decade of Education for Sustainable Development (UN DESD), which ran from 2005–2014, took place at all political levels (Federal Republic of Germany, Federal States). By 2014, more than 1900 projects had been realised in this specific area of education and had been awarded the title "Decade Project".

As the UN Decade of Education for Sustainable Development ended in 2014, discussions raised how to continue developing and strengthening education for sustainable development after 2015. The considerations were summarized in the "Curriculum framework Global Education" (Engagement global 2017) (discussed below).

10.4 Different Conceptions of ESD

ESD includes all activities that are oriented towards the fundamental principles of sustainable development. It connects different traditions of education, such as environmental education, global learning, intercultural learning and peace education. The *BLK* and *Transfer 21* programs as well as the *Decade Education of Sustainable Development* have addressed the inclusion of global contexts with regard to the world climate and the biodiversity loss, and thus widened the conception of environmental education. The KMK report, *On the situation and perspectives of*

Education for Sustainable Development (KMK 2012), concluded that ESD has been included to a large extent in the educational and teaching plans of all federal states. The cross-curricular and subject-linked integration of ESD at schools was quite successful.

Although ESD is a construct of the global and national Agenda-21 processes, the roots are much older and goes back to the mid of the twentieth century. It is mainly based on the two strands: the concept of environmental education (EE) and the concept of global education (GE). It is further developed in the concept of transformative learning (TL).

10.4.1 Environmental Education

Environmental education (EE) in Germany has its roots in the 1970s. Due to the growing threat to the environment, principles for comprehensive EE were included in the curricula in 1971 (Bolscho et al. 1980).

- EE at school should help students to understand the natural, social and built environment;
- EE at school should foster the ability to solve problems in complex systems;
- EE at school should help enable students to participate in political life.

As a methodological approach, situated planning with real-world experiences, problem-oriented working and activity-oriented learning were suggested. The concept of “eco-education” was in opposition to “economic-technical natural exploitation” and the social structures that favor it. Above all, eco-education criticized fundamental patterns of thinking and acting as the cause of the environmental crisis. It was not enough to modify what already existed (eg. conservation of resources), but there was a radical critique of existing society (Beer and de Haan 1984).

Rost (1998) identified six unresolved EE issues that ultimately led to abandonment of the classic EE and opened the gates to model BLK-21 and ESD:

- Motivation for “right” action: Studies have shown that although the environmental awareness of the students rose, their environmental behavior did not change.
- Dealing with Complexity: No methods were known on how to teach and learn how to handle complexity.
- Value Education: The EE did not develop convincing approaches to value education.
- Dealing with polyvalent decision situations: The consideration of conflicting values with different perspectives was overlooked.
- Positive goals: The classic EE was not future-oriented but in a good sense conservative. It was aimed at the preservation of the existing and the restoration of the lost.

Knowledge canon and competence orientation: No canon of knowledge contents or approaches of competence orientation had developed.

In his summary, Rost (1998) stated:

Education for sustainable development is development-, value- and competence-oriented, whereas classical environmental education was more conservative, monovalent (the protection of nature as the highest value) and action-oriented

The perspective of Education for Sustainable Development is more fundamental and prevalent new accents:

The focus on the vision of a sustainably developing society makes the students' own future the meaningful moment of educational processes.

Value education ... includes learning how to deal with many contradictory values. Such educational goals can only be achieved if the students are supported and encouraged to develop very challenging competences. These competences are highly deficient in the current generation of adults too. (Rost 1998, pp. 8–9)

10.4.2 *Global Education*

The historically oldest and most important frame of reference for global learning is development education and so-called *Third World Education*. These concepts, which were differentiated in the 1960s and 1970s, derive from colonial pedagogy, from the idea of reparation and the desire to return even experienced assistance and the growing experience of internationalization. Developing countries appear in the didactic discussion as a new educational content with a lot of pent-up demand. In the 1960s, there was a clear politicization of the development policy debate, focusing in particular on the dependency structures of international economic interdependencies and the connection between development in the First and Third Worlds. This perspective takes up development education. In the 1980s, the connection between resource consumption in the north and that of the developing countries was discussed. Since the 1990s, the broader concept of global learning has prevailed. (Lang-Wojtasik and Klemm 2012; Hoffmann 2015; Schreiber 2010).

Global learning is a response to globalization and related risks. It can be characterized by four basic aspects:

- broadening the horizon (worldview) and networking;
- future orientation;
- orientation to universal ethical principles;
- opening up the forms of learning.

Global learning derives from the tension between globalization and local options, complexity and necessary reduction, uncertainty and the need for security, future orientation and dealing with current events, the learning of social skills and knowledge acquisition. To achieve these goals, global learning promotes change of perspective and inclusive thinking.

For the selection of topics and fields in which Global Learning plays an essential role as teaching principle, the “socially relevant key problems” defined by Wolfgang Klafki (1996) can be used: environmental destruction, mass poverty, social disintegration, violent conflict, migration, international crime, uncontrolled atomic potential, ruinous location competition, speculative capital transactions, population

development (Hoffmann 2015). According to Klafki (1996, p. 61), “The result must be that every learner recognizes the indivisibility of one’s own judgment, reflected decision and one’s own actions ..., thus communicating in a reflexive way, being affected and co-responsible.” He also argues that “General education means addressing such key issues: at the various levels of education and training, every young person and every adult should have at least some of these central problems – in the sense of exemplary, thorough, understanding or discovery learning – penetrated” (Klafki 1996, p. 62).

By providing the right information, and classroom discussions about these key issues, learners can learn the following important qualities: willingness to criticize and critical faculty; argument readiness; empathy; connected thinking. Not only do students learn about key issues, but they also learn about life in society. The need to open up teaching becomes more apparent in the context of the teaching principle of global learning than in traditional learning structures. Cooperation with extracurricular institutions, partnerships, actions, exhibitions, games, theater, discussions are important forms of learning and require an open teaching organization (Hoffmann 2015).

10.4.3 *Transformative Education*

The concept of transformative education is based on the on the review “World in Change – Social Contract for the Great Transformation” by the German Advisory Council on Global Change (WBGU 2012). Transformations are processes within which the global society should tackle transformation towards sustainable development. In doing so, research and education play a central role as the insight into the restructuring of the global economy is based primarily on science. In addition, society should decide on actions that are predictive and precautionary. To this end, education should empower people to develop awareness, learn systemic thinking, and act responsibly (WBGU 2011).

The concept of social transformation provides for a meshing of the levels of transformation education, transformation research, transformative research and transformative education.

Transformation education includes education through participation, understanding of pressure to act, global sense of responsibility, mediation for sustainability-relevant knowledge, systemic thinking, and understanding of scientific knowledge processes.

Transformative education includes knowledge of the key factors of transformation, basic problem awareness, interdisciplinary learning, and understanding of global relationships. (WBGU 2011)

In both forms of education, it is important to understand society as a participant in the transformation process and to enable it in the future also in the education of participation. Only if the man sees himself as an active factor of the mediated context, he can also understand the transformative power of his actions. Appropriate educational structures are essential for this. (WBGU 2011, p. 24)

10.5 Developments Since 2015 and Current Status

In 2015, all members of the United Nations signed the *Transforming our World – Agenda 2030 for Sustainable Development* with its 17 Sustainable Development Goals (SDGs) (United Nations 2015). The education goal, SDG 4, states: “Ensuring inclusive, equitable and quality education and promoting lifelong learning opportunities” is of particular importance for the educational sector, and for ESD Target 4.7 is the focal point:

Ensure [...] by 2030 that all learners acquire the knowledge and skills needed to promote sustainable development and sustainable lifestyles, human rights, gender equality, the promotion of a culture of peace and non-violence, global citizenship and the appreciation of the cultural diversity, as well as the contribution of culture to sustainable development. (United Nations 2015, p. 19)

As complex global developments are increasingly influencing our daily lives everyone is encouraged to engage in the sustainable development of a lifelong future. Education should trigger this process of a lasting learning process that empowers and encourages citizens’ life and participation in social transformation. Target is that citizens are aware to be an important part of communities, of local, national, European and social society to contribute to democratic design processes. This requires orientation and education that enables the development of the necessary basic skills.

To put these ideas into practice, in 2016, the German *Curricular Framework for the Global Development Learning (OR) / Education for Sustainable Development (ESD)* was launched (Schreiber and Siege 2016). The framework is based on the results of the joint project of the Standing Conference of the German Ministers of Education and Culture (KMK) and the German Federal Ministry of Economic Cooperation and Development (BMZ). The OR comprises approaches of *UNESCO Textbooks for Sustainable Development* (UNESCO and MGIEP 2017) and experiences from the National Strategy “*From the project to the structure*” following the UN Decade 2005–2014. It supports institutional and civil society actors in the implementation of the goals and recommendations of the National Action Plan (2015–2019) especially in the field of education.

The OR takes into consideration and gives orientation towards five areas: (1) orientation towards the mission statement of sustainable development, (2) orientation the content and goals of SDGs, (3) orientation regarding ESD – competences, (4) inclusion and an active self-determined learning process, and (5) a sustainable overall institutional approach (see below).

10.5.1 Orientation Towards the Mission Statement of SD

The OR takes account previous experiences of development education and global learning, and integrates them into Education for Sustainable Development (ESD). It is oriented to the “triangle of sustainability” (economy, social, and environment) as

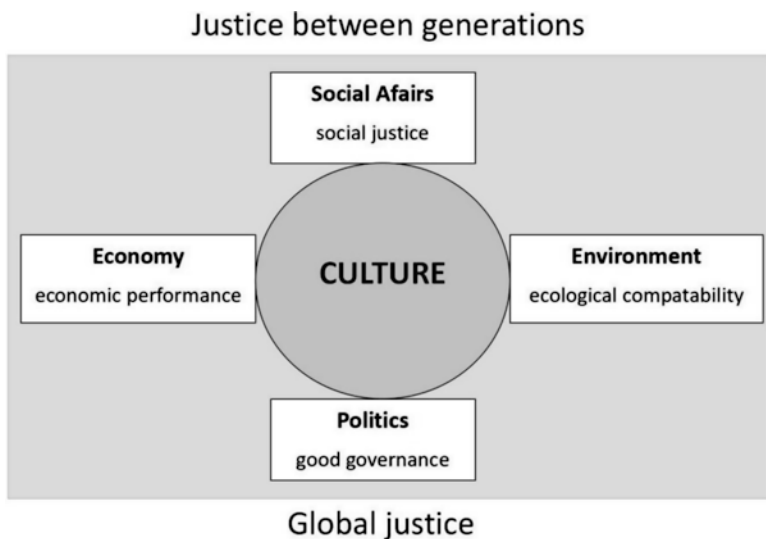


Fig. 10.2 The guiding principles of sustainable development (SD)

a holistic development model. In such a model, economic growth should be balanced against environmental protection and social justice. The OR goes a step further; it integrates culture and politics (good governance) into the model of sustainable development (Fig. 10.2). From a pedagogical point of view, this inclusion in a value-oriented, globally valid model of an inclusive society, which leaves no one behind, makes sense. Politics and culture in its various forms are preferred topics in the mass media and primary fields of participation in sustainable development. In case of conflicting goals of the development dimensions, the model offers orientation for one's on behaviour and for the negotiation of sustainable solutions against the background of cultural diversity.

10.5.2 Orientation Towards the Content and Goals of SDGs

Teaching and learning in the context of ESD makes use of the opportunity to define relevant, life-world oriented and problem-oriented topics. Every sustainable problem can become a topic if it leads to conflicts between persons involved or affected by the consequences. All SDGs and their sub-goals can lead to an underlying local problem in one of the 21 subject areas named in the OR. In addition, one or more certain criteria for the selection of an ESD topic must be fulfilled:

ESD themes

- are socially relevant and interesting for the learners,
- are problem-oriented and require an opinion and a sustainable solution,
- support a change of perspectives,

- require the perception of socio-cultural diversity,
- give rise to the investigation of interactions between local, national, European and global factors and processes,
- pick up on prior knowledge and promote self-organized knowledge acquisition,
- connect to one or more SDGs,
- are embedded in one or more subjects.

Based on UNESCO (2016) in the OR the 21 open topics of the OR can be limited to a few core concepts:

- Environmental stress and unsustainable patterns of economic production and consumption
- More prosperity, but also more deprivation and inequality
- Increasing networking but growing intolerance and violence
- Progress and challenges in the human rights are embedded in one or more subjects.

10.5.3 Orientation Towards ESD – Competences

Since the launch of the National Educational Standards (KMK 2004) all curricula for schools at the secondary level are competence-oriented. According to Weinert (2001) competences are defined as

the cognitive abilities and skills available or to be learned by individuals to solve certain problems, and the connected motivational, volitional and social preparedness and abilities to successfully and responsibly use problem solutions in variable situations. (Weinert 2001)

Competences consist of specialized knowledge, interdisciplinary and practical action knowledge, meta-cognitive as well as social and emotional abilities and both physical and practical skills, attitudes and values that can lead to meaningful actions. In ESD the overarching educational goal is to acquire core competences for sustainable shaping of life, participating in society and co-responsibility on a global scale. Therefore, the OR names eleven core competences in the three areas *recognition – evaluation – action* in which the sub-competences of the subject relate (Fig. 10.3). Competencies are acquired in the learning process in term of content that is designated as a principally open catalogue of 21 relevant subject areas that are assigned to the SDGs of the Agenda 2030.

10.5.4 Orientation Towards Inclusion and an Active Self-Determined Learning Process

Didactical concepts of ESD are based on the paradigm of constructivism and are linked to current educational reforms – for example with regard to inclusion and digital education. The principle is that inclusive and quality “Education for All”

Recognising	Assessing	Acting
1) Aquisition and processing of information on topics of globalisation and development;	5) Change of perspectives and empathy , reflect upon own and others' values and the significance;	8) Solidarity and shared responsibility for humans and the environment, and respect the respective challenge;
2) Recognising diversity , socio-cultural and natural diversity in the One World;	6) Critical reflection and comment on issues of globalisation and development, SD and human rights;	9) Understanding of socio-cultural barriers , communicating and cooperating, and contribute to conflict resolution;
3) Analysis of global change and processes of globalisation and development by using the concept of sustainable development;	7) Evaluation of development projects here and in other parts of the world, and come to self-reliant conclusions	10) Ability to act in times of global change , by openness and readiness to innovate, by an appropriate reduction of complexity;
4) Differentiation between levels of action , from the individual to the global level;		11) Participation and active involvement to pursue objectives of SD in private, school and society.

Fig. 10.3 Core competences of Global Development Education (ESD). Students should acquire the mentioned competencies but decide autonomously whether or not they want to apply it in a certain situation

(SDG 4) is the main goal. Learning takes place, where learners are actively involved in a process of meaning construction as well as discovering reconstruction and critical deconstruction of the world. They acquire knowledge and competences independently. The role of the teachers is changed too; they can more easily gain an understanding of the learning processes through mentoring, accompaniment and support of the learners. The interdisciplinary and multidisciplinary form of organization (mainly with a project structure) over a much longer period of time than a few lessons allow the study of complex problems, excursions, discussions with professionals, and a better integration of a pan-European school concept. In ESD, learner-centred, research-based and problem-solving, interactive, self-determined and democratically determined learning activities, along with sustainable problem-solving issues, form the core elements of the transformative quality of this learning approach.

10.5.5 *Orientation Towards a Sustainable Overall Institutional Approach*

Based on the National Action Plan (2011) the 16 federal states of Germany are called to re-organize the curricula. The intention is not the overburden with new contents but to promote a re-orientation of content and pedagogical implementation. Quality should be geared as a socially negotiated transformation towards sustainable development. The guiding idea of *“From project to structure”* is the integration of ESD in all subjects and to combine it with an institutional approach, the Whole School Approach, whose starting point and value centre is the guiding principle of sustainable development (Fig. 10.4).

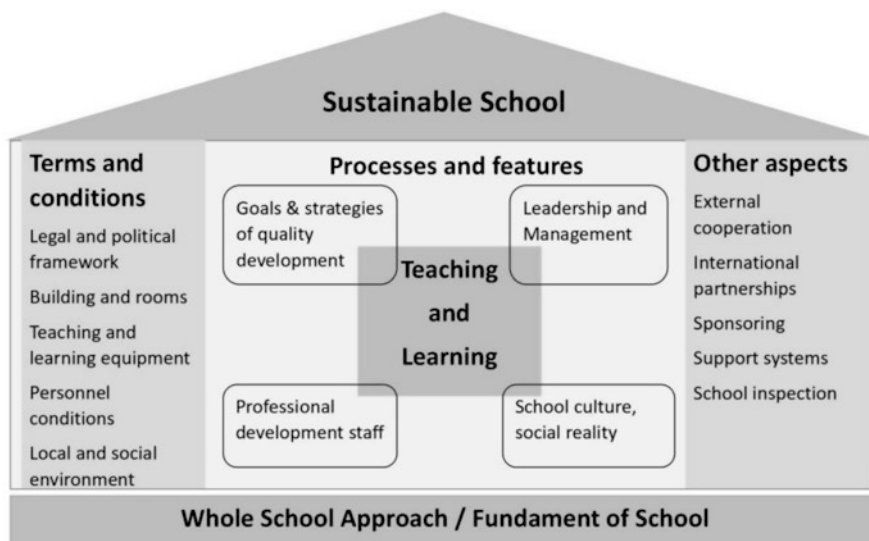


Fig. 10.4 The Whole School Approach for sustainable development

Schools can be understood as “microcosms of society”. Like many other institutions they face the challenges of sustainable facility management, the responsible use of resources, the shaping of democratic participation, the inclusion and the handling of socio-cultural conflicts. They can combine these issues with their educational mission, and become a role model and a learning field for life.

10.6 Impact of Eco-Schools on the Development of ESD in Germany

Eco-School in Europe (in German ‘Umweltschule in Europa’) is an award of the Foundation for Environmental Education (FEE), which is coordinated by the German Association of Environmental Education (Deutsche Gesellschaft für Umwelterziehung DGU) in Germany. The award is given to schools that promote students’ environmental awareness and pro-environmental behaviour. The schools apply for the award with a self-developed concept. A jury decides after evaluation about the assignments. The title *Eco-School* is given only for one year, but it is possible for the school to apply again.

In Germany, the Eco-Schools movement started in 1994/95 with eight participating schools in the BLK-program. Over the next ten years the program developed to the largest environmental program in German schools. In 2005/06 350 schools from 12 of 16 federal states participated in the program (DGU 2019).

In 2005/2006 the DGU enlarged the programme with the title *International Agenda-21 School*. The award was given to schools with special achievements

regarding environmental activities in the schools as well as at out-of-school sites. In 2018, more than 960 schools from eight federal states participated in the programme.

Each year the campaign takes place nationwide under specific themes:

- Themes in 2016/17: natural habitat water, life in 2030, school garden
- Themes in 2017/18: sustainable and fair consumption, Europe in the core, climate change and energy transition.
- Themes in 2018/19: Anchoring sustainability in the school, health and benefits, digitalisation at school.

In 2019, the campaign was enlarged and the award changed to '*Eco-School in Europe – International Sustainability School*'. That showed the important shift from environmental literacy to sustainability literacy (see below). The participating schools were from eleven federal states. The award is still on-going.

The Eco-School award is an important steering instrument in the bottom-up – top-down implementation process of ESD developments and goals. It is connected with important educational reforms like the implementation of national educational standards in natural sciences (in 2004), UN guidelines like Agenda 2010 and Agenda 2030 and European developments like Horizon 2020.

Schools are invited to develop their own curricula with a specific SD focus. When creating in-school curricula, schools face the challenge of coordinating subject curricula with one another and with the respective school environment and the respective priorities. This is often a challenge, especially in interdisciplinary learning areas such as global learning. Only in some schools is there already a merger of subject-specific educational tasks into areas such as “nature and technology” and “society”. Only a few countries have so far drawn up master plans for interdisciplinary education and training tasks. In Eco-Schools, teachers face the challenge of systematically shaping their school from the students’ point of view. In many places, you have to face considerable social challenges and rapidly growing requirements and expectations. Important orientation points for the curricular work are the eleven core competences of the learning area Global Education, the related sub-competencies of individual subjects and the subject themes. If the school wants to apply as an Eco-School, then the subject themes are specified by the yearly changing Eco-School award call for submissions.

Many schools that have taken different approaches to global learning, environmental education or other areas of education for sustainable development, and these provide inspiring examples:

- Grundschule Obervorschütz has identified interdisciplinary learning areas such as Ecological Learning, Global Learning, Democratic Learning and Music-Aesthetic Learning in its school program.
- The Carl-von-Linné School received in 2013 as one of the first schools in Berlin the award as a fair school. For this, schools meet criteria from the areas (1) Fair to people in school/democratic school culture; (2) Fair to environment and climate/environmental responsibility; (3) Fair to people around the globe/Global Learning.

- The E.T.A. Hoffmann Gymnasium in Bamberg is one of 200 UNESCO project schools in Germany. Pupils, teachers and parents of this school follow the UNESCO guidelines when carrying out the following activities: (1) networking with other UNESCO schools (regional, national, international); (2) International project days e.g. on human rights; (3) educational projects in Nepal and Tanzania; (4) Immediate environmental education in the large school grounds.

School buildings, grounds, classrooms and their equipment are an expression of the school's self-image and the social model of sustainability. Participation processes for the future users have become a matter of course, although not always easy to implement. Sustainable public procurement of e.g. teaching materials has become an important discipline. The close-to-life confrontation with problems and their discussion in the wider field of school with parents and friends leads to the important experience of the meaningfulness of learning processes and to a sense of self-efficacy. School-related examples of implementation are the following:

- The Pauline School has been awarded the title School of the Future 2016–2020. Significantly were following responsible actions:
 - The project resource protection paper: 98% of the families use the E-Mail distributor of the school and thus save paper and copying costs.
 - In the Paulus store of the school only school supplies with “Blue Angel” (recyclable products) are listed.
 - Starter Package: Third-grade students make first-class starter packs of high quality and ecologically valuable products at a competitive price.
 - Waste separation in the classroom on the basis of a waste seminar of the consumer center.
- The vocational training Georg-von-Langen School Holzminden has founded a sustainable student cooperative. The students take over the production and marketing of wood and metal products.

10.7 Future Visions for the Realization of ESD

10.7.1 Change of Society in Favour of Sustainable Development

The values pursued in ESD are mostly not in line with social orientations. For example, the goals of social justice, solidarity, ecological compatibility, conservation of resources and responsibility for the future, as pursued in the mission statement on sustainability, contradict the social values of individualization, self-interest, personal freedom and unrestricted mobility (Sybold 2009).

Other problems include individual's lack of awareness of many problems and their gradual changes. Examples of this include the issues of global warming, biodiversity loss, and poverty. In addition, temporal and spatial distances between

causes and effects, (e.g. of emissions and ozone depletion) are hardly tangible. Typical judgment strategies in dealing with complex systems or in risk assessment (such as mono-causal explanations) predominate.

A possible solution may come from the cultural sciences. They see the path to sustainable development as less a problem of lack of technical solutions and primarily a cultural problem (Leggewie and Welzer 2010). They assume that cultures and values are based on “great stories” or “positive narratives”. These are accepted by a majority of a society and assessed positively in the context of individual development and lifestyle (Leggewie and Welzer 2010). Examples of these positive narratives are justice, individual freedom, and democracy, freedom of movement, consumption and prosperity. The necessary change in society will only be achieved if ESD is integrated into this canon as another positive narrative (Welzer and Rammler 2012).

10.7.2 Preparing Sustainability-Literate Teachers

The education of the next generation on pathways towards a more sustainable way of life is of great importance. Therefore, sustainability topics need to be woven in teacher preparation and education programs (Nolet 2009).

Our Common Future, the report of the World Commission on Environment and Development (1987, p. 8) states that “the world’s teacher has a crucial part to play in helping in bringing about the changes in attitudes, social values, and in aspirations related to and required for the longevity of our planet”. The goal is to build a capacity for teachers to be able to approach the broad and complex nature of sustainability, the problem-oriented, solution-driven nature of sustainability, and, how sustainability connects to them as both citizens and classroom teachers. To reach this goal Warren (2014) developed the complex Sustainability Education Framework for Teachers (SEFT). The goal is to acquire “sustainability literacy”, various abilities and subsequent actions such as problem-solving and decision-making (Nolet 2009). Once teachers gain sustainability literacy they become empowered to approach society with a critical lens; teach sustainability topics and ways of thinking to their students; make informed decisions; contribute to rethinking interpersonal, intrapersonal, intergroup and intragroup concepts of society and the environment (Warren 2014; Nolet 2009; Bertschy et al. 2013). SEFT embraces four ways of thinking – futures, values, systems, and strategic – which are more than just a list of steps to set. They build a complex framework for analyzing and sustainability problems and solutions through a networked approach.

In the German context, the first steps to promote sustainability literacy are set in the Curriculum Framework for Global Education (Schreiber and Siege 2016). Universities strive to integrate ESD in teaching and research; the declaration of the Hochschulrektorenkonferenz (HRK) has clearly emphasized this point (HRK 2009). Networks like the Hochschulnetzwerk BNE Baden-Württemberg (www.bne-hochschulnetzwerk.de) play an important role as platforms for the cooperation and

exchange on current research and for the co-operation among didactical researchers and scientists in the subject fields.

A further concrete example for the promotion of sustainability literacy in teacher education is the practical course INQUIRE (Inquiry-based teacher education for a sustainable future) at the University Bremen (Elster and Müller 2017). In this module teacher candidates work in teams by the development of complex simulation games in the context of biodiversity loss and climate change. The students are part of an “community of practice” and supported by an interdisciplinary team of biology and geography educators, scientists and external experts. They conduct their self-developed simulation games in school classes and assess pupils’ learning in respect system thinking, decision making competence and design competence.

The didactical lab *Backstage Science Biology* (BaSci lab Biology) works in close cooperation with teachers and schools of the secondary level (Elster 2018). INQUIRE modules with different contexts (examples are the bio-invasive species in the Wadden Sea, green cotton and global trade, risk literacy in respect to nanotechnology) are offered to schools and for in-service teacher education. Sustainability literacy as a new goal for teaching and learning is discussed and design competence as the “new hand-print approach” is disseminated.

Schools play a crucial part in this process of the promotion of sustainability literacy. Therefore, in 2019, the campaign of the German Association of Environmental Education (DGU) has been enlarged and the Eco-Schools award changed to ‘*Eco-School in Europe – International Sustainability School*’. The participating schools are currently from eleven federal states: Hamburg, Lower Saxony, Thuringia, Saxony-Anhalt, Brandenburg, Mecklenburg-Vorpommern, Bavaria, Berlin, Hessen, Baden-Wuerttemberg and North Rhine-Westphalia. These are first concrete traces that the concept of sustainability literacy has entered into German schools too. UNESCO schools are especially open to educational approaches to promote Global Learning. As an example of this, the UNESCO school Bremen developed in a whole-school-approach in close cooperation with didactical researchers and teachers of different subjects around the educational concept of an “Eco-Ambulance” based on the “Buen Vivir” concept from Ecuador (Berning 2017).

Financial resources from the BMZ (Federal Ministry for Economic Cooperation and Development) are provided – e.g. for projects to implement the Curriculum Framework Education for Sustainable Development – to support activities to promote sustainability literacy in school classes and institutions.

Although in recent years there has been a rising awareness of the key problems of our century, and although ESD has become an integral part of our current school system and the curriculum of teacher education, and different state organizations and NGOs financially and ideally support ESD issues, there is still a rough road to go for living in a society based on sustainable principles. Teachers will play an important role in the process of sensitization and cultural change – for a better world tomorrow. They need to develop not only their pedagogical and didactical competencies in respect to Global Learning and sustainability literacy, but also competencies regarding educational change, including critical analysis, curriculum design and implementation. Governments need to recognize these competencies and the

dedication of teachers by giving them autonomy and trust to use their expertise to develop – collaboratively – curricula that meet the needs of pupils and society.

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Chapter 11

The Green School Award in Hong Kong: Development and Impact in the School Sector



Eric Po Keung Tsang, John Chi-Kin Lee, Sai Kit Eddie Yip,
and Annette Gough

Abstract The Hong Kong Green School Award (HKGSA) is a school award scheme hosted by the Environmental Campaign Committee (ECC) to encourage schools to promote environmental awareness and for students to develop an environmentally-friendly lifestyle. Since its inception in 2000, the HKGSA has undergone several phases of development. Between 2000 to 2008 it took the form of a competition with 3 winning schools and 10 merit schools. After an initial review in 2005, it was decided to change the 8th HKGSA from a competition format to a benchmarking process. The successfully accredited schools were given the title of Green School once they fulfilled certain requirements. Another major reform took place in the 12th HKGSA in 2013 to allow flexibility for schools to satisfy the requirements in phases by completing the accreditation to attain the gold award over a period of 3 years, the introduction of facilitators to act as mentors and the enforcing of a maximum validity period for the accreditation. This structure mirrored the sustainable schools program in Victoria, Australia. HKGSA has become a well-received accreditation scheme which can also act as a driving force to promote education for sustainable development in the school sector which in 2020 will be subsumed under the Hong Kong Awards for Environmental Excellence (HKAEE). This chapter describes the development of this initiative in Hong Kong, its framework, implementation, impact and future.

E. P. K. Tsang · J. C.-K. Lee · S. K. E. Yip
The Education University of Hong Kong, New Territories, Hong Kong SAR, China
e-mail: etsang@eduhk.hk; jcklee@eduhk.hk; yipsk@eduhk.hk

A. Gough (✉)
School of Education, RMIT University, Melbourne, VIC, Australia
e-mail: annette.gough@rmit.edu.au

11.1 Introduction

Dealing with environmental issues is increasingly becoming a regular part of daily life, and general societal concern about the environment has increased in recent decades, as reflected, for example, in the United Nations 2012 conference on sustainable development, and the 2030 Agenda for Sustainable Development (United Nations 2015). In Hong Kong, the Environmental Campaign Committee (ECC) is a major governmental advisory committee which was set up in 1990 to promote public awareness of environmental issues and encourage the public to actively contribute to a better environment. Over the past 28 years, the ECC has played an active role in the organisation and support of various environmental educational activities for the public, schools and business sectors. Its committee members are appointed by the Chief Executive of the Hong Kong Special Administrative Region (SAR) Government. Representatives from relevant government departments, including the Environmental Protection Department and the Education Bureau, also sit on the committee. Key ECC initiatives for local schools include the Hong Kong Awards for Environmental Excellence (HKAAEE 2018), the Student Environmental Protection Ambassador Scheme, the School Waste Reduction and Recycling Education and Awareness Campaign, and the Hong Kong Green School Award (HKGSA).

The implementation of environmental education in Hong Kong schools began in 1990s when the Education Department (former name of the Education Bureau) issued the first version of the “Guidelines on Environmental Education in Schools” (“The Guidelines”) in 1992 (Lee 1997) in response of increased concern on air pollution. A revised version was published in 1999 (CDC 1999; Advisory Council on the Environment 1999). Such publication provided not only the concepts for environmental education, but also frameworks and practical examples. The Guidelines suggested that environmental education should be implemented through both formal and informal curricula, and cross-curricular and environmentally friendly practices in schools. Since the Guidelines’ implementation, a wide range of formal curriculum subjects are offered in the interest of knowledge, skills and attitudes related to the environment (Lee 1997). “The Guidelines” also offered clear directions and criteria of how a “green” school should be. The Guidelines referred to a “Green School Award Scheme”, but this is not the HKGSA. However, because the Environmental Campaign Committee was highly involved in developing “the Guidelines” and the initiatives recommended in it, it was very likely that the Guidelines idea was adopted by ECC to design and launch the HKGSA in 2000 as there is a correlation between the rubrics in the HKGSA and the Guidelines.

These actions indicate that the SAR government is aware of and increasingly involved with environmental issues. For example, an Education Bureau report to the Council For Sustainable Development Education & Publicity Sub-Committee (2010) on Education for Sustainable Development in Hong Kong Schools, stated that “schools are encouraged to develop ESD plans focusing on three major aspects, namely ‘awareness’, ‘action’ and ‘attitudes’” and “Schools are encouraged to adopt a cross-curricular, whole-school and action-oriented approach in the promotion of ESD with focus on environmental citizenship and sustainable development.” (p. 2).

More recently, the 2016 Environment Report from the Education Bureau, states that

Our mission is to enhance students’ environmental awareness through education and enlist their participation in conserving the environment. To take this forward, we adopt a cross-curricular approach in the promotion of environmental education and promote school-based and action-oriented activities. To fulfill the goal of promoting environmental education, various initiatives have been undertaken. They include:

- issuing curriculum guides and other reference materials to promote environmental education in schools;
- producing multimedia packages and education television programmes on environmental education;
- organising school events on environmental education together with various government departments and green groups;
- incorporating appropriate environmental education elements in school syllabuses at all levels and updating curriculum guides and exemplars to assist schools in planning environmental education programmes; and
- supporting the “Greening for the Chest” Campaign organised by the Community Chest of Hong Kong. (p. 4)

Consistent with this mission, the *Basic Education Curriculum Guide for Primary 1–6* (EDB 2014), recognises that “sustainable development” is becoming a widely accepted concept and that there is an increase in awareness of environmental conservation in various sectors of society, both of which have brought impacts and challenges to the sustained development of school curriculum. Environment related issues are covered in the Moral and Civic Curriculum and in the chapter on effective teaching where a problem solving higher order thinking activity example is: “In view of the environmental problems, if you were the Chief Executive or a related official of the HKSAR Government, what would you do? (General Studies)” (Section 4.3.3).

Environmental education is also given as the exemplar of a whole school thematic models to integrate life-wide learning into students’ learning experiences:

Exemplar 4: Whole-school thematic model

A primary school adopts the whole-school thematic model to implement life-wide learning. With “Environmental Education” as the school theme, the school is developed into a green primary school through systematic and structural planning which covers the school environment management system, a sustainable education programme, school activities and project learning. The theme “Environmental Education” has become the focus for the development of life-wide learning in the school. (Section 6.5).

Addressing environmental problems is also seen as an exemplar for lifelong learning and developing citizenship skills:

Exemplar 2: Learning how to learn

The upper primary students in a primary school take part in a series of environmental protection and community service activities. Students not only nurture positive values, but also change their daily behaviours and attitudes as revealed from their self-assessment data. They are more willing to participate in voluntary services outside school and are interested in learning more about the relevant issues. Their understanding of the school and the community is also enhanced.

Apart from this, after participating in a clean-up activity in the community jointly organised with an environmental group, the students, teachers and members of the group conduct an in-depth discussion. They share their feelings, reflect on what they have learnt, and make suggestions on how to improve the activity. Finally, it is agreed that, as citizens, they should convey the opinions they have collected to the Food and Environmental Hygiene Department and make suggestions on how to improve the community. (Section 6.5.4).

More recently, the Education Bureau (2017) issued a circular reminding schools of the importance of formulating a school-based environmental policy and implementing measures for energy saving:

all schools are urged to formulate and put in place their school-based environmental policy which aims to enhance students' environmental awareness, develop their environmentally friendly attitude, and promote green practices and environmental education as a whole so as to prepare students for making well-informed, justifiable and practical decisions and taking actions in response to the impact of climate change. The environmental policy, which should be endorsed by the School Management Committee (SMC) / Incorporated Management Committee (IMC) of schools, is expected to be reported regularly at the SMC / IMC meetings for ongoing review and sustainable development. (para 2).

Other governmental bureaus have also arranged schemes and activities to support the environmental education or ESD activities in schools and activities. For example, the Leisure and Cultural Services Department under the Home Affairs Bureau provides a [Greening School Subsidy Scheme](#) for local schools and kindergartens to bolster their greening of the environment through campus greening projects and greening activities, with the aim of fostering a green culture among students and enhancing their interest in cultivating plants. In addition, schools with meritorious achievements are recognised with the Greening School Project Award (<https://www.lcsd.gov.hk/en/green/education/school.html>). In addition, the Environment Bureau launched the Sustainable Development School Award Programme with different themes in 2017. The Sustainable Development Division of the Environment Bureau has set up the Sustainable Development Fund which has supported some ESD related projects (<https://www.enb.gov.hk/en/susdev/sdf/index.htm> and <https://www.enb.gov.hk/en/susdev/sdf/approvprj.htm>). The annual progress of the education and publicity programmes is under the purview of the Education and Publicity Sub-committee of the Council for Sustainable Development, which is under the Environmental Bureau.

NGOs and the business sector are also becoming increasingly aware of the importance of the environment. Many large corporations, such as HSBC, have set environmental efficiency targets and funded environmental projects as part of corporate social responsibility. In 2013 the Hong Kong Green Building Council (HKGBC) had commissioned the Business Environment Council Limited (BEC) to develop the *Hong Kong Green School Guide*, targeting primary and secondary schools in Hong Kong in order to support schools in becoming greener. The HKBGC recognized that “schools are responsible for a significant portion of the community’s environmental impacts. In areas ranging from the resources used in the construction of the school building to the energy used to operate them, greener schools can alleviate the overall impacts on the environment. Green schools can also help

raise community awareness of environmental stewardship.” In 2001, the NGO Green Power established a Green School Network to strengthen their connection with schools, and serve as a platform for communication with school members in the belief that education is the ultimate means of transforming thinking and behavior. Currently, more than 60% of primary and secondary schools and kindergartens are members of the Green School Network. Each year, Green Power produces a wide range of interdisciplinary environmental education materials and workshops to introduce environmental protection knowledge to the next generation (Green Power 2019).

Tsang et al. (2010) evaluated Hong Kong schools’ experiences with the implementation of ECC associated programmes. The results suggested a broad similarity with those in other parts of the world: the implementation of EE/ESD is primarily based on voluntary enthusiasm and participation of individual schools and teachers (Tsang and Lee 2014). UNESCO Hong Kong has actively promoted ESD in Hong Kong and seven schools have been designated as ESD schools (Luo et al. 2015). These schools are required to fulfil quality standards pertaining to school management, teaching and learning, moral education activities, school campus environment and student all-roundedness. Luo et al. (2015) evaluation of these ESD experimental schools found better performances in behaviour education (under the quality criteria of moral education activities), school rationale and management system (both under the criteria of school management) while social cultural research (under the criteria of moral education activities), teacher development (under the criteria of school management) as well as student learning and innovation needed some improvement (under the criteria of student all-roundedness). Iwan et al. (2018) investigated the characteristics of award-winning green preschools in Bali, Berkeley, and Hong Kong and found their distinguishing features to be their holistic approaches, buildings and curriculum, and that these green characteristics appeared to be influenced by cultures, city regulations and the external institutions that established the green awards.

11.2 The Hong Kong Green School Award

The Hong Kong Green School Award (HKGSA), initiated by the ECC, Environment Protection Department and Education Bureau in 2000, is a well-known flagship school award scheme that encourages active contribution from and environmental education of school stakeholders, for a better environment. The Education University of Hong Kong, the Hong Kong Productivity Council and the Vocational Training Council are the co-organisers of the award. The objectives of the scheme are “to encourage schools to formulate a school environmental policy and environmental management plan for a Green School, and enhance environmental awareness, develop environmentally friendly attitudes and promote green practices among school managers, teachers, non-teaching staff, students and their parents” (ECC 2018).

The award is divided into preschool, primary school and secondary school categories and is open to all schools in Hong Kong, including preschools, public schools (known as government schools and aided schools), special schools (schools for children with special education needs), direct subsidised schools (DSS) and private schools (including international schools and the 22 schools affiliated with the English School Foundation). If the school is a through-train school, which consists of both primary (or equivalent for pupils in years 6–11) and secondary (or equivalent for pupils above year 11) sections, it may enrol in the primary school, secondary school or both categories.

From the first to the seventh HKGSAs, schools that met the assessment criteria were presented with Green School Awards and then they competed for the championship, first runner-up, second runner-up and merit awards. Starting with the eighth HKGSA, the scheme was restructured into a benchmarking system to forge a partnership between the HKGSA and the HKAEE.

In 2010, one year after the implementation of the New Senior Secondary Curriculum, the Hong Kong Institute of Education conducted an evaluation of ECC's environmental education programmes, including the HKGSA (Tsang et al. 2010). The study identified that the change to the eighth HKGSA was not widely or well understood among school teachers. Although the change was useful for reducing the barriers hindering schools' participation, further modifications needed to be applied to fully develop an environmental resource accreditation scheme specific to local schools' needs. The study recommended that modifications could also provide an opportunity to address the concerns of schools in relation to the HKGSA and to revive the popularity of the scheme and increase participation.

Based on the results of the study report, the benchmarking system for the primary and secondary categories was modified with the 12th HKGSA. The assessment criteria for the preschool category remained unchanged, while those of the primary school and secondary school categories were revised to align with the latest developments in environmental management and education in primary and secondary schools.

HKGSA participants must complete a self-assessment manual (SAM) comprising a core module and four supplementary sections within a three-year timeframe (ECC 2019). This allows them time and flexibility to accumulate achievements and consolidate the outcomes into essential documents for assessment. The core module is compulsory and helps schools summarise their background information, division of labour and year-round consumption of resources (electricity and water) and solid waste recycled and disposed volumes. The four supplementary sections (as listed in the nineteenth HKGSA SAM (ECC 2019)) are as follows:

(A) Environmental Policy and Campus Environment

- Establishment, enforcement and revision of school environmental policy
- Coverage of policies among stakeholders
- Hardware available or to be introduced shortly

(B) Environmental Management Measures

- Establishment of proactive management groups
- Measures encouraging environmental self-discipline
- Strategies to identify and collect quantitative/qualitative feedback and outcomes

(C) Environmental Education Plan and Implementation

- Long-term, short-term themes / goals
- Selection of appropriate educational activities
- Coherence of topics, cross-sectional or longitudinal
- Appropriate measures gauging students' learning outcomes

(D) Environmental Education Effectiveness, which comprises three subsections:

- (D1) Partner Synergy in Environmental Activities
- (D2) External Recognition of the School's Environmental Activities
- (D3) Environmental Education Evaluation.

Before the 12th HKGSA, schools had to claim their achievements by selecting the most suitable description from four statements for each aspect during the self-assessment phase. The main concepts of these aspects used in the eighth to eleventh HKGSAs were retained in the 12th HKGSA, but reorganised into their corresponding sections, and multiple selections were added for achievements in some aspects to allow alternatives or novel design of pro-environmental activities/measures.

Up until 2019, schools had to complete the Core Module and Section A to achieve any award in the scheme. For schools targeting the minimum accreditation (i.e., bronze award) as a Green School, sections B, C and D were optional — schools may complete one or all of them. If schools were striving for higher recognition, both sections B and C become mandatory. Section D was also crucial for schools targeting silver or gold awards — silver award winners must complete subsection D1 and gold award winners had to complete all sections. For the 18th HKGSA, completion of the Core module, Section A and several or all of the other supplementary sections of the SAM within this school year is compulsory to achieve any award in the scheme.

All accredited Green Schools are invited to compete in the Hong Kong Awards for Environmental Excellence – Schools (Primary/Secondary) where applications are restricted to Champions, first runners-up and second runners-up of the Primary School and Secondary School Categories under the past Hong Kong Green School Award Committee as well as all Green Schools.

The distribution of the awards is as follows:

- *Green School Bronze Award*
 - *Completed Core Module and Section A, plus Section B or C and meeting benchmark scores*

- *Green School Silver Award*
 - *Completed Core Module and Sections A, B, C and D1 and meeting benchmark scores*
- *Green School Gold Award*
 - *Completed Core Module and Sections A, B, C and D (all subsections) and meeting benchmark scores.*

Any award obtained (including the ‘Green School’ title) before the 12th HKGSA was capped with a three-year expiry when the 12th HKGSA was implemented. Schools that wanted to keep the title for a longer period had to apply and go through the assessment process again. Schools that have obtained bronze or higher accreditation were eligible to keep the accreditation for three years. These arrangements offer a mechanism for schools to phase out if they are less focused on environmental education. Although the three-year timeframe was allowed, schools were encouraged to upgrade their status by submitting supplementary SAM information (updated core module and completed additional sections) on an annual basis, to achieve gold accreditation. Prior to 2019, once their accreditation has expired, schools had to resubmit an updated SAM (and undergo another audit by the ECC) or lose their accreditation. Schools that achieved gold accreditation needed to resubmit a SAM every three years to maintain their accreditation. Audits were completed on a discretionary basis. Another affiliated award with a particular theme was launched with the HKGSA every year. The following affiliated awards, related to focal issues addressed by the Environmental Protection Department that year, were launched during the 12th to 18th HKGSAs.

- With the 12th HKGSA — Minor Works Project Award, to evaluate the environmental effectiveness of the hardware sponsored by the Minor Works Project, funded by the Environmental and Conservation Fund.
- With the 13th, 14th and 15th HKGSAs — Waste Less School Award, to encourage monitoring and reducing waste to be dumped in landfill. In the 14th and 15th HKGSAs, a handheld digital scale was provided free upon request.
- With the 16th HKGSA — Green Lunch School Award, to encourage pro-environmental dining habits and minimise use of single-use disposable tableware, cutlery and food packaging.
- With the 17th and 18th HKGSA — No Disposables Campus Award, to encourage primary and secondary schools to ditch the use of single-use disposable items and share good practices on waste reduction in school campuses.

Since the 12th HKGSA facilitators have been available, on request, to mentor schools that require guidance and advice for a period of one year. Facilitators are experts in environmental protection. Some are professionals in the sector, working in tertiary institutes, pro-environmental NGOs or related departments in corporations. Some are active educators from Green Schools with silver or gold awards.

Since its launch in 2000, the HKGSA has attracted the participation of nearly 900 schools. However, the 18th HKGSA will be the last. From the 2020/2021 school

year the HKGSA will be subsumed under the HKAEE with all pre-schools, primary and secondary schools eligible to compete under the schools section of the HKAEE.

11.3 Evaluation of the HKGSA

The HKGSA is evaluated immediately after the on-site inspection period every year. Both quantitative (questionnaire) and qualitative (open-ended questions in questionnaire and invited telephone interview) methodologies are used. Double-blinded questionnaire surveying has been used since the twelfth HKGSA. A questionnaire was drafted in two languages (English and Cantonese). It consisted of three major series of questions to collect feedback on the overall arrangement of the HKGSA, field assessment and the facilitator scheme, with most questions using a 4-point scale to gauge interviewees' level of agreement (or disagreement) with a given statement. Each option was then assigned a weighting value of 1, 2, 3 or 4, representing 'Strongly Disagree', 'Disagree', 'Agree' and 'Strongly Agree', respectively. The overall means were determined, with 2.5 the cut-off point between agreement and disagreement. At the end of the questionnaire there was an open question to collect qualitative feedback and a reply slip to collect appropriate details for a qualitative telephone interview. During the 12th and 15th HKGSA, a paper copy of questionnaire was mailed to all participating schools. Completed questionnaires were to be mailed back to the Environmental Campaign Committee for filing and then to EdUHK anonymously for statistical analysis. In response to some complaints that it was ironic for a pro-environmental project to consume lots of resources (papers and effects on postage), an online questionnaire on Google Form was adopted in the 16th HKGSA and only those schools who had submitted their self-assessment manual (SAM) for that year received the e-mail invitation to access the digital copy of questionnaire. Unfortunately, the response rate dropped considerably when the questionnaire went online.

Although the questionnaires in different years were not identical, a series of questions with the same exact wording was used in all questionnaires from the twelfth to sixteenth HKGSA. Two examples are as follows:

- Q1. 'I am satisfied with the overall arrangement of the HKGSA.'
 Q2. 'My school will join the HKGSA again in the future.'

These two questions were intended to reflect teachers' satisfaction with the HKGSA and their willingness to remain in the scheme. The response rates for the questionnaire surveys and the level of agreement (in terms of the mean value of the two questions) are listed in Table 11.1.

Although only an average of one third of questionnaires was returned, the respondents were positive about the overall arrangements of the HKGSA and would join

Table 11.1 Responses to the HKGSA survey

HKGSA (academic year)	No. of participating schools	Survey distribution	No. of copies sent	No. of responses	Return rate	Q1 Mean	Q2 Mean
12th (2013–14)	1144	Mail	137	51	37.23%	3.08	3.34
13th (2014–15)	1141	Mail	195	63	32.31%	3.05	2.98
14th (2015–16)	1139	Mail	230	58	25.22%	3.21	3.07
15th (2016–17)	1142	Mail	248	77	31.05%	3.09	3.08
16th (2017–18)	1149	Online platform	175	30	17.14%	3.23	3.30

the program again in the future. The qualitative responses are confidential to the ECC but in general, the respondents perceived the HKGSA as a source of motivation as well as a guideline for promoting sustainable development in schools.

The number of schools participating has been stable since the 12th HKGSA with the coverage at about 10% of the schools' population. A comparison of the annual feedback with the evaluation study (Tsang et al. 2010) indicates that the design of the new mechanisms had already been addressed to the concerns of teachers successfully. Almost all teachers were satisfied with the new mechanism without enforcing much pressure or workload, with many teachers pointing out in telephone interviews and written comments that the self-assessment manual was a useful tool/a good reference to evaluate a school's environmental performance so that they did not have to create their own, even if they were not going to enrol for any HKGSA accreditation. This seems to indicate that the reasons for low participation were not on any barrier due to the design of HKGSA, but the lack of teacher motivation and driving force. On the other hand, some schools which tended to be very pro-environment did not participate in the HKGSA.

11.4 Impact of HKGSA on Education for Sustainable Development in Hong Kong Schools

As discussed earlier, the Education Bureau is responsible for formulating and reviewing education for sustainable development policy and overseeing the effective implementation of education programmes (EDB 2016). According to the EDB Environmental Reports' archive available for the years 2011–2016, the HKGSA has been one of their major activities for schools to promote environmental awareness. As noted earlier, the HKGSA is closely related to the Education Bureau's guidelines

for schools and will continue to be an important component of how Hong Kong schools implement ESD, but schools do have many alternatives. There are now many other activities and programs available to schools that are supported by the Education Bureau (as described in the 2016 Environment Report). A total of 228 pre-schools, primary and secondary schools participated in the HKGSA, 366 primary and secondary schools participated in the Student Environmental Protection Ambassador Scheme (SEPAS), funding was provided for 400 school visits to the Mai Po Nature Reserve, 103 primary and secondary schools forming 138 teams joined the Inter-school Cross-curricular Project Competition on Climate Change, and 901 schools participated in the Outdoor Education Camp Scheme (OECS) which enhances students' awareness of environmental protection.

There has also been an impact on the universities. The Department of Science and Environmental Studies of the Hong Kong Institute of Education (now called The Education University of Hong Kong) was set up in 2009 and it has played an active role in research and in training environmental educators. In addition to offering a Master of Arts in Education for Sustainability programme, faculty staff engage in a range of relevant projects, including a plastic recycling and waste management project which found that primary students had enhanced their pro-environmental knowledge, attitudes and behaviours towards plastic recycling (Cheang et al. 2019; So et al. 2016).

11.5 Future Directions

The 2019/2020 school year is the last for the HKGSA before its merger with the HKAEE schools section, so the future is uncertain with the details yet to be announced (ECC 2019). Participation in the HKGSA seems to have plateaued, so it is perhaps not surprising that the Environmental Campaign Committee is adopting a new approach and combining two of its award schemes.

There remains the need to investigate the impact of the HKGSA and the various other schemes on stakeholder (schools, teachers, students and parents) engagement with education for sustainable development. To date the research on this has been sparse (a rare example is Iwan and Rao 2017). It would be an interesting topic to identify and validate the major driving forces for schools to join (or not to join) a pro-environmental activity. Hong Kong schools have a wide range of choices of education for sustainable development related programs and activities to join, of which the HKGSA has been an important component. Education Bureau documents indicate that education for sustainable development related activities are on their agenda, long may it be so.

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Chapter 12

Journey of Green Schools in India



Pramod Kumar Sharma and Preeti Rawat Kanaujia

Abstract Historically environmental concerns and practices resulting from environmental education (EE) were not a new idea or concept in India. The concept was rooted in its traditional wisdom, knowledge systems and practices. Due to its colonial past and pressing challenges of development, there was a major shift in the values towards environment and it influenced the school system. The education, awareness and value systems towards the environment, which were passed on to generations through practice and oral traditions, are losing their significance.

This chapter describes the evolution of EE in India which started post-Independence, where important steps were taken for reviving and promoting EE across the country. It then discusses how the constitution, policies, practices and various experimental initiatives supported EE movement in schools and through them reaching out to masses. One of the landmark decisions by the apex court of the country in 2003 made EE compulsory to be taught at all levels of education, giving required impetus. This chapter reflects on how EE in schools was introduced using formal, non-formal and informal approaches to reach out to the youth.

The chapter also reviews various models of Green Schools evolved by a range of stakeholders in India and contributing to environmental awareness activities becoming a movement where schools are adopting whole school – whole system approach to become sustainable schools. Learnings from various Green School initiatives envisaged and implemented by the government, NGOs, institutions and private companies through CSR in the country provides good insight on opportunities and challenges for the future course of action.

P. K. Sharma (✉)

Foundation for Environmental Education, Copenhagen, Denmark
e-mail: pramod@fee.global

P. R. Kanaujia

Centre for Environment Education (CEE) North, Lucknow, India
e-mail: preeti.rawat@ceeindia.org

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12.1 Introduction

Environmental Stewardship is part of the culture in India that is demonstrated as respect and reverence of nature. This makes people have a general inclination towards need-based consumption and an ingrained sense of responsibility which resists wasteful consumption and propagates respect for life. Many communities across India have been documented for their practices and extent of stewardship, to an extent dying for the conservation of nature. It is observed that traditional communities close to nature follow a frugal lifestyle which is not based on high consumption. One of the most known examples are the *Bishnoi*, residing in the Western Thar Desert of India, who follow the tenets of conserving the biodiversity of the area and ensuring a healthy eco- friendly social life for the community. For them, harming the environment means harming themselves (MoEFCC 2018a, b; NCERT 2006c).

The 2014 National Geographic/GlobeScan Consumer Greendex put Indians as the top-scoring environmentally sustainable consumers. The cultural consciousness of the connection with the natural environment is also reflected in the Greendex finding that Indians appear to be the most easily influenced to change when they are informed about their personal impact on the environment. The role of education is also strengthened by the finding that consumers who already display behaviour that is relatively sustainable and are told that their behaviour is above average from an environmental point of view are more motivated to improve their behaviour further than are consumers who display less sustainable habits (GlobeScan 2014).

Behaviours shaped by culture often expressed as part of religion are always at the risk of rapid erosion. Technology and consumerism are putting pressure on certain types of lifestyles and may erode the traditional wisdom in a matter of a generation. In 1992, the India report to the United Nations Conference on Environment and Development stressed that the “the real challenge of development was not how to get there but not to” (Gorana and Kanaujia 2016). This was apparent in an agricultural project reviewed by the Author to the text in the Thar desert of India, the generation that has grown seeing the canal water brought from North of India have completely ignored the traditional wisdom of water conservation while designing the canal water storage systems for irrigation. In another location, in the midst of the oldest mountain ranges of Aravali, where the project focused on sacred groves, the conservation was limited to the perceived boundary of the land that belonged to the deity associated with the sacred grove.

The environment is under a lot of stress in India, home to one-sixth of the world's people with disproportional available resources. The pressure also comes from the rapid economic development that has made it the third largest economy, an important aspect to fulfil the basic needs of a large population living in extreme poverty. India is a country full of diversity and contradictions. Indicators like per capita ecological footprint and carbon emissions, on one hand, are amongst the lowest in the world, the population makes it the third biggest generator of emissions (Pandey 2017; MoEFCC 2018a, b).

There have been various organized efforts by organizations in India towards nature conservation. The Bombay Natural History Society India, a pan-India wildlife research organization, has been promoting the cause of nature conservation since 1883. The earlier years of environmental education (EE) were not different than the rest of the world with a primary focus on nature education. The current organized movement of EE perhaps got a boost due to the then prime minister Ms. Indira Gandhi's keen interest in environment and ecology. Her commitment reflects from the fact that she was the only visiting head of state to attend the first United Nations Conference on the Human Environment in Stockholm in 1972 (WWF India 2006).

12.2 Evolution of Environmental Education in India

Environmental education has evolved from nature appreciation, conservation education, and outdoor education to education for sustainable development. The origin of the green school's idea in India can be traced back to traditional schooling in India which is known as 'gurukul system' where classes used to be held in nature and entire schooling was based on learning from nature. The environment movement in India is based on traditions that date back several centuries. The movement blends concern about development and environment, while reflecting a broad spectrum of perspectives. In its innovativeness, it reflects the vibrancy of India. Both government and non-governmental organizations (NGOs) have taken significant initiatives as active partners in this movement.

The Indian constitution captured much of these deep-rooted values and further strengthened them by giving responsibility to its citizens to protect the environment. The constitution enjoins the state to "take measures to protect and improve the environment and to safeguard the forests and wildlife of the country" (Article 48 -A). It also makes it a "fundamental duty of every citizen to protect and improve the natural environment including forest, lakes, rivers and wildlife and to have ecological compassing for the living creatures" (Article 51 A (g)).

Article 47 provides that the State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties. The improvement of public health also includes the protection and improvement of environment without which public health cannot be assured. Article 21 guarantees the fundamental right to life. Right to environment, free of danger of disease and infection is inherent in it. Right to healthy environment is important attribute of right to live with human dignity (Vardhan 2014; Sharma and Menon 2017; NCERT 2007).

The Basic Education movement, launched by Mahatma Gandhi in 1937, was perhaps the first serious attempt at relating education in schools to local environmental needs. The essential elements of Basic Education were (a) productive activity in education, (b) correlation of curriculum with the productive activity and the physical and social environment, and (c) intimate contact between the school and

the local community. After independence, the National Policy on Education was formulated in 1968, keeping this premise in background (NCERT 2006a; Sharma 2012, 2013; Sharma and Menon 2017; Sharma and Gregory 2015).

In 1986, India unveiled its new National Policy on Education. In this it stated: “There is a paramount need to create a consciousness of the environment. It must permeate all ages and all sections of society, beginning with the child. Environmental consciousness should inform teaching in schools and colleges. This aspect will be integrated in the entire educational process” (MHRD 1992).

The national system of education, as defined in the National Policy on Education 1986, visualized a national curriculum framework which contains a common core including several elements having direct bearing on the natural and social environment of the pupils, such as: Protection of the environment, content essential to nurture national identity, and inculcation of the scientific temper. These core areas are expected to occupy a place of prominence not only in the instructional material, but also in the classroom and out of school activities (MHRD 1992; NCERT 2007, 2014; Sharma 2013).

Following the National Policy on Education, NCERT released detailed curriculum guidelines and model syllabi for classes I to X reflecting these ideas. The approach strongly recommended adoption of innovative teaching and learning techniques. Subsequently curriculum frameworks brought out by the NCERT in 1975, 1988, 2000 and 2005 reiterated the importance of EE in school education (Sharma and Pandya 2015; NCERT 2006a, b, c, 2007, 2014; MHRD 2000).

The major thrust and vigour for Universalization of Environmental Education in India came from the intervention of the Supreme Court of India as a result of an application filed by Shri M C Mehta in 1991 as a public interest litigation. One of the pleas was to issue direction that the study of the environment becomes a compulsory subject in schools and colleges. The Supreme Court declared, “We accept on principle that through the medium of education, awareness of the environment and its problem related to pollution should be taught as a compulsory subject.” (NCERT 2006a, 2007; Sharma 2013) Following this declaration, in December 2003, the NCERT prepared a model syllabus for EE. On July 13, 2004, the Supreme Court directed “the syllabus prepared by the NCERT for Class I to XII shall be adopted by every state in their respective schools.” It further directed “NCERT be appointed as a nodal agency to supervise the implementation of this Court’s order.” (NCERT 2007; Sharma and Menon 2017) The agreement was finalized in its current form in 2010. Compliance with the Supreme Court order is mandatory and applies to all states and union territories. In fact, it is one of the few orders that apply to the entire formal education system in India (NCERT 2007; Sharma 2012).

Simultaneously, the National Curriculum Framework (NCF) adopted an infusion approach to introduce compulsory EE in schools into the curricula of all disciplines while ensuring that adequate time is earmarked for pertinent activities. This is in line with the recommendation made in the Tbilisi declaration: “EE is not to be added to educational programmes as a separate discipline, or programme of study but as a dimension to be integrated into them” (NCERT 2006a, b, c; Sharma 2012).

NCERT has recommended the following systems in the context of EE (NCERT 2007; Sharma 2012; Sharma and Menon 2017):

Classes I and II – EE concerns are transacted through activities.

Classes III to V – EE is being imparted through a subject namely EVS (Environmental Studies).

Classes VI to X – Follows infusion approach for EE.

Classes XI and XII – Projects infusion in electives and General Studies.

EE has been mainly the initiative of Ministry of Environment, Forest and Climate Change and the Ministry of Human Resource Development (MHRD) and its line departments at the State level. Other ministries have also contributed on issues due to the nature of the issues of environment, the role in formal education, but the major thrust has been from these two ministries.

The Ministry of Environment and Forests (now Ministry of Environment, Forest and Climate Change) was established in 1984. Earlier it was a department under the Ministry of Agriculture. During its inception, it was realized that the education has to play a central role in the strategy to achieve its mandate of “conservation of the country’s natural resources including its lakes and rivers, its biodiversity, forests and wildlife, ensuring the welfare of animals, and the prevention and abatement of pollution” (MoEFCC 2012). As part of the implementation of the educational thrust, the Centre for Environment Education (CEE) as a Centre of Excellence was established in 1984, followed by the establishment of the C.P.R. Environmental Education Centre (CPREEC). Creation of these institutions was recognition of the importance of EE in India’s overall environment and development strategy (MOEFCC Website).

The Ministry of Human Resource Development has been engaged with EE through the National Policy on Education. The National Council of Educational Research and Training (NCERT) set up in 1961 as an autonomous body to assist the Ministry of Human Resource Development and Department of Education, Government of India, is the country’s apex body in implementing policies and programmes related to school education. In 1988, it brought out the National Curriculum for Elementary and Secondary Education: A Framework. This document emphasized that “the school curriculum should highlight the measures for protection and care of the environment, prevention of pollution and conservation of energy” (NCERT 2007; Sharma 2012; MHRD 1992, 2000).

In consonance with these documents, environmental studies were made an independent subject at the primary level and topics related to the environment were suitably infused into different science and social science subjects at all school stages. Books under a ‘Reading to Learn’ series was brought out to highlight a number of environment-related subjects and concerns. Emphasis was also laid on teacher orientation-cum-training in the subject and a number of training modules were developed by the NCERT (NCERT 2015; Sharma 2017a, b).

After the Supreme Court judgement, NCERT was made the nodal agency for implementation of the directive. EE has been included in the form of ‘integration, infusion, separate subject and project-based learning’ at different age levels. ‘Learning about the environment; Learning through the environment and Learning for the environment’ is the underpinning strategy of EE in formal education. NCERT

as per its mandate has developed a variety of materials to support the directive that includes analysis of the environmental content, developing the textbooks of Environmental Studies (EVS) for primary level and supported the infusion of the model syllabus in the new textbooks as per the NCF 2005 (NCERT 2004, 2007, 2014; Sharma 2016a, b). Further to the curriculum development, NCERT recognized the need to promote Education for Sustainable Development (ESD) in schools, thus a resource book was developed 'Towards A Green School' for teachers to guide them in adopting 'whole school' approach where the students' experiences are not confined to the classroom but are part of the learning in the school and the community.

12.3 An Overview of Schooling in India

The Law of Universal and Compulsory Education under the Constitution of India was declared in 1960 with the two national policy statements on education, which came in 1968 and 1986 (and revised in 1992). This emphasized making education accessible to children of age 6–14. A 2002 amendment to the Constitution provided free and compulsory education of all children between 6 and 14 years as a Fundamental Right in such a manner as the State may, by law, determine. As a consequence, the Right to Free and Compulsory Education Act (RTE) was enacted by parliament on 2 August 2009 (MHRD 2018).

RTE provides for development of curriculum in consonance with the values enshrined in the Constitution, to ensure the all-round development of the child, building on the child's knowledge, potentiality and talent and making the child free of fear, trauma and anxiety through a system of child friendly and child centred learning (MHRD 2018).

In India, both State and the Union governments can frame legislation about Education. The school system in India recognizes 68 boards (NIOS 2018) for affiliation and certification for continued education, with international boards included as one category. In India, the Council of Boards of School Education in India (COBSE) is a voluntary association of all the Boards of School Education. It works in close collaboration with Ministry of Human Resource Development, Government of India, and national level apex educational organizations and agencies like the National Council of Educational Research and Training (NCERT), National University of Educational Planning and Administration (NUEPA) and National Council of Teacher Education (NCTE).

There are over 1.5 million schools recognized by education departments and local bodies, including private schools where students are charged fees (see Table 12.1).

The quality of education is still the bigger challenge in India. Studies have indicated the poor learning outcomes particularly in public schools. At national level, learning outcomes have been developed for each subject at the elementary level by NCERT (NUEPA 2014). According to the Annual Status of Education Report

Table 12.1 Number of schools by type

School type as per level	Numbers	Percentage of total
Primary	840,546	56
Upper primary	429,624	28
Secondary	139,539	9
Senior secondary	112,637	7
Total	1,522,346	100

Source: Educational Statistics at a Glance, MHRD (2016/2018)

(ASER) 2017, foundation skills are lacking in the age group of 14–18. About 25% cannot read basic text fluently in their own language, and more than half struggle with division (3 digit by 1 digit) problems (ASER 2018).

India is moving towards a national assessment on predetermined standards as part of the Sustainable Development Goals (SDGs). Student proficiency is low as only 54.69% of responses on Learning Outcomes in Language, Mathematics and Environmental Science (EVS) were attempted correctly by Class 5 students (Age 11) across the country. This percentage stood at 44.58% for Class 8 (Age 14) students when assessed on Learning Outcomes in Language, Mathematics, Science and Social Science (Niti Ayog 2018).

Teachers play critical role in the entire school system. At present 81.15% of school teachers in India are professionally qualified for their job. The national target for 2030 is to have all teachers to be professionally qualified. In India, 70.43% of elementary and secondary schools have achieved a Pupil Teacher Ratio of less than or equal to 30. The 2030 national target is to have 100% schools providing at least one teacher for 30 students (Niti Ayog 2018).

12.4 Green School Initiatives and Programmes

The efforts for integrating EE in India have been more towards greening the curriculum than a whole school approach. Despite of these efforts at policy and curriculum level, there is urgent need to work with schools to promote EE through other models. To address this, several initiatives have been introduced throughout the country by government and non-government organizations using formal and non-formal approach (Sharma and Pandya 2015). These include several variations of Green School programmes.

According to NCERT, a Green School is one which is guided by the principles of environmental sustainability. It emphasizes that the school environment, should encourage, support and nurture students' growing capacities as learners through its green environment, curriculum, and teaching and learning process (Sharma 2016a, b). After the Supreme Court directive, NCERT developed a national curriculum

framework where EE has been referred as 'Habitat and Learning' to encompass education for sustainability. A position paper was developed by national focus group on Habitat and Learning which laid emphasis on exposing "children to the real world to enable them to analyze, evaluate and draw inferences about problems and concerns related to the environment and take suitable action to facilitate and participate in the pursuit of sustainable development" (Sarabhai 2004; NCERT 2006b).

The national curriculum framework advocated to adopt whole school approach in schools which envisions child friendly schools, responsive towards the needs of all children by ensuring safe, secure, clean and hygienic environment for all children with optimum resource utilization through environmentally sustainable practices. In order to guide schools, NCERT has developed a Resource Book on ESD for Elementary Schools titled "Towards a Green School". The Resource Book is divided in four sections, first section brings insight of ESD, 'Greening' and 'whole school' approach as per national and international outlook. The second section focusses on ESD in the context of curriculum, whereas the third section gives different strategies to transact a Green Curriculum. It includes various case studies with examples of schools that have done a lot in demonstrating practices for ESD. The book has been shared with State education departments and various boards to promote its practice. However, the application of the green school framework has not been evaluated (Sharma 2016a, b; Sharma and Pandya 2015).

One of the largest initiatives taken to support the implementation of the Supreme Court Directive is the Paryavaran Mitra (Friends of Environment) programme that involved about 218,000 schools across the country. This was a partnership between Ministry of Environment, Forest and Climate Change, Government of India and ArcelorMittal India Ltd. and implemented by CEE. The programme aimed to build students' capacity to demonstrate environmental citizenship qualities through positive change in behaviour and action by working in five thematic areas: Water and Sanitation, Energy, Biodiversity and Greening, Waste Management, and Culture and Heritage. Many young leaders emerged who were involved in the Paryavaran Mitra programme (Pandya and Gorana 2011; Sharma et al. 2013; Sharma and Gregory 2016).

This programme has been successful in demonstrating the project-based learning pedagogy in action across the country. The programme, since its launch in 2010, piloted the opportunities created by influx of smart phones to reach the large number of teachers and schools through a website, social media (WhatsApp and Facebook), YouTube videos and a telephone helpline. As a strategy it also became a platform or vehicle to support and partners for project-based learning initiatives on the five themes. These partnerships helped in producing thematic material on the various themes keeping the project-based learning at its core with the 5 step pedagogy of Explore, Discover, Think, Act and Share (Sharma and Gregory 2016).

The Centre for Science and Environment (CSE) is a public interest research and advocacy organization based in New Delhi. CSE conducts research, lobbies and communicates the urgency of development that is both sustainable and equitable. CSE initiated a Green Schools programme in 2006. It looks at guiding a school to

have a resource-efficient building: one that uses little water, optimizes energy efficiency, minimizes waste-generation, catches and recycles water and provides healthier space for its occupants as compared to a conventional building. The programme helps schools to move beyond theories and textbooks and concentrate solely on 'doing'. It is an EE programme to sensitise students to the environment through hands-on and thought-provoking activities. It is also an environment management system that audits, through students, the consumption of natural resources within school campuses and helps schools become good environmental managers by deploying pragmatic solutions to reduce wastage of precious resources. Over 15,000 schools participate in the programme annually throughout India. Each year, schools are given themes for their activities. Based on work done by schools, an activity report is submitted at the yearend stating results and outcome of the actions. Green Schools Awards are given every year to the 10–12 best performing schools (Website <http://www.greenschoolsprogramme.org>).

C.P.R. Environmental Education Centre (CPREEC), a Chennai based NGO, is also recognized as a Centre of Excellence by MOEFCC. It has developed an Education for Sustainable Development programme called the 'Green School Initiative' (GSI). GSI encourages students to become environmentally pro-active – engaging students through action, improve environmental standards of schools, reduce the use and wastage of resources, knowledge enrichment through practical experience and development of personal and social responsibilities for the school and its environment. The programme is being implemented in selected schools in the cities of Chennai, Ooty, Puducherry, Hyderabad, Bangalore and Mysore. The programme is implemented using a club approach. CPREEC has also been conducting a series of awareness programmes on Humane Education and Go-Veg among school students in order to sensitize the younger generation about the realities of modern meat production, dairy farming and its impacts on the environment and kindness to animals (Website www.cpreec.org).

The Foundation for Environmental Education's Eco-Schools programme was introduced into India in 2013–14 and it currently involves 72 schools across 10 cities. Eco-Schools India is run by the Centre for Environment Education.

The Confederation of Indian Industry (CII) is a non-government, not-for-profit, industry-led and industry-managed organization, playing a proactive role in India's development process. The Indian Green Building Council (IGBC) was formed in 2001 when the IGBC Green Schools rating system was introduced as a voluntary and consensus-based programme. The School rating system addresses eco-education, health & hygiene besides the infrastructural facilities, energy efficiency, water conservation and waste management. Aspects like nutrition, physical activity & safety are also addressed. Different levels of green building certification are awarded based on the total credits earned. This is a fee-based programme offered to schools.

Another example of a Green Schools initiative is from industry and research institution association in India. Tata Steel, an industry group, has partnered with The Energy Resource Institute (TERI) to launch 'The Green School' project with an aim to create awareness and sensitize students, teachers and the community on issues

related to the environment. This project is being offered to schools where Tata Steel is operating in the country.

12.5 Other EE Support for Schools

12.5.1 Efforts by Environment Ministry

One of the major schemes since Ministry's inception has been the Environment Education, Awareness and Training (EEAT). This scheme aims to promote environmental awareness amongst school and college level students aim to create awareness on various aspects of environment, climate change and connect to nature, and is being implemented across the county. The scheme has pioneered various programmes that have helped raise awareness and action on environmental issues. The Ministry lists development of educational/teaching materials and aids in the formal education sector, encourage non-governmental organisations, mass media and other concerned organisations for promoting awareness among the people at all levels, promote environment education through existing educational/scientific/research institutions, ensure training and manpower development in environment education; and mobilise people's awareness for the preservation and conservation of environment as its objectives for EE (MoEFCC 2019).

12.5.2 Extra/Co-curricular Programmes

Wildlife and eco-clubs have a long history in India: an eco-club programme has been one of the flagship initiatives of the Ministry of Environment and Forests since 1993–94. More than 10,000 eco-clubs across the country were part of this programme until 2000–2001. However, the total number of schools involved was grossly inadequate compared to the total number of schools in India. In view of the potential of this programme in sensitizing the school students, it was decided to intensify this programme to cover each and every district of the country. Thus in 2001, the eco-club programme was launched as National Green Corps (NGC) programme with an aim to reach to all the districts of the country. This has been the flagship programme of the Ministry and over 120,000 Eco Clubs have been set up around the country. The programme has been the major network for taking active action-based education and often the schools use their eco-club as a synonym for EE. NGC has emerged as a key programme which contributes significantly to fulfilling national and international mandates in the areas of conservation education and local actions towards conserving biodiversity as part of the Convention of Biological Diversity, Climate Change Education and Actions under UNFCCC (MoEFCC 2012, 2014; Roberts 2009).

The other major ongoing programme is the National Nature Camping Programme (NNCP). NNCP was launched in 2013 with the vision to provide each child an opportunity to join at least one nature camp during his/her schooling. Each year 20 nature camps of 3 days duration are conducted, involving over 1000 students (MoEFCC 2019).

The National Environmental Awareness Campaign (NEAC) was launched in 1986–87 as a flagship programme of the MoEF. The objective of the programme was to enhance awareness among a wide spectrum of the population on various environmental issues and to encourage them to participate in the protection of the environment. Every year the Campaign focused on a theme related to environment and development. Under the scheme, a large number of NGOs, schools, colleges, scientific and educational institutions, use an array of awareness activities like rallies, door to door campaigns and demonstrations etc. focusing on environmental issues and problems relating to the main/regional/local themes. After almost 32 years of rigorous campaigns run under the programme, NEAC was discontinued in 2017. It had established network of over 14,000 agencies, mainly NGOs, the programme had reached out to various sections of society across the country through more than 2,00,000 projects. MoEF has funded nearly 10,000 programmes every year across 28 States and 7 Union Territories in the country (CEE 2011, pp. 5–6; MoEFCC 2019; Sonowal 2009).

The Global Learning and Observations to Benefit the Environment (GLOBE), is another initiative of the Ministry to engage schools in a hands-on international environmental science and educational programme. GLOBE links students, teachers, and the scientific research community in an effort to learn more about the environment through data collection and observations. Thus, GLOBE is a hands-on, minds-on effort in which students are guided to become the environmental expert. Around 1000 schools are involved across country under the programme (www.globeindia.org).

12.5.3 Curricular Programmes

The Environment Education in School Systems and Greening of Textbooks was a major programme initiated by the Ministry with the support of the World Bank. In 1998, the Ministry developed a discussion paper *Revitalization of EE in schools (REES)*, which was presented at a meeting of State Education Ministers. As a result, a national project titled Environmental Education in the School System (EESS) was conceived. In first phase of the project, a massive study was undertaken by the Bharati Vidyapeeth Institute for Environmental Education and Research (BVIEER) on the ‘Status of infusion of environmental concepts in school curricula and the effectiveness of its delivery’ (BVIEER 2002). The study was undertaken in all the States and Union Territories and revealed major gaps in the infusion of environmental concepts in the textbooks. Some of the major problems pointed out were a lack of coordination, continuity, concept levels, and inappropriate pictures (BVIEER 2002).

This analysis paved the way for the ‘greening’ of textbooks at the national level. In the second phase, over 10 State Education Departments joined this project for pilot testing. With the support of the Centre for Environment Education (CEE), various environmental concepts were infused into science, social science and language textbooks of classes VI, VII, VIII during 2003–2004. These textbooks were field tested in 100 schools in each state. However, this initiative had to face several constraints: many State Education Departments were not convinced; MHRD, the body responsible for mainstreaming EE, did not show much enthusiasm and hence there was no active participation; and the process itself was very slow. The project, as Strengthening Environmental Education in School Systems (StrEESS), was taken to eight more states after the Supreme Court directive to provide assistance in its implementation (Pandya 2016; MoEFCC 2005; CEE 1998).

12.5.4 Efforts by Ministry of Education

One of the major schemes initiated by Ministry of Human Resource Development (MHRD) was named Environmental Orientation to School Education (EOSE). The scheme launched in 1986 focussed on harmonizing EE with local environmental situations. This helped to complement the content in the textbooks as the context of the immediate environment was brought in. The scheme was based on the following perceptions:

- A compact area having uniform eco-system would have similar environmental concerns and therefore, can form the unit for designing one set of programmes for implementation in schools and the community in that area.
- The basic components for identification of a specific area are geological formation and features, crops grown, rainfall and plant life.
- The success of the programme would largely depend on the involvement of and interest created among the teachers, students, educationists, voluntary agencies, environmental experts and the local communities

From 1991, the EOSE scheme has taken the form of the “Cluster Approach” where an NGO and 20–25 schools in geographically contiguous area form a “Cluster”. Each cluster is an autonomous unit. The cluster approach is based on the principle of networking and horizontal communication with training, material and monetary resources provided. The local NGO with the support from Department of Education and Centre for Environment Education facilitated EE activities in the cluster. Each school was provided with a set of educational materials, teacher training and technical support to perform EE activities more efficiently (Sonowal 2009).

Jawaharlal Nehru National Science, Mathematics and Environment Exhibition for Children is one of the major initiatives of NCERT that supported the implementation of EE. Starting as a Science, Mathematics education initiative, it included the theme of Environment as part of its implementation. The environmental perspective was included by suggesting explorations based in science of problems in the

physical and social environment, self-reliance and socio-economic and socio-ecological development, producing good quality and environmental friendly materials for the use of society, becoming sensitive and responsible citizens, critical thinking about global issues, maintaining healthy and sustainable societies, meeting challenges of climate change, opening new avenues in the area of agriculture, fertiliser, food processing, biotechnology, green energy, disaster management, information and communication technology, astronomy, transport, games and sports etc. and to create awareness about environmental issues and concerns and inspiring children to devise innovative ideas towards their mitigation (NCERT 2018b).

The National Council for Teacher Education (NCTE), established in 1995, is an apex body which gives suggestions on the course contents for the development of courses of teacher education in India. NCTE has developed EE curriculum framework for teachers and teacher educators. Based on this framework, the Centre for Environment Education (CEE) has developed a set of three resource books to help teacher educators from various streams of discipline to adequately address and effectively communicate the challenges of environmental conservation and sustainable future (CEE & NCTE 2007).

12.6 Non-government Organizations Efforts

Non-Governmental Organizations have played a major role in supporting the EE movement in India. The support came from Government first by establishing the Centre of Excellence for Environmental Education under which the Centre for Environment Education (CEE) was setup in 1984 with the national mandate for supporting the role of Education in protection of the Environment. In 1987, CPR Environmental Education Centre (CPREEC) was set up with its focus on Southern India (Eames and Barker 2011).

12.6.1 Centre for Environment Education (CEE)

CEE works nationwide with EE in schools, focusing on the development of locale-specific programmes and materials along with prototype material that can be translated and adapted for EE. CEE has been working closely with both the ministries (MoEFCC and MHRD) to support initiatives in the educational systems in India. CEE has been successful in developing EE resource materials acceptable to almost the entire country along with several locale-specific print materials and training modules suitably developed to local and regional level use for EE.

CEE took up the leadership in supporting NCERT for implementation of the 2003 Supreme Court directive on compulsory EE. The support included training of textbook writers, training of master trainers and development of prototype materials on various issues, with active learning as the major pedagogical approach. CEE has

Table 12.2 CEE programmes to support sustainability education in schools

Level	Name of the programme	Year of introduction	Key focus
Pre primary (age 3–6)	Planet Pre School http://planetschool.in	2017/18	Put a model of Nature based Pre Schools in India in line with SDG target 4.2 and 4.7
Primary (age 6–11)	Eco-Schools India http://www.ecoschools.in	2013/14	A programme offered in partnership with Foundation for Environmental Education. The programme strengthens the activity-based learning through the seven step pedagogy.
Upper primary (age 11–14)	Paryavaran Mitra (Friends of Environment) www.paryavaranmitra.in	2010/11	The programme uses project-based learning pedagogy. It uses five step pedagogy of Explore, Discover, Think, Act and Share. The Programme built of the concept of Positive Action uses Hand Print to engage children in action-based learning.
Secondary and senior secondary (age 14–18)	Young Masters Programme and The Goals www.goymmp.org www.thegoals.org	2012 and 2016	The programme offered in partnership with International Foundation for the Young Masters Programme/Internationella Stiftelsen Young Masters Programme (ISYMP), a non-governmental organisation in Sweden internationally recognized as a leader in innovative and transformative ICT-based education for sustainable development.

also provided support to NCTE in the implementation of judgement in the field of pre-service teacher education by developing the three resource books for the use by Teacher Educators at Diploma in Education, Bachelor of Education and Master of Education.

After the Supreme Court directive, CEE focussed more on programmes that improves the transaction of EE in the classroom, and aligned with the Decade of Education for Sustainable Development (DESD). CEE organised its programmes for all age groups as given in Table 12.2.

To address the rapidly growing need for continuing education and professional development in the field of EE, thus building capacity of teachers and educators, CEE and Commonwealth of Learning (COL) Vancouver, Canada developed a distance education course ‘Green Teacher’ diploma for in service teachers and educators. Offered through distance education, this programme was the first of its kind in India. The diploma offers teachers an opportunity to empower themselves with the requisite knowledge and skills for effective transaction of concepts in environment and development in the classroom. This programme has been designed for teachers of all subjects. (www.greenteacher.org).

12.6.2 Other Organizations' Activities

The Children's Forest Programme (CFP) was initiated in 1991 by the Organization for Industrial Spiritual and Cultural Advancement (OISCA) from Japan, and it is presently being implemented in more than 30 developing countries around the world. In India, the CFP programme is reaching to 2550 schools of State of NCT of Delhi and in the States of Haryana and Kerala, Karnataka, Tamil Nadu, Manipur and Uttar Pradesh. The important feature of CFP is to develop children's sense of voluntary tree planting and understanding of the important role forests plays in global ecological balance. Similar to the international Eco-Schools programme, the CFP initiative follows a seven step process to engage students, teachers and communities.

WWF India has been conducting various EE programmes and projects in India since 1969. Eco trails and nature camping for school children are the most popular programmes. A handbook titled *Methodologies for the future: A guide to develop education for sustainable development on whole school approach* (Sellgren 2012) was developed. The handbook guides and helps school to evaluate themselves for becoming a model ESD school (<https://www.wfindia.org>).

The Energy and Resources Institute (TERI), a national institution, has been conducting a GREEN Olympiad in schools since 1999. It is an annual written examination on the environment conducted as part of their Environment Education & Awareness activities. This Olympiad attracts participation by more than 2000 schools, and over two million students across India and abroad take part in the exam.

Many corporations through their foundations or as part of corporate social responsibility (CSR) have initiated sustainability education programme in schools. These initiatives received a major push after CSR was made compulsory for companies meeting certain stipulation of turnover and profit, and environmental sustainability and education being the two major thrust (CII 2013). For example Wipro has a programme, called Earthian, which is designed as environmental sustainability education programme around the themes of water and biodiversity for schools and colleges. The prescriptive process for schools has the elements of collaborative learning and stimulate sustainability thinking and action. The programme runs on an annual cycle where school students form groups and participate in a project over a 4-month period. The programme is implemented nationally with over 10 partners that includes government education and environment departments and NGOs (Shasha and Sreedharan 2015).

Tata Power started "Tata Power Club Enerji" (TPCE), to propagate efficient usage of energy and to educate society on climate change issues in 2007. TPCE started with a pilot programme of educating and sensitizing 12 schools in Mumbai in 2007 and reached 6000 students in 12 schools across Mumbai. In 2009, TPCE become a national programme that covered more than 250 schools across nine cities on the subject of energy conservation. The programme has evolved and now aims to contribute towards disaster management preparedness, nation building by creating responsible citizens who will focus not only on conserving energy and natural resources (like fossil fuel-coal, oil, gas, water, managing waste, afforestation) but

also imbibe civic and moral values (www.clubenerji.com). The programme has four phases defining the intensity of engagement students. *Educate* that concentrates on awareness generation, *Enhance* that focus is on advanced training sessions for the students and mentors, *Engage* that imparts skills to propagate the message of energy and resource conservation, and becoming responsible citizens, to their immediate sphere of influence and *Empower* through participation in the National Energy Savvy School (NESS) competition. Under NESS, principals, students and faculty members are empowered to initiate and execute energy saving activities that would make their school an Energy Savvy School (www.clubenerji.com).

12.7 Assessment of the Impact of Green Schools Initiatives

The curriculum and teaching in various initiatives being implemented for green schools in India are following approaches related to an integrated curriculum, project-based learning and promotion of environmental protection activities. These are in line with the goals of EE and education for sustainable development but with different emphasis. The green school initiatives in India have adopted various strategies which involved infusion/integration of EE/ESD in curriculum, non-formal and informal initiatives which has exerted great influence on green school development.

Teaching about the local environment and the students' surroundings is the highlight of CEE's Paryavaran Mitra programme which lays emphasis on knowing about learner's immediate environment. Learnings are focused on environmental values education and the cultivation of environmentally friendly behaviour. Teachers feedback and documentation received every year in the form of reports show how five step process has helped in bringing sustainability thinking in education. Similar reflection is visible in reports of students who act as young environment leaders by taking up action projects in their own local environment. Behaviour change in terms of reducing footprint and increasing handprint at individual, team and institutional level is the focus of the programme (Pandya and Gorana 2011; Sharma and Gregory 2016).

In CSE's Green School initiative, the teachers and students are encouraged to conduct regular campus-wide environmental surveys and environmental audits, to co-develop policies for improving the school environment and establish environmental action groups with the commitment and support of principals and school leaders. The focus of the programme is on making resource efficient school that optimizes energy efficiency, minimizes waste generation, harvests rainwater, recycles materials, uses solar power and so on. Every year schools submit their documentary evidences which shows how environment friendly practices have been adopted at the school campus level.

Under the eco club programme, MoEFCC has developed a self-monitoring and assessment tool called "Journey from Grey to Green". The focus was on guiding and helping teachers in assisting the eco-club students to assess outcome of activities taken up by the eco clubs at three levels; individual students, the school and in

the neighbourhood. The assessment was designed as a reflective exercise where teacher facilitated eco club students to see how far they have gone on the journey from “grey to green”. The assessment was not so much about comparison across students, eco clubs or schools, but a tool to gauge progress on their own journey. It acknowledged the requirement of development of the skills of facilitation amongst the teacher in charge to help the children to build leadership on development, that is environmentally sustainable and socially just. No performance criteria were suggested but indicators were listed to give an idea of areas of performance to look at the three levels. The schools were given activities to do the process at all the three levels. The students and teachers were encouraged to discuss their status or performance based in their criteria evolved through discussions. The performance was to be mapped every 6 months as Grey indicating Low, Brown as a Colour for medium performance levels and Green indicating high levels of achievement. The focus was on achieving visible environmental outputs and outcomes (MoEFCC 2014).

A study was conducted by NCERT in 2015–16 to identify examples of green schools’ efforts in the country. The study aimed to compile case studies from parts of the country and select a few of them as success stories, to further study them to understand the green processes and whole school approach adopted by the schools. The study, in 8 States involved over 83 schools where various methods were adopted to compile the case examples. The key findings of study revealed that only plantation and celebration of events related to environment such as Earth Day, Wildlife Week etc. were done by most of the schools. Some schools have displayed innovative work which seem to be scattered lacking an overall vision. For example, one school created water-harvesting system, the other harnessed solar energy and still another worked on conservation of water. A lack of understanding of environmental sustainability by different stakeholders at both the planning and implementation level appears to be the key reason for its ineffective implementation of ESD in schools (Sharma 2016a, b).

The study suggests that for creating green schools, there is need to adopt multi-faceted approach at different levels from policy makers and curriculum developers to the teachers working at the grass root level. This approach needs to focus upon

development and implementation of green curriculum where ESD is at its core to help children connect with their context and enable them nurture a strong bond with it and thus ensuring their holistic development. Limiting it to a subject centric approach where the activities conducted are routine based and do not relate with the real life of children will restrict it to be an isolated and neglected activity. (Sharma 2016a, p. 71)

The study identified that teacher’s preparation at pre-service and in-service level is very crucial to integrate ESD in the curriculum. It also suggested development of educational resources and supplementary material for teachers to enable them to adopt teaching-learning process by integrating ESD in the classroom. Also, availability of self-learning material will help bring behavioural change and sense of responsibility towards environment and sustainability. More research studies need to be conducted to study successful examples which can be further replicated and also highlight the gaps which could be addressed.

Table 12.3 State wise performance of students

	NAS class V	NAS class VIII	
	EVS	Science	Social Science
Andaman and Nicobar Islands	54	36	36
Andhra Pradesh	64	48	49
Arunachal Pradesh	43	34	36
Assam	64	50	51
Bihar	58	44	47
Chandigarh	68	52	53
Chhattisgarh	53	44	45
Dadra and Nagar Haveli	63	50	53
Daman and Diu	47	34	35
Delhi	49	34	36
Goa	48	38	37
Gujarat	58	52	54
Haryana	52	42	42
Himachal Pradesh	56	43	43
Jammu and Kashmir	55	38	34
Jharkhand	64	53	54
Karnataka	68	53	51
Kerala	65	44	44
Lakshadweep	45	32	30
Madhya Pradesh	56	43	44
Maharashtra	56	40	42
Manipur	61	43	42
Meghalaya	47	36	38
Mizoram	52	33	33
Nagaland	51	35	37
Odisha	56	44	41
Puducherry	52	31	29
Punjab	51	37	35
Rajasthan	70	62	63
Sikkim	45	38	38
Tamil Nadu	52	36	33
Telangana	54	38	40
Tripura	57	41	38
Uttar Pradesh	53	42	42
Uttarakhand	62	47	48
West Bengal	54	41	38
Simple Average	55.64	41.89	41.97

Source: Collated from NCERT State Level Dashboard – NCERT 2018a

Looking at how curricular changes have made an impact, the National Achievement Survey (NAS) is referred which is conducted throughout the country. The survey was done in 2017, for Classes III, V and VIII in government and government-aided schools. The competency-based test questions developed reflected the Learning Outcomes developed by the NCERT which were recently incorporated in the RTE Act by the Government of India. The learning levels of 2.2 million students from 110,000 schools across 701 districts in all 36 States/UTs were assessed. The survey can be used as a proxy indicator of cognitive skills of the environment as a subject (NCERT 2018a).

Table 12.3 gives the findings of the survey for class V (Environmental Studies as an integrated subject and class VIII (Environmental content infused in Science and social science. The size of the states differ and a weighted scale would have given a more accurate picture, but simple mean gives an indication that achievement of desired competencies is around 50% at class V level and it is at around 41% at class VIII level. This paints a sorry picture of the state of affairs and EE cannot escape the effect of the general quality of education. As an infused subject, the quality of EE is connected to the quality of science and social science education. It has been the experience of the authors that the schools from Southern States (Andhra Pradesh, Kerala and Karnataka) do better in national EE programmes.

A large study in Gujarat to create a baseline found that the level of environmental literacy as the total score was moderate. Disposition and behaviour component levels were high. Competency and knowledge component levels were low. Educational boards seemed to have an effect on the environmental literacy outcomes but the difference in the mean was not significant for the total of environmental literacy scores. The effect of the board was significant, for competency and knowledge. The mean difference in boards was not significant for disposition and behaviour (Sharma 2016b).

The experiences of the authors at various levels indicates that there is widespread interest and awareness of EE. The content has increased but the pedagogy that leads to action or change in behaviours is missing (Gregory and Sharma 2015).

Widespread initiatives by various actors have definitely created a movement, but the lack of systematic large-scale studies makes it difficult to generalize impacts. There is a dearth of research on the impact of the Green School movement in India, particularly evaluating the impact of compulsory EE. Even the NCERT, who has implemented the compulsory EE directive, has not done any review or study to see the impact (Sharma 2016b).

12.8 Gaps and Challenges in Environmental Education

One of the major gaps that EE programmes have is the way they are implemented. EE has been made compulsory in India but the inertia of the co-curricular club approach and capacity of the teachers to implement an activity based or project-based learning pedagogy has made it more of an additional fact, the instrumental

Environment Education Awareness and Training

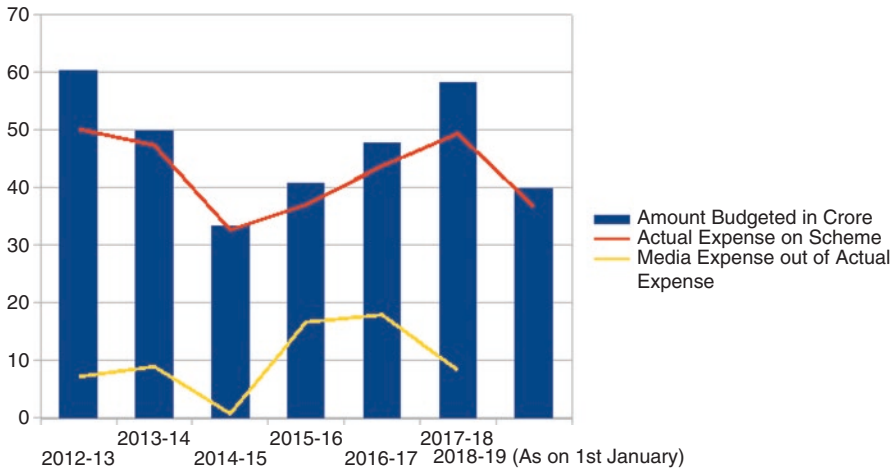


Fig. 12.1 Budget allocation to Environmental Education Awareness and Training. (Source: Reply under Right to Information by MoEFCC (Registration No. MOENF/R/2018/51369))

role being stronger than the emancipatory. Event thinking and doing good on certain days still dominates the way EE happens in schools.

The budget allocation for Environmental Education Awareness and Training, the flagship government programmes, has stagnated or decreased over last 8 years (Fig. 12.1). This has spread the resources thinly over a large school network. To cut costs the services of NGOs that were engaged for capacity building and training has been stopped.

The other challenge is the nature of the subject itself. India being such a diverse country in terms of its culture, natural resources and socio-economic development, it becomes a challenge to bring in local contexts within a formal education system. The disconnect between what the children learn and practice in school and life outside is a gap that needs attention. The curriculum is driven by textbooks and due to lack of capacity, time and space in an over loaded education system, the pedagogy of project-based learning to explore the local issues often becomes a challenge (Sharma 2017a, b; Siddiqui and Khan 2015).

The textbooks have been revised, adopting a constructivist approach, as recommended by NCF 2005 and the implementation strategy of the Supreme Court directive. However, the suggested activities in the textbooks are sometimes taught as material to be memorized, rather than as an opportunity for students to build critical thinking and problem-solving skills. Motivation and capacity building of teachers is a key element in the success of the EE infusion initiative, as pedagogy, particularly in project-based learning, is important in influencing responsible environmental behaviour (Gregory and Sharma 2015; Dhull and Verma 2017).

Implementing changes is a challenge for a large country like India. The most important aspect of change in terms of building capacity of teachers is using the textbooks with the infused content of EE to take up the perspectives adequately along with the science and social subject that they have been teaching for years. The infusion approach requires adaptability and patience to accommodate localized needs and limitations.

The efforts towards achieving SDGs have triggered new initiatives in different States/UTs pertaining to sub-State implementation and monitoring structures, establishing new modalities, capacity building initiatives and resource materials, etc. There is a need to facilitate continuous learning, knowledge development and sharing for continuous improvement in the implementation process. Greater focus is needed on documentation, validation, sharing and replication of best practices. The planners have their focus on primary issues and the Goal on Quality Education Index has only looked at target 4.1 and 4c. SDG target 4.7, that measures provisions or inputs that goes for Education for Sustainable Development, is missing (Niti Ayog 2018).

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- <https://oisca-cfp.jimdo.com/>
- <http://www.cpreec.org/>
- <http://www.greenschoolsprogramme.org/>
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Chapter 13

Green Schools in Israel: Multiple Rationales and Multiple Action Plans



Tali Tal

Abstract Green schools in Israel are recognized as such by the Ministry of Environmental Protection (MEP) according to a list of criteria related to the management of the school – e.g., reducing material consumption, recycling, energy efficiency, and to its environmental education (EE) curriculum. However, these requirements do not necessarily mean that a school will be viewed as a “Green School” by a random visitor. Some of the schools run an extensive school-based EE curriculum, and act accordingly. Others are satisfied with the Green Certificate, and since further or continuous evaluation is rare, those schools continue to the “next agenda item” and the “Green” remains mainly on the surface. In this chapter, I will discuss this duality, the ways NGOs and the MEP contribute to both deep and shallow approaches, and I will present one case study of an exemplary green school.

13.1 Introduction

Environmental Education (EE) in Israeli schools has been mainly voluntary. Although the Ministry of Education (MoE) strongly recommends that EE be taught in elementary and middle schools for 30 hours per year, and although professionals in EE see much development in the field, EE is still marginal in Israeli schools. Since 2004, the MoE together with the Ministry of Environmental Protection (MEP) have published policy papers and guidelines for implementing EE. Large-scale collaboration between the two ministries has resulted in the launching of Israel’s biggest professional development program in EE – *Education for Sustainability: Weaving life together*, or the “Ministers’ Program” (The Ministry of Education 2012) as it is often referred to (Tal and Peled 2017). This is in addition to collaboration between the ministries whose aim is to certify “Green Schools”.

Green Schools in Israel are recognized as such by the MEP according to a list of criteria which relate to the management of the school – e.g., reducing material

T. Tal (✉)
Israel Institute of Technology, Haifa, Israel
e-mail: rtal@ed.technion.ac.il

consumption, recycling, energy efficiency – and to its EE curriculum. However, these requirements do not necessarily mean that a school will be viewed as a Green School by an expert or even by a non-expert. Some of the schools run EE curriculum, which is school-based, in which the teachers play a central role and act accordingly. Other schools are satisfied with the Green Certificate, and since further or continuous evaluation does not exist, these schools continue to the “next agenda item” and the “Green” remains mainly declarative. In this chapter, I discuss this duality: the ways non-governmental organizations (NGOs) and the MEP affect the Green School agenda. I conclude the chapter by presenting a case study of an exemplary Green School.

What are Green Schools in Israel? According to the MEP, there have been about 1000 schools certified as Green Schools by the ministry since 2004. Certification is a joint project between the MEP and the MoE. The certification process, which is carried out in collaboration with the local municipalities, focuses on five components:

- A curriculum – environmental topics and concepts are included in various subjects. Altogether, 30 hours per year in three age cohorts should be dedicated in the elementary school (years 1–6; ages 6–12), and 10 hours per year for half of the students in the secondary school (mainly middle schools).
- An action plan for a sustainable lifestyle – this includes planning on how to use resources in the school, its infrastructure and the plans for the behaviour of students and parents.
- Green visibility – as expressed in signs, exhibit boards and a website.
- Community involvement – at least one age cohort is required to execute a longitudinal project to increase environmental awareness and behaviour in the community.
- Green leadership – this includes student representatives and teachers who advance the certification process and who lead pro-environmental actions.

Schools certified as Green Schools receive small government grants to support the “greening process”.

“Persistent” Green Schools are schools that maintain these components for at least two consecutive years, show a decrease in resource consumption, and expand the program to all classes at all year levels. In 2016, for example, 50 more schools were certified as green and 16 more as persistent green, and in 2017, 56 new schools were certified as green and 17 as persistent green. Figure 13.1 shows the total number of schools certified as green (light bars) and Persistent Green (dark bars) during 2004–2015 (The Ministry of Education [n.d.](#)).

Many terms are used worldwide to describe programs that advance environmental education and action in schools: for example, Sustainable Schools, Eco-Schools, EnviroSchools, Green Schools. “All these programs are part of a global effort to reorient formal education towards sustainability” (Rickinson et al. 2016, p. 360). As Rickinson et al. argue, the impact of such programs on the participants is unclear and the emphasis should be more on what is influential about the program. I take the distinction they offer between impact and influence in discussing green schools in Israel further.

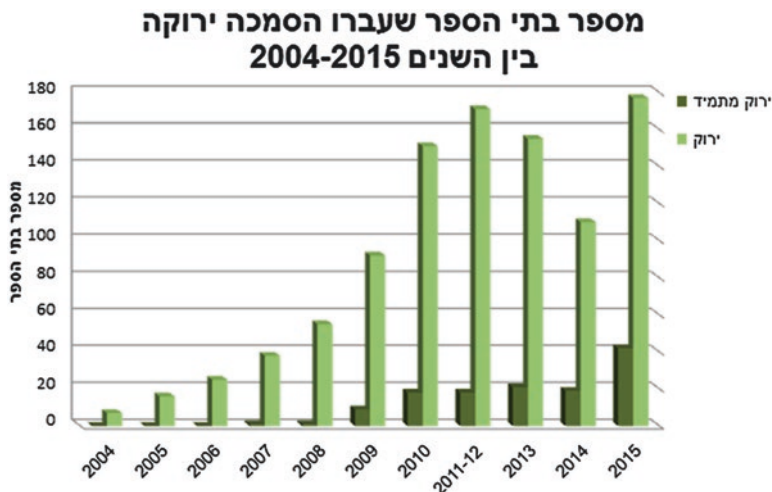


Fig. 13.1 The total number of schools certified as green and persistent green from 2004 to 2015

13.2 Prior Studies

Very few studies have focused on the impact of Green Schools in Israel, or more generally, on EE on a large scale. A comprehensive study of the environmental literacy of students finishing 6th grade (the end of elementary school) and 12th grade (high school seniors) was done by Negev et al. (2008). The researchers studied hundreds of students from diverse demographic backgrounds and used a questionnaire they modified from existing international environmental literacy instruments and translated into Hebrew. The authors found no significant correlation between environmental knowledge and behaviour. Ethnic and socio-economic characteristics were moderately associated with environmental literacy, whereas the presence of an adult who mediated the children's relationship with nature was strongly related to environmental attitudes and behaviour, and weakly related to environmental knowledge. They concluded that the intended objectives of EE in Israel had not been achieved. Almost a decade later, during which both the Green School program and other EE programs had been established, Shay-Margalit and Rubín (2017) again measured environmental literacy using the same questionnaire (with slight modifications). They studied students aged 9–12 in regular, green and persistent Green Schools and found that both levels of the Green School program had an impact on student attitudes, but only the persistent Green School program had a behaviour impact.

Already in 2010, in response to a research request from the MEP for Indicators for Environmental Literacy, I argued, based on the research literature, that the term “environmental literacy” is problematic for many reasons (Tal et al. 2010). To name a few of the problems: Do we expect environmental knowledge to be transmitted, or do we expect EE to be transformative? Can we use the same measure to assess

students learning under these different models? Or, referring to Roth (1992), do we always expect to see awareness, concern, understanding and action, and do they have linear relationships? What place does the behavioural aspect have in EE? Is environmental literacy the target of EE, or is it behavioural and manipulative, ignoring individual development and values (Jickling 1992; Robottom and Hart 1995)? Is EE goal-based or process-based (Wals and van der Leij 1997), and what is its conceptualization (Sauvé 2005)? Based on these questions, we responded to the ministry's request in two ways: (1) We developed another rigorous instrument, which we administered to hundreds of students and found that older students have better environmental knowledge, that younger students show better environmental attitudes and they also show some better behaviour intentions. However, in general, Israeli students' environmental knowledge was poor, and their environmental intentions are higher in general statements but lower when asked about specific behaviours (Tal et al. 2010); unfortunately, this finding is not innovative or surprising. (2) In addition to developing these indicators, we offered a more thoughtful instrument: a socio-scientific, issues-based assignment to measure student environmental literacy. Two assignments (pre/post) were developed, based on real and relevant issues. We administered these to high school students learning about environmental sciences to understand their usefulness and to assess student knowledge, but mainly to assess their higher order thinking skills. This instrument was open-ended and students had to: (a) identify the environmental conflict(s); (b) make an argument; (c) present (a few types of) knowledge and understanding; (d) present evidence of environmental sensitivity, and (e) provide statements on possible actions. We developed a detailed rubric to score the assignments. The results showed that after learning an action-based unit – “the environmental workshop” – student gains in all aspects were significant (Tal and Abramovitch 2013). The recommendations to the MEP was that: (a) the concept of environmental literacy is not objective and is thus problematic; (b) standard instruments do not show differences (as shown in 2008 and even in the 2017 publications), and (c) complex learning requires a more sophisticated assessment of learning. Socio-scientific, issues-based assignments can be one example of such an assessment. To conclude this section, I argue that EE and EE processes in Green Schools are too complex to be measured by a “one-size-fits-all” instrument.

13.3 Actors Playing in the Green School's Arena in Israel

Avoiding the formal definition of Green Schools (i.e., certified as such by the MEP and the MoE), I now describe EE initiatives in Israeli schools while assuming that a school that carries out a substantial EE program can be considered green, at least with regard to some criteria. As mentioned before, the main authority behind the formal certification is the MEP. For decades, the main funding for EE has come from this ministry, which is one of the smaller in the Israeli government and whose budget is tiny compared with the MoE's budget. In addition to the Green School

certification, the two ministries have launched the Integrated Program for Education for Sustainability, known also as the “Ministers’ Program”. The program consists of school-based professional development (PD) of 30 hours, in which 80% of the schools’ teachers must enrol, including the principal. According to the program’s requirement, the PD consists of 12 hours of introduction to Education for Sustainability (EfS), 12 hours of developing a specific topic for teaching, chosen from a list of topics relating to sustainability, and 6 hours of field trips focused on the topic the school has chosen. Each school then identifies a leading team of four or five teachers who get further support throughout the school year by the “disseminating organization”, as described in the next paragraph. This support includes nine 3 hours meetings in school to (a) design a curriculum that ties EfS to at least four topics taught in the school (e.g., science, social studies, maths); (b) plan a school policy for a sustainable lifestyle, and (c) plan and execute an environmental action with the school community. According to its documents, participating in the Integrated Program for Education for Sustainability is “an important step on the way toward certification as a Green School” (MEP and MoE 2017). EfS, according to this formal document, aims at: “Strengthening education for democratic, social and environmental values; developing citizens who adopt responsible social and environmental attitudes and behavior; developing activism and environmental leadership; creating an optimal educational climate; and enabling the adaptation of the curriculum to the changing reality in the country and worldwide” (translated from Hebrew). Between 2011 and 2016, 670 schools took part in the program, most of which were elementary schools.

The “disseminating organizations” are two non-governmental organizations (NGOs) working with the two ministries. The MEP and the MoE selected these NGOs to execute the program in the school system. The NGOs’ staff provides the PD and the in-school support based on a guidelines document that was developed by a group of experts and on specific programs developed by each organization. The integrated EfS program is voluntary, but as already mentioned, the schools get the PD and the support at no additional costs.

Potentially, this integrated EfS model is very promising. Two government ministries collaborate, and they both fund and support a program which is designed and enacted by two NGOs. Schools are requested to allocate hours for the program, first for the PD and then for enactment, and are expected to develop a curriculum and an action plan to carry it out. However, there are a few pitfalls along the way. Zaradez et al. (2020), who interviewed the educational staff, describe alienated teachers with low self-efficacy, who feel that EfS was imposed on them. They see it as unimportant and something that cannot increase their motivation or their professional reputation. The teachers, according to the authors, see themselves as inferior to the NGO staff, who enjoy a higher professional reputation and enjoy the status of “visitors” at the schools that provide their service and leave. The principals also see the program as being imposed by outside agents and as harming their autonomy. Zaradez et al. study uses the lens of social justice and its role in EE, and point to EE as a representation of privatization in the Israeli school system. Although the study was qualitative–interpretative, the number of participants – comprising 30 interviewees:

ten school teachers, ten educators from an NGO and ten principals – is impressive. Its findings cannot be dismissed as being anecdotal.

In another study, funded by the MEP, we studied the integrated EfS program after its second year (Tal et al. 2015). We collected pre- and post-program data from 52 classes of Year 6 and 7 students (aged 10–12) from 13 schools supported by the two NGOs. The schools represented diverse socio-economic statuses. We used our previously developed questionnaire (Tal et al. 2010) and developed new pre/post assignments based-on socio-scientific issues. Overall, 1328 students responded to the questionnaires. In addition, we interviewed 35 teachers, conducted observations in the schools and analyzed their EfS curriculum materials. The scope of this chapter does not allow us to elaborate on the findings, but in general, we found high satisfaction with the program. Teachers were proud of the curriculum they had developed and they reported an increase of environmental discourse in the school. In that early stage of the program, many schools who had enrolled in the program were already looking for ways to increase their environmental activity. We found that the leading teachers were mainly science teachers who felt more comfortable participating than other teachers. Although some principals joined the program in response to the MoE call, most of them were eager to develop EE in their school. Many of the teachers' statements about the PD reflected an eye-opening experience for them, although more experienced teachers thought they were "requested to learn the alphabet when they can already read fluently". In some schools the principals were described as the driving power that pushed the school forward, but in others, the teachers described a top-down process that forced them to participate. In accordance with Zaradez et al. (2020), we found that the NGO staff often felt a lack of support from the teachers, and reported that their insufficient pedagogical knowledge limited their ability to support the teachers.

Overall, although the teachers were satisfied with the PD, implementation of the EfS programs in the schools was disappointing. This is mainly due to the time gap between the school year in which the PD took place and the following year when only a small team of teachers from each school, with insufficient knowledge and a lack of support, was expected to carry out the program. Although I acknowledge that the evaluation took place fairly early in the study, and maybe too early before the program was established, more recent findings (Shay-Margalit and Rubin 2017; Zaradez et al. 2020) support our findings on the teachers' frustration and the student learning outcomes, and expose the problematic nature of implementing EE in schools.

13.4 Focused Study on Sustainable Schools

Given the problematic and technical definition of Green Schools in Israel, in the remaining part of this chapter I refer to schools that maintain an extensive EE/EfS program regardless of the MEP certification. However, most of these schools are certified, or were in the certification process while our study took place. In a study

that investigated ten Israeli schools that run such EE/EfS programs, we aimed at understanding what characterizes schools that implement EE programs in terms of the programs' structure, content, and the pedagogy of EE (Tal and Peled 2017). We were especially interested in schools which had developed and implemented an EE program as part of their curriculum rather than as some short-term enrichment program. We defined an EE program as a "structured educational program with its own rationale, which includes topics and activities that deal with environmental issues, and which is acknowledged by the school staff as a school-based curriculum". In the search for such schools, we administered a questionnaire to a large number of schools. The questionnaire included questions concerning the organization of the EE program, its scope in terms of teaching hours, its main activities, and who ran the program (the school or an environmental NGO). The responses to this questionnaire helped us select schools that had a structured program and that represented different communities – urban and suburban – of different sizes and with different operators of EE (the schools or NGOs). This diversity provided a richer picture of how EE is implemented.

Finally, we selected ten elementary public schools based on the descriptions of their EE programs and on the school principal's consent to participate in the study. In Israel, most elementary schools teach grades 1–6 (ages 6–12). In this study, we had nine such schools; the tenth school taught grades 1–8 (ages 6–14). The size of the schools varied between 300 and 500 students.

Seven out of the ten schools were already accredited as Green Schools by the MEP, and three were in the process of certification. None of the schools participated in the Education for Sustainability PD since the PD only began during our data collection period. In all the schools, a student "Green Council" was active. The idea of a Green Council was first proposed by one of the NGOs involved in the EfS initiatives, although the idea of Green Councils has spread to other EE programs as well as to the Green School certification requirements.

EE programs in Israel are carried out either independently by the school or with support from environmental organizations. One form of support is to guide the teachers, who then teach the program themselves. Another form is through direct enactment by the informal institution whose informal educators come to the school and teach EE. We named the first type of support "Teacher Support", and the second type "Informal Institution Teaching". Both types of support are provided by NGOs, but their practice is different. Four schools in the study operated their own EE program with no additional supervision or support; four schools were part of the Teacher Support program, and two schools enjoyed Informal Institution Teaching. Both NGOs were compensated for their work by the school itself, by special grants, or by the municipalities. To understand EE in Israeli elementary schools that explicitly focus on EE, we collected data from observation, interviews and from documents (for details, see Tal and Peled 2017). In the next section I describe the main findings of the study.

13.4.1 Operation and Structure of EE Programs

Most of the schools varied in the way EE was integrated into their system. In some schools there was a leading EE teacher who was a homeroom teacher (the teacher who teaches the majority of the topics and is responsible for a particular class) or a science teacher, who coordinated the entire EE in the school. In other schools, every homeroom teacher was involved in EE. As mentioned earlier, in two schools the entire teaching of EE was done by informal educators, employed by the NGO, who had no teaching qualifications. Several questions already arise: What happens when the grant or the municipality money ends – do these two schools stop their EE program? What is the school's responsibility for developing its teachers' capacity to deal with EE? Does EE happen only “during second lesson on Monday” when the informal educators teach? What happens in social studies classes? What happens in the hallways? How can a school define itself based on an outsourced program?

13.4.2 Theoretical Approaches

We looked at how the schools manifested the programs' rationales. We classified the theoretical approaches identified in the documents based on the main 'currents' in EE as identified by Sauv  (2005), and found that the theoretical approach indicated in the schools' documents did not necessarily reflect their practices. The documents from three schools reflected the bio-regional approach; three schools reflected the value-based approach; one school reflected the systems approach, and six indicated the EfS approach. This makes more than ten because three schools referred to two approaches (e.g., EfS and bio-regional; EfS and value-based), one school's documents reflected three currents, and three schools expressed one current. In two schools, we were not able to find a document that addressed an EE mission coherently. Here are some examples that clarify our classification.

Examples of the EfS approach, which was the most common approach (in six schools):

We live in an era of global environmental crisis and the ecological footprint is increasing: The amount of resources we use for human needs is growing faster than their renewal in nature, through constant damage we cause to basic elements that provide us with system services. We do not harm only ourselves, but the next generations' ability to survive. (School 8)

Maintaining sustainability principles in school and in the community through thoughtful use and the saving of resources and acquiring thoughtful consumption habits. (School 1)

The value-centered approach was evident in three schools, for example:

One of the basic premises that guides EE in school and directs its activities with respect to the relationship between humans and the environment, is nurturing diverse, universal, moral, humanistic values, and values related to Jewish culture. (School 8)

Through the values of respect for humans and the environment and their assimilation in our school life, the school seeks a genuine change in the thinking and behavioural patterns of the students – the future citizens. (School 7)

The bio-regional approach, which was found in three schools, drew attention to local issues:

Encouraging preservation and nurturing local natural resources/objects together with learning to know and preserving the school environment; developing students' interest and knowledge in and about the local environment; and developing local initiatives for changing behaviors in the school community and in the town. (School 3)

The systems approach was identified mainly in one school's documents:

Humans have developed monitoring and measuring tools that allow them to understand weather conditions in order to forecast and plan further actions. Human involvement in the environment strongly influences the relationships between different earth systems, and humans are affected by these relationships. The goal is to develop student awareness of the importance of the relationship between humans and their environment. (School 2)

In many of the aspects we focus on in this chapter, the EE programs were very similar. For instance, all programs included special whole-school activities like "Green Days" or "Green Weeks" in which topics such as environmental health and conservation were taught in a holistic and cross-age manner. Moreover, all schools participated in environmental action in the form of nature conservation projects such as protecting hedgehog dens or cleaning nature reserves. In all schools there was a visible "recycling point" where solid waste was separated to paper, plastic and glass. Some school projects were carried out in collaboration with the local community, such as older students teaching kindergarten classes, public campaigns to raise awareness of environmental issues, and advocacy acts such as "Walking to School Week" or "Clean Air Day".

A significant part of the EE programs in the schools was directly connected with their accreditation as Green Schools. As indicated earlier, certification required that certain curricular and operational commitments that the schools undertook were evaluated. However, once a school is certified, there is no continuous evaluation of its management and teaching. Only relatively recently did the MEP apply a new policy which allowed schools more autonomy in determining the topics they wanted to integrate into their EE program, and the way they wanted to implement those topics in their curriculum. As mentioned, student-led Green Councils were active in all the schools. The councils' main activities included promoting recycling and

reducing waste, maintaining a waste separation site in the school, and organizing school activities around these themes. In terms of structure, EE had high visibility on the schools' agendas. Despite variability, we found that in all schools there were classroom activities, school activities, and collaboration with the community.

13.5 The Impact of Green Schools on ESD in Israel

The unique and special collaboration between two government ministries – The Ministry of Education and The Ministry of Environmental Protection is the main characteristic of the two major programs: The Green Schools and Education for Sustainability Programs. The Ministries have developed, together, guidelines for both programs (see Table 13.1), and as such, they can be viewed as top down ones. In addition, the Ministries work together with two main NGOs that, operate the EfS Integrated Teacher Professional Development as sub-contractors. Table 13.1 presents the guidelines of the two programs.

Table 13.1 EfS and Green Schools guidelines

EfS Integrated Program	Green Schools
<i>Focus:</i> Teacher professional development targeted at bottom-up EfS in kindergartens and schools	<i>Focus:</i> Changing the school management, curriculum and educational emphases
A team, led by the principal is committed, involved and act like role models. Alignment between explicit and implicit message	A curriculum – That includes environmental topics in different disciplines. Altogether 30 hours per year for at least 3 years
Advancing respectful relationships between humans and the environment	An action plan for a sustainable lifestyle – This includes planning on how to use resources in the school, its infrastructure and the plans for the behavior of students and parents
The school continuously act to reduce the ecological footprint and its consumption	Green visibility – As expressed in signs, exhibit boards and a website
Place-based learning	Community involvement – At least one age cohort is required to execute a longitudinal project to increase environmental awareness and behavior in the community
School sustainability workplan that includes mission, events, activities and milestones throughout the year	Green leadership – This includes student representatives and teachers who advance the certification process and who lead pro-environmental actions.
A curriculum emphasizing broadening knowledge and experiential pedagogy, critical thinking, outdoor learning, inquiry learning and problem solving	
An ongoing dialogue between the school and its community and seeking growing influence	

I interviewed five leaders of Green-Schools and EfS initiatives from the two ministries and from the two NGOs involved in the Integrated EfS Program for this chapter. A Head of “Environmental Education and Community” at the MEP has indicated that only a small minority of the Green Schools, most of which are Persistent Green Schools develop a substantial EfS program and act accordingly. Despite the support from the Ministries and the local municipality, the impact is limited. However, she sees the processes led by the Ministries and the involved NGOs as deeper and more professional since the collaboration began almost a decade ago. This MEP official argued that the main contribution of Green Schools is in their number, visibility and the new language adopted by the schools and not necessarily in the extent they apply EfS. The MoE superintendent agrees that not all schools act as Green ones, but she believes the impact is seen and that no one questions EfS or Green Schools any more in the education system. All the interviewees see the unique collaboration between government ministries and NGOs as a major force that changed the discourse over education for sustainability and increased its visibility and improved professionalism. The main question that emerged from all conversation was about the impact direction, meaning whether Green Schools affect EfS or the other way around. There was agreement that although some schools that were already certified as Green prior to the EfS PD, take part in the PD to increase and sustain their activity. However, commonly, the trigger for “greening the school” is the EfS-PD that drives school-teams to enroll in the Green-School certification. All interviewees agreed that only persistent Green-Schools and even a smaller new group of “Ever-Green Schools” systematically and continuously integrate EfS in the school curriculum, pedagogy and management. All interviewees pointed to the political system in Israel and the frequent changes in government that cause constant changes and different educational emphases that push the schools toward adoption of new foci every year. Under these circumstances, they all agreed that they would prefer to see more consistent activity in the schools and more independence and leadership. Nonetheless, they find the fact that more schools now integrate sustainability principles in their yearly agenda promising. In general, the collaboration between the Ministries is seen as a strength, but the MEP interviewee expressed her concern that the long-lasting collaboration prevents healthy critique and innovation, especially such that the NGOs can offer. The two NGOs representatives agreed that the EfS-PD becomes more professional, but they are not satisfied with what they called the “average green school”. As one of them indicated, there are financial benefits and the local municipalities like this “branding” of schools, but after 1 year, “most schools retreat to what was there before.” Finally, the Head of Education in the MEP provided the broad picture. She sees a growing movement of Green Schools that get school-based, in-house PD that leads to writing a school-based program. She believes that using the NGOs as providing school-based support has proven to be effective. She argued that under the circumstances that the MoE and the formal education system do not prioritize EE/EfS, the model of the Integrated Program provides teacher PD, support in the schools and the certification process – all which substantially contribute to EfS in Israel.

Our previous studies have shown that, as in other countries, EE implementation is complex and its integration is challenging (Wals et al. 2014). One of these challenges is the inclusive and interdisciplinary nature of EE and the problem of how to integrate it into an education system that is organized in separate disciplines. In Israel, lack of recognition of EE as a discipline has many consequences in terms of the lack of a recognized curriculum, insufficient professional development for teachers, and ambiguity regarding the continuous development of the field, which, unlike other school disciplines, depends strongly on the financial and professional support of the MEP.

In our evaluation of the EfS program we found that the schools were enthusiastic about EfS. The teachers were eager to tell about the programs and share their achievements as well as their concerns. Green Councils were active in all the schools identified as Green-Schools, and EfS was taught both indoors and outdoors. On the other hand, Zaradez et al. (2020) who studied a small sample of teachers engaged in the Integrated Program and facilitators from the two NGOs, point to disempowered teachers who were often forced to coordinate and teach EE. Those teachers are torn between too many responsibilities and tasks and they critically refer to power struggle with the NGO's educators who benefit from higher reputation compared to the hard work and limited acknowledgement of ordinary teachers. They documented as well much criticism expressed by the NGO staff toward the collaboration with the schools and the teachers and large gaps between their expectations and what occurs in the schools.

The Head of Education of the MEP has argued, with this respect, that she cannot address a small convenience sample. She would rather have the MoE take responsibility and lead all EfS initiatives, but given that EfS is never prioritized by the MoE, the comprehensive school-based processes the Integrated EfS program promotes genuinely support the movement of Green Schools.

Yet, there are Green-Schools in Israel that have developed comprehensive and deep EfS programs regardless of the government ministries programs. These bottom-up EfS programs are led by committed and enthusiastic principals who managed to impact their broader community – parents, neighbourhoods and municipalities and offer innovative curricula, action plans and transformative pedagogies. Although the Head of Education of the MEP states their number is tremendously small, one such school is described in detail in the next section.

13.6 An Exemplary Green School – The Case of Woodland School

By addressing this Green School's history, its unique EE program and the staff commitment, I intend to draw up some guidelines for the meaningful "greening" of schools. Woodland (Woodland is a pseudonym, as is Mira, the principal) represents a small number of schools that have developed EfS programs independently from

the Ministries programs. Throughout the years, they were certified as well, mainly to benefit from the small budgets associated with the procedure, but the initiatives began long before and the scope of the programs went farther away from the average green school in Israel.

Woodland school is a Year 1 to Year 8 school (aged 6–14) located in a poor, underserved neighbourhood in the metropolitan area of Tel Aviv. It is located next to one of the most affluent neighbourhoods in the metropolitan area, which is served by another school. In the past, parents who were able to enrol their children in other schools did their best to do so. In 2001, a new principal was hired who decided to use her personal interest in nature conservation and the environment to promote a systemic transformation in the school. Seventeen years later, Woodland school is very prestigious and attracts students from all neighbouring towns. Nowadays, no one in the neighbourhood looks for other schools, and parents from other neighbourhoods and towns do their best to enrol their students in the school. There are extensive new construction projects and much new immigration of young professionals into the neighbourhood, which is associated with the school's reputation – according to “Madlan”, a large and highly influential real estate website, the school's score is 94/100. The city's average school score is 81/100. The students' achievements in standard tests are excellent and the school became a “pilgrimage site” for educators and policy makers from across the country. We follow Woodland EE and outdoor education for 15 years, during which we bring our EE students to visit the school and meet the students, teachers and students. A few years ago, a picture of happy, wet kids playing and enjoying a macroinvertebrate investigation in a pond made the cover of a *Journal of Research in Science Teaching* issue (2013, issue 9).

Woodland school is a certified, persistent Green School, but this is not what makes it exemplary. After all, about 1000 schools are certified. What the principal, Mira, noticed upon her first visit to the school was its unique location: within walking distance from a big zoo, from a big city park and from a small natural history museum, and in close proximity (though transportation is needed) to an educational farm. The first decision Mira made was to bring in and integrate all these institutions in the school curriculum. Woodland students frequently learn in all these informal environments throughout the year, and a school-based curriculum was developed by the school in collaboration with the informal institutions. In addition to collaborating with these local institutions, other activities of the school are carried out in areas like science, marine sports, and marine environments with other institutions. Mira, has emphasized that unlike other programs, where the schools are dragged into the process

...all these collaborations are initiated and led by the school. It is the school that sets the agenda, co-designs the activities, provides feedback and reviews each activity to decide upon its continuation. The teachers are very active in the process, and all informal institutions like it.

In Woodland, field trips are central. The young prospective year 1 students begin school with a night activity in the dunes a few days before the school year begins, where they are engaged in collaborative experiential tasks. The 6-year-olds are

supported by the school staff in completing all the physically, emotionally and socially demanding tasks. Before sunset, they sign the school convention on protecting the environment and are rewarded with a “Track Pin” acknowledging their achievement and their belonging to the school community. At the end of year 8 (senior year), they repeat the activity and receive a “Graduate Pin”. Each grade level has about six or seven field trips per year, and beginning in year 5, the residential field trip includes 2–4 days in remote nature reserves. The seventh and eighth graders have two or three residential field trips, and as Mira says: *“This is something the school is outstanding for. It is a culture of outdoor activity that we nurture from very early.”*

The schoolyard is designed to reflect the school’s focus on EE. There is an outdoor class, outdoor furniture – built by students and parents together from recycled material – and an ecological garden that the principal has developed on an abandoned field that joined to the school yard, first as an “occupied territory” and then with the approval of the municipality. The students took part in planning, building and planting the garden, which serves as an outdoor classroom for several topics.

13.6.1 The Activism

The principal defines herself as an environmental and social activist. Her plan to make the school green and focused on outdoor and environmental education was in line with her belief that students in underserved communities should have the same quality education as their counterparts in affluent communities. By becoming a magnet for students and families from medium-high socio-economic status homes she believes that she has elevated the status of the entire neighborhood. When referring to educating the students to take action, Mira tells many stories about the ways in which the students’ Green Council has promoted actions. Two years ago, the Green Council chose to focus on the issue of the live shipment of cattle and sheep: the topic of an appeal by two NGOs to the High Court of Justice. The two activist NGOs requested that the shipment of live animals be stopped as it causes incredible suffering. The students who studied the topic invited representatives of the organizations to the school, prepared lessons and presentations, and wrote a petition. A group of students prepared a video in which they showed calves being shipped overseas to be slaughtered upon arrival. Due to this activity, they were invited to present their case and their actions in a morning TV edition. To learn more about the issue, the attorney who appeared in the High Court of Justice came to school to teach the students about the civic and legislative aspects, and the whole group traveled to observe the appeal in court. They were also invited to the Knesset – the Israeli parliament – to present their case during Animal Rights Week. Another topic selected was free range eggs. The students decided to promote the marketing and the control of the price of the eggs. When I asked Mira about the line between transformative education and indoctrination and whether parents agree with all this activism, she replied:

Not all parents agree, and in fact, we refine messages. Someone claimed that a vegan message is delivered by the school. This is not true, but I guess most parents will agree with the softer focus on animal well-being and about compassion. Some parents objected [about the] involvement of [Anonymous] so we work also with organizations that are more within the consensus like “Let the Animals Live”. Anyway, the Animal Rights Week is very central in school. We invite lecturers and offer many activities. Examples are: endorsing the adoption of pets from shelters rather than buying ones, or supporting a bill on reducing the number of game birds. We got a first place award for learning about birds, and were invited to give the opening presentation at the International Birding Conference in Eilat to which we traveled five hours with the students who then gave the presentation in English. In any topic the students choose we have an initial investigation stage before choosing modes of actions. The students have administered surveys, interviewed families and experts, and even conducted observations in the park when we examined the issue of smoking in open public areas.

Mira has emphasized the critical thinking the school promotes and insisted that every action is a result of thinking at several levels: the students, the school staff and further consultation with experts. She is proud of such activism and says that she does not play a role in the selection process of the Green Council. When asked about who leads the Green Council, she acknowledges that the teacher who runs it used to work for an educational environmental NGO, but stresses that she prefers teachers who are eager to do, initiate and become leaders of processes in school. This is very different from Zaradez et al. (2018) findings on other green councils. Mira adds that

It’s always easier to avoid controversial issues. We take complex issues and dilemmas, unpack them and come up with suitable teaching plans for each age group around those dilemmas. We don’t expose our 1st to 4th graders to topics discussed by older ones. And as a principal, I am not concerned with criticism. The school’s slogan – “I know. I am responsible. I make an impact” – means that we need to deal with the most complex issues. Not everyone agrees with the LGBT flag that we raised or with the liberal values of equality to all that we endorse, but I feel satisfied with the way our actions are aligned with the school’s mission.

13.6.2 Criticism Toward the Green-School Initiative

When asked about how she views Green Schools in Israel, Mira expresses her criticism, arguing that both the MoE, the MEP and the municipalities have an agenda to present schools as green with almost no valuable activity. She claims that municipalities mainly want to brand kindergartens and schools as green, and the MoE needs to raise the green flag as well. For the schools, the green status is mainly only another measure they can present. Greening the school is totally an extrinsic motive related to the visibility of the school. Very little effort is required, which makes the real Green Schools wonder about the value of the process. Mira referred to private companies that write curricula for schools following requests from the municipality, and about schools that use those curricula with no adjustment or modification for the real school needs or its settings. Finally, she talked about the culture of Woodland.

It's all about culture. It's culture, culture and culture. It's not only our green agenda. It's our identity, which is expressed in holiday ceremonies which have a unique civic message, Jewish culture and human one. You enter the school and see its culture on the walls, in the halls, in celebrations, graduations.

As already indicated, Woodland school is not a typical school. It is clear that Mira, the principal, is the driving force behind the school's agenda and its operation, values and methods. Even the way she uses 'our' in the above quote reflects her own identity and how it is embodied in the school work. She sees EE in her school as transformative, as discourse-based and as community-based. Her long experience and solid reputation allow her to criticize the Green Certification, and to point to the need of deeper action in the arena of Green Schools in Israel. She supports the position I presented earlier in this chapter, that certification does not necessarily indicate that meaningful EE exists in a school. There are other schools in which EE is central and meaningful, but usually it is not the label of Green School which made them such.

13.7 Conclusion

The first EE-focused school in Israel was a boarding school established in Midreshet Ben-Gurion in the desert in the 1970s. This unique and progressive school was followed in the 1980s by other schools, a few of which became leading schools in writing their own school-based curricula. These curricula stemmed from negotiating with the schools' communities and reflected local and community needs (Tal and Morag 2013). These pioneer schools set the stage for upscaling the green message, beginning with the 1992 Earth Summit in Rio de Janeiro and continuing throughout the Decade of Education for Sustainable Development (2005–2014). One can argue that every tailor-made suit that is converted to mass production loses some unique features, but the benefit of upscaling is greater. However, the studies I referred to earlier in this chapter show otherwise. I cautiously argue that the adoption of standardization for Green Schools might serve some agendas of city mayors, politicians, and educational and environmental administration, but it does not necessarily strengthen EE as transformative, holistic, and critical education. Although there are about 1000 Green Schools and a few dozen persistent Green Schools in Israel, do 30 EfS teaching hours per year, 1 year of operating a Green Council, 1 year of reducing resource consumption and one community activity make a school green? Maybe a slower, bottom-up process, through which schools set their own agendas, and set up their own educational principles and practices, could contribute better to the deeper ideas behind Green Schools? On the other hand, can those few exemplary schools really lead a nation-wide movement with their very experienced, knowledgeable and committed principals? I am not convinced that their models fit better a diverse education system? Thus, I believe that both routes – the bottom up and the top down – have place. Yet, I strongly believe that the fewer exemplary schools should become models for other schools doing their first steps as

Green-Schools. The way those exemplary schools set their EfS agenda and constantly work toward transforming their pedagogy in general and in the context of EfS in particular, can inspire other schools.

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Chapter 14

Eco-Schools Kenya: Practising Education for Green Economy and Sustainability



Dorcas Otieno, David Wandabi, and Lorraine Dixon

Abstract The Eco-schools Kenya Programme has developed in tandem with global development agendas including the Millennium Development Goals, the Decade for Education for Sustainable Development (DESD), the Global Action Programme on ESD, and the Sustainable Development Goals and Green Economy. The Kenya Organisation for Environmental Education (KOEI) has been implementing the programme since 2003, growing it from a pilot in 12 schools, to over 1000 primary and secondary schools. This chapter explores this growth along with its impacts and recommendations for the future. The programme has evolved from traditional environmental education to ESD with the promotion of experiential learning for green enterprise development in schools, in response to development trends. This growth has aligned with priority areas in Kenya, including promotion of renewable energy, livelihood diversification, water, green innovation, energy efficiency, integrated waste management, mainstreaming green economy into learning, and creation of green jobs. Major successes include ESD demonstration centres of excellence in schools and government-approved ESD curriculum learning materials for schools. Despite challenges with funding, high teacher turnover and difficulties in implementation of the whole-institutional approach to ESD, the future of Eco-schools in Kenya looks bright, with it being a key reference point for good practice in Kenyan ESD policy, and a strategy for achieving green growth and sustainable development.

14.1 Introduction

Sustainable development issues in Kenya are both complex and interlinked. It is estimated that 42% of Kenya's Gross Domestic Product (GDP) and 70% of the overall employment is derived from natural resource-related sectors, including agriculture, mining, forestry, fishing, tourism, wildlife, water supply and energy (Kenya 2016). These sectors are highly sensitive to climate change and variability, making Kenya's economy highly vulnerable. The strain on ecosystems is especially

D. Otieno (✉) · D. Wandabi · L. Dixon

Kenya Organisation for Environmental Education, Nairobi, Kenya

e-mail: dorcas.otieno@koei.org; wandabidavid@gmail.com; lorraine.dixon@koei.org

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apparent in the arid and semi-arid lands (ASALs), which make up more than 80% of Kenya's total land mass and are home to over ten million people, about a quarter of Kenya's total population (UNEP 2014). Rapid population growth and urbanisation are priority challenges for the country's development. High poverty levels have created a great demand for sustainable job creation to support poverty alleviation and promote inclusive growth (Kenya 2016).

In light of these challenges, Kenya has adopted various policy and global strategies with efforts evolving in the advent of new global development agendas. The Kenya Green Economy Strategy Implementation Plan (GESIP) (Kenya 2016) in particular, is geared towards supporting a globally competitive low carbon development path for Kenya through promoting economic resilience and resource efficiency, sustainable management of natural resources, development of sustainable infrastructure and providing support for social inclusion. GESIP lays emphasis on the need to re-orient education and training to instil knowledge, skills, attitudes and values to promote sustainable production and consumption for sustainable lifestyles (Kenya 2016). The institutionalisation of ESD policy is proposed as a strategy for the achievement of this.

Education for Green Economy and Sustainability aims at imparting knowledge and skills that prepare learners for the real world, demonstrating how to generate income and opportunities which enhance their communities' resilience and improve their economic status, motivating young people to be responsible citizens of their environment and to foster an attitude of self-reliance among students. It delivers practical learning on green growth and enterprise development, in line with Education for Sustainable Development (ESD) (Ministry of Education 2017).

This chapter explores the growth of the Eco-schools Programme in Kenya as a strategy for Education for Green Economy and Sustainability, describing its development in line with global development agendas, its current status and impacts, together with challenges towards achieving the sustainability agenda in Kenya.

14.2 Education for Sustainable Development Policy Frameworks in Kenya

The Government of Kenya is committed to providing quality ESD in line with various global and regional frameworks. In 2015, Kenya adopted Sustainable Development Goals (SDGs) along with the rest of the global community. In particular ESD is embraced in SDG-4, which aspires to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UNDP 2014).

The country has developed a national ESD policy (Sessional Paper No. 11 of 2014 on National Education for Sustainable Development Policy) spearheaded by the Ministry of Environment and Natural Resources. The policy provides mechanisms for engaging all stakeholders in addressing sustainable development

challenges through education (Ministry of Education, Science and Technology 2015a).

The Global Action Programme (GAP) for ESD focuses on generating and scaling up ESD action at all levels and in all areas of education, and in all sustainable development sectors (UNESCO 2018). Kenya has been supported through the Japanese fund-in-trust for ESD to implement GAP priority action area 1 on advancing policies. As a result, Kenya launched an ESD policy for the education sector in March 2017. The policy was developed through a countrywide consultative process, taking into account a nationwide stakeholder engagement already endorsed in the national development plans of Kenya for sustainable development (UN 2017). The policy's overall objective is to reorient education and learning so that everyone can acquire the knowledge, skills, values and attitudes necessary for contributing to sustainable development (Ministry of Education 2017). In this policy, the Eco-schools programme is highlighted as being an effective whole-institution approach to mainstreaming sustainability into all aspects of the learning environment. As a next step, the country is planning awareness-raising and capacity development for the education for sustainable development policy in its 47 counties.

14.3 Eco-Schools in Kenya

14.3.1 *The Birth of Eco-Schools in Kenya (2003–2005)*

The Eco-schools Programme was first piloted in Kenya between October 2003 and September 2005 using 12 schools. The programme was titled “Eco-school in Kenya: Promoting Environmental Action-based Learning in Primary and Secondary Schools as a Tool for Development”. The programme was based on five key components of environmental action learning, namely environmental policy, cross-curriculum teaching and learning, micro-projects, school-community partnerships and networks. The pilot phase was funded by DANIDA and was managed by Kenya Organisation for Environmental Education (KOEE) and Danish Outdoor Council (DOC). The main focus during the pilot phase was poverty alleviation. The main focus themes were water, energy, health, agriculture, biodiversity and waste. Crosscutting themes including HIV/AIDS, entrepreneurship, and disaster preparedness and management were also addressed.

The Eco-Schools pilot phase in Kenya was in response to the Kenya Economic Recovery Strategy for Wealth and Employment Creation, 2003–2007 that sought to maintain macro-economic stability, improve the investment climate, restructure public expenditure to support growth, ensure equity and poverty reduction measures, improve public service delivery, carry out financial sector reforms, and develop infrastructure and the productive sectors of the economy (World Bank 2003). It also responded to the Millennium Development Goals (MDGs) 2000–2015, New Partnership for Africa's Development (NEPAD) and the Dakar Framework for Action on Education for All (EFA) in 2000. The pilot phase also just came after the

United Nations World Summit on Sustainable Development (WSSD), held in Johannesburg, South Africa between August 26th and September 4th 2002. All these strategies placed emphasis on the need for quality education to ensure inclusive sustainable economic growth and in particular for poverty alleviation (Ministry of Education, Science and Technology 2005).

These national and global discourses helped shape Eco-schools Kenya to focus most activities on demonstrating ways of tackling poverty for long term economic prosperity. The programme provided a mechanism for schools, and indeed the students themselves, to understand the importance of establishing and putting in practice appropriate environmental and sustainability policies for the school but also at personal levels. This was through remodelling schools as demonstration centres through which the community could learn ways using their local environments for socio-economic and ecological growth. The project aimed at supporting and implementing the new Kenyan curriculum (2003) in which the environment was considered a cross-cutting issue in education (Ministry of Education, Science and Technology 2015b).

14.3.2 Eco-Schools Kenya Implementation Strategy

The programme had two strategic approaches. First, an extensive approach in mobilising and recruiting eco-schools through a national Eco-school award campaign established and run every project year in all project areas, providing only limited on-site support for schools signing up for the campaign.

Secondly, an intensive approach in establishing Eco-schools demonstration centres on how school and communities in cooperation could approach poverty alleviation on a local scale in collaboration with network partners. In addition, Eco-school networking nodes were established around demonstration centres. This approach was based on an Eco-schools flag certification awarded to schools which successfully followed the Eco-Schools methodology, adapting its application to meet their specific needs and achieving their own determined, concrete objectives. The Eco-schools methodology was based on Eco-schools International Framework.

14.3.3 Eco-Schools and the Whole Institutional Approach

Eco-schools Kenya employ a whole institution approach (WIA) that uses schools as entry points to reach communities through pupils, teachers, parents, non-teaching staff, all departments and other stakeholders of the school to address local challenges of sustainable development. WIA requires not only the reorientation of teaching content and methodology, but also school and facility management that is in line with sustainable development as well as the cooperation of the institution with sustainable development stakeholders in the community (UNESCO 2015).

Eco-schools strategy acknowledges that all departments in a school need to synergize for sustainable development action.

Some of the benefits of the WIA include: efficient use of resources hence the institution saves money, greening of school grounds, creating extra source of income from the micro-projects, creation of environmental awareness, development of desirable skills and attitudes for sustainable development, development of a sense of belonging in the school and ownership of sustainability initiatives, enabling acquisition of new professional learning opportunities by the teachers, providing opportunity to have hands on learning opportunity using sustainable development micro-projects, contribution to solving local development challenges by the school and community and thus reducing their ecological footprints significantly and strengthening relationships with families and local community.

14.3.3.1 Whole Institutional Approach Case Study

An Eco-school that best demonstrates the whole institutional approach is Watema Primary School. The school is located in Kaiti Sub-county in Makueni County of Kenya. It has a student population of 463 (239 boys and 213 girls) with 15 teachers.

14.3.3.1.1 School Governance

The school has an inclusive Eco-committee including the head teacher, Eco-schools coordinator, representatives from school board of management, parents and pupil representative from all classes. Additionally, the school has also co-opted a civil society representative in the committee. Being in arid area, the committee is proactive in guiding the school on how to get the best out of their environment to make learning as enjoyable as possible.

14.3.3.1.2 Facilities and Operations

The school has strived in making itself a model of sustainability in the area, embracing a number of green initiatives to promote self-reliance in the community in order to eradicate poverty in the area. The school has two solar panels to supplement electricity to cut energy costs. The school has four roof water harvesting tanks with a capacity of 10,000 l each to supplement their water which they get from a dam outside the school. With the area having erratic rainfall patterns, the water harvesting system ensures the school has water for drinking, cooking, washing hands and watering plants for over 2 months. The water has enabled the school grow vegetables, sweet potatoes and fruit trees for food and income generation. The school also grows fodder to make hay for sale. The school has a nursery for indigenous trees to provide seedlings for sale. The harvested water has also been used to construct hand wash facilities near the toilets to enhance sanitation and hygiene.

The main outcomes of the green initiatives are:

- The pupils have been able to learn practical skills in the conservation of the environment.
- The pupils have been taught ways of being self-reliant through starting green enterprise for income generation.
- The community has been enlightened on the importance of green entrepreneurship for sustainable development.

14.3.3.1.3 Teaching and Learning

The Eco-school initiatives have enhanced teaching of sustainable development issues in all subject areas in the school as teachers use the projects as teaching and learning resources. Students are provided with an opportunity to learn issues like enterprise development, water harvesting, tree nursery development, irrigation among others which offers them a platform to create green jobs. This has helped in propagating the teaching of critical, creative and futures thinking as students are challenged to be innovative in finding practical solutions to their local challenges. In this way, the pupils are contributing to solving local development challenges and thus reducing their ecological footprints.

14.3.3.1.4 Community Partnerships

The school is working with community members in implementing the projects for learning and teaching. Community members and groups visit the school to buy vegetables, tree seedlings and fodder and the school has also influenced other schools around them to embrace environmental conservation. Additionally, the school is working closely with the County Government of Makueni which donated two water harvesting tanks to the school to support the Eco-school initiative (see Fig. 14.1). The school uses local experts from the community to teach the students on various farming technologies.



Fig. 14.1 Roof water harvesting system with solar and vegetable gardening projects at Watema Primary School

14.3.4 Major Achievements of Eco-schools Kenya Pilot Phase

The major achievements of Eco-schools Kenya pilot phase include a range of successes. Under the supervision of the DOC, KOEE successfully developed a Kenyan version of the Eco-Schools programme focusing on the linkage between environmental degradation and poverty. KOEE gained skills in coordinating and facilitating Eco-schools at school level.

Twelve pilot schools were established as demonstration Eco-Schools setting up income generating micro-projects addressing local environmental problems. The micro-projects were also used for out-of-classroom curricula teaching and cooperation with local community e.g. women groups. This improved the quality of learning for the 6196 Primary school and 1201 students in secondary involved. This was further enhanced by 30 teachers who went through an intensive training course and acted as Eco-Schools ambassadors encouraging other schools to effectively address local environmental problems through action based learning following the principles of eco-schools. An additional 208 teachers were introduced to the programme on extensive course sessions.

Around demonstrations schools, local community groups were mobilised to support the school micro-projects through donations, offering expert advice and acting as caretakers of micro-projects during holidays and working for free. School micro-projects demonstrated income-generating projects that were replicated by groups/individuals in neighbouring societies. These included new farming practices; agro forestry, introducing new crops, tree nurseries and poultry among others.

The project led to collaborations and networks between communities, schools and regional partners that led to enhanced knowledge transfer, motivation and abilities for sustainable use and management of natural resources. Some of partners involved in the Eco-schools pilot phase include; Ministry of Education, Ministry of Environment, Kenya Forest Service, National Environment Management Authority, Kenya Institute of Curriculum Development, WWF, Japanese Embassy in Kenya, UNESCO, UNEP, UNDP and World Agroforestry Centre.

The project raised awareness about environmental problems in the public through radio programmes and articles in newspapers. The project made a significant contribution to increased awareness within the educational system about environmental education and the need for change in practice to effectively equip students with relevant knowledge to address environmental problems and poverty alleviation strategies (Otieno and Odeke 2006).

In close cooperation with the teachers and the key governmental institutions the project developed unique environmental education materials that comply with the curriculum requirements to treat environment as a cross curricula subject. Six environmental theme-packs for primary schools and 6 for Secondary schools were developed and were widely acknowledged by relevant authorities in the Kenyan Educational sector as a best practice in mainstreaming ESD into the curriculum. The Ministry of Environment and NEMA used the Eco-schools programme as a best practice in environmental management and conservation in International

Environmental conferences e.g. Cop 7 at UNEP Nairobi, October 2005. The programme was also used as a Regional Centre of Expertise (RCE) – Greater Nairobi flagship programme to implement ESD (Republic of Kenya 2012).

The Eco-schools programme was further acknowledged by National Environment Management Authority (NEMA) as a good strategy to respond to the needs of ESD in Kenya (National Environment Management Authority 2012) i.e. improving lesson planning for outdoor learning, resource material development, methodologies of ESD delivery i.e. by fostering action learning, project management and problem solving, public awareness campaigns and advocacy skills in environmental conservation and local curriculum development and implementation.

The project was also acknowledged for having contributed to actualising the objectives of Environmental Education strategy for Kenyans (Republic of Kenya 2008). The project provided every person with opportunities to develop the awareness and acquire knowledge, skills, attitudes, values and competences required to take full advantage of the environment. It built the capacity among stakeholders in environmental management and empowered them to actively participate in environmental management for sustainable development. Lastly, it tailored education to address the needs of schools and communities to enable learners and communities to develop a shared vision by addressing natural resources management threats and be involved in the development of learning programmes.

14.4 Eco-Schools Kenya Phase II (2006–2010)

After a successful pilot phase of the Eco-schools, a second phase started in 2006 that ran through to 2010. Five hundred schools participated in the programme. Which targeted rural population in 6 Kenyan provinces, involving an average of 500 girls and boys from 200 primary and 100 secondary schools and 300 local community groups adjacent to the project schools.

The main objectives of the second phase were;

- Strengthen the capacity of KOEE to enable the organization to effectively run the programme on a national scale.
- Promote Eco-Schools on a national scale, in order to enhance school community cooperation on environmental micro project implementation at community level.
- Ensure that the Eco-Schools approach and materials were adopted by the Kenyan Government for use in primary and secondary schools in Kenya.

This second phase coincided with the United Nations Decade of Education for Sustainable Development (DESD) 2005–2014 which saw the giving of an enhanced profile to the central role of education and learning in the common pursuit of sustainable development in the world. The phase therefore laid more emphasis on ESD thrusts of (UNESCO 2014a):

- Improving quality of education: reorientation of teaching and learning processes to make them locally relevant, culturally appropriate, age and gender-sensitive, inclusive of all learners.
- Orientation of education towards sustainable development – advocating for curriculum to accommodate ESD perspectives informed by a critical approach/paradigm to curriculum development as opposed to a technocratic approach. Promoting engagement of students in activities that impart practical skills, knowledge and values/ethics for sustainable development.
- Promoting public understanding and awareness of sustainability: organizing public awareness initiatives to help individual communities and governments to promote sustainability measures, by encouraging people to participate, belong and contribute to collective decision-making on sustainability issues.
- Capacity building: infusing initiatives that enhance all stakeholders seeking to be appropriate, relevant and timely by providing opportunities for knowledge and skills development for all.

14.4.1 Achievements and Lessons Learnt of Phase II

Over 800 schools participated in Phase II, with 250 schools attaining Green Flag status against an initial target of 1500. The lower number was caused by problems with the network partnership approach, which proved more cumbersome than expected. The main weakness of the partnership approach was the underlying assumption that partners had the same goals and would use the same approaches and tools as KOEE.

Through the Programme, KOEE played a notable role in developing the official Kenyan ESD Strategy and established a partnership with Ministry of Environment on promoting Environmental Education and Awareness Initiative. This was to ensure that teachers at teacher training colleges would be trained, and that students proceeding for teaching practices would be targeted within the partnership framework.

In general, the Eco-schools Phase II achievements can be summarised as;

- Established development centres based on school micro-projects on how schools and communities in cooperation could target poverty alleviation on a local scale in 6 regions in Kenya, in collaboration with network partners.
- The micro-project component under the Eco-schools Kenya Programme greatly facilitated environmental awareness at student level. The positive impact at the schools included decreased firewood and water consumption, increased agricultural production, increased food quality and supply, and income generation.
- Through the programme, KOEE played a significant role in advocating for environmental education and for mainstreaming ESD in the curriculum of schools, and for the integration of environmental concerns in national development educational action plans (UNESCO 2011).

- The programme further enhanced policy support for promoting ESD across Kenya. This was evidenced by inclusion of the Eco-schools programme in Kenya's Education for Sustainable Development Strategy as a best practice to be emulated by other sectors which was launched by NEMA in 2008 (Republic of Kenya 2008).

14.5 Eco-Schools and Value-Based Education (2010–2014)

As the Eco-schools Phase II concluded, the Programme introduced a value-based approach to promoting ESD in education as a measure to enhance sustainability. The flagship project was a Faith-based Education for Sustainable Development (FBESD) initiative developed in collaboration with the Alliance of Religions and Conservation (ARC) in 2010. The project aimed at delivering quality education that imparts knowledge, skills, attitudes and values that lead to a holistic development of the learners. The project used faith-based values as instruments for entrenching faith-based values into ESD in schools, while promoting action for the environment with faith as the motivation. Religious leaders (Christians, Muslims and Hindus) played a key role in identifying and mobilizing the schools they sponsor, and also in helping coordinate the programme's pilot phase. A total of 20 schools were involved in the initiative.

The FBESD initiative saw the implementation of projects in biodiversity, agriculture, water, sanitation and hygiene (WASH). The projects improved both the schools' and communities' social, economic and environmental wellbeing. The WASH micro-projects for instance made a difference. Through the WASH micro-projects, schools had a positive impact on enrolment, retention and girls' attendance. Simple interventions such as hand washing with soap helped reduce the risk of diarrhoea, pneumonia and other infectious diseases. The project directly engaged students leading to community adoption of good WASH behaviours and technologies as well as promoting improved health.

14.5.1 *Project Impact*

The project produced a faith-based ESD teacher's toolkit for primary schools that illustrated an approach of solving society's development issues using faith; a context in which God's principles and values are mainstreamed in our day-to-day classroom and out of class learning environments to solve sustainable development issues (poverty) through topics on water, energy, waste, health, agriculture, biodiversity and climate change. The toolkit was launched and endorsed by leaders of the three major faiths that were involved in the process (Christianity, Hinduism and Islam) in 2013. Although the toolkit was developed specifically for the Kenyan context, it has found widespread application in other regions of Sub-Saharan Africa,

with some adaptation to the specific contexts. The toolkit was subsequently approved by the Kenya Institute of Curriculum Development (KICD) as a curriculum supplementary material. The initiative reached over 50 primary and secondary schools in Kenya and culminated in the development of another project.

14.5.2 Case Study of FBESD Project

14.5.2.1 Kirukuma Primary in Eastern Kenya: Construction of Eight Ventilated Improved Pit Latrines

In 2012, MCK Kirukuma Methodist Academy constructed 8 ventilated improved pit (VIP) latrines in order to improve the health, sanitation and hygiene conditions in the school, and the learning environment. The school's inadequate sanitation facilities were a major setback that lowered living standards among both the pupils and teachers. The school did not have enough toilets to support the number of pupils and teachers. Hand washing with soap was not practiced at all as there were no facilities in place. The school depended on River Tana as a source of water. The water was not treated before consumption both at the school and the community level.

The project had several objectives in line with the overall goal. They were to:

- Increase sanitary facilities for both girls and boys from one facility to three.
- Provide three hand washing points to promote hygiene.
- Incorporate faith-based ESD values in the teaching/learning of WASH.
- Use the project as a learning resource for neighbouring schools and community members.

In implementing this project, the school worked with other organisations such as Alliance of Religions and Conservation (ARC) and Kenya Organization for Environmental Education (KOE) (Fig. 14.2).



Fig. 14.2 Old and new latrines at Kirukuma Primary School. (Photos courtesy of Kirukuma Primary School-Kenya taken in August 2012)

14.5.2.1.1 Project Benefits

The project saw the construction of one latrine for boys and two latrines for girls, therefore discouraging sharing of latrines between boys and girls. Two hand washing facilities (using buckets and tippy tap) promoted hygiene. In addition, faith-based ESD values were incorporated in the teaching/learning of WASH and also acted as a demonstration resource for learning by different stakeholders, including local community members. The school head teacher acknowledged that the project had improved the school and community sanitation and hygiene conditions thereby leading to improved learning and living conditions. School and community behaviour on WASH had also been improved courtesy of the value-based approach of the project. The main values promoted were: respect and care for the community of life, ecological integrity, social and economic justice and democracy, nonviolence and peace.

14.5.2.1.2 Challenges

Challenges included; inadequate water for regular cleaning of the toilets, hand washing and cleaning the dusty temporary classrooms, and a continuous supply of soap and towels. In order to address these challenges, various partners provided solutions. The local church offered to provide bars of soap for hand washing while the Eco-school committee provided sanitary towels for girls. Parents provided tissue papers for use in the toilets. Through the project, critical thinking ability was improved especially through the preparation of hand washing facilities by teachers and pupils who worked together. Proper resource management was also instilled among the participants in the project. The project enhanced responsibility, accountability, teamwork and leadership among pupils and teachers. The values of sharing with others and appreciation of the environment were also encouraged.

14.5.3 Lessons Learnt from the Faith-Based Project

There is need for multi-stakeholder collaboration in order to strengthen implementation. This includes involving local government and state actors to create goodwill among the community.

The engagement of local civil society partners, who understand the local cultural dynamics of the beneficiary community reduces instances of conflict in the project cycle, enhances understanding of community, allowing for the adjustment of certain project components to better suits the needs of the community. This also helps to increase confidence and ownership of the project.

It is important to integrate risk analysis and management during project design and planning, in order to ensure successful implementation despite arising risks. For instance, the project was initially meant to be in Garissa and Machakos counties but due to security threats faced in Garissa, Marsabit county was chosen as an alternative location.

14.6 Eco-Schools Kenya Today (2015 to Date)

The Eco-schools Programme in Kenya has grown from 12 pilot schools in 2003 to over 1000 primary and secondary schools in 2018, with over 600 schools having been awarded the green flag. Table 14.1 and Fig. 14.3 below illustrate the distribution of Eco-schools across the country.

Table 14.1 Distribution of Eco-schools in Kenya

Regions	Nairobi region	Nyanza region	Coastal region	Central region	North Eastern region	Eastern region	Western region	Rift Valley region	Total schools
Eco-schools	91	116	26	29	7	31	232	119	651
School %	14%	17.8%	4%	4.5%	1.1%	4.7%	35.6%	18.3%	

Distribution of Eco-schools in Kenya

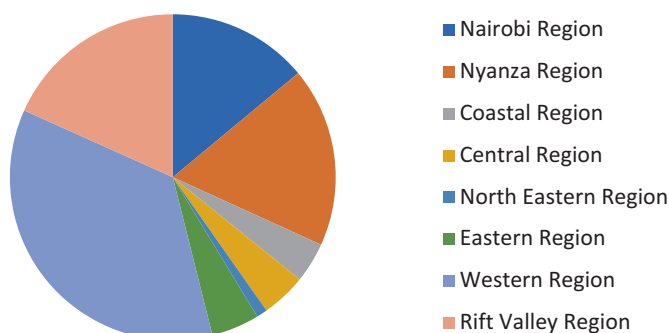


Fig. 14.3 Distribution of Eco-schools in Kenya

14.6.1 Eco-Schools and the Global Action Programme for ESD (2015–2019)

With the advent of the GAP for ESD (2015–2019), KOEE committed to strengthen the capacity of 100,000 educators and trainers and 100,000 non-state actors to become ambassadors for ESD in Kenya and regionally by 2019, through Eco-schools (UNESCO 2014b). This has been achieved through training, development of resource materials on ESD, climate change and food security education, as well as establishing national and regional ESD networks and partnerships. As a way of promoting widespread implementation of the GAP for ESD, the Eco-schools programme focuses on the following priority action areas:

- Improving teaching and learning environments – the promotion of action based learning in schools by encouraging outdoor learning and project based learning, as well as through promoting whole-institution approaches to ESD at all levels and in all educational settings. An example of this is the Litter Less Campaign which has encouraged schools to practice integrated waste management, while using their local waste as resources for learning.
- Strengthening the capacity of educators, trainers and other change agents to become learning facilitators for ESD – through training for primary and secondary school teachers, as well as trainers and facilitators in non-formal and informal education including technical vocational and educational training institutes (TVETs). This is demonstrated through the Faith-based Climate Change Education for Sustainable Development (FBCCESD) project that provided training-of-trainers for teachers, community groups and faith leaders on climate change adaptation strategies based on faith values.
- School-community partnerships have enabled mobilisation of local community groups to support school micro-projects through donations, offering free expert advice and labour, as well as acting as caretakers during holidays.
- Partnerships with government ministries, civil society, media, private sector and development agencies have enabled Eco-schools Kenya to support ESD initiatives across the country.

14.6.2 Eco-Schools and Green Growth (2017 to Date)

The Eco-schools Programme in Kenya is dynamic and has evolved as a strategy to promoting Green Growth – the latest approach to sustainable development. The African Development Bank defines Green Growth as “the promotion and maximization of opportunities from economic growth through building resilience, managing natural assets efficiently and sustainably, including enhancing agricultural productivity, and promoting sustainable infrastructure” (AfDB 2016). Green Growth is closely related to the concept of a Green Economy, spearheaded by United

Nations Environment Programme (UNEP) and framed as: “An economy that results in improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities” (UNEP 2011).

Some of the Eco-schools Projects implemented during this period include Litter Less Campaign and Green Enterprise Development.

14.6.2.1 Litter Less Campaign Project

The Campaign started in Kenya in 2013 as part of the International Eco-schools Litter Less Campaign, sponsored by Wrigley Company Foundation. Its goal is to reduce litter and affect long-term behaviour change among youth. The main objective of the campaign is to raise awareness of the effect of litter on the local environment and wider community, increase student knowledge and practical skills in preventing and managing litter, collaborate with other schools to promote ESD, and influence others by communicating with them through multimedia and other channels. The Campaign has now reached over 40 public and private primary and secondary schools in Nairobi and Kiambu counties. Activities include waste management initiatives tackling various types of waste within and around participating schools; community action days for schools to showcase their work to the surrounding community; and joint communication campaigns by schools through social media platforms to create awareness on issues of waste management.

Key achievements of the project so far include: Increased awareness of the effect of litter and waste on the local environment and wider community by holding community action days in schools; Improved student knowledge and practical skills in preventing and managing litter and waste, as well as using waste as a resource; contribution to poverty alleviation through income generating projects initiated by schools e.g. selling items made from waste and composting waste for organic farming; Healthier school environments for both teachers and students as a result of waste management initiatives; and Enhanced collaboration and partnerships between schools, communities and local governments for improved waste management.

A notable example of a participating Eco-school is Kariobangi South Primary School. The school is faced with waste management challenges given the high population in the surrounding slum environment and many business stalls nearby. Resulting problems include: water borne diseases, loss of aesthetic value due to garbage heaps, poor drainage which encourages mosquito breeding, open sewer drainage and soil contamination. The school has initiated a project where plastic waste from bottle tops and cans are used to make table-mats, baskets, handbags, toys and ashtrays, which are sold for between 1 and 5 USD each (see Fig. 14.4). The project has helped learners gain innovative and entrepreneurial skills through recycling and reuse of solid wastes.



Fig. 14.4 Different items made from bottle tops at Kariobangi South Primary School

Lessons learnt from the Litter Less project include:

- Schools require more support in formulation of project/activity proposals in order to ensure viable projects are developed, and to avoid delays in implementation.
- There is need for flexibility in planning for activities with schools due to sometimes conflicting school calendars.

14.6.2.2 Green Enterprise Development in Schools

KOEE partnered with the Micro-Enterprises Support Programme Trust (MESPT) to implement the Schools Green Challenge (SGC) Project since 2017. The purpose of the project is to help transform schools into models of sustainability for communities through the challenge, while its main objective is to inculcate a greening culture to youth in schools by mentoring and engaging them in hands-on green growth initiatives for sustainability of communities. The project is being implemented in 12 primary Eco-schools from Kwale, Makeni, Embu, Kirinyaga, Bomet and Kisumu Counties. The project is supported by the Royal Danish Embassy in Kenya and the Ministry of Education-Directorate of Policy, Partnerships and East Africa Affairs.

A teacher's guidebook on green enterprise development for schools in Kenya has been developed in consultation with teachers from schools participating in the SGC,

and the Ministry of Education. The guidebook is undergoing evaluation by the Kenya Institute for Curriculum Development (KICD) to approve its use in schools as supplementary learning material. It is anchored in not only the Green Growth agenda, but also promotes competency-based learning. This is in line with Kenya's new curriculum, which seeks to provide flexible education pathways for identifying and nurturing the talents and interests of learners early enough to prepare them for the world of work, career progression and sustainable development (KICD 2017).

Core competencies covered by the guidebook include: Critical thinking, Problem-solving, Creativity, and collaboration. The competency based approach to learning, particularly in the pursuit of a green economy, is seen as critical to ensuring that learners are effective agents of change, and equipped with relevant practical abilities for dealing with current and future sustainability challenges (KOE 2018). The guidebook is intended to help complement and bridge gaps in the existing curriculum support materials, with a view to empowering schools through enterprise development competencies to find innovative solutions to their social, economic and environmental challenges.

Another main output of the project is the establishment of green enterprises in each of the participating schools. A green enterprise is one that has minimal negative impact on the environment, community, society or economy, while maintaining a profit (KOE 2018). Head teachers and selected teachers from the SGC Eco-schools were taken through training on the background and components of green enterprise development (GED), including coming up with a good business case for setting up a green enterprise and writing a business plan. The schools subsequently participated in a competition to show case the most innovative, socially impactful green project/enterprises initiatives. Key judging criteria included innovation and problem solving; commitment; marketing; and community involvement and replication.

Makini School in Kisumu County was declared the winner of the Schools Green Challenge (see Fig. 14.5). The school has an orchard that produces fruits used to supplement the students' meals. The school's tree nursery is tended to by students, serving as a teaching and learning resource. The school practices rabbit keeping for sale and improved traditional poultry keeping for eggs and meat. The school also does greenhouse farming (tomatoes). Additionally, the school practices indigenous vegetable farming using harvested water from an earth dam. The school came first in the competition due to the innovation in using rabbit urine as a pesticide and fertiliser, and empty milk packets as seedbeds for their tree nursery; commitment and ownership shown by students towards the tree nursery; as well as community partnership through the area chief.

Lessons learnt so far during the Schools Green Challenge project include:

- Schools that embrace whole institutional approach and specifically with proactive involvement of the head teacher, board of management and parents exhibited proper management of projects. Therefore the concept of whole institutional approach still needs strengthening for enhanced uptake. Most schools however, prefer to work through clubs as the driving organ of greening initiative.
- Students' engagement in actual implementation of micro-projects is less prominent in private schools compared to the public schools.



Fig. 14.5 Makini School-Kibos receiving their trophy and certificate for 1st place in the SGC competition

- Teachers still require more capacity building on how to use the green micro-projects as teaching and learning resources. However, more awareness is required by schools on existing government policies linking education to sustainable development for enhanced commitment from school management, parents and teachers.
- Successful school green projects require considerable investments in term of finances and human resources.
- For effectiveness of such green competitions, schools need to be judged or evaluated on a new initiative introduced to the school.
- The understanding of the business angle of green projects is still low in schools especially in terms of product/service and market identification. More focussed awareness initiatives on green entrepreneurship for students, teachers and school management is needed for enhanced uptake of the concept.
- There is need for increased sensitization of respective government education officers both at sub-national and national level on sustainable development and green growth for improved political support in implementation of green initiatives at government and school levels.

- There is need for deliberate framework to integrate green issues in school co-curricular activities like sports, music and drama for to increase students understanding and engagement in green initiatives.

14.7 Broader Impact of Eco-Schools on the Development and Implementation of ESD

14.7.1 Advancing Policy

The Eco-schools strategy is a reference point for ESD practice in Kenyan policy papers such as the ESD Policy for Education Sector 2017. The Eco-Schools Programme has also been used as a flagship programme in the Greater Nairobi Regional Centre of Expertise on ESD.

The Climate Change Education for Sustainable Development Project, an off-shoot of the Faith-based Education for Sustainable Development (FBESD) initiative in Eco-schools, led to enhanced participatory policy development at sub-national level. For example, climate proofing of Machakos County Agriculture Development Fund Act to respond to the National Climate Change Policies & Strategies. The Bill is now in Machakos County Assembly awaiting approval.

Successes of the programme in Kenya have influenced the uptake of ESD in other countries in the region. For instance Rwanda invited KOEE to assist with drafting their ESD strategy. The East African Community (EAC) used some of the experiences of the Eco-schools programme in drafting the EAC ESD policy.

14.7.2 Transforming Learning and Training Environments

The Eco-Schools framework provides numerous opportunities to enhance learner-centred education, through contextualization of learning, strengthening school-community interactions/partnerships and enabling active involvement of learners in decision making. School micro-projects and green enterprises have demonstrated income-generating activities that have been replicated by groups/individuals in neighbouring communities. This includes new farming practices such as agroforestry, tree nurseries, poultry production and others. The local community and in particular students have been the beneficiaries e.g. improved lunch programmes and free seedlings. The most important benefit is that they have gained skills and competences which have enabled students and community members to practice sustainable development. Micro-projects have also been used for out-of-classroom learning and cooperation with the local community.

KOEE, through the Eco-schools programme, has spearheaded the development of action learning environmental education supplementary curriculum materials.

The materials target teachers, students and non-formal learners and have proved to be valuable resources which schools can use to address sustainability challenges facing them. They comply with the Kenyan curriculum requirements, with a significant number having been approved for official use in schools by KICD. The materials have also been widely acknowledged by relevant departments in the Education sector. Recent publications include:

- Education for Sustainable Living: A Faith-based Approach to Natural Resource Management and Adaptation to Climate Change: Training Guide for Alternative and Continuing Education (2015).
- Faith-based Education for Sustainable Development: Teacher's Toolkit (2014).
- Climate Change Reporting Guidelines for Journalists (2018).
- Green Enterprise Development: Teacher's Guidebook for Schools in Kenya (2018).

14.7.3 Building Capacities of Educators and Trainers

The programme's approach in Kenya entails carrying out training of trainer sessions for primary and secondary schools, as well as higher level and alternative learning institutions, on pertinent sustainability issues and innovative ways of teaching about them to learners in various contexts. Training emphasises on experiential learning, encouraging teachers and trainers to explore new ways of building the necessary competencies in learning for solving environmental challenges. Over 5000 teachers have been trained and act as Eco-schools ambassadors encouraging other schools to effectively address local environmental problems through action-based learning following the principles of Eco-schools.

Every year approximately 100 teachers are trained on ESD, implementation of the Eco-schools programme, experiential learning approaches, thematic issues (Waste, Water, Health, Agriculture, Energy, and Biodiversity) and project management. The Schools Green Challenge project has enabled the training of 22 teachers on green enterprise development, as well as business planning and management.

14.7.4 Empowering and Mobilizing Youth

Over 250,000 students in Kenya have been sensitised on sustainable development. Young people both in formal and non-formal learning institutions, as well as in the community have been able to access ESD training and hands-on learning through micro-projects implemented in the Eco-schools and related ESD activities. This has built their capacity to respond to their local environmental challenges, while improving livelihoods through income-generation projects.

14.7.5 Accelerating Sustainable Solutions at Local Level

Over 500 schools were established across Kenya as demonstration Eco-schools, and supported to set up income generating micro-projects addressing local environmental problems.

The Eco-schools programme promotes the Climate Change Education for Sustainable Agribusiness Development and Risk management (CCESDAR) strategy, that provides a useful tool to address challenges of poverty, unemployment and food insecurity in Kenya (KOE 2015).

The Eco-Schools programme in Kenya promotes innovations in agriculture that help increase production, add value to products before marketing as well as enhancing action skill-based learning. For instance the program promotes active school gardens for food production using improved farming methods such as organic farming and mulching. This helps increase food production, make savings for the schools and impart practical skills among learners for survival.

Eco-Schools promote alternative livelihoods and creation of jobs e.g. Establishment of modern bee-keeping, agroforestry, commercial tree nurseries in schools and communities as well as value addition. Extension services offered to the community by youth after training creates employment opportunities. Market for packaging materials is also expanded thus boosting income for industry.

Promotion of activities such as dairy farming and vegetable/fruit tree farming in schools and communities improves health of the learners through school feeding programmes, makes savings for the school and generates income through sale of excess produce. Biogas projects using animal waste generates green energy and manure for use in gardens, as well as reducing emission of greenhouse gases into the atmosphere.

Harvesting of rain water for use in irrigation agriculture in the arid and semi arid lands (ASALs) is a green innovation that helps increase food security, create self-employment for the youth as well as check soil erosion through reduced run-off.

Eco-Schools program promotes private-public partnerships (PPPs) thus helping to link learners/trainees to industry and private sector players thus promoting information and resource sharing – which is a key factor in development of a green economy.

14.8 Challenges Facing Eco-Schools in Kenya

Some of the challenges facing the Eco-Schools Programme in Kenya include:

- Inadequate sustainable funding sources to meet the needs of the ever growing demand of schools interested in the programme. Funding has shrunk in recent years with some partners withdrawing due to effects from the global recession.
- Poor ICT infrastructure among some poor rural schools slowing implementation of projects.

- High cost of project implementation, particularly of teaching resource material production.
- It takes a long time to build relationships with partners due to different priorities and bureaucracy, thus slowing down effective project implementation.
- Conflicting school calendars as Eco-schools deals with both local (public/private) and international schools.
- Rigid school calendars that leave limited time for Eco-school activities.
- Inadequate monitoring, evaluation, reporting and learning (MERL) and sustainability framework. This hinders sustainability of some school micro-projects as they need close monitoring.
- Difficulties in uptake of whole institutional framework leading to instances of low cooperation from some school managements. High teacher turnover also affects the implementation of the programme in some schools.
- Inadequate community support in some areas hindering school-community cooperation.
- Inadequate capacity – there is still a problem of proper understanding of the concept of Eco-schools/greening leading to difficulties among some teachers in viewing ESD as a cross-curricular subject with most of them looking at it as an independent/stand-alone subject.

In conclusion, the future of Eco-schools in Kenya looks bright with growing awareness and appreciation for the role of ESD in national development. However, for the movement to have optimal impact there needs to be a concerted effort in addressing the challenges outlined above, in order to facilitate a true shift in attitudes, behaviour and action for sustainability.

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Chapter 15

Green Schools in Mexico and Spain: Trends and Critical Perspective



Edgar J. González-Gaudiano, Pablo Á. Meira-Cartea,
and José M. Gutiérrez-Bastida

Abstract As happened in other parts of the world, the strengthening of the environmental dimension in educational processes in the 1990s had its impact on the promotion of green schools in both Mexico and Spain. They have been promoted for practically all educational levels from primary schools to universities, in the latter through various strategies, among which green campuses stand out. The scope of these programs has also varied. In general, they intend to contribute to the formation of environmental values that promote, through collaborative work, comprehensive environmental management actions to achieve an environmentally responsible citizenship. In recent years there has been a notable boost to the creation of national and international networks of schools and educational centers that share their sustainability projects and collaborate in the generation and transfer of pedagogical approaches and teaching materials. This chapter critically analyzes the development of these actions in Mexico and Spain, as well as their scope and medium and long-term impacts on school education processes and on the movement on education for sustainable development in both countries.

15.1 Introduction

Like similar actions taken in other parts of the world, the introduction of the environmental dimension in the educative process in the 1990s had an impact on fomenting green schools, both in Mexico and in Spain (Perales-Palacios et al. 2014).

E. J. González-Gaudiano (✉)

Universidad Veracruzana, Xalapa-Enríquez, Mexico

e-mail: egonzalezgaudiano@gmail.com; edgagonzalez@uv.mx

P. Á. Meira-Cartea

Universidad de Santiago de Compostela, Santiago de Compostela, Spain

e-mail: pablo.meira@usc.es

J. M. Gutiérrez-Bastida

Ingurugela, Bilbao, Spain

e-mail: josemanu.gutierrez.arroba@gmail.com

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These programs have borne different names, according to the entities promoting them, which range from public and private bodies, to foreign foundations and institutions, as well as to projects operated by NGOs. Among the most common names are green schools, schools Agenda 21, eco-schools and, more recently, sustainable schools or schools for sustainability. They have been promoted practically at all levels and in all types of education, from elementary schools to universities. In the latter, through different strategies, among which some of the most important are green campuses (Gonzalez-Gaudio et al. 2016).

The range of these programs has also been varied. Generally, they aim at contributing to the shaping of environmental values among the population with the objective of fomenting, through collaborative work, global actions of environmental management, all aimed at developing an environmentally responsible citizen base that might contribute with solidarity to the social change required by the situation of planetary emergency. Such programs usually involve the entire educational community which includes students, teachers, heads of family, management and administrative staff. School projects are usually based on the design of strategies and actions in keeping with the problems and characteristics of the educational centers and their environment. Other projects have a narrower range, oriented towards the preservation of common goods through fomenting school vegetable gardens or school production units in order to improve livelihoods based on learning in the garden, as well as to strengthen food safety, nutrition and health in children. The most substantive projects and programs foster the students' protagonism and empowerment, and have a direct impact (more or less successful) on local or regional environmental policies, as well as on promoting social change. In recent years, there has been a considerable growth in the creation of national and international networks of schools that share their sustainability projects and cooperate in creating and transmitting pedagogical approaches and resources.

Although there are activities that have continued throughout the years, many programs, especially those promoted by public entities and organizations, have been vulnerable in the face of governmental policies, as well as of the changing priorities of both the educational and the environmental sector due to changes in administration. This chapter offers a critical analysis of the development of these activities in Mexico and in Spain, as well as of their range and impact in the medium and long term on the school educational processes, and plots some possible courses of action for the future.

15.2 Green Schools in Mexico

As in other countries, in Mexico fomenting greener schools has raised interest. Although initially the International Environmental Education Program (IEEP, UNEP-UNESCO 1975–1995) had focused a great deal on the strengthening of academic tasks (i.e., curriculum, teacher training, extracurricular activities), in Mexico this did not have a great effect given that the Secretariat of Public Education (in

Spanish: Secretaría de Educación Pública, SEP), the organ officially responsible for regulating the activity of public schools, ignored such recommendations. It was the Secretariat of Environment, Natural Resources and Fisheries (in Spanish: Secretaría de Medio Ambiente, Recursos Naturales y Pesca, SEMARNAP) who picked up the banner of change and, especially during the second half of the nineties, promoted the acceptance of such commitments by the SEP.

The SEMARNAP was created in 1995, thus materializing for the first time in ministerial form a set of aspirations and social struggles in order to promote environment to the level of national policies. This achievement was also the result of the development of a complex network of global, regional and national agreements, but also of commitments taken on the basis of commercial agreements, of the expansion of information and communication technologies, as well as of the new context of exchange that is a result of economic, cultural and political globalization, among other aspects.

Together with SEMARNAP, the Center for Training and Education for Sustainable Development (in Spanish: Centro de Educación y Capacitación para el Desarrollo Sustentable – CECADESU) was created, and soon became the axis of environmental advocacy. This has become ever more evident since the establishment in 1983 of the first department of Environmental Education in the federal government, although within the area of environmental management. A problem stemming from this institutional affiliation is that education is considered an instrument of environmental management; from this point of view, without intrinsic objectives, the function of education is to contribute to achieving the ecological conservation of the territory and environmental quality, among other aims.

Despite jurisdiction and conceptual limitations, CECADESU developed an ambitious program that also included strengthening educational processes at a school level. To this end, agreements of institutional coordination were signed between the two sectors of the federal government (environmental and educational) in order to carry out different activities, such as updating school curricula, strengthening textbooks, and organizing primary teacher training courses. This process was not continuous, as the changes in administrative staff in the educational sector made it necessary to frequently reformulate the criteria and scope of joint projects. These agreements were renewed between 1994 and 2012, when they were finally terminated.

During these 18 years, important programs were initiated, such as Clean Schools between 2000 and 2006, program which supported public schools that developed environmental protection actions. Schools' participation in the program was voluntary and their main focus was managing the solid waste they produced. In 2011, the Secretariat of Environment and Natural Resources (in Spanish: Secretaría de Medio Ambiente y Recursos Naturales – SEMARNAT), through the Center for Training and Education for Sustainable Development (CECADESU) launched a pilot test for the environmental certification of schools (Green Schools Program), but with the change in federal government in 2012 this program was shut down without an evaluation of its first results. This has been the most global governmental proposal that fostered school environmental management and could have contributed to a change

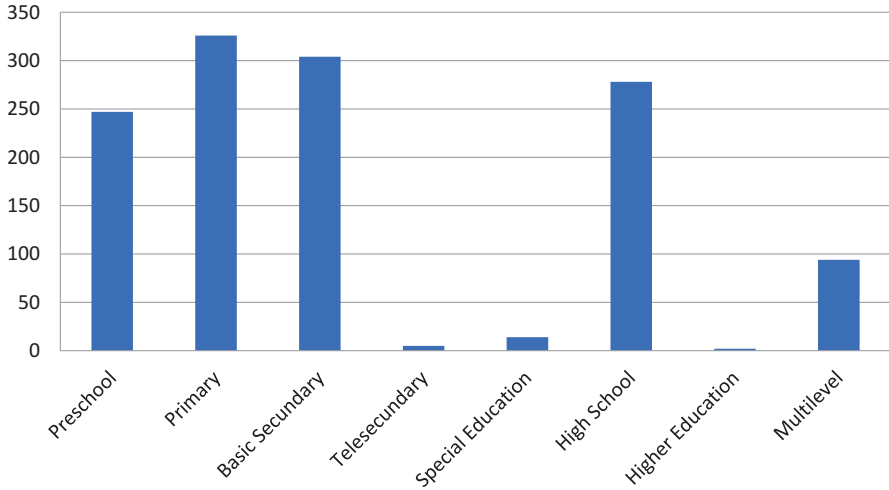


Fig. 15.1 Schools certified as green by educational level in Mexico (2013). (Source: Prepared by the authors, with 2013 data provided by Teresita Maldonado Salazar)

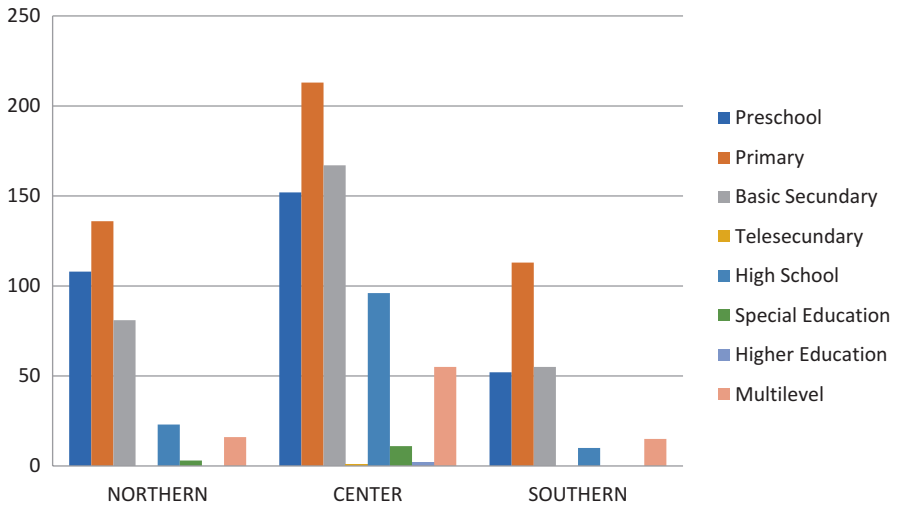


Fig. 15.2 Certified green schools by region in Mexico (2013). (Source: Prepared by the authors, with 2013 data provided by Teresita Maldonado Salazar)

in regular school routines; unfortunately, it was launched when the term of the federal administration was close to coming to an end, so there was no time for it to be adopted by a larger number of educational units. Despite this, the program certified more than 1200 schools, though there has been no further monitoring in order to know how many continue work on their own.

Figures 15.1 and 15.2 show that most schools are grouped together at the level of primary and secondary education. Although the program was not aimed at universities, a small number of private institutions wanted to be certified.

Participation in the Green Schools Program was voluntary. In this program, schools formed an environmental committee, made a diagnostic of their environmental situation, designed an action plan to respond interests and problems identified in the diagnostic, and carried out activities of their own proposal. On the basis of their achievements, CECADESU issued them a certification on four levels, in the view of consolidating a permanent program that might serve as an example of leadership and good practices for other schools. Schools organized activities in different areas, such as: primary teacher training, curricular and extracurricular pedagogical programs, appropriate management of solid waste produced by the school, water and energy-saving activities, as well as activities for environmental improvement in the community, with the participation of local families, authorities and NGOs, addresses to establishing and maintaining green areas in the school area of influence, recyclable material collection campaigns and water leak prevention programs, among others (CECADESU 2011).

The Green Schools Program contributed to strengthening a large number of isolated activities that had been carried out in schools for some time, fomented by the initiative of primary school teachers or directors, both in public, and in private institutions. These experiences have now been adopted by a larger number of schools, as well as by other educational levels and forms, ranging from preschool units to universities, forming networks. Thus, it is possible to encounter a very diverse range of experiences denominated green, environmental, ecologic, sustainable and even self-sustainable (sic), usually without a clear definition of the reason for their conceptual choice. In contrast to Spain and other countries, the denomination School Agenda 21 has practically had no use in Mexico.

These school experiences have been promoted by local or State governmental institutions, resulting in their support being vulnerable to changes in administration, but most are fomented by non-governmental organizations and groups of individuals organized around nonprofit projects, some of which supported by companies, such as Coca-Cola Foundation or ADO Foundation. These do not tend to be programs that undergo periodic evaluation, and their success indicator tend to consist of their number of participants. Some examples of the diversity of such experiences are:

- The Network of Schools for Education and Environmental Awareness (in Spanish: Reeduca), supported by an NGO, focuses on fomenting the exchange of proposals on specific environmental actions and creating a connection between educational centers. This project was established in 2009, when it only included 9 schools; now more than 300 schools, both public and private, are a part of this network. This program includes from kindergartens to universities. Reeduca has organized ten Schools for Sustainability encounters, built around different central axes ranging from consumption to biodiversity and waste. The activity of the Network is available at <https://www.reeducamexico.org/conoce-reeduca>.

- The Safe, Healthy and Sustainable School program is part of the Non-Formal Education programs of the Department of Education of the State of Nuevo León. It was established in 2006 with the objective of fomenting awareness on health, safety and environment issues within the school community and in families. It is based on carrying out a diagnostic in order to determine the actions that need to be accomplished, coordinated by a Technical Council integrated by three Subcommittees for each school: Health, Safety, and Sustainability. These subcommittees carry out the diagnostic and plan activities in the three areas with the support of a guidebook. A monthly report is issued on the activities carried out (De León Rodríguez and Infante Bonfiglio 2014).
- The Sustainable Schools Network is a project established in 2008 on the basis of a participative methodology of school sustainability education and management, with a view to supporting public and private primary schools in the States of Mexico, Morelos and Michoacán. The main interests of this project are solid waste, responsible consumption, vegetable gardens and healthy nutrition. Their activity is available at <http://fundacionflorycanto.org/escuela-sustentable/escuelas-participantes/>
- The Eco-Schools Program (Network) promotes educational processes addressed to the educational community in general, through teacher training, establishing eco-audit for environmental improvement and developing educational resources, addressed to all educational levels, from pre-basic to secondary education. It offers certification to educational centers based on the ISO 14000 standard. Apart from Mexico, this program has been implemented in Bolivia and Peru. Its activities are available at <https://www.fondoverde.org/soluciones/programas-internacionales/programa-ecoescuelas>.
- Finally, UNESCO Associated Schools' Network (ASPnet; in Spanish: redPEA), operating in numerous countries, works in support of international understanding, peace, intercultural dialogue, quality education in practice, but also education for sustainable development, and, more recently, with the help of the Japanese government, is carrying out a pilot project on climate change education. In Mexico, more than 600 schools from 27 States are members of this network. Their activity is available at https://aspnet.unesco.org/es-es/Paginas/Acerca_de_la_red.aspx.

15.3 “Green Schools” in Spain

In Spain, the end of the UNESCO-UNEP International Environmental Education Programme (IEEP) coincided with two key references for the understanding of the institutionalization of EE (environmental education) in the national school system. Firstly, the Organic General Law of the Educational System (in Spanish: LOGSE 1990) was in full development. In its preamble, Article 2, the Organic Law established the following educational principles, among others: “the relationship with the social, economic, and cultural context” and “education for the respect and defense

of the environment". To this end it is recommendable to "foment the implication of educational centers in the environmental problems of their context and of the rest of humanity" (MOPU 1988, 26). Nevertheless, this perspective favoring the 'greening' of school centers – a concept which is not used throughout the entire document - is diluted to a constructivist model of learning-teaching that gives more importance to individual learning than to its social and community dimension.

Partly taking into account these recommendations, the LOGSE introduces two referential innovations. On the one hand, social and ecological contents, traditionally divided into disciplines, are unified in the Natural, Cultural, and Social Environment Subject Area. On the other, Environmental Education is identified as one of the "cross-cutting issues", understood as a topic that references socially relevant contents that, through their complex and transdisciplinary nature, cannot be assigned to a certain curricular area, but rather must be addresses in different areas with a view to fomenting comprehensive training.

Secondly, in the third Spanish Conference on Environmental Education (Pamplona 1998) the *White Paper on Environmental Education in Spain* (1999) was presented. With reference to formal education, this document proposes as objective "Ensuring a real presence at the level of the educational system of a comprehensive, global, permanent model of Environmental Education, within the framework of values education", in concordance with the interpretation of school Environmental Education established in the LOGSE (MOPU 1999).

The expectations stirred by these changes in school Environmental Education did not achieve their full potential for different causes: insufficient public inversion in the development of the educational reform, lack of commitment on the part of the different agents involved in EE, insufficient teacher training, lack of coordination between educational and environmental administrations, and the rejection of the LOGSE on the part of the most conservative areas of society in the full scope of their positions. Nevertheless, the development of EE as a cross-cutting area was unbalanced as a direct result of the decentralized nature of the Spanish Educational System, where a large part of education authority has been transferred to the Autonomous Regions. This circumstance allowed for the local or regional administrations of some Autonomous Regions (Catalonia, Basque Country, Andalusia, etc.) to develop more ambitious EE activities, including programs in support of the "greening" of school centers. Nevertheless, in general lines, we might say that the LOGSE, rather than being committed to the greening of educational centers in their interaction with their communities, focused on the greening of the curriculum. As already shown, this bias was influenced by the adoption of a psycho-constructivist teaching-learning model, where the social and environmental dimensions of the educational act were a secondary consideration (Meira 1993). On the other hand, the *White Paper on Environmental Education in Spain* gradually became less relevant as an institutional framework of reference, and its recommendations had a limited impact on schools. It can be said that in this stage the focus was on the greening of the curriculum, rather than on the development of school projects that might combine curriculum aspects with others connected to an environmentally

cohesive management of the centers and its projection within the school community, as well as in the respective local community.

Despite the inconsistencies in the pedagogical and EE model structured by the LOGSE, Spanish schools experienced a certain environmental effervescence in the 1990s. The echoes of the 1992 United Nations Conference on Environment and Development (Rio Summit) channeled many of the efforts that teachers, individually or in small groups, were integrating into their educational centers, often without institutional support. This way, the eco-auditing processes that aim to involve the entire educational community extend throughout the academic world, and the Eco-Schools Program, promoted by the Foundation for Environmental Education, was successful in some centers concerned about the role of the educational system in the face of the eco-social crisis.

In 2002, the Johannesburg Summit proposed integrating sustainable development into education systems at all levels in order to promote the role of education as a key agent of change and recommended promoting a decade of sustainable development education to start in 2005 (ONU 2002). The possibility that the Government of Spain might assume the implications of this commitment was cut short in 2006, when a new Organic Law of Education (in Spanish: LOE) appeared. Said Law, while maintaining the generic postulates of the LOGSE, proceeded to suppress cross-cutting issues. With the LOE, a curricular approach based on educational competences was adopted. The subject area of Education for Citizenship and Human Rights emerged as a possibility to include the EE in the curriculum, but this sparked social contestation from the most conservative social and political sectors.

However, in this context, pursuing the fact that local administrations developed their commitments adopted at the 1992 Rio Summit with the Aalborg Charter and the Local Agenda 21, many environmental education programs adapted to the new times by seeking synergies with these processes, mainly through adapting the Agenda 21 model to the school environment. The programs that followed this model no longer only involved the school institution, but also its educational community, including local administration, and worked towards the sustainability of the educational center, the community and the municipality. These projects addressed both ecological and social issues, in which the students' participation and protagonism became key elements.

The programs continued to develop under different names and with different degrees of involvement and support from local authorities, depending on their commitment to the Local Agenda 21. In some cases, it was non-existent, and eco-audits and eco-school processes continued to be developed. In others, the School Agenda 21 became an important part of the development of the Local Agenda 21. In between these extremes, a wide range of programs and projects of different ambitions were developed.

The financial crisis of 2007 meant the drastic reduction in the supply of environmental education centers, programs and public aid to EE in general, whose existence was important for the initiatives developed in the school framework. Even so, many centers continue carrying out actions in favor of sustainability, substituting real visits for virtual activities and for information searches on the Internet. The use

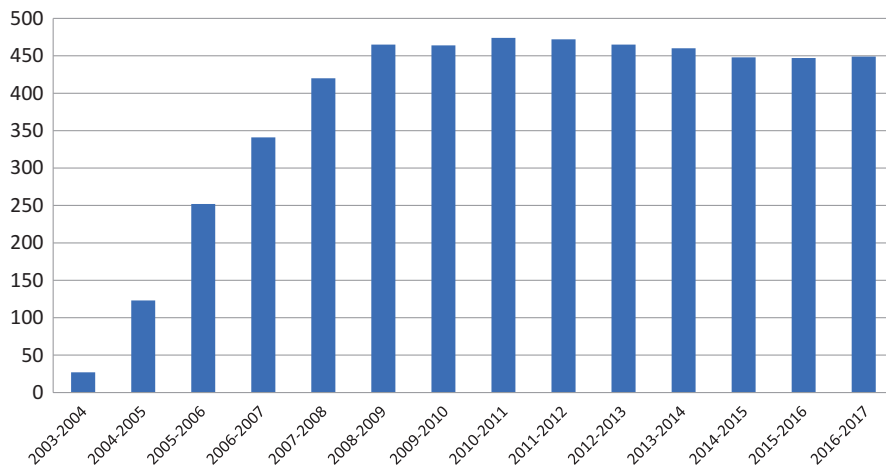


Fig. 15.3 Evolution of the number of centers in the Basque Country that have adopted School Agenda 21 since its creation. (Source: Ingurugela 2017)

of new technologies mitigated, in part, the scarcity of resources for carrying out field trips and activities in specialized EE centers. Furthermore, through the creation of webs and blogs run by the students themselves, the new technologies helped give voice to the schools in the face of eco-social issues.

In 2013, the Organic Law for the Improvement of Educational Quality (in Spanish: LOMCE) was passed, which deepened the educational regression initiated with the LOE. The new Law divided the social and natural sciences into different areas, while Education for Citizenship and Human Rights, which offered curricular space and time for EE, disappeared.

Spain has been a member of the Foundation for Environmental Education's (FEE) Eco-Schools international program since 1996. Currently, there are 549 Spanish schools in the network, involving 12,110 teachers and 14,4075 students. The Andalusian Eco-schools Network has the largest State involvement: 346 educational centers, more than 9000 teachers and some 100,000 students (Junta de Andalucía 2015). This network is part of ALDEA, the Environmental Education program of Andalusia, with a trajectory of more than 25 years, and that in the school year 2015/2016 included 2445 educational centers, 37,110 teachers and 441,748 students (Junta de Andalucía 2016).

At the level of the Spanish State, the relative decentralization that allows territorial organization in autonomous regions has facilitated in some of these regions the development of specific "green school" educational programs that have been able to overcome the combined impacts on the education system of the crisis and the various educational reforms. This is the case of the Government of the Basque Country, through the School Agenda 21 in this autonomous community. The network of public facilities responsible for moving this experience forward was created in 1989 under the name of CEIDA (Centers for Education and Environmental Didactic

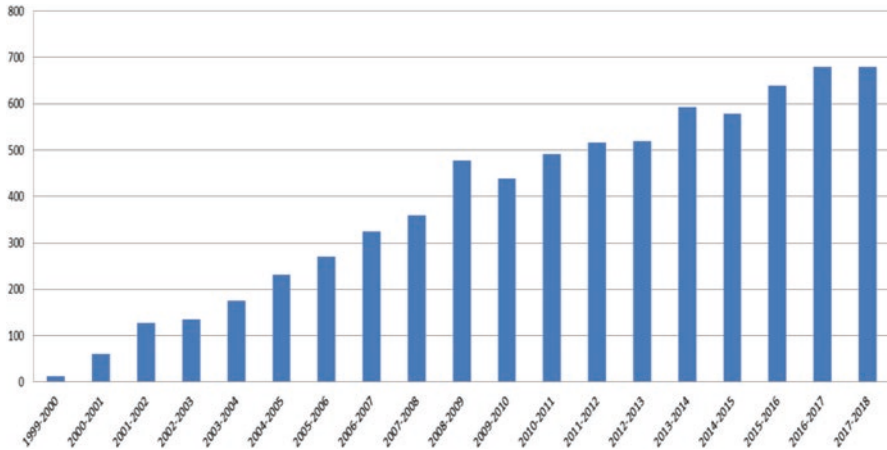


Fig. 15.4 Evolution of the number of centres in Catalonia's Escoles Verdes program. (Source: Prepared by the authors on the basis of data from the Department of Territory and Sustainability 2018)

Research). This network, which changed its name to Ingurugela in 2005¹ forms a platform in which educational and environmental administrations collaborate to promote Environmental Education in the regional education system through training, research, advice, preparation of teaching resources and awareness campaigns. The School Agenda 21 program began in the 2003–2004 academic year, with the participation of 27 compulsory education centers, and reached its peak of participation in the 2010–2011 academic year, with 474 centers (see Fig. 15.3) and later maintained a steady number of members despite the crisis. This evolution has meant moving from 8330 students of primary education and compulsory secondary education in 2003–2004, to 229,134 students in the 2016–2017 academic year, covering 64% of the schools in the region (Ingurugela 2017). In addition to training and advice, the program provides direct aid to the centers involved, namely 700,000 euros per year (having reached 1,100,000 euros before the crisis).

Another Spanish region that has been groundbreaking in promoting Environmental Education in its centers is Catalonia, as reflected in Fig. 15.4 with data from the Escoles Verdes program. Created in 1998, this program is promoted by the Department of Territory and Sustainability in coordination with the Departament d'Ensenyament, which provides training, material resources and advice.

Within Catalonia, it is worth mentioning Barcelona, where the Escoles + Sostenibles program (previously School Agenda 21) has had a great success with 352 centers involved, which represented 37% of the total (see Fig. 15.5). The program also offers training, material resources and advice.

In parallel with these developments, faced with the difficulties that arise from the official curricular framework, in the school environment, projects evolved seeking

¹Information on the history and activity of the School Agenda 21 in Basque Country is available at: <http://www.euskadi.eus/centros-ingurugela/web01-a2inghez/es/>

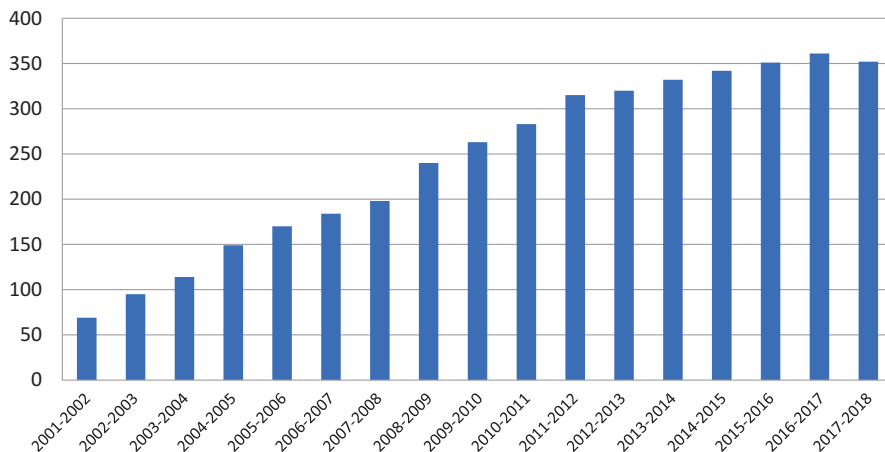


Fig. 15.5 Evolution of the number of centers of the Escoles+Sostenibles program (previously called School Agenda 21) of Barcelona. (Source: Prepared by the authors on the basis of data from the Secretary of Barcelona Escoles+Sostenibles (2018))

new approaches, scenarios, and synergies through networking between primary and secondary schools that had turned environmental problems into axis of their social and educational commitment. One of the first networks to be set up in Spain is the Xarxa d'escoles per a la Sostenibilitat de Catalunya (XESC, Catalanian Network of Schools for Sustainability). Today, it includes networks of schools in 17 municipalities, with 1363 educational centers, which represents 28% of the total of the Catalan educational network.

The creation of the XESC was the seed of ESenRED (Schools towards Sustainability in the Network, esenred.blogspot.com), the network of non-university sustainable educational centers promoted by public administrations throughout the Spanish State (autonomous communities, town halls or councils). ESenRED is a network that encourages meeting and exchange between the different networks of actions, resources, materials and ideas; promotes reflection, evaluation and innovation; develops common or shared projects that seek to improve the students' competency-based learning, through their protagonism, as well as that of the teaching professional training (4 symposia for teachers have already been organized); and establishes relations and common projects with other international networks of schools towards sustainability. Currently, it brings together the networks that appear in Table 15.1.

In its common projects, ESenRED promotes the International Youth Conference (Confint), a process that seeks to empower young people for themselves, their community and in face of the global eco-social crisis (Gutiérrez Bastida 2014). It is based on principles such as “the young learn with the young”, “one generation learns with another” and “the young choose the young”, and on levels of development such as school, regional, state, European and international. Confint is based on the concept of responsibility, offers absolute prominence to those who learn under

Table 15.1 ESenRED Networks, with data on the number of centers, teachers and students

Autonomous Region or Province	Network	N° Centers	N° Teachers	N° Students
Albacete	Agenda 21 schools (Agenda 21 escolar)	39	1112	11.482
Andalucía	Andalusian Ecoschools network (Red Andaluza de Ecoescuelas)	310	8.224	96.202
Canarias	RedEcos	198	6.300	95.000
Cataluña	XESC	1.356	39.657	466.898
Illes Balears	Eco-environmental Centers (Centres Ecoambientals)	150	–	72.411
La Rioja	Centers towards sustainability (Centros hacia la Sostenibilidad)	22	222	9.462
Madrid (municipality)	Network educate today for a more sustainable Madrid (Red Educar hoy por un Madrid más Sostenible)	114	2.324	69.724
Madrid (autonomous community)	Network of sustainable schools of Community of Madrid (Red de Escuelas Sostenibles de la Comunidad de Madrid)	36	276	5.800
Málaga	Agenda 21 schools (Agenda 21 escolar)	7	–	8.000
Murcia	ESenRED	33	265	5.000
Navarra	Network of sustainable schools of Navarra (Red de Escuelas Sostenibles de Navarra)	56	391	27.108
País Vasco	IRAES-schools toward sustainability network (IRAES-red de Escuelas hacia la Sostenibilidad)	443	18.903	229.322
Palencia	Schools for sustainability (Escuelas Para la Sostenibilidad)	14	258	2.630
Total		2.778	77.932	1.099.039

Freire's educational principles, and brings together commitment with social and political action, leading to the presentation of conclusions, commitments and proposals before the corresponding authorities at each level. In 2018 the fourth State Confint (Albacete) and the third European Confint (Lisbon) were held.

In recent years, we can find a diversity of projects, networks, and regional, state or international programs. Rare is the center that does not have any action protocol to reduce the consumption of paper, water or energy, or for the collection of waste; there are many who have a school vegetable garden as an educational space; there are quite a few who work with advertising, responsible consumption, noise, healthy and sustainable food, and campaigns to reduce consumption of palm oil, fast food, and over-sweetened soft drinks. Issues such as the ecological footprint, climate change, ecological debt or loss of biodiversity, as well as major international agreements such as the Paris Agreement or the UN Sustainable Development Goals by 2030, have entered the classroom. There are many centers that organize solidarity

markets to send funds or necessary resources to the Food Bank, to the Sahara or to impoverished countries.

After the financial crisis, environmental education centers once more receive massive numbers of visits from schools. Likewise, there is an increase in recognition for centers that demonstrate quality in their work towards sustainability (certificates, flags, badges, etc.). Also, an increase in the educational offer and of interest on the part of teachers (given the increasing relevance of this problem) is noticeable.

15.4 Green Schools and Education for Sustainable Development

Neither in Mexico, nor in Spain has the concept of education for sustainable development had a great impact. However, as the names of the different programs mentioned show, the concept of environmental education tends to be associated with “sustainability”. In general, there is more focus on sustainability or on a culture of sustainability, than on sustainable development. This has been both a result of the debate on the concept of ESD that took place over the first decade of the century, and of the fact that the process of integrating environmental education in these countries has generated an important political and pedagogic capital that might have been underappreciated should one term simply replace the other. Cultural changes take time.

As shown in Fig. 15.6, not even on a global level has the concept of “Education for Sustainable Development” become as relevant as the concepts of “Environmental Education” or “Educación Ambiental” in the framework of a comparative analysis of the evolution of searches for these three terms. If this analysis carried out with the

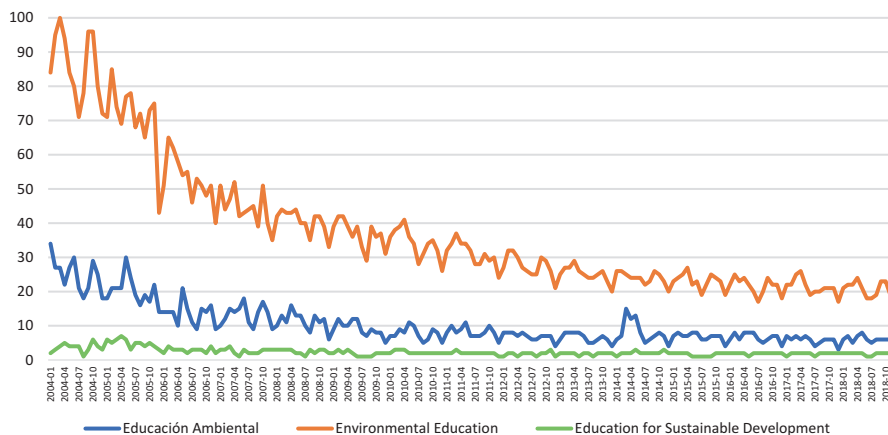


Fig. 15.6 Relative importance of Google searches using the key words “Environmental Education”, “Educación Ambiental” y “Education for Sustainable Development” (worldwide): 01-2004 to 11-2018. (Prepared by the authors using the Google Trends tool)

Google Trends tool is reduced to the searches performed in Spain or Mexico, the concept of (Sp) “Educación para el Desarrollo Sostenible” (“Education for Sustainable Development”) yields a completely negative result. From our point of view, these data show the low degree of relevance and the limited penetration that the discourse of Education for Sustainable Development has had in Latin American countries.

Given this scenario, from the point of view of the educational system, what is the reason for the lack of promotion of environmental education when it is more necessary than ever? It is true that the evolution of environmental education may have at a certain point stagnated due to focusing on issues and perspectives that proved to be limited given the complexity of present challenges. Sustainability was then seen as a promise in order to make the fundamental change of perspective needed. In practice though, this process has not been entirely successful, at least not in the region we, the authors, come from. It has been like a sort of palimpsest where ESD has tried to write over the institutional, and to some respect also the conceptual, platform built by EE over the course of three decades. Actually, we note that in the Latin American countries where ESD has had greater impact, such as Colombia, basically the same EE programs and projects are being fomented, only that, now, on behalf of ESD.

It is certain that many of the great challenges we are faced with, and that we will be faced with on a larger scale over the course of this century, such as climate change, cannot be correctly defined by solely using a reductionist environmental approach. Nevertheless, they have an undeniable environmental background. Subsuming the environmental dimension of these challenges to the concept of sustainability is to many unconvincing, thus the need to adopt other related concepts. Therefore, over the course of these years the green schools movement has not only reactivated many environmental education programs that had suffered cuts in funding, but also it has strengthened their approaches by focusing on building eco-citizenship (Sauvé 2014; Sauvé and Asselin 2017). Nevertheless, this process supporting green schools has been subjected to important restrictions and limitations of different kinds and scopes, as we shall see in the next section.

15.5 Critical Analysis

The response of Mexico and Spain to the planetary emergency situation faced by the living systems of the planet, from the perspective of formal Environmental Education, has not had the required impetus, nor the desired results. The capacity of Environmental Education, in general, and school EE, in particular, has been very limited for various reasons.

The first, perhaps, lies in the very essence of education. As affirmed by Victoria Camps (2011), “sometimes it is difficult to believe that education is useful because the results are very long-term and are rarely verifiable” (p. 118). Education is a process that can bear fruit in the long term, when a specific situation or context

awakens knowledge that had laid dormant for some time. Clear examples are the response of an important sector of the population to a catastrophe such as the sinking of the Prestige tanker and the pollution of the Galician coasts at the beginning of this century (Meira 2005), and the social mobilization against the Caballo Blanco open-cut mining project in Veracruz, Mexico, with the result that communities in several municipalities have declared themselves free from toxic mining (Diario de Xalapa 2018). Therefore, it is difficult to measure the real impact of the processes of Environmental Education in compulsory education.

The school institutional context can be a great obstacle for Environmental Education. The systemic characteristics and complexity of the global eco-social crisis tend to minimize the efforts of schools to incorporate the culture of sustainability into their educational project. Likewise, they hinder the perception of their usefulness, and the positive added effects that are actually generated at different scales, from local to global. Through Environmental Education, students may well learn in the classroom values and attitudes related to solidarity, responsible consumption and healthy eating, while upon leaving class they encounter competitiveness, consumerism or fast food abounding in excess sugars and fats. Through the colonization of subjectivity, from childhood to adulthood, by using the tools of marketing and advertising, the market creates artificial needs and sets up lifestyles difficult to manage.

In addition, financial crises and management changes often directly affect environmental programs, including those that promote environmental education, so they are the first to be removed from government initiatives and lose importance among the priorities of the political agenda.

On the other hand, there are also those who think that the short history of Environmental Education is part of the general educational crisis, manifested in the different reforms of the education system that occurred in Mexico and Spain – and in many more countries – in the last decades, tending to put the school apparatus at the service of the demands and needs of the market, which coincide less and less with the demands and needs of human societies and with the objective environmental conditions in which these should be met.

Governments and public administrations congratulate themselves for signing international agreements and treaties in favor of Environmental Education and show their willingness to contribute to sustainability. However, only on rare occasions do these adhesions become commitments with real budgets. On the contrary: in more than one occasion, they turn out to be obstacles to their development. As has happened in recent decades, both in Mexico and in Spain, the different changes in government have resulted in new objectives, different laws, changing civil service, etc., and even new curricula. If a government has tried to commit itself to Environmental Education, its successor tends to dismantle the attempts of the previous one.

In this context, multinational companies and financial institutions increasingly invest in sweetened, superficial and uncritical Environmental Education programs that promote generalized blame, changes in individual habits, and cosmetic modifications in the socioeconomic system when these allow for the imperatives of growth

and the generation of benefits. Environmental Education on the issue of waste offers multiple examples of a garbage pedagogy perfectly integrated into the dominant model of production and consumption. The socio-ecological transition that might offer hope to overcome the leading to collapse is not included in the institutional school agenda.

However, the relative autonomy of school institutions also provides elements of critical analysis, conflict and contradiction. One of the main reasons for the limited development of Environmental Education is found in the way schools are organized. Primary schools, secondary schools, and high schools maintain an obsolete organization and functioning system, based on a nineteenth century conception, which is unable to address educational innovations, in general, and Environmental Education, in particular. The Environmental Education programs require new structures (e.g., environmental committees) that open participation to all levels of the educational community, but clash with the models of school organization still prevailing. The organization of assemblies, debates or, simply, simulation games requires a flexibility in the organization of subjects, spaces, groups, and schedules that hardly is understood within the confines of the school.

Furthermore, teacher training is far from adequate. Although it is true that the offer has increased ostensibly, it is also true that the vast majority of teachers suffer from a lack of knowledge about environmental issues that might help to better fit Environmental Education into the curriculum.

On the other hand, school networks, mainly, are centralized networks where communication, proposals and monitoring arise between the node and each center of the network rather than in the form of a mesh, between different centers or networks among themselves.

Finally, formal environmental education has focused more on raising awareness, acquiring habits, and aesthetic aspects, than on empowerment, reflection-action processes, or ethical and political-social reasoning. Over the years, the level of school activism has not been overcome, and learning to think has been insufficiently encouraged, as there is little reflection that critically links curricular praxis with the conceptions of society and its relations with the environment.

Looking to the future, focusing on the school environment, mechanisms should be established so that governments might comply with and develop the agreements on Environmental Education they have signed, in the manner of what is being done with sustainable development goals. And this, especially, at the level of local administrations, since a context striving for sustainability would be a great ally for Environmental Education in educational centers.

Within this environment, there are social agents, associations, NGOs, etc. with which schools should establish connections and create networks between unequal members. These agents offer new possibilities of knowledge and growth, of projects linked to the near reality, of innovative relationships that allow access to other social actors working for sustainability and social change. It is the moment of networks, networks of schools, networks of centers and social agents, networks of networks, etc. In networks there is the collaboration, the complementation, the community articulation that enriches the work of each agent insofar as one collaborates with

others in a stable and systematic way, sharing leadership and resources, coordinating efforts and actions, or encouraging dialogue and agreement. In networks, the positive overall effect of local school initiatives and their added value, both objective and subjective, can be made visible.

In such a process, the university is a key agent. In this respect, on the one hand, it is essential to increase research in Environmental Education, research merged with action, to improve processes, build solid theoretical foundations and exemplify sustainable educational action. On the other hand, collaboration between universities and schools is essential so that actions taken at school level might benefit from follow-up, evaluation and proposals for improvement in the work of educating in and for sustainability through research. Schools can also be a good laboratory for universities, so the synergies that can be generated in the future will be of great value (Benayas et al. 2017).

However, there is a great deal of room for improvement in the school itself. Firstly, Environmental Education projects should not be a complement or a subsidiary addition to curricular activity. On the contrary, at first, these developments should be a part of the centers' educational projects, their aims and objectives. It should be remembered that the Environmental Education movement was born in the 1960s and 1970s with the aspiration of being a catalyst for educational innovation, and not just another issue or area of the school curriculum. In a second moment, Environmental Education can become an integrating element of the educational project of the center, since its ethical and socio-cultural approach, its complexity and its educational and administrative extension allow to establish the bases, the personality and the lines of action of an educational center. A school will be more involved with sustainability, with the eco-social crisis and with social change if its philosophical pillars and its daily actions are framed by the ethical principles and the aims of Environmental Education.

The centers that follow these lines of action must be acknowledged and socially prestigious. A symbolic acknowledgement that, achieved with effort and through a system of evaluation and rigorous certification and guarantees, would involve matching the work accomplished, rekindling the motivation of the educational community, and establishing models of action consistent with environmental education and sustainability.

It is important that educational administrations offer the necessary resources and the organizational and curricular flexibility required for the optimal development of Environmental Education in schools. Without compromising on the safety of people, it is important to open flexible spaces for grouping together students, schedules, protocols for field trips, etc.

The school establishment must be a model of sustainability, its spaces must offer an image of commitment, and the management of resources must be in line with this. The consumption of water, energy or consumables, the arrangement of the playground and the entrance, the corridors and classrooms, the reception of new students, the management of waste, etc., all must respond to values of sustainability, solidarity and care. All this will make sense if this management is connected with the development of skills and personal development of the students. It is pointless

(from an educational point of view) that the management of a school should establish an environmental management system, if it is not linked to research, to the questioning of reality, to the critical construction of knowledge and to the formation of attitudes and alternative actions on the part of the students.

In this context, the definition of eco-social or sustainability competencies that students must achieve, both in primary and secondary education, cannot be postponed. It is necessary to specify and categorize these competencies: what skills to develop and what type of situations students should be able to solve or overcome.

All this must go hand in hand with learning to think, to reflect and to act, to offer students spaces of protagonism, where they can face real situations in which their contributions are taken into account; in short, to propose learning contexts that help students to empower themselves and their community, and that also help them generate and experience alternative public spheres that allow them to experience that another world is possible.

It is clear that we must continue working on traditional issues such as water, waste, recycling, school vegetable gardens or energy. However, it is important that these topics form part of broader and more complex issues that make visible the eco-social crisis, its structural causes and consequences that identify the role of the current human civilization in them, and the need for change (Gutiérrez Bastida 2018). Therefore, it is essential to work on climate change, food sovereignty, loss of biodiversity, capitalism, circular or spiral economy, ecological footprint, vulnerability, heteropatriarchy, ecological debt, ecological limits, immigration, publicity and values, crisis of care, North-South relationships, decline, etc. In order to work on these issues, it is also clear that teachers must be trained to increase their teaching competencies regarding these issues and the specificity of Environmental Education.

All these measures do not guarantee the success of the practice of Environmental Education with regards to sustainability but, at least, we can be sure that they are not just another alibi of the system so as to avoid any alterations in its course.

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Chapter 16

Eco-Schools as Education for Sustainable Development in Rural South Africa



Eureta Rosenberg

Abstract This chapter takes the reader into the context of rural South Africa with a sketch of developmental and educational challenges from the point of view of a young person born here. It goes on to ask whether Eco-Schools has a role in this challenging context, as a vehicle for or form of Education for Sustainable Development (ESD). Past Eco-Schools evaluations are reviewed against current educational needs and livelihood opportunities. The findings suggest that Eco-Schools gives teachers greater environmental awareness and motivates pedagogical practices such as active learning in relation to locally relevant issues. Learners develop environmental commitment and a sense of agency, and may become more committed to academic learning – all of which is necessary to prepare them for thriving in and also improving their socio-ecological contexts. Eco-Schools further supports schools systemically through meaningful partnerships with external agencies.

The conclusion is that attempts should be made to scale up and scale out this impact. In the process, key features of the programme should be preserved. These include a focus on sustainable solutions.

16.1 Context: Rural Schooling in South Africa

Before Zolani was old enough to attend school, he could find stray cattle by studying the sky. He would remember where he had seen rain against the horizon a few days ago, and work out which way the strays went for sweet new shoots of grass. Barefoot, he would navigate the terrain and by day's end, he would bring home his charges, in time to explain his achievement to the visiting researcher (Masuku 2018).

The five year-old was highly motivated to gain the knowledge and skills involved in this achievement, perhaps because he was proud of his role as herder in the

E. Rosenberg (✉)
Rhodes University, Grahamstown, South Africa
e-mail: E.Rosenberg@ru.ac.za



Fig. 16.1 Landscape in Kwa-Zulu Natal, South Africa

household, almost certainly to avoid the beating that boys who lost cattle could expect.

Later, when his time came to don shoes and a uniform, this bright child failed the first year of school.

Zolani is at risk of becoming a statistic among thousands of South African youth who are failed by formal education. Although the country has achieved near universal access, around 12% of the roughly 1.2 million children who start Grade 1 each year, do not complete the compulsory nine years of schooling. Only 55% complete the full 12 years (DBE 2016). The rest fail or ‘drop out’ for a variety of reasons, including the perceived lack of value in schooling in some parts of the country.

In Masuku’s (2018) study in an under-resourced area of the KwaZulu-Natal province (Fig. 16.1), parents expressed their frustration with the low value of the available education by referring to children who arrive home from school as “sitting around like zombies”. Unlike pre-school Zolani, these children are no longer engaged, nor contributing to the household.

Commercial farmers in a study by Human (2018), conducted in the Eastern Cape province, commented that they could not employ the local post-school youth, because they did not have relevant skills. There are even suggestions that the introduction of schooling may have had negative impacts in these areas. Researchers tracing livelihoods histories (Rowntree 2018), postulate that the introduction of compulsory schooling meant that communities lost their herders and eventually

their herding skills, and that this has contributed to the increase in cattle raiding among villages, which may in turn have opened the door to other crimes menacing parts of the Eastern Cape today.

Of course, people look to education as a pathway out of an impoverished life, in which being beaten for a mistake is but one of many harsh realities. But for a large number of hopefuls, their schooling fails to live up to the promise of a better life. South Africa does have good and even great schools, in urban and rural areas, but the majority of children cannot attend these. Due to low levels of household income, 65% of children attend 'no-fee' schools (DBE 2016), where the quality of teaching, school management and resources, is generally poor, with some striking exceptions. The majority of schools in under-resourced areas (both rural and urban) produce poor learning outcomes. In international benchmark tests, more than 60% of South African learners lack basic reading, mathematical and science skills (DBE 2016; Reddy et al. 2016). Many of those who make it into further and higher education and training, lack foundational concepts and skills that schools were meant to develop (Rosenberg and Burt 2009; Rosenberg et al. 2009a).

These are the challenges – shared in other parts of the world – that make striving towards the Global Sustainable Development Goals so important. Education has a vital role to play in sustainable development, but in South Africa some schools are part of the problem, rather than the solution. While a substantial portion of the fiscus (17% of total government expenditure and just below 5% of the Gross Domestic Product or GDP) is annually allocated to the Department of Basic Education (UNICEF 2018), the funding is not well spent and many schools lack the necessary infrastructure. A particularly disturbing example is the inadequate toilet facilities at some schools. In recent years, poorly maintained pit latrines caused the deaths of at least two young children (Etheridge 2018).

But this bleak picture is not South Africa's full story. The country also has teachers and environmental practitioners who are passionate about the youth and the environment, and enthusiastic about Education for Sustainable Development (ESD) and programmes like Eco-Schools. Since 2003, when the programme started, some 4500 schools have registered as Eco-Schools. Many of these are in the rural areas outside the main towns and cities.

But does this extra-mural programme, in which an organisation in Europe offers schools a flag for environmental activities, play a meaningful role in Education for Sustainable Development, particularly in the marginalised parts of South Africa?

In this chapter I narrate just a slice of the story of Eco-Schools South Africa. I will contend that the programme has a lot to offer, that it has been having an impact, and that it could play an even bigger role. I describe the methodology followed to come to this conclusion, followed by an overview of findings, and conclusions. First however, I start with a brief overview of the programme.

16.2 Eco-Schools South Africa

Eco-Schools South Africa is implemented by the Wildlife and Environment Society of South Africa (WESSA), which, being established in 1926, is the oldest environmental organisation in the country. To run the schools' programme, WESSA partners with the Foundation of Environmental Education in Europe (FEE), who provides the Green Flag accreditation, with a range of local partners, including government agencies like the Department of Water & Sanitation and Department of Environmental Affairs; local governments like the City of Cape Town; businesses who provide small-scale funding; and a variety of civil society organisations, non-governmental organisations (NGOs) and community-based organisations (CBOs). These local partners use the Eco-Schools framework and process to engage with schools around environment, development and sustainability.

Eco-Schools is popular in urban and rural areas alike, in both affluent and marginalised areas. In 2018, 66% of Eco-School participants are primary schools; 20% are high schools; the rest are combined or special schools and centres of various kinds. The schools choose the projects they undertake; the choice is made by teachers, or learners, or they do so together. School improvement projects are popular and include flower and food gardens, tree planting, recycling (often seen as a means to reduce litter at and around the school), fixing water leaks, reducing electricity use, and installing solar panels and water tanks. In the wider surrounds, children participate in river or beach clean ups, stabilisation of soil erosion, or building a bird hide at a wetland.

The most successful schools add a new project each year, while maintaining existing projects. Often the Eco-Schools activities are led by a 'champion' teacher, but WESSA and FEE promote a 'whole school' approach which encourages all the teachers at the school to become involved. The lead teachers attend professional development workshops with teachers from other schools.

WESSA runs these workshops with partners; it also provides an Eco-Schools 'toolkit' (Share-Net 2008) which includes information about environmental issues (Water; Biodiversity; Energy; Waste; Healthy Environments and Heritage), guidance on how to run action projects, and ideas for linking these to the official school curriculum. WESSA and partners also provide human resources in the form of Eco-Schools facilitators and coordinators whose primary role is to encourage teachers to participate, and to guide them towards meeting the requirements for obtaining the Green Flag and its various versions, including Bronze, Silver, Gold and Platinum. To achieve a certificate and eventually a flag, schools must submit a portfolio demonstrating their environmental projects and how they have linked these to lessons in the classroom. The requirement of curriculum links helps WESSA and partners to motivate to government why they should be allowed to work with schools.

An annual flag ceremony is held in each province, and some schools are invited to a national event where a senior official may be the guest speaker, to congratulate learners and teachers on their achievements. While government does not formally endorse the programme, many officials regard it as worthy of their support. (In some

provinces, the provincial governments have started a similar programme, without ties to Europe and therefore no cost to register, called Green Schools).

In 2007 WESSA commissioned an evaluation of the Eco-Schools programme, which they had been implementing since 2003. Several other evaluations and research projects were also undertaken in the programme. In this chapter I return to some of these evaluations to consider the contribution of Eco-Schools to ESD in South Africa. I am particularly interested in considering what a programme like Eco-Schools can offer children like the young cattle herder Zolani, in rural and other marginalised parts of the country. For only when all children receive an education that is able to meet and build on their intelligence and prepare them for the world into which they are born, and the better world they could one day create, would we be educating for sustainable development.

16.3 Methodology

The methodology followed for this paper is simple. I reviewed a selection of past evaluations and research projects undertaken, in Eco-Schools and related programmes. To ensure that I had an in-depth understanding of the findings, I focussed mostly on research and evaluations in which I had been personally involved.

I reviewed these findings against a more recent body of work which aimed to develop an understanding of the work and livelihood opportunities available to South Africans, in the context of environmental sustainability challenges including transitioning to a green economy. This body of work provided an understanding of some of the sustainable development challenges as well as opportunities that school leavers face, which is useful for reflecting on the relevance of Eco-Schools and its actual and potential ESD impact.

The key data sources were:

- An evaluation of Eco-Schools South Africa commissioned by WESSA and undertaken with programme implementers in 2007–2008 (Rosenberg 2008a, b); this study included teacher interviews and questionnaire based surveys, a review of enrolment trends, document analyses of the programme resources, and document analysis of portfolios produced by teachers, including lesson plans and examples of learner work.
- A more recent unpublished evaluation of the Lapalala Wilderness School (LWS), a rural environmental education (EE) centre which supports Eco-Schools in South Africa's Limpopo province (Rosenberg 2016). LWS invites nearby schools to attend a 3-day camp of nature-based activities, which ends with an opportunity for learners to make a pledge to the environment, and then to start Eco-Schools activities as a way of following up on their commitment. LWS staff continue to visit the schools to provide ongoing inspiration, information, guidance and when available, resources like spades, seeds or recycling bins.

- Three studies into the quality and relevance of environmental learning respectively in schools (Rosenberg et al. 2009b), vocational education and training institutions (Rosenberg and Burt 2009), and higher education institutions (Rosenberg et al. 2009a), undertaken as part of a broader research programme by Rhodes University to produce a national environmental skills plan (DEA 2010).
- A study supported by the United Nations Institute for Training and Research, into the skills needed by sustainability practitioners in South Africa (Rosenberg et al. 2016)
- A range of studies into macro- and meso-level trends in sustainability and associated work and skills needs in diverse sectors, namely agriculture (Cobbin and Visser 2017), mining (Rosenberg et al. 2015), the chemicals industry (Jenkin et al. 2017) and public procurement (Ward et al. 2016).
- Studies into the potential of sustainable development to create employment (Mclean 2018; Ward et al. 2018), and finally,
- An update on Eco-Systems South Africa provided by the WESSA General Manager: Schools and Youth (Donovan Fullard) and the current Eco-Schools Programme Manager (Delana Eksteen).

The next section shares findings most pertinent to this publication.

16.4 Findings

16.4.1 *The Sustainable Development Context of South Africa, 2018*

In the 10 years since 2008, when the national Eco-Schools evaluation was concluded, the South African economy has been stagnating and declining (National Treasury 2017; StatsSA 2018). Unemployment in general and youth unemployment in particular is high, and more than 30% of South Africans aged 15–24 years are not in employment, education or training (DHET 2017).

The decline in the economy has been linked to global markets, but also to environmental factors like resource depletion and climate change. Mining and agriculture used to form the backbone of the South African economy, creating wealth for the few and providing work for many school leavers, particularly those with lower educational attainment. These primary industries, and associated secondary industries like manufacturing, are struggling. National Treasury (2017) notes that mining is in recession due to a reduced demand for mineral commodities, and the depletion of resources like coal and the water needed to process it (also see Rosenberg et al. 2015). Agriculture has been hit by droughts. Both sectors are affected by unstable relations between labour and management. The economy as a whole suffered from a period of erratic electricity supply caused at least in part by the depletion of good quality coal combined with the failure of the state to effectively manage a transition

to renewable energy, despite clean energy being a policy intention (Republic of South Africa 2011; DoE 2018). As a result of the depressed economy there are fewer jobs.

However, a large number of South Africans have always had to survive outside the formal economy. Some rural communities have been able to sustain themselves with livestock, small scale crop production and wild plants for nutritional supplements and healing, combined with government grants (social welfare). However, they are affected by physical environments becoming degraded with soil erosion and bush encroachment, droughts, the loss of biodiversity and, in the case of subsistence fishers, reduced catches.

Scientists predict that climate change in Southern Africa will result in more extreme weather events, exacerbating already prevalent droughts, and more severe flooding when the rains do come. Nearly all of South Africa's potable water supply has already been allocated; the demand is set to grow, but very few rivers have not yet been impounded (WWF-SA 2016). Large parts of the country experience water shortages, and many subsistence farmers have stopped planting. This affects food security. Statistics South Africa reports that 13.8-million South Africans, or one in every four, live under the food poverty line, which means they cannot afford their basic food demands (Sihlobo and Boshoff 2017). A 2016 Country Survey reports that only 23% of children are receiving adequate nutrition, and identifies both malnutrition and water-borne diseases as key drivers of under-5 mortality (Sanders et al. 2017).

Clearly, efforts to achieve sustainable development are vital. There are positive signs that there is a will in government, civil society and business to embrace sustainable development, with a low-carbon, green and labour intensive development path being regarded as a significant opportunity for growth in wealth and employment. Such a will is evident in the National Development Plan (Republic of South Africa 2011) and the Green Economy Accord (EDD 2011). The Integrated (Energy) Resources Plan (DoE 2018) includes the use of renewable energy for electricity generation, and subsidies for solar energy.

In August 2018 the Minister of Environment Affairs announced a new, ZAR 1.7 billion initiative to protect and sustainably utilise South Africa's outstanding biodiversity (Arnoldi 2018). In the same month, State President Ramaphosa launched a campaign for SAFE – “Sanitation Appropriate for Education”. In it he called for business and civil society to support government to provide safe sanitation for schools, as well as water and energy, with proposals for new solutions including “off-grid” technologies (The Presidency 2018).

Fortunately, many organisation around the globe and in South Africa are already developing ‘green’ technologies that provide the necessities for a decent quality of life. Examples of these technologies include:

- Safe, eco-friendly and affordable sanitation (the Puerto Morelos Composting Toilet being just one example from Mexico, see Horizon International Solutions);
- Permaculture to ensure household food security and nutrition even on a small piece of land (for a case study from Samburu County in Kenya, see Thiong'o 2016); coupled with

- Rain-water harvesting techniques such as tanks and swales (an example is “Amanzi for Food” in South Africa’s Eastern Cape; see Lotz-Sisitka et al. 2016);
- Small scale production of locally available energy in the hands of the users (see e.g. Climate CoLab 2015); and
- Internet and telecommunications (e.g. the iShack project in Enkanini township in South Africa, <https://www.ishackproject.co.za/>).

The latter example of ‘low tech – high tech’ can enable communities in marginalised contexts to not only survive, but thrive, establishing their own household, commons and market economies and participating in wider markets for the kinds of commodities and services that are usually only produced on a small scale, in areas that can be either remote and desolate, or, with the right development, spaces for tranquillity and well-being. These include growing markets for adventure and eco-tourism, organic fibres and foods. An example is grass-fed beef such as that produced by Zolani’s community. While farming cattle on natural grasslands is not as productive on the same scale as raising cattle in feedlots, grass-fed beef can fetch a higher price, because it has been found to be more nutritious than beef from grain-fed animals. This opens new development opportunities, provided farmers are aware of such trends, that differ from the prevailing (industrial scale) development model.

What the above review suggests is that sustainable development is needed for the challenges in rural South Africa, and that there are new possibilities – ‘green shoots’. It also suggests that education needs to play its role in ensuring that the youth are aware of and able to participate in available opportunities, whether they are opportunities in a formal ‘green economy’, or opportunities they create themselves in their homes and communities. Raworth (2017) argues that a country’s economy involves not only the formal markets, but also the economic realms of the household, the commons, and governance; all four are important and ideally support each other.

To participate in these opportunities, and create even more, the youth need basic academic and technical skills like literacy, numeracy, computing, an understanding of scientific and civic concepts and associated values. But since the opportunities are not the traditional jobs that previous generations could expect, the youth will in addition to technical know-how, need transformational competencies, to envisage new and different possibilities; as well as the relational competencies to work with others to make that possibility, a reality (Rosenberg et al. 2016).

Much has been written about possible dis-junctures between school curricula and the nature of learners’ current and future life worlds. Schools might be preparing learners for scholarly careers, when the only work opportunities might be for manual labourers on farms or mines. Or, schools might be preparing learners to work in an industrialised economy, when no such economy exists in their context. The combination of demographic and economic trends means that South African youth will have to find ways to survive and thrive that are not currently common practice. These will almost certainly include a degree of self-sufficiency in providing for basic needs such as food production, water harvesting, minimization and re-use of ‘waste’, localised energy and sanitation solutions, and more. As the above

showed, the possibilities are there, but young people will need to have the necessary disposition, knowledge and skills to utilize them. Without these, they may, as the Kwazulu-Natal parents lamented, 'just sit around like zombies' and hope to survive on social welfare or worse, criminal activity.

It is in shaping the disposition, knowledge and skills of young people that I believe Eco-Schools can make a contribution. Much of its potential lies in the design of the programme. In South Africa, Eco-Schools activities start with a collective audit of the school and its environment (For details, see Share-Net 2008.) Learners go out of the classroom and investigate their school and wider environment. With regards to water, they ask: Are there any leaking pipes, taps or urinals? Do our friends let the tap run unnecessarily? How can we get water to our school? The audit is repeated for electricity and waste: How much electricity do we use? Where can we reduce consumption? Is there litter or dumped garbage? And on the positive side, celebrating resources: Do we have natural heritage that we can explore? Are our biodiversity hotspots at risk? Following the audits, teachers and learners decide together which of the problems or opportunities they would like to tackle, and a practical action project is developed, in which the learners themselves get involved. The results of the project are shared in a portfolio and importantly, the school is encouraged to continue the project in the following year, for the same or other learners, to take it further.

The findings that follow suggest that Eco-Schools South Africa has the potential to contribute to learners developing a disposition to be active citizens, by getting the opportunity to be, even on a small scale, agents of change. Since the programme is situated inside schools, this opportunity has to be created by their teachers, which is therefore the next set of findings to consider.

16.4.2 Eco-Schools Motivate Teachers

Research, newspaper reports and own experience suggest that some teachers are truly awful, while others are heroes. The majority probably vacillate between the extremes. Studies have shown that inadequate curriculum and pedagogical knowledge on the part of teachers, poor curriculum management practices and teacher absenteeism, are significant contributors to the poor learning outcomes in many South African schools (Gustaffson 2005; Carnoy et al. 2008).

Other factors also play a role, including socio-economic poverty in learners' home environments, and education levels of parents. Many schools also lack resources, because of poor use of available budgets, that, in a hierarchical education system, lie outside of teachers' control. Support from national, provincial and district departments is sometimes appreciated by teachers, but often takes the form of 'advocacy roadshows' that tend to introduce teachers in a top-down fashion to the requirements and procedures with which they need to comply. These are more attempts to 'clamp down' on poor teacher behaviour and to compensate for poor

skills, than professional development opportunities, and seem to have little positive impact on teaching skills and learner outcomes.

By contrast, teachers participating in the evaluations reviewed here expressed great appreciation for the learning opportunities and resources offered in the Eco-Schools programme. They find that they learn a lot, about the environmental content of the curriculum and about innovative teaching practices. There is evidence that teachers participating regularly in Eco-Schools are motivated to:

- Invest in their own professional development, to improve their knowledge of environmental topics in and beyond the curriculum
- Try out new teaching methods such as excursions, field work and project work, and learn from others in this regard
- Share their learning with colleagues in their own and other schools
- Reach out to partners outside the formal education system for resources to improve their schools and their teaching, from water tanks and seedlings to guest speakers and posters
- Develop and lead school and environment improvement projects
- Engage colleagues for a ‘whole school’ improvement and action learning process.

This is self-motivation; teachers receive no financial incentive for participating in the programme, and often they have to undertake Eco-Schools activities outside of school hours, in what would have been their leisure or family time. Some even spend their own money to support these activities. It can be argued that the participating teachers are those who are already motivated, but there are many examples of teachers who only become involved once their colleagues introduce them to the programme; furthermore, for many motivation seems to increase with programme participation. Several schools recently achieved Decade Awards, signifying that they have been part of the programme for 10 years or more.

WESSA’s records show that most schools voluntarily re-register year after year, and that a main reason for failing to register, is an inability to raise the registration fee.

There is no mistaking the pride and joy of teachers – and principals – who arrive with their learners to receive their certificates and flag. When I visited participating schools, not only the flag but copies of portfolios and photos of project activities were proudly displayed in foyers and passages.

Motivation also manifests in teachers choosing to increase their environmental knowledge through studying the materials in the toolkit, attending professional development workshops (outside of school time), developing new lessons, teaching new content and attempting new teaching methods. They lobby local partners for resources like rainwater tanks and recycling bins; they lobby their colleagues and start gardens and nurseries, take learners on excursions into the local environment and beyond, develop and teach new environmental lessons, and spend hours compiling the portfolios on which their success will be assessed. All this – but in particular the changes to the teaching programme and whole school management – require careful planning on the part of the teachers, and as one teacher noted: “We have

become better at it; Eco-Schools is now part of our routine planning.” This potentially addresses one of the factors Gustaffson (2005) and others identified as a contributing variable in poor learning outcomes; as teachers become better at managing their time, more time can be spent on teaching and learning.

Introducing and involving colleagues and learners in optional environmental projects in what is for many an already packed school programme, with high administrative loads, is not an easy feat. Colleagues are often either stressed with too much to do, or apathetic. Yet many teachers make this work. Some become so interested that they even enrol for formal degree programmes in environmental education.

Why do I suggest that increasing teachers’ motivation is a key factor in ESD? Motivated teachers are motivated to become more skilled at their job, and positively disposed to what they do. When positively disposed, teachers engage learners in hands-on activities to address an environmental issue they have identified and studied together, they demonstrate both the commitment and the ‘how’ of improving and caring for the environment. This is profoundly different from simply reading or lecturing about environmental issues in theory – although this also has a role, as illustrated in Fig. 16.2.

Next, I discuss the impact of the programme on learners.

16.4.3 *Eco-Schools Motivate Learners*

Zolani’s story (as documented by Masuku 2018) suggests that it is not the intelligence of children that is to blame for poor attainment in schools. Often children are not motivated to do well at school, particularly where they do not experience it as relevant to their lives. I visited teachers at schools in the Cape Flats townships of Cape Town. Here, although this is an urban area, some youth still have few development options. They are at high risk of forming or joining criminal gangs to survive, as the film *Noem My Skollie (Call me Thief)* (Joshua 2016) so vividly depicted. Teachers were excited to share that participation in Eco-Schools activities increased the motivation of some of their most dis-engaged learners, including a boy who could not read when he arrived in Grade 7. This child, at risk of dropping out before completing his schooling, had started to perform better at academic tasks after he was exposed to Eco-Schools activities and associated lessons (Rosenberg 2008a, b).

Motivation to succeed and even to participate, cannot be taken for granted. Some learners resent gardening activities, which was historically used for punishment in some schools; it may also be associated with a view that working the land is only for the poor and poorly educated. One of the success factors of Eco-Schools is therefore, in my view, the high profile given to awards and award ceremonies, in which a variety of persons of stature publicly recognise the value of the children’s involvement in restorative and productive practical activities. Another is the example set by enthusiastic young people who serve as Eco-Schools coordinators and work alongside teachers and children to ‘roll up their sleeves’ and get stuck into hands-on environmental activities.

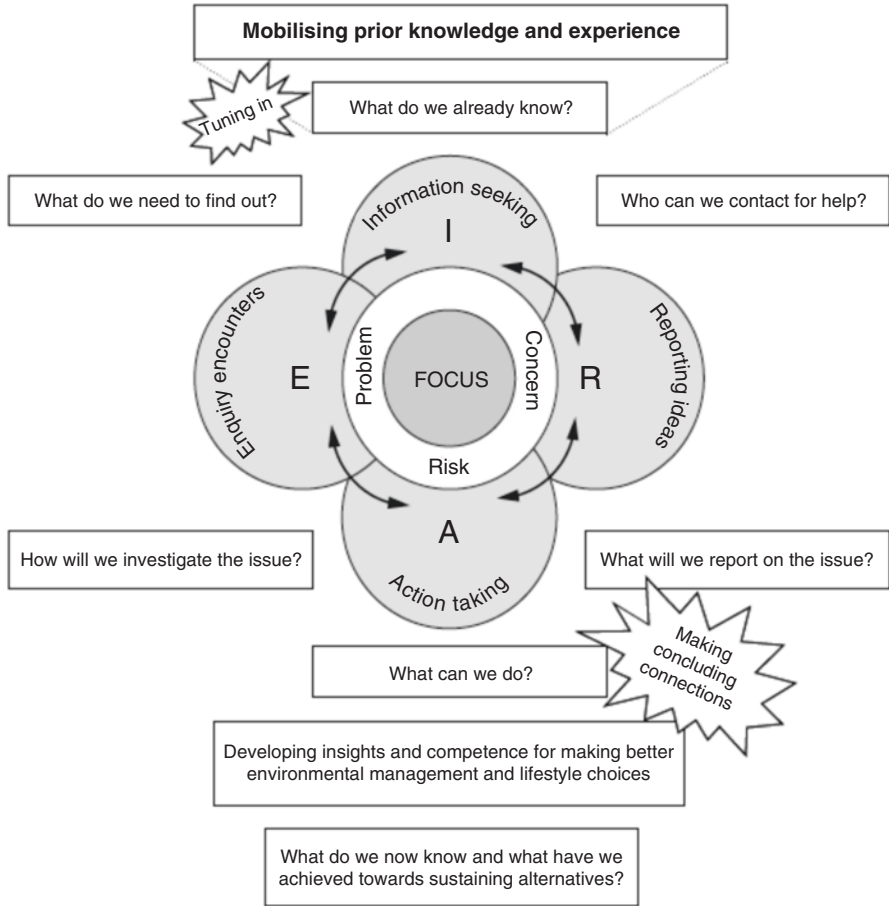


Fig. 16.2 A pedagogy for active learning. (O'Donoghue 2001)

Environmental practitioners and teachers alike often share stories of young people who have chosen environmental careers because of their experiences and exposure in programmes like Eco-Schools. At Shea O'Connor School in Mooiriver, Kwazulu-Natal, Mrs. Makhabela gave testimony of four young Eco-School participants from this school, who went on to study environmental degrees (Honours in Environmental Sciences, Environmental and Life Sciences; Environmental Sciences specializing in Tourism, and Geography and Environmental Sciences).

In the LWS study (Rosenberg 2016) I tried to better understand this phenomenon. It seems that it is often the enthusiasm and care displayed by inspirational educators and facilitators, as much as the environmental content, that inspires participants in extramural environmental education activities like nature camps and Eco-Schools, to choose an environmental career. In a survey among environmental

professionals with links to the LWS, they all traced their interest in the environment such early experiences, in nature, and in the presence of inspiring role models.

O'Donoghue (2001), a key architect in the framework of Eco-Schools South Africa, described a useful teaching and learning cycle as:

- Tuning in to the environment or issue
- Getting to understand it better
- Discussing and deciding what to do
- Taking action, and
- Reflecting on the outcomes – what have we learnt?

“Tuning in” may include a sensitising experience, such as a visit to a beautiful wetland, or a smelly garbage dump where cattle chew on everything including plastics. Crucially, it also involves mobilising learners’ prior knowledge (Fig. 16.2). This is a critical opportunity to engage what learners already know – for example, the ways of animals, or how to read weather patterns. Through participating in decisions about what to investigate and what to do, learners’ sense of agency is engaged. Developing new knowledge and understanding is part of the process, guided by a sense of meaning, as one figures out what is needed, in order to undertake the chosen action. Actions are followed by reflections and sense-making: What did we learn? What does this mean? Results are reported and shared with others. Another cycle may follow.

The process of enquiry, decision-making, action-taking, information-seeking and sense-making, as well as communicating, can be describe as ‘active learning’. There are many versions of this important concept in schools’ contexts (e.g. Posch 1991) but the framework developed by O'Donoghue in 2001 and refined by him with colleagues over the years, has guided many Eco-Schools teachers’ workshops and teaching activities in South Africa.

Following many years of raising public environmental awareness and lobbying governments, many school curricula and text books now share facts about the environmental crisis and development issues facing the world. When this information remains in the theoretical realm, learners may simply shrug it off as ‘academic’. Others take it to heart but, as reported by Eco-Schools teachers and in the literature (e.g. Breiting et al. 2009), in the absence of practical solution-oriented action-taking, young people become despondent about seemingly insurmountable challenges. A high school Geography teacher told me that her learners dislike Social Geography because of the focus on development problems.

Through programmes like Eco-Schools, which congruently combine facts and figures with practical action-taking, adults share with children a sense that the environment matters, that we are custodians of that environment, with a shared responsibility for it; and, that we need not be helpless. In the process, teachers may be providing learners with a glimpse of what the critical pedagogue Paolo Freire (2000, p. 34) called “*education as the practice of freedom, the means by which men and women deal critically and creatively with reality and discover how to participate in the transformation of their world*”.

In Eco-Schools, learners with their teachers strive to be agents of change, demonstrating that we can step in and improve our surroundings if we find that no-one else is taking care of them. This is particularly important where governments are not providing resources and services. Instead of developing a disgruntled or resigned disposition, learners engaging in practical activities of care and commitment, have the opportunity to experience what can be done if we take positive collective action.

This is not to imply that citizens (and particularly children) need to take sole responsibility for their environments; part of being an active citizen working towards sustainable development is to engage other agencies, like government and businesses, in a positive and constructive manner. This requires a knowledge of other actors in the system. Such knowledge does form part of the Life Orientation subject in the school curriculum (DBE 2011), but the DBE recently advised that the subject will be discontinued in high school.

The argument for learning how to take care of one's environment, as a necessary part of sustainable development in a challenging context, also does not imply that South African youth will have to survive entirely outside of a formal economy. But to benefit from, and contribute to a formal economy, youth will need at the very least to be functionally literate and numerate, and ideally finish school with excellent learning outcomes to prepare for further learning in vocational, professional or academic settings. Currently, this is not the case for a majority of learners. The observation that Eco-Schools engage learners in relevant livelihood activities such as rainwater harvesting and food gardening, as well as motivate them to do better at scholastic tasks like reading, suggests that the programme contributes to a variety of learning outcomes relevant to livelihoods outside *and* inside the formal economy.

Finally, I share an example of sustainability projects in well-resourced schools. Two private high schools in my home town, the one a former Eco-School and the other currently an Eco-School, sent a student team to the *International Water is Life 2018* Conference in Tokyo, an event that brings together learners from around the world to, in the words of two of the learners, “discuss and solve the current and future issues related to world water crises” (Poole and Schlebush 2018, np). The South African learners had collaborated on a project to address a “local water issue”, using natural, bio-absorbent substances to remove heavy metal toxins. The organisers lauded the project for its relevance to Africa – where mining and agriculture have polluted many surface and groundwater resources. The learners were excited about the awards they won, but also about staying with local families and learning about their customs, and meeting global peers. While the project was not formally an Eco-Schools activity, one of the teachers was an Eco-Schools champion, and the example further demonstrates that where teachers are motivated, schools do engage learners in active learning with a strong sustainable development and solutions focus, with the potential to develop learners' technical and scientific skills but also, their relational and transformational skills.

16.5 Eco-Schools Partnerships Strengthen the Schooling System

With the understanding that development and environmental sustainability crucially involves the youth, many government agencies, businesses and organisations want to work with schools to increase the exposure of the youth to environmental issues from their particular perspectives; whether this be a conservation agency wanting to caution learners against hunting or wildlife poaching, or the Plastics Federation wanting to encourage learners to recycle. Such engagements from external agencies can improve EE and ESD at schools, but it can also disrupt schooling negatively, taking teachers and learners away from curriculum work. Some agencies engage schools simply for their own ulterior objectives, and may push a ‘greenwashing’ line that is not necessarily aligned with national policy, curriculum or sustainability.

Evaluations have shown that Eco-Schools provides an educationally sound framework for partners to engage with schools. It is sensitive to schools’ existing programmes and works with the existing curriculum, rather than to try and replace it. In many schools, it therefore achieves the optimum balance between bringing novelty and energy to the stable core of the given curriculum framework (Posch 1991), as well as supporting teachers to ‘bring out’ the existing environmental content in the formal curriculum.

Teachers appreciate the engagement with external agencies, when this happens on their own terms. One teacher noted that: “these people are ready to help”. Eco-Schools gives teachers an agreed-upon platform for engaging and working with these partners; by engaging with well-informed, independent Eco-Schools facilitators, it can also help them to think critically through proposed solutions like plastics recycling or nuclear energy.

16.6 Under-Utilised Potential

Despite the positive findings above, the evaluations reviewed for this paper also showed that the scale on which Eco-Schools and other enquiry-based, active learning and ESD activities happen is small compared to the need. The potential for improving the relevance and quality of teaching and learning outcomes is under-utilised; only a percentage of schools participate, and many high schools in particular have never been involved. Within participating schools, the involvement of the whole school approach is not always achieved; often it is only the learners of a few teachers, or a single teacher, who experience the benefits of participation. WESSA and partners have too few resources for expanding the programme. Incorporating the programme into the formal education system may increase resources and motivate expansion. However, such a move may ironically reduce the programme benefits, if it becomes yet another compliance criterion, and loses its novelty value for

teachers and learners alike. Robottom (1996) suggested that environmental education may be at its most effective, as an innovation that challenges mainstream thinking, from a position of being “permanently peripheral”. In an OECD report Posch (1991) argued for an optimal balance between pedagogical innovation and a stable curriculum core. Our findings indicate that such a ‘movement’ between the given curriculum, and active enquiry into novel, local environment and development issues, might be ideal.

16.7 Conclusions

This glimpse into South Africa’s development challenges confirms that Sustainable Development Goals and Education for Sustainable Development are critical aspirations in this country.

Upon reviewing current sustainable development challenges that range from climate change, water scarcity and unemployment, to poor quality education, I conclude, as I did in 2008, that Eco-Schools South Africa has enormous potential to improve both the relevance and the quality of the learning outcomes achieved, in relation to education in general and ESD specifically. To come to this conclusion, I drew on a variety of sources including my observations at the Eco-Schools themselves, and on the voices of teachers and learners encountered.

Eco-Schools and other programmes that combine environmental action and knowledge have high potential for ESD, and evaluations showed that this potential is being achieved in individual contexts:

- There is evidence that Eco-Schools motivates teachers to improve their knowledge and teaching practices as well as curriculum and resource management practices at schools; in this way it can improve formal learning outcomes as well as learners’ commitment to environmental causes
- Eco-Schools can improve the relevance of learning outcomes by fostering agency and stewardship through locally relevant, meaningful projects and an active learning approach, thus better preparing learners for surviving and thriving in a challenging context.

Despite these positive findings, the scale on which Eco-Schools and other enquiry-based, active learning and ESD activities happen is too small compared to the need and the potential is under-utilised. Much more needs to be done to impact ESD significantly, and to help South Africa progress towards sustainable development. How can this be achieved?

Firstly, it should be noted that the studies informing this paper suffered from a lack of access to data on learning outcomes. Environmental agencies and governments need to invest in ongoing evaluation of programmes like Eco-Schools, to try to better understand and quantify their impact.

While the available evidence suggests that taking programmes like Eco-Schools to a greater scale would be very beneficial, it also suggests that it is important to not, in the process of upscaling, lose attention to the following:

- Sound pedagogical principles, such as the ‘active learning cycle’ (O’Donoghue 2001)
- The ongoing motivating support from partners which teachers require, but on their own terms to support their ‘core business’ of teaching
- Attention to teachers’ own knowledge and the quality of the learning they support
- Good quality ESD teaching resources that include local and curriculum relevant examples
- A mutually supportive rather than compliance-driven approach to teacher professional development, which
- takes the realities of all school contexts into account.

The reality of the context of youth like Zolani is a moribund economy in which old ways of creating livelihoods and wealth are no longer available. As the State President noted, new solutions must be found. The ‘new green shoots’ of sustainable development could include old methods like permaculture and new technologies like solar powered smartphones. Such solutions are already being developed. Programmes like Eco-Schools are an ideal vehicle for not only exposing learners and teachers to these innovations for future well-being, but importantly, to work with them to become part of the solution, drawing, as Zolani did when he found his missing cattle, on innate intelligence, motivation and a deep knowledge of our natural world.

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Chapter 17

The Green School Movement in Sweden – Past, Present and Future



Niklas Gericke, Annika Manni, and Ulrica Stagell

Abstract The Green Schools Movement in Sweden has a long history. In this chapter we will start with a historical review of the long interest of green issues in Swedish society and how these have influenced curriculum and teaching. We will address the different teaching traditions that evolved in environmental education in Sweden over time. Then we will describe how the green school movement been promoted in Sweden through initiatives from NGOs such as *Håll Sverige Rent* and *World Wide Fund for Nature*. This has led to certification systems for schools to participate with the possibility to be accredited as “green schools”. These certification systems have turned from an environmental perspective to a perspective towards Education for Sustainable Development (ESD). Finally we will go through the extensive research conducted in Sweden the last years of the effects these certification systems has had in the schools at student, teacher and school organization level, and what we can learn from these studies in order to develop the green school movement for the future.

17.1 Introduction

Sweden is often regarded as a pioneer and champion of care for the environment and the green school movement. Thus, it is an interesting case for exploring numerous aspects of the movement’s development, current status and future challenges. Hence, this chapter begins with a historical overview of cultural and societal aspects

N. Gericke (✉)
Karlstad University, Karlstad, Sweden
e-mail: niklas.gericke@kau.se

A. Manni
Umeå University, Umeå, Sweden
e-mail: annika.manni@umu.se

U. Stagell
School of Communication and Education, Jönköping University, Jönköping, Sweden
e-mail: ulrica.stagell@ju.se

of environmental interest and concerns in Sweden that apparently provided foundations for the current green school movement. We believe this is important as the distinct courses of historical and societal development in Sweden and other Scandinavian countries have inevitably influenced concepts, attitudes and organizations related to the internationally established concept of green schools in the Swedish context. Moreover, we differentiate between informal and formal eco-educators, since both types have played major roles in development of the green school movement in Sweden and influenced the national curriculum. Hence, ideas associated with the movement have gradually been incorporated in the national curriculum. Award systems associated with the movement are also addressed, particularly the *Green Flag awards* of the European eco-school movement and *Green School Awards* of the Swedish National School Agency. A primary consideration here is how these award systems shifted focus from an environmental education (EE) to an Education for Sustainable Development (ESD) perspective. In addition, we present examples of research and educational activities in green schools (of all levels: preschool, compulsory school, and secondary school) today. We then consider degrees to which studies indicate that these schools have achieved the green school movement's aims, i.e. to foster youths' environmental awareness and environmentally responsible behavior. Finally, in concluding remarks we address the impact of the green school movement on the implementation of ESD and future challenges.

17.2 Development of the Green Schools Movement in Sweden

The green schools movement in Sweden is rooted in strong traditions of outdoor activities and interest in both nature and its conservation. These traditions led to formation of non-governmental organizations (NGOs) engaged in dissemination of information, provision of education and teacher support, and political campaigns promoting the 'greening' of education and society at many levels. Green issues were first introduced in formal and informal education by individual teachers and organizations. Subsequently, however, changes in society ushered in formal requirements to cover the issues, and broaden them to include environmental concerns and later ESD. In parallel developments, the green school movement led to the establishment of award systems such as the Green Flag awards of the eco-school system. Hence, educational initiatives to address green issues have multiple historical roots and drivers in Sweden. Due to the complexity of the green school movement's development in Sweden, involving numerous actors and diverse factors, we believe it is essential to consider the movement in a broad sense, including both formal and informal activities intended to promote knowledge and awareness of environmental and sustainability knowledge and values. We would also like to recognize that many Swedish scholars, researchers and educators have made important contributions to the development, evaluation and investigation of the green school movement in

Sweden, and there is insufficient space in this chapter to address all aspects of their contributions.

In Sweden, and the other Scandinavian countries, there is a long and well-documented public tradition of *friluftsliv*, a complex notion referring to spending time on outdoor activities and communing with nature, because they promote physical, mental and emotional well-being, together with environmental awareness and care (e.g. Pedersen Gurholt 2014; Sandell and Öhman 2010). In Sweden, ‘*Allemansrätten*’, the right to roam in the countryside, has also played an important role in the tradition of outdoor leisure activities (Sandell and Öhman 2010). This right allows anyone to pass through forests, pick berries, swim in lakes, and camp without permission from the owner of the land, provided that the natural environment and property is not damaged or disturbed and relevant legislation is obeyed (Swedish Environmental Protection Agency 2017). In addition to physical aspects of the *Friluftsliv* tradition, there are other more emotional and aesthetic aspects of the outdoor encounters (e.g. Quay 2013; Wickman 2012), manifested in various artists’ aesthetic work.

These traditions of outdoor activities and encounters with nature obviously have ancient roots. However, they generally seem to have been boosted by reactions to the industrial revolution in the nineteenth century, when people changed their ways of life and work, moved into cities for employment, and yearned for the countryside they had left. Diverse outdoor activities and adventurous challenges started to flourish at this time (Sandell and Sörlin 2000).

Beliefs in the educational benefits of the outdoors also spread in Sweden, partly through informal organizations such as the Scouts, and partly through ideas of educational pioneers such as Jean-Jacques Rousseau, Ellen Key and John Dewey. Despite an emerging interest in environmental issues, initially outdoor education was advocated for its claimed practical and epistemological benefits (e.g. Dahlgren et al. 2007; Lundegård et al. 2004).

Moreover, despite the traditions, for a long time environmental issues were not on the public agenda in Sweden. However, some decades after the transformation from an agrarian to an industrial society, the effects of pollution started to receive broader public attention in the 1960s and 1970s. A major trigger of the contemporary ‘environmental discourse’ was publication of *Silent Spring* by Rachel Carson (1962). Before the public debate on that book there was not much public interest in Sweden about education in relation to environmental issues (Breiting and Wickenberg 2010), but soon after its publication the orientation of the outdoor educational approach shifted somewhat towards environmental concern.

An early informal educator, not only of children and youths but also adult citizens, was the NGO *Håll Sverige Rent* (Keep Sweden Tidy). Environmental concern at that time focused on litter, and there were official “cleaning days” in both communities and schools (as part of pupils’ formal schooling). In 1990, the first educational program especially targeting schools and preschools (called *NaturligVis*) started, and associated teaching materials and courses were provided for teachers. During this decade, the international *Green Flag Award* program and eco-schools concept were initiated and enthusiastically embraced in Sweden, due to their

alignment with the national spirit of friluftsliv and ethos of environmental care (Håll Sverige Rent 2018). Today, about 2200 Swedish schools and pre-schools are engaged in the *Green Flag Award* program and associated environmental and sustainability education (Håll Sverige Rent 2018). The organization Keep Sweden Tidy supports all participants and shares ideas for practical work in the green flag schools.

While one branch of the informal green school movement was mainly concerned with environmental issues, another continued to focus on teaching and learning outside school. For many years, advocates of outdoor-learning promoted inclusion of *Lägerskola och Skolresor* (School Journeys) in the compulsory school curricula, as a way to engage children and youth in the local society (Rantatalo 2002). This had similarities to the *Outward Bound* movement founded in North America and Australia (Quay and Seaman 2013). In line with the more progressive educational ideas, the School Journey movement was quite big in Sweden and many adults today have fond memories of such school trips and camps (Stensson 2007).

Other informal outdoor and environmental learning initiatives include activities offered by *Naturskolan* (the Nature School Association), for schools and preschools. Outdoor educators either invite groups of schoolchildren to their locations or visit schools and arrange activities in a local forest or park. Besides programs directed towards children and students they also hold courses for teachers and school staff. The Nature School Association, established in the 1980s, is a national network of 90 Nature Schools, often of private origin that collaborate with pre-schools and schools in their local communities (Naturskoleföreningen 2018).

Another well-established informal outdoor educational actor in Sweden is the organization *Friluftsförbundet* (the Swedish outdoor association), which has a history of offering and arranging outdoor activities for children in their spare time, for example skiing, skating and scouting. A well-known character developed by the association is *Skogsmulle* or simply *Mulle*, a kind of friendly ‘troll’ living in the forest with his friends. Children’s books are written about Mulle, and around two million Swedish children (aged 5–7 years) since 1957 have met Mulle in the forest, and learned about the nature and our environment from encounters with this troll (Friluftsförbundet 2018).

Friluftsförbundet entered the formal schooling structure in the late 1980s when private actors were first allowed to run schools in the Swedish public educational sector. They established schools called *I ur och skur* (roughly ‘come rain or shine’), where a major educational aim is for children to spend the whole day outside to become environmentally aware and enjoy natural environments (Friluftsförbundet 2018).

Sandell and Öhman (2010) report on the branches of outdoor educational activities in Sweden, their differences and similarities in terms of aims and scopes, and particularly the educational potential of outdoor encounters. They identify six potential benefits, briefly defined as development and/or acquisition of knowledge of: *experience-based meaning of nature, a relational ethical perspective, a fourth perspective to sustainable development, human ecology in practice, sensing the quality of simple life, and democracy, identity and dwelling*. They provide a good overview of the variety of educational intentions represented in the Swedish

informal, and formal, green school movement, with a common theme of ecological awareness, and an emphasis on eco-relational aspects.

17.3 Development from Nature Conservation to Education for Sustainable Development – The History of Formal Green Schooling

Sweden, together with other Nordic countries, provides “optimal conditions for the development of democratic and value-oriented forms of environmental education and education for sustainable development” according to Læssøe and Öhman (2010, p. 2). As outlined in previous section, EE and ESD have been strongly influenced in Sweden by the long tradition of outdoor encounters, engagement with nature and environmental concerns. The strong democratic foundations in both society and education have also played important roles. Telhaug et al. (2006) describe three periods of democratic relations during the last 50 years. *The first period*, which they call ‘the golden era of social democracy’, was rooted in a social development tradition, where school and education were seen as active contributors to the overall project of developing and maintaining equity and a just society by fostering good, responsible citizens. The long tradition of EE in Sweden can, as explained by Breiting and Wickenberg (2010), be traced back to at least 1919, when the National School Plan stated that there should be education in “nature conservation and animal protection” (p. 12). The dependence on natural resources for industrial development together with the democratic and participative traditions at both local and national levels in Sweden, they argue, have influenced the development of values towards caring for nature during the twentieth century, and hence recognition of the importance of ESD (Breiting and Wickenberg 2010).

Early in the 1960s, Sweden established a nine-year compulsory school system for all children, and the Swedish National Curriculum from 1969 (Lgr 69) included sections related to what was later called EE. During the same period, the *Swedish Nature Protection Agency* (Naturvårdsverket) was established (1967) and the *Swedish National Agency for Education* initiated an investigation concerning “the School’s Fostering of Environmental Protection” (1968–1971) (Breiting and Wickenberg 2010, p. 13). This was followed by what Telhaug et al. (2006) denote *the second period*, “the intermediate phase: the radical left of the 1970s” (p. 256). During this period, pedagogic experts promoted education focusing on students’ well-being, student-centered and activity-based teaching methods, and propagation of a new form of teacher, prioritizing pedagogical skills more than academic qualifications. Teamwork on themes was strongly promoted and new educational issues emerged, or increased in prominence, for example gender, peace and ecological concerns (Breiting and Wickenberg 2010). According to Östman and Östman (2013), the *UN Conference on the Human Environment* in Stockholm (1972) and *UNESCO Conference on Environmental Education* in Tbilisi (1977) also influenced

EE's development in Sweden by fostering its broader acceptance in Swedish society and schooling during the 1970s and 1980s.

Following the *UN Conference on Environment and Development* (UNCED) in Rio de Janeiro in 1992, the Agenda 21 Education program in the 1990s and early 2000s drove inclusion of ESD perspectives in Swedish schools. The policy agreed at the conference directly influenced steering documents of the national curricula, and initiated local municipality level efforts to promote ESD involving local politicians, coordinators and both heads and teaching staff in schools. As Telhaug et al. (2006) conclude, this was a time with less focus on the national culture, where the central government became weaker, and more powers were given to individual schools that were requested to develop local curricula.

The third phase described by Telhaug et al. (2006) was initiated by the technological developments leading to globalization of both materials and ideas. Another major influence during this period was post-modern philosophy questioning the 'search for truths', leading to a decline in confidence in science as the solution for societal problems. A former tendency for schools to withdraw from society, to form delimited and scientified knowledge, was then challenged by societal changes demanding engagement with international concerns and new ways of acting (Amnå et al. 2010). Consequently, environmental problems also became economic and social problems in line with the concept of Sustainable Development (SD). Perhaps the most important step in this direction in Sweden was an amendment of the Education Act (*skollagen*) in 1990 stating that environmental issues should be regarded as societal issues. Accordingly, ESD and the concept SD were included in the new national curricula of 1994 for compulsory schools (grades 1–9, 7- to 15-year-olds) and upper secondary schools (grades 10–12, 16- to 19-year-olds).

In 2002, the Swedish government formulated a national strategy for SD that was propagated at the *World Summit in Johannesburg* in 2002, including recognition of education's vital role for achieving sustainability (Breiting and Wickenberg 2010). By then the EE discourse had been transformed into the ESD discourse at policy level in Sweden, and an ESD-orientation has been retained in subsequently modified curricula and steering documents, or even strengthened (especially in the reform of 2011). Much of this transformation was due to international, UN-level influences that were integrated into Swedish school policy. The most widely used definition of SD comes from the Brundtland report "Our Common Future" (WCED 1987). This defines SD as development that meets needs of the present generation without compromising the ability of future generations to meet their own needs. There is wide acceptance of this definition amongst educationalists and policy-makers globally (e.g. Scott and Gough 2003), and this understanding of SD and ESD became the goal for teaching in Sweden. To summarize, the general trend during the last decades is that the SD theme has been expanded and paid greater attention as the steering documents have changed, as also argued by Östman and Östman (2013, p. 90).

In Sweden, ESD has developed from EE, and there are clear distinctions between them in terms of content, aims and teaching, although they are not incompatible (Sund and Wickman 2008). Care for the environment has remained in focus, but ESD recognizes a need to address and resolve conflicts of socio-economic interests

among stakeholders to counter increasing environmental problems. Hence, a shift of focus from nature-human relations to human-human relations can be seen in the transition from EE to ESD (Sund 2015).

This paradigmatic shift from EE to ESD in Sweden has also been promoted by, and reflected in, the green school movement, and associated support systems. For example, in 2005, the award system administrated by the National School Agency in Sweden (*Skolverket*) shifted to promote ESD, and replaced *Green School Awards* with *National Sustainable School Awards* to support and inspire schools. The number of schools that received these awards has increased since then from 50 schools in 2005 to 191 pre-schools, 108 primary and secondary schools, and 15 upper secondary schools in 2018 (Skolverket 2018). Likewise, the eco-school program that was introduced into Sweden as the Green Flag program in 1996 by the Keep Sweden Tidy Foundation was reoriented towards raising pupils' awareness of sustainable development, including social and economic issues in addition to environmental issues. Numbers of schools receiving this award have also increased, from around 900 in 2007 to 2282 in 2018. To obtain a Green Flag award a school or pre-school needs to form a committee, then develop, evaluate and submit an action plan (Håll Sverige Rent 2018). Teaching materials are also available for the schools. Pre-schools and both elementary and upper secondary level schools have shown increasing interest in the two ESD awards, and stakeholders such as *The Global School* (Den Globala Skolan) frequently arrange professional development courses for teachers and school leaders, as well as seminars with regional and national stakeholders.

17.4 ESD as a Discourse in the Swedish Green School Movement

Trends in all three identified periods of societal development influenced the green school movement, and development of ESD not only on policy level, but also on pedagogical and didactical levels in the development of different teaching traditions, as discussed in this section.

In the Swedish ESD discourse, to which the award systems and green school movement are now aligned, the content is viewed from a holistic perspective, in which environmental problems are viewed as political problems due to the need to resolve socio-economic conflicts of interest (Öhman 2004). Therefore, a holistic perspective of SD integrating ecological, economic and social aspects is promoted in teaching ESD (Sandell et al. 2005). The aim of the teaching is to educate action-competent citizens who will engage in sustainable actions in society. The green school movement was an early adaptor and propagator of the concept *Action Competence* as a way to promote SD. Action competence was defined by the Danish researcher Karsten Schnack as a: “capability – based on critical thinking and incomplete knowledge – to involve yourself as a person with other persons in responsible

actions and counteractions for a more humane world” (Schnack 1994, p. 190). Therefore, in the Swedish ESD discourse a learner-centred and interactive teaching strategy has been advocated, involving critical thinking, participatory decision-making, value-based learning and multi-method approaches (Englund 2006; Öhman and Östman 2008). Öhman (2004) called this teaching approach pluralistic, and equates it to an ESD approach. This ESD discourse can also be seen in the current evaluation criteria of the Green Flag award, which emphasize a need for a holistic perspective on the content area (not only the environment), action competence, and pluralism (critical reflection and thinking) (Håll Sverige Rent 2018).

During the UN’s Decade of Education for Sustainable Development (DESD), 2005–2014, and the continuation of UNESCO’s Global Action Plan (GAP) from 2015 this ESD discourse has been reinforced in the Swedish green school movement. Moreover, new interest in whole school approaches and whole institutional approaches has been aroused to meet ambitious goals of the GAP (Mogren et al. 2018).

An important issue to address is whether this change in discourse in society and policy, from EE to ESD, also affected teaching practices in school classrooms (Sandell et al. 2005; Öhman 2004). Thus, the environmental education research community in Sweden started to investigate different teaching traditions in the classroom to see if the policy and societal discourses were transformed into teaching practices. Three approaches, or teaching traditions, were identified in the EE/ESD teaching practices: *fact-based*, *normative* and *pluralistic or ESD* traditions (Öhman 2004; Sandell et al. 2005; Sund and Wickman 2008).

A general finding of these studies is that teachers’ methods and educational goals depend on the tradition they align with. In the fact-based tradition, environmental issues are seen as knowledge problem that should be addressed by objective ecological scientific facts and models. This tradition is usually teacher-centred with elements of laboratory work, excursions, field trips and study visits. Integration with other subjects is rare. It is based on the belief that if students receive the correct scientific facts, they will automatically take the right actions regarding environmental issues (Sandell et al. 2005). In the normative tradition, education is seen as a tool to transform society in a more environmentally friendly direction. Experts and politicians decide the correct solutions for, and values associated with, environmental issues. Schools are supposed to teach accordingly and engender in students the right values and attitudes to behave appropriately. The teaching is periodically thematic with a focus on science, scientific facts, values and emotional aspects. Issues are addressed in active learning situations, where students seek information by themselves and mainly work in groups (Sandell et al. 2005; Sund and Wickman 2008; Öhman 2004). In the pluralistic tradition (often referred to as ESD), diverse perspectives, views and values are acknowledged when dealing with sustainability issues. This tradition is influenced by the effects of economic globalization, and recognition of the diversity of perceptions within the environmental debate. Conflicts of interests are viewed as the ultimate causes of environmental problems, indicating that they are primarily political issues, and that science cannot provide unambiguous moral guidance, because different social groups have different perceptions and

considerations of environmental phenomena (Öhman 2004). Environmental problems are instead associated with changes in society, and the term environment is often replaced with the concept of SD. ESD or pluralistic teaching requires learner-centred and interactive teaching strategies, e.g. critical thinking, participatory decision making, value-based learning and multi-method approaches, involving (for instance) oral and text-based communication, art, drama and debate (e.g. Björneloo 2004; Öhman 2004).

These three teaching traditions are, of course, research typologies, and in reality elements of teachers' practices might be aligned with all of them, and vary due to contextual factors. This is understandable, as teachers must consider other curricular goals, and different situations demand shifts in focus. Few generalizable studies have evaluated the alignment with these teaching traditions of teachers in the Swedish green school movement, or in Swedish schools generally. However, in a large nationwide survey of more than 3000 upper secondary teachers of various subjects, Borg et al. (2012) found that science teachers were mostly grounded in the fact-based tradition and lecturing was their most common teaching method. The teaching of the social science teachers seemed to be most aligned with an ESD, i.e. pluralistic approach. However, many language teachers (41%) stated they did not include ESD in their teaching at all (Borg et al. 2012). The overall conclusion is that there is still a long way to go before the policy-level ESD discourse becomes the dominant discourse in the classrooms, at least at upper secondary level. Interestingly, the most common barriers Borg et al. identified for teaching in line with ESD were that the teachers lacked skills and expertise required to include SD in their teaching. Hence, they advocated greater efforts to improve teachers' professional development in this respect.

Another study focusing on Green Flag teachers' opinions of including different sustainability-promoting actions in their teaching found that they preferred to include private actions that have direct implications for sustainability, rather than indirect political-level actions (Stagell et al. 2014). When asked to justify this preference, the teachers referred to what they found easy to teach, what parents would think, and the need for education to be neutral, i.e. to avoid taking political standpoints (Stagell et al. n.d.). The actions that were found easy to include in teaching were those often supported by the Green Flag program, e.g. litter collection and campaigning against littering. This reflects a tension in Swedish schools, and the global field of ESD, between aims to foster responsibility and predefined SD-promoting behaviours in pupils, and the view that the purpose of education is open-ended facilitation of students' development into responsible citizens. Wals (2010, p. 143) comments on this tension as being "Between knowing what is right and knowing that it is wrong to tell others what is right...". It is also reflected in the different teaching traditions related to EE/ESD linked to cultural, historical and societal factors and trends during the past 70 years in Sweden. Despite being nominally engaged in the green school movement, the teachers still seemed to base their teaching on facts and norms rather than pluralistic perspectives (Stagell et al. 2014).

Borg and colleagues also showed that teachers of different school subjects understood (Borg et al. 2014) and taught (Borg et al. 2012) SD and ESD differently. In the

Swedish discourse at policy level, and most research studies, SD is treated as a coherent concept, and ESD as a coherent way of teaching. In addition, ESD is often taught thematically, with participation by teachers of different disciplines. However, results of the two studies by Borg and colleagues show that this might be problematic, because teachers are affected by the subject traditions they encounter during their teacher education and practice. Researchers like Stables and Scott (2002) argue that teaching within disciplinary teaching approaches should not be based on any external framework, because it alters the primary agenda of the discipline. Likewise, Young (2009) argues that disciplinary boundaries should be considered in teaching about 'knowledge of the powerful', i.e. education with the capacity to empower students with some kind of action competence. These are aspects of education that the green school movement largely ignored when trying to implement ESD. Hence, Gericke et al. (2018) have identified a need for empirical investigation of the influence of teachers' subject traditions on their ESD teaching in particular and sustainability education in general. We also conclude that it is an issue that needs further attention in the green school movement's efforts to develop ESD, because disciplinary traditions could potentially strengthen or severely hamper interdisciplinary teaching depending on how they are combined.

17.5 Green School Activities at Different Levels of the Swedish School System

The previous sections outlined historical aspects and the underlying discourse of the green school movement in Sweden. In this section we provide descriptions and examples from the formal educational system in Sweden (including preschool, primary, lower and upper secondary school) illustrating how aspects of the movement are represented in green schools through activities today, and summarize relevant research.

17.5.1 Preschool

Preschool is not compulsory, but the system is well developed and almost all children attend pre-schools for at least some of the time between ages of 1 and 6 years, so it is an important part of the Swedish school system with its own curriculum (Lpfö18). In 1998, the pre-school system was first included in the Swedish school system and its first national curricula quoted the *Education Act* of 1990. However, a change in the new national curriculum (Lpfö18) implemented in 2019 explicitly use of the SD concept, rather than the environmental concepts in the previous curriculum. The use of the outdoors is still mentioned, due to the importance of qualitative and varied educational environments for physical and mental well-being.

Many preschools in Sweden organize their activities seasonally in a ‘Year-wheel’. Besides raising awareness of the changes in nature during the four seasons, thematic and creative work based on the children’s interests are common in today’s preschools. However, the shift from a focus on nursing and care towards more schooling-like aims in the current curricula has triggered debates about the role of preschool, in which some defend the idea of play, freedom and care, and others promote more formal learning possibilities such as early reading and writing. Some agreement in balancing these ideas has been reached through broad acceptance of ‘Educare’, i.e., learning through play and socializing.

Regarding green school-related activities in preschools, the emphasis on traditional outdoor encounters seem to be continuing. Many preschools in Sweden have obtained a Green Flag award for their work on eco-issues. This may include diverse creative activities, which are also shared via the internet: gardening and sustainable cultivation of vegetables, re-cycling in arts and crafts, eco-drama, construction of bug-hotels and so forth. In southern parts of Sweden, there are action-oriented projects involving preschools to improve health and sustainability. For example, there is an ongoing establishment of mini forest gardens (Almers et al. 2018) where preschool teachers and children grow edible perennials and increase biodiversity inspired by a former forest garden project for primary school children (Askerlund and Almers 2016). The outcomes of ongoing eco-activities thus seem bright, according to self-reports by participating teachers and children.

The importance and role of preschools in the green school movement have been discussed by Swedish researchers not only in a Swedish context but also globally (Hägglund and Samuelsson 2009). For example, the Swedish researcher Ingrid Pramling Samuelsson was formerly president of the international organization for early childhood education (OMEP), which has a strong focus on sustainability. In a review of research on ESD in preschools, Hedefalk et al. (2015) identified and discussed three environmental perspectives of pre-school education: *about*, *in*, and *for* the environment. Children’s possibilities to be active agents in their own learning processes and develop action competence are also important foci of Swedish early childhood research (Caiman and Lundegård 2014; Hedefalk 2014). Moreover, Ärlemalm-Hagsér (2012) found that social aspects of sustainability, such as democracy, are parts of the everyday practices in Swedish preschools. However, a survey of a random sample of preschools found that in many cases ‘ESD’ is restricted to encounters with nature and re-cycling waste (Ärlemalm-Hagsér and Sundberg 2016).

A recent study led by Farhana Borg (2017a) evaluated the implementation of ESD in preschools, aiming to widening our understanding of ESD in Swedish preschools. Part of the study focused on children’s knowledge of the environment (Borg et al. 2017), another on their conceptions of money and economic matter (Borg 2017b), and a third on social aspects such as economic (in)equality (Borg 2017b, c). The most controversial results of these studies concerned comparisons of preschools that had obtained Green Flag awards and otherwise similar ‘ordinary’ schools. A presumption that staff and children would be more environmentally aware in the former was not validated; instead results from both groups of schools were similar. The conclusion from her study was that the commitment and

engagement of individual teachers and parents are better predictors of sustainability awareness than acquisition or lack of a Green Flag award. The reason for these results show the need for further studies evaluating the green pre-school movement, but one possible explanation could be that green preschools in Sweden are focusing more on outdoor activities and practical work rather than ESD, as found by Årlemalm-Hagsér and Sundberg (2016).

17.5.2 Primary School

Primary school is part of the compulsory schooling system, reaching from preschool class to grade 6 with pupils aged 6–13 years. Preschool class up to grade 3 is often organized as a whole school day including integrated co-operation with the School-age educare. Thus, the teaching structure affords some flexibility for transdisciplinary work on environmental and sustainability issues, in and out of school, which is exploited in many cases. Many primary schools also have a Green Flag award or National Sustainable School Award.

In 2008, ten schools in Sweden were selected as Model schools for sustainable development by the World Wildlife Fund, so their work on ESD is displayed on WWF's website to provide inspiration for others (World Wildlife Fund 2018). Due to the long history of outdoor life and education in Sweden, there is also some co-operation between the forest industry and schools today through the *Skogen i skolan* (Forest in the School) organization. An investigation of four primary school teachers' intended uses of the school forests in their daily teaching (Wilhelmsson et al. 2012) found variations in their objectives in cognitive, affective, social and physical dimensions. Two participating teachers had "mainly cognitive objectives", regarding affective responses as positive factors for stimulating interest in and care about nature. The other two had primarily affective objectives. The latter pair considered the "dichotomy between learning theoretical knowledge indoors, and learning practical, concrete knowledge outdoors [...] and the out-door arena as crucial for students with learning difficulties" (p. 26). In relation to EE and ESD, this study confirmed the history and educational intentions of outdoor learning in Sweden as addressed in previous sections.

Since SD-related teaching practices of the green schools in Sweden are often performed as part of mandatory curricular ESD, we next present some of the research findings relating to the green school movement in general, including outside the award systems. A large Swedish study showed that primary school students had most understanding, knowledge, and values related to the ecological dimension of SD, and least about its economic dimension (Manni et al. 2013b). Statements written by participating children included more value-laden expressions concerning the social and ecological dimensions than the economic dimension. Furthermore, their understandings of sustainability were not divided and separated into the three dimensions, but intertwined more holistically in their statements. Regarding the outdoor teaching traditions connected to primary education, the study confirmed the

use and recognition of the educational value of outdoor environments for fostering problem-solving abilities, social interaction, direct encounters with nature and ethical reflections. However, no significant differences were detected between participants from green schools and other ‘ordinary’ schools, in terms of eco- or SD knowledge and values, although the green school students had more experience of outdoor teaching (Manni et al. 2013a, 2017a). In addition, a case study of learning processes of students in a green school found that the emotional aspect played a vital role in continuous processes of learning about environmental and sustainability issues, as initial emotions turned through reflection to deeper understandings and more general pro-environmental values (Manni et al. 2017b).

Several Swedish studies have shown the importance of considering emotions when teaching primary school students about green issues, as children’s emotional thoughts are rooted in their daily life, or life-world, so they may feel threatened by or deeply engaged in environmental problems. For example, Ojala (2012) showed that many children worry about effects of climate change, indicating a need for teachers to promote hope. Similarly, Jonsson et al. (2012) found that Sami (indigenous people living in Northern Sweden for whom herding reindeers is an important part of culture) children worried about difficulties reindeers would face in a warmer climate.

These studies highlight important aspects to consider in green schools’ efforts to foster meaningful learning about environmental and sustainability issues, such as teachers’ responsibilities to respond to pupils’ questions. Manni (2018) also found that the knowledge and skills, Swedish pupils of grades 4–6 envisioned as important was not school subject-specific knowledge, but rather practical solutions for the environmental problems they faced in their lives, and social skills like empathy and solidarity (Manni 2018).

17.5.3 Secondary Schools

Many lower secondary schools (compulsory, grades 7–9, with students aged 13–16 years) and upper secondary schools (tertiary, grades 10–12, with students aged 16–19 years) in Sweden actively participate in the green school movement through the Green School Flag and National Sustainable School Award programs. Moreover, the movement inspires teachers at other schools that do not participate in these programs. The teaching at these secondary levels is mainly subject-bound. Aspects of ESD and EE are included in the formal curricula and syllabi for various subjects, especially biology, civics and geography. In addition, an ESD perspective is part of the common overriding curriculum for all teachers. In that sense, ESD is a responsibility for all teachers, although it is most commonly addressed by science and social science teachers, as discussed in relation to the work of Borg et al. (2012, 2014). Due to this common responsibility for addressing sustainability issues, they are often the focus of thematic work and school projects where teachers of different disciplines are supposed to collaborate. NGOs often provide teaching materials for

such lessons and projects. Examples of thematic work include a role-playing exercise called *UN Conference on Climate Change*, in which students prepare and learn facts related to climate change in different subjects for a ‘UN conference’ at the school where they represent different countries (The Swedish UN Association 2018). In another widely used thematic exercise, ‘The mission’, groups have to plan the habilitation of a space ship that will be away for 6000 years (SWEDESD 2018). A third example is *The Young Masters Programme* of sustainability courses, where secondary school students interact globally and act locally in projects oriented towards problem-solving (The Young Masters Programme 2018).

To enhance teachers’ knowledge and teaching capabilities in relation to global issues of ESD, the governmental organization SIDA funds a program called *The global journey* that arranges study visits for teachers and school leaders in various developing countries. The experiences of cultural diversities from these journeys have been shown to provide important grounds for ethical reflections (Sund and Öhman 2014) that may be later used as platforms for projects at the home school.

SD issues are inherently transdisciplinary and complex. These characteristics have been exploited by upper secondary schools’ school leaders in whole-school projects aiming to improve students’ participation and teaching methods (Leo and Wickenberg 2013). School leaders also reportedly recognize the value of meeting challenges of transdisciplinary teacher collaboration for professional development (Nordén and Anderberg 2011). However, teachers’ experience of such work may vary substantially, and Nordén (2018) found that teachers’ sense of ‘ownership’ in such transdisciplinary collaboration is related to their engagement with challenges of this complexity. If teachers lack a sense of the meaningfulness of transdisciplinary work, they tend to feel overwhelmed by the complexity (Nordén 2018). In contrast, experienced ESD-teachers use the complexity as a starting-point developing student awareness and action competence (Sund 2015).

In line with the findings of Manni (2018) in primary school, Torbjörnsson and Molin (2015) found that secondary level students in Sweden feel there is too little collective discussion in school about questions relating to the future. Moreover, in order to address complex global issues fruitfully a collaborative approach is needed, with the ability to take command and rearrange current orders, including changes in the teachers’ role from providers of answers to partners in collaborative efforts to solve problems (Nordén et al. 2012). However, the importance of interaction with teachers to support students’ deliberative discussion about ESD-related issues is stressed in Swedish research, to avoid risks of consensus-oriented norms reducing the diversity and complexity in reasoning (Öhman and Öhman 2013).

Despite the long tradition of environmental concern and well-developed field of EE and ESD research in Sweden there are still gaps to fill in relation to secondary school. Content dimensions of SD, and their incorporation within disciplinary teaching, have generally received little attention to date. However, some interesting results have emerged regarding the teaching and learning of economic aspects. Upper secondary students seem to have difficulties in discerning relationships between these aspects and both social and ecological factors (Ignell et al. 2013), and rarely mentioned economic issues in open discussions on ecological footprints

recorded by Ottander (2015). Moreover, Berglund and Gericke (2016) found that priorities of upper secondary students' regarding sustainability issues were highly contextualized. Generally, societal considerations were highly prioritized by participating students, but when exposed to a conflict situation in which they had to make choices, they gave economic and ecological aspects higher priorities. Interestingly, students showing high sustainability consciousness prioritized environmental considerations most highly, while students showing low sustainability consciousness prioritized economic considerations. In a follow-up study with more than 600 students, the aim was to identify and analyze young peoples' views of relationships between economic growth, economic development and sustainable development. It was found that students' beliefs could be categorized into four clusters: *un-differentiating positive*, *nuanced ambivalent*, *two-way convinced*, and *critical* (Berglund and Gericke 2018). Hence, these studies indicate that Swedish secondary students' economic beliefs influence their overall understanding of the environment and SD. This calls for further explorations of the potential influence of these (and other) beliefs on students' action competence.

17.6 Evaluation of ESD in Swedish Green Schools

As previously discussed, there is a long tradition of care for nature, outdoor education and ESD in Sweden (Sandell and Öhman 2010), which could lead to an assumption that attitudes are more biocentric and ecocentric in Sweden than in most other countries. Accordingly, results of a large randomized survey of 1280 Swedish citizens' values and beliefs regarding environmental responsibility suggests that most respondents had strongly ecocentric views. The authors state: "a large majority of the respondents recognizes the rights also of other species and rejects any notion of human beings as being at the top of a nature's hierarchy" (Jagers and Matti 2010, p. 1076). In contrast, Torbjörnsson (2014) reported that young Swedes' interest in environmental matters declined between the last decades of the twentieth century and first decade of the twenty-first century. Further, data from the OECD-PISA study of 2009 indicate that young Swedes had a lower sense of environmental responsibility than the OECD mean. Moreover, they were more optimistic regarding prospects for solving environmental problems (Torbjörnsson 2014). Hence, from a general societal perspective, the Swedish relationship with green issues, as promoted by the green school movement, is not clear-cut.

Turning attention to investigations of outcomes and effects of the green school movement, again there are few generalizable studies. This seems to be a common problem in ESD discourse globally, as illustrated by recognition in the final DESD report of "the need for more research, innovation, monitoring and evaluation to develop and prove the effectiveness of ESD good practices" (UNESCO 2014, p. 10). However, subsequently there was a large evaluative survey in Sweden, which we refer to in the following paragraphs.

Despite criticism that ESD has been implemented as a common discourse globally from a top-down perspective (Nurse 2006), promotion of ESD through governmental and non-governmental agencies supporting schools via the green school movement has been very influential globally, as shown elsewhere in this volume. Often this support is in the form of award systems that encourage schools to integrate ESD into their daily educational practice, like the Green Flag and National Sustainable School Awards in Sweden. Due to the importance of these award systems, scholarly attention has been drawn to effects of green school certification systems in EE in many countries. Studies in the Czech Republic (Cincera and Krajhanzl 2013), Flanders in Belgium (Boeve-de Pauw and Van Petegem 2011a, 2013), Israel (Goldman et al. 2017) and the USA (Warner and Elser 2015) have indicated that student-level effects are limited. However, frameworks more suitable for probing EE than ESD were applied in most of those evaluations. Moreover, in Sweden the award systems are complemented by inclusion of ESD in the official curricula, and the professional development support provided by NGOs, such as The Global School. Hence, the Swedish case “can provide a good example of how important the interplay between top-down and bottom-up processes can be for developing effective ESD” (Östman and Östman 2013, p. 106).

In the nationwide Swedish survey mentioned above, 2413 students from grades 6, 9 and 12 participated. Half of the students attended the green schools most actively engaged in ESD over time in Sweden (based on the two award systems and participation in documented professional development activities related to ESD). All considered variables (geographic location, socio-economic factors and educational performance) except ESD-implementation efforts were controlled (Berglund et al. 2014, Olsson et al. 2016). To evaluate the Swedish discourse on ESD, as previously elaborated in this chapter, a new concept (‘Sustainability Consciousness’) and a new survey instrument (The Sustainability Consciousness Questionnaire, SCQ) was developed (Gericke et al. 2019). Previously available research instruments had been designed to evaluate the impact of an EE discourse. Therefore, the SCQ instrument was designed to probe the impact of the ESD discourse in all three dimensions (environmental, social and economic) as well as associated affective and cognitive perceptions (attitudes, knowingness and behaviour), see Gericke et al. (2019) for a full description.

Strikingly, only small differences were detected in sustainability consciousness between students attending the schools classified as most actively engaged in the green school movement (‘ESD schools’) and corresponding reference schools (schools with no official ESD perspective). Attendance of the former had a small positive effect on pupils’ sustainability consciousness in grade 6, mainly in the environmental dimension. In grade 9, ESD schools even had a negative effect, primarily in the social dimension (see Olsson and Gericke 2016), but at grade 12 of upper secondary school level the ESD schools had significant positive effects, mainly in the economic dimension. The most important indication of those studies is that the award systems, and professional development efforts related to ESD, have marginal impact on students’ understandings, attitudes and self-reported behaviour connected to SD (Berglund et al. 2014; Olsson et al. 2016). Moreover, it was found that girls

respond more positively, than boys, to the teaching in the green schools (Olsson and Gericke 2017). At first glance, these results seem very disappointing, although not totally surprising in the light of results from other countries. However, from the same data collection effort another instrument was developed to investigate the students' experiences of ESD teaching (Boeve-de Pauw et al. 2015).

The definition of ESD teaching applied in that study was based on the ideas of holism and pluralism, as previously discussed, and a scale measuring these dimensions of ESD was constructed, based on the description of ESD by Sandell et al. (2005). Items asked to what extent the students experienced different aspects of holism and pluralism in their teaching. Holism refers here to subject integration and addressing different temporal and spatial perspectives, while pluralism refers to highlighting different perspectives in the teaching and encouraging students to be critical and make their own decisions. The results indicated that teachers in 'ESD schools' only practice holism and pluralism more than teachers in corresponding reference schools in grade 12. These findings to some extent explain the absence of effects (or even negative effects) of 'ESD schools' in grades six and nine on students' Sustainability Consciousness. Hence, the conclusion is that only upper secondary level schools that have received ESD awards have actually implemented ESD-associated practices (Boeve-de Pauw et al. 2015).

Even more important findings of Boeve-de Pauw et al. (2015) are that holistic and pluralistic teaching approaches (in either an 'ESD' or 'ordinary' school) positively affected students' sustainability knowingness, and experiences of pluralism positively affected their self-reported behaviour. This provided the first empirical demonstration from a generalizable study that ESD as a teaching approach has an effect on student outcomes. In addition, the authors conclude that neither holism nor pluralism are particularly prominent in school education, so there are good opportunities to improve teaching, and hence ESD and associated action. However, the results clearly show that it is very difficult to induce such changes, even in schools that are actively participating in green school award programs (Boeve-de Pauw et al. 2015).

Evans (2015) has shown that the local motives for schools to participate in the Swedish ESD award systems are: *political* (pressure from political decisions taken outside school), *symbolic* (some schools want to use the flag or symbol provided by the award), *personal* (in some cases an individual or group within the school is interested), and *institutional* (some schools want to use teaching materials provided in the award system). According to Evans (2015), the identified categories relate mostly to extrinsic motives, concluding that, 'the motive is for approval from others or for a feeling of self-worth/measurement rather than congruence with the values of the award' (p. 91). Evans concludes that there is a lack of intrinsic motivations and schools' efforts to obtain awards are often driven top-down, which could explain the difficulties in changing teaching practices in green schools (and hence students' perceptions) detected in the previously discussed surveys.

Recent organizational level studies of ESD schools in Sweden have shed some light on the difficulties in redirecting teaching practices towards ESD. Mogren and Gericke (2017a) identified 26 quality criteria that school leaders in active upper

secondary 'ESD schools' recognize as important for high quality education. Based on comparisons with previous work of Breiting et al. (2005), Boeve-de Pauw and Van Petegem (2011b) and Leo and Wickenberg (2013, 2014), 13 of these 26 criteria were novel and had not been identified in previous studies. Cluster analysis grouped the 26 quality criteria into four principal quality criteria that apparently guide leaders of 'ESD schools'. First, *collaborative interaction and school development*, i.e., recognition that school development is an ongoing process in which all the teachers and other co-workers of the school must actively participate. Second, *student-centered education*, i.e., organization of the education in alignment with students' needs, recognizing that a good relationship between teachers and students is a sign of quality. Third, *cooperation with local society*, i.e., recognition of the need for school organizations to cooperate with the local and global society. Fourth, *proactive leadership and continuity*, i.e. a leadership style based on collective learning, implemented through gradual progression of far-reaching plans (Mogren and Gericke 2017a).

A follow-up study found that no school leader addressed all these principal quality criteria, and they tended to focus either on the school's internal organization (*collaborative interaction and school development* and *student-centered education*) or external collaboration (*cooperation with local society* and *proactive leadership and continuity*) (Mogren and Gericke 2017b). However, in one of the (10) investigated schools, the school leaders focused on student-centered education and cooperation with local society. That school had succeeded in its ESD implementation by initially focusing on proactive leadership, as the school's leadership actively introduced a societal perspective in the school organization. The focus subsequently shifted towards student-centered education so that all the actors of the school participated in the school's vision of collaborating with society. This progressive introduction and permeation of ESD throughout the school seemed a successful whole school approach.

These results were confirmed at the teacher level, as the teachers at this school scored its coherence and organization highly in a questionnaire study (Mogren et al. 2018). These authors concluded that appropriate structures and routines within the school are crucial for successful student-level collaboration with stakeholders in society (Mogren and Gericke 2019, Mogren et al. 2018). These findings conflict with a common emphasis on 'authentic' aspects of education, and criticism of more conservative modes of school organization, in transformative or even transgressive elements of ESD discourse (e.g. Lotz-Sisitka et al. 2015). Another positive finding of the study by Mogren et al. (2018) is that, according to participating teachers, 'ESD schools' were more coherently oriented towards a common vision than other, comparable schools. These results indicate that organizational elements of 'ESD schools' may provide stronger support for teaching and learning than those of 'ordinary schools', and upper secondary schools associated with the green school movement in Sweden may be starting to reorient organizationally towards a whole school approach (Mogren et al. 2018).

17.7 Conclusions and Future Challenges for the Green School Movement

From our overview of the historical development of the green school movement we can conclude that green perspectives are deeply rooted in Swedish society and culture. In addition, there are many initiatives based on informal as well as formal education, and the green perspective is now recognized in the policy documents steering Swedish schools. Hence, bottom-up and top-down developmental drivers have worked in parallel and often synergistically. The identified developments indicate that Sweden could be described as a progressive country, where there has been a long-term re-orientation from an EE towards an ESD perspective, and the green school movement has played an important role in the process. The green school movement has actively embraced ESD, and promoted its inclusion in Swedish schools. However, we also know that despite this recognition of ESD, the green school movement has not led to clear changes in teaching practices in line with ESD, or substantially influenced student outcomes. Here we see a great challenge for the green school movement in the future. Interest in it is present, and even larger numbers of schools want to participate, but the effects seem more directed towards fact-based and normative teaching approaches rather than ESD. We conclude that representatives of the green school movement should engage in more long-term professional development of teachers to overcome the identified difficulties in integrating ESD as a teaching approach in schools. Looking into the future of the green school movement in Sweden we also see some additional challenges.

Rapid digitalization is underway in Sweden. For example, textbooks are being transferred to digital media, and teachers are organizing their teaching through digitalized learning platforms. In what ways will these changes in teaching practices influence ESD and how will the green school movement adapt to these changes? As discussed in this chapter, there is a long tradition of environmental concern and outdoor education in Sweden, but how will the digitalization affect these traditions?

We also recognize a recent trend in Swedish society of young people taking private eco-actions in line with their personal beliefs and values, manifested in many youngsters becoming vegetarians and vegans or avoiding use of products tested on animals. This trend raises the question of how (and how quickly) the formal school system can meet demands in society regarding environmental awareness and action. Here we see great potential for the green school movement to build on students' own interests when developing teaching practices. Much in this recent development seems to relate to a change in values among youth from a human-human focus in favour of a nature-human relationship, which raises the interesting question whether the ESD discourse, focusing on human-human relationships, will be challenged in the future? If, so how should the green school movement react to this challenge?

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Chapter 18

The Development of Greenschools in Taiwan: Current Situation, Obstacles and Prospects

Shun-Mei Wang, John Chi-Kin Lee, and Sin-Jia Ho

Abstract Greenschools have been promoted in Taiwan since 1999, including the Greenschool Partnership Program and Sustainable Campus Project. The former is the most visited environmental education website and demonstrated the promotion results of environmental education in Taiwan and its quality requirements, based on the school teachers' voluntary sharings of the schools' environmental education teachings and actions, the responses of committees from the platform and the mechanism of the "Leaves of Hope tree". In the Sustainable Campus Project, schools apply for subsidy funds to carry out engineering transformation of campus hardware and research and development of curriculum software, so that teachers and students are able to experience the transformation and value of the green campus. The link between the Greenschool Project and the sustainable campus project was developed efficiently through the Central Integrated Supervision System and promoted by the Local Education Bureau. Since Integrated Supervision was withdrawn in 2016, a decreasing number of schools have participated in and applied for Greenschool projects. The long-term promotion of the sustainable campus project has also been in a state of fatigue, which resulted in the reformations of the Greenschool partnership program and sustainable campus project, including the platform transformation of the Greenschools program into a single window for environmental education and the combination of materials of other environmental education programs and resources of various departments. We argue that in the future, the government and school sector should seize the opportunity of 12 years of core literacy and school-based curriculum, use campus space and life, encourage

S.-M. Wang
National Taiwan Normal University, Taipei, Taiwan
e-mail: t73004@gmail.com

J. C.-K. Lee (✉)
The Education University of Hong Kong, New Territories, Hong Kong SAR, China
e-mail: jcklee@eduhk.hk

S.-J. Ho
National Taichung University of Science and Technology, Taichung, Taiwan
e-mail: shinjia@gmail.com

teachers to promote environmental education, establish a community of teachers, and allow teachers and students to actively participate in greenschools with practical, problem-oriented and program-oriented teaching method and under the theme of environment and sustainable development.

18.1 Introduction

Greenschools aims to work towards an ecological and sustainable direction, and a school-wide (all-round) environmental education campaign. In Taiwan, the Greenschool's substantive promotion is not limited by the name. It includes Greenschool Partnership Network, Sustainable Campus Partial Renovation Plan and U.S.-Taiwan Eco-Campus Partnership. Among them, the Greenschool Partnership Network and the Sustainable Campus Partial Renovation Project have a history of more than 15 years. It is Taiwan's own spontaneous development, showing Taiwan's environmental education and promotion. This paper mainly discusses the development of these two projects, including the implementation of the current situation, connotation, and the dilemma and prospects.

18.2 The Concept, Operation and Promotion of the Greenschool Partnership Network

Greenschools is an environmental education strategy with the "whole school approach" (Wang 2004). Its goal is to achieve the establishment of teacher and students' environmental literacy, the reform of teaching methods and content, the school organization policy, and the greening of school buildings and campus. The Taiwan Greenschool Partnership Network encourages self-evaluation, goals setting and actions taking, emphasizing the construction and promotion of the "bottom-up" and "top-down" dual-track system. The spiritual connotation emphasized in the operation process includes "ecological thinking, human care, partnership network, and learning growth". This is to guide the teachers and students of participating schools to choose an aspect and self-automatically improve according to their current situation and schools' abilities, and to encourage them to support and exchange resources with each other in a spirit of partnership.

The Greenschool Partnership Network operates mainly through a website platform. Seed germination, growing leaves, flowering, fruiting, and becoming the tree house is the mechanism that encourages schools to participate in the Greenschool Partnership Network (see Fig. 18.1). The program also includes the issuance of greenschools license and visiting the operation of schools in the field.

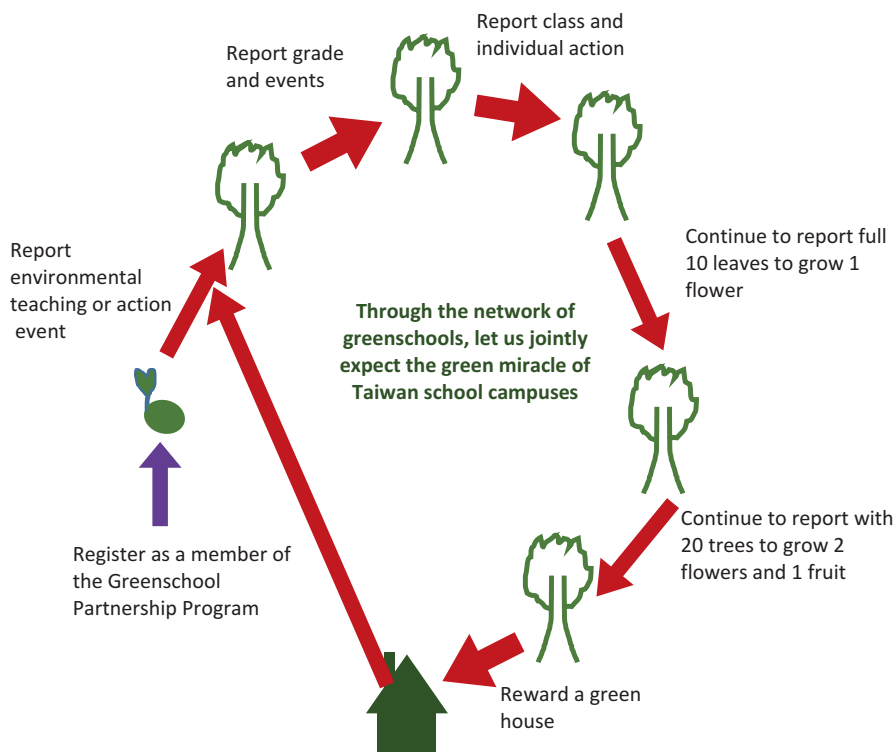


Fig. 18.1 Hope-tree mechanism of the Greenschool Partnership Network. (The figure is revised and based on the illustration of *Tree of Hope* from <https://www.greenschool.moe.edu.tw/eng/practice.htm>)

In 2001–2003, the Ministry of Education Environmental Protection subsidized the local education bureaus of different cities to promote environmental education by setting up the Environmental Education Promotion Groups and Counselling Groups, including counselling visits and promoting the concept and practice of greenschools, in order to effectively combine the expertise from professionals with powers from the community groups (Wang 2009). Starting from 2002, the Ministry of Education continued its Sustainable Campus Project, providing funding for local hardware improvements to achieve sustainable campus, and requiring applicants to be Greenschool partners and present their reporting records. Later, the Ministry of Education has also included whether the county and city promote their affiliated school to join the Greenschools network project as the assessment components. Therefore, the schools no longer voluntarily participate in the Greenschool Partnership Network, and the content of schools' reports are not limited to a certain topic.

18.3 Current Situation of the Greenschool Partnership Network

Under the continuous propaganda and administrative requirements of the Ministry of Education and the County and Municipal Education Bureau, the number of participating schools has increased, and there are more than 100,000 reports on the website (as of 22 June 2018). From 2012 to 2018, the number of reports has changed every year. From 2012 to 2015, the number of articles submitted increased annually, but it has declined since 2016, from 12,000 a year to around 8000 (Xue 2018). This is because after the withdrawal of Integration Supervision in 2016, most of the county and city appraisal items began to shrink, and the participation status of the Greenschool Partnership Network was removed from the evaluation system.

Based on statistics on the participation rate of schools in counties and cities in the past 5 years, we can see that New Taipei City, Tainan City, and Chiayi County maintain a high participation rate. This is because New Taipei City will include the greenschool partnership network into the school evaluation, while Tainan City provides relevant rewards (Xue 2018).

The Greenschool Partnership Network emphasizes quality reporting to respond to the quality of environmental education, especially regard to whether environmental education or environmental action can escalate students' environmental literacy. In addition, a committee member who participated in the report and gave the Hope tree leaves, pointed out in our interview that "a quality report is not just to tell the students what to do, but to be able to bring the context out and let students understand the meaning before it is executed".

According to the classification system, we can see the rich content and diversity in the promotion of environmental education of Taiwan schools. Topics include local awareness, pollution and disaster issues, use of resources, biological species issues, habitat conservation, space creation and the use of eco-friendly technology. However, it currently lacks social topics, such as caring for underprivileged people.

According to the experience of the authors and website manager, a number of reports on one or two particular themes will be more than others in each year, which shows the promotion themes of the government and the non-governmental groups at that time. Overall, the history of Greenschools is a history of environmental education in Taiwan. The manager used the software of data mining to analyze the 2016 report which the content response included a lot of words such as ocean and plastic, reflecting the theme of plastic reduction in the ocean.

18.4 The Greenschool Medal and School-Wide Environmental Education

Greenschools should involve the whole school. However, because the report is submitted individually, it may not cover the whole school. Therefore, the medal award mechanism is used to let the teachers and students of the whole school know that

their school is participating in the plan and has good results. This enhances the publicness of the program.

For example, the four schools which received a gold medal in 2017 each has its own characteristics. The Haishan Elementary School of New Taipei City has an environmental education group that covers the entire school administration and teachers. The establishment of environmental education workshops (teacher community) for teachers helped to promote environmental education throughout the school. They systematically promoted food and agriculture education in 2015 and were invited to share at the listing ceremony. Through the food and agricultural activities, the school guides students' understanding of agricultural practices and responsible life behaviours, and encourages students to express their gratitude to organic farmers. The school is full of warmth and action in forming culture.

The school is small, 15,000 square meters, very crowded, and the edible landscape is only half of the classroom. The soil has to be cultivated for many times a year to give more opportunities for classes to experience. The Fuzhi Foundation teaches teachers to cultivate and the teacher will then teach the children. Each class has only a small piece of land, and this is an opportunity to teach students when to water. At the beginning of the cooperating period, we found that there are a lot of muddy footprints in the campus, then we had to let the children know that the soil is wet and does not need watering. If the campus is dirty after watering, they are responsible for their actions. He uses this method to teach children.

Last year's "Good Cycle" painting competition, the senior art teachers led the middle-aged students to draw and used the works to make a desk calendar in order to thank the Sunflower Charity Association that subsidized organic rice of our school. We also made the students' work into gift card and sent to the organic farmers throughout the nation. Those organic farmers who received our cards were very touched by the presentation on Facebook. (Video of 2015 greenschool results presentation)

The Sanchong Elementary School is in the city center of New Taipei City, and the school teachers are also happy to report and share actively. And, they won the highest number of leaves among national greenschools.

The biggest feature of our school is that the teachers hope that ecological education is on the curriculum. This is the consensus of the teachers. We are lucky as all teachers in the school have a lot of feelings about the environmental issues and their concepts are also clear. I hope that there will be a room for the students to contact. Instead, we don't want to see the children who mourn of meeting the butterflies.

One teacher is very interested in ecology and planting. He organizes the community of gardening clubs and organizes students. This teacher is very happy every day and begins to take students to handle the potted plants. This is to beautify the campus. They are responsible for planting and taking care plants as they were sent to the plant recovering area when the plants are not in good condition. The teacher found that the dark corners of the campus had grown green silently in recent years. Many teachers were then affected by that. The teacher organized a community. More than a dozen teachers participated. Seeds are left behind for planting when everyone eats fruits. There are one or two pots of the plant on the table. The class became very comfortable. When students are graduating, all graduates to send their plants with a thankyou card to the teachers in order to show their gratitude. The teacher personally brought the pot to his teacher as well. This activity has a very good effect on campus. This activity is matched with green beautification, and the emotion between each other is also satisfied. I admire the teacher. In the ecological zone, many teachers, whether they are natural classes or language classes, have used the leaves and seeds to create artistic creations and poetry. (Video of 2015 greenschool results presentation)

18.5 Taiwan's Sustainable Campus Partial Renovation Project

The Greenschool Partnership Network is mainly driven by the concept of environmental education, including changes in school teaching and living behavior. At the same time (in the year 1999), after the “921 earthquake” in Taiwan, many buildings, especially the school buildings were seriously damaged. The community then put forward new campus planning concepts. The Ministry of Education has integrated opinions from all walks of life and proposed the goal of constructing a [green campus environment for sustainable development], for sustainable campus planning and Greenschool education (Su 2009).

Between 2002 and 2017, Taiwan's sustainable campus promotion project subsidized more than 740 schools (Ministry of Education 2017), from the national primary school to the university campus, and carried out hardware engineering and software curriculum development. The transformation projects are as follows:

1. The theme of resource and energy flow cycle: including recycled rainwater utilization, natural purification water cycle treatment, renewable energy application (wind power, solar energy, etc.), energy conservation design measures and water conservation measures planning
2. The theme of sustainable basement: including water-permeable pavement and surface soil modification.
3. The theme of ecological cycle: including affinity fences and multi-level ecological degeneration: native species or plants adapted to local climatic conditions should be used. The original woody plants cannot be removed.
4. The theme of healthy building: including the use of healthy building materials and natural materials, indoor environment improvement (such as sound, light, heat, gas, etc., should be replaced with easy maintenance)
5. Others: such as campus friendly space planning, idle school re-use.

Most of the network schools are national primary schools, and the participating schools combine the social characteristics of each township to create an ecological campus, or showcase the innovation of each school's technical expertise. Among the subsidized schools, the 117 schools in Tainan City (15.04%) ranked as the largest numbers, following the 77 schools in Kaohsiung City (accounting for 9.90%), and the 70 schools in New Taipei City accounted for three (9.46%). In more than half of the 368 towns in the country (260 townships), at least one of the schools they belong to has received subsidies and become a demonstration point for local sustainable space (Xue 2018). In the educational process of these school renovations, school teachers often share in the Greenschool Partnership Network.

During the grassroots period of the Sustainable Campus Partial Renovation Project, the government invested 500 million Taiwan dollars to actively promote the measurement of environmental and resource changes. For example, Taipei Shenkeng Elementary School, the campus's sustainable campus started with the rescue of

local centuries-old trees, combined with community resources, excavated 200 square meters of cement pavement, freeing the old trees. It also made every year's 10th of March become the [Shenkeng Old Tree] Festival, and the Shenkeng Elementary School uses the rainwater interception and recovery project, to build [artificial stream] and the [ecological pool] in order to create a campus environment with biodiversity. From 2002 to 2004, the sustainable campus project brought multi-level ecological greening ratio from 23.4% to 35.8%, and the permeable area increased by 12.8% (the ratio of greenschool yard areas returned to ecological processes has increased from 23.4% in 2002 to 35.8% in 2003) (Su 2009, p. 26). Among the subsidized schools, 33.2% implemented renewable energy utilization and teaching, and 10.6% integrated the kitchen waste composting into organic farms (National Council for Sustainable Development 2014, p. 26).

The Sustainable Campus Project continues to promote implementation, and in schools that have won the National Sustainable Development Awards in each of the years you can see the campus actively using space transformation for environmental education, such as, Taichung Xiaoming secondary school in 100 years, which won the National Sustainable Development Award. Energy conservation and carbon reduction are an important part of the school's environmental protection work. For this reason, the school has adopted the school's overall electricity and water assessment, then switched to use energy-saving lights and rechargeable batteries, and established the Green Life Research Institute (National Council for Sustainable Development 2011, p. 26). In 2016, the Pudong Elementary School in New Taipei City shaped an ecological low-carbon campus (National Council for Sustainable Development 2016, p. 25). The concept of sustainable campus has been deeply rooted in the schools.

In the above-mentioned sustainable campus hardware facilities, the project itself requires that the participating schools cooperate with the transformation project to have corresponding software teaching or activities, including teaching plans, teaching modules, process records and achievements. In addition, it is also expected that the schools can combine community strength, create campus characteristics, promote teacher professional growth, and enhance students' learning effects. Through the long-term data tracking analysis course teaching process, the most commonly used is the study list and video, so that the students can achieve multiple results of learning, and also help the school's overall marketing and communication with the outside world. The distribution of teaching themes is dominated by energy, the construction environment and water resources; ecology, consumption and food are of less concern. According to the results of the 2012–2013 second-stage, the average number of items in the project are – 22.5% for permeable pavement, 30% for rainwater reuse, and 36.25% for indoor environment (Chen 2016). The proportion of above items are higher. In the education curriculum, the proportion of the two major projects, such as 45% for nature and life science and 28.75% for comprehensive activities, is higher (Chen 2016).

18.6 Barriers to Greenschools

1. Gradual marginalization of the Greenschool project in the schools

Since the pressure of the Integrated Supervision assessment was removed in 2016, the number of schools reporting on the website has declined. In addition, the top-down pressure does not necessarily reach the level of teachers. It is still a challenge for teachers to put environmental education into practice.

2. Obstacle in promotion of sustainable campus

Although Taiwan's sustainable campus promotion project emphasises the close connection between sustainable hardware facilities and curriculum, the most direct incentive for schools is the funding of hardware facilities. Therefore, it is often the business of the General Affairs Office. There is still a distance between teaching and hardware improvement, which makes the teachers and students of the school unclear about the concept of sustainable facilities. In the courses proposed in the individual cases, a large part of the courses did not indicate which hardware transformation projects were associated with them, resulting in the separate development of hardware and software courses.

Some studies have found that schools that have actively participated in the sustainable campus in the past have gradually stagnated after years of construction. School teachers do not understand why schools promote sustainable campuses and do not understand the school's existing sustainable environmental resources (Yeh 2015). Chung (2011) explored the awareness of the primary school teachers in Tainan City of the sustainable campus and pedagogy on how to use the campus facilities and the campus environment to facilitate teaching. The results showed that,

- For the schools have subsidy for the local campus reconstruction project, under the pressure of resource acquisition and performance, teachers have higher awareness of the goal of sustainable campus than those who do not receive subsidies,
- The attitudes towards environmental education are greater than those of a teacher,
- The subject considers that the concept of "sustainable campus" is most suitable for integration into the natural and life sciences and technology, and the teaching method is higher for "promote sustainable education-related activities" (31.5%).

However, the teaching methods of "teachers sharing" (20.6%), "discussion between teachers and students" (20.6%), and "environmental observation activities" (16.4%) are more common, and (4) The subject believes that the most common difficulty encountered in teaching is "the lack of relevant professional literacy (20.8%)".

18.7 The Future of Greenschools

18.7.1 Expanding the Platform of Greenschool Partnership Network, Connecting Resources and Strengthening the Application

18.7.1.1 Turning Greenschools Platform into a Single Window

In the face of the reduction in the number of reports submitted in the network, the Ministry of Education has planned for the website to become a single window for the Ministry of Education's environmental education, and revised the reporting format, requesting the theme of environmental education for the 12-year national education in the report. In addition, the website administrator suggested setting a column which discusses what is a good report or case on the Greenschool partner website would be clearer and direct to guide partners. The Ministry of Education plans to put the results of other environmental education and disaster prevention education programs on the platform for the future to be used by Greenschool partners, and hopes that the website will be more active.

18.7.1.2 Encourage International Connections

In recent years, the US Environmental Protection Agency and the Taiwan Environmental Protection Agency jointly launched the "Taiwan Eco-School Alliance Program". It aimed to conduct alliance and cooperation between Taiwan and the United States, refer to the seven steps of the International Eco-School Program Certification Index, and to issue bronze medals, silver medal and green flag award according to the degree of conformity (Chiayi County Environmental Protection Bureau 2016).

Teachers who have participated in eco-schools said this is a very good development, and greenschools can develop in this area. One of our teacher interviewees mentioned:

That is like the Eco-school of the EPA, it has ten directions for seven steps. I think that is very systematic, and some schools are used this to report. At the time, we brought up the global view of the children by connecting with the partner schools in the United States. We used that, and then we talked to each other. When we filmed the film, what did our school do? Then we could communicate in English so that the children and teachers will also be interested.

18.7.1.3 Strengthen Teachers' Training and Encourage Teachers to Use Campus Environmental Issues and Space Transformation to Carry out Thematic Teaching

In the past, the Greenschool partner network and the sustainable campus promotion process came from central and local administrative pressures. The principals took it seriously. Under the atmosphere of self-awareness, teachers did not necessarily cooperate with the implementation. In addition, the Chung (2011) survey showed that the teaching part of the sustainable campus space transformation, the curriculum designed by the school often does not mention the transformation project; it related to the hardware, the teaching method is mostly the way of telling, then the discussion and visit. The aim of the Greenschools National Network is to encourage the use of local development themes and problems to challenge students and allow them to solve their problems related to environment and sustainable development. After collecting data on their water or electricity use, students would then analyse the data (e.g. calculating the water rate or electricity rate) and find out ways that can help the schools to adopt sustainable practices in daily life (Greenschools National Network [n.d.](#)).

Currently, the reform of Taiwan's Twelve Year National Basic Education Curriculum encourages the school curriculum to be directed toward a problem-oriented program, using inquiry-based, problem- and program-oriented teaching methods. In response to the above-mentioned dilemma in promoting and implementing sustainable campus, Taiwan's sustainable campus project has been undergoing an adjustment process. The main axis of the project has been defined to present and implement sustainable campus as a self-exploration program. During the process, the participating school would stock take its resources, identify and locate its environmental issues and clarify the relevant concepts. The whole process would take one year so as to enable the teachers and students to deeply explore and understand the issues. On the other hand, hardware modifications would not be included in this one-year program (i.e., hardware modifications should be applied and executed separately). As a result, the subsidized schools are allowed to implement the self-exploration program as a school-based curriculum under the Twelve Year National Basic Education Curriculum. Based on "Exploration of Sustainable Campus/Discovery of Sustainable Campus", the most fundamental and core question is: Do we know the school and the land in which the school is located? It is an opportunity for the school to achieve sustainable development, and to find a suitable path and method, and then through the campus environment transformation, to build a sustainable system, such as symbiotic ecological campus system, smart health campus system, low carbon cycle campus system and resilience and disaster reduction campus system. At the same time, they can also respond to the UN Sustainable Development Goals (SDGs) (UN 2015), so that Taiwan schools can understand the language of international common education and form their international vision.

Because teachers often indicated that their professional literacy is insufficient to design a curriculum, and respond to the hardware transformation project in the sustainable campus project, it is recommended that, pre-service and in-service training

of teachers be expanded, and the formation of a teacher community encouraged, such as the above-mentioned Haishan Elementary School's teacher community of environmental education to overcome this problem. The Greenschool Project and the Sustainable Campus Renovation Project need to synergize with this educational reform, arrange teacher workshops, encourage teachers to form communities, and develop the ability to use a topic-oriented approach. Through practical evaluation, in the course, teachers and students can participate in shaping Greenschools and ecological campuses to establish environmental literacy and national core literacy. In 2017, the Ministry of Education revised the website reward mechanism and added watering devices to encourage school environmental actions to step out of the school. In addition, they will consider the selection of quality reports and sustainable campus courses in the past as examples of the 12-year national environmental education agenda. School teachers can learn about environmental issues or project-oriented teaching methods, which enhance the status of administrative orientation.

18.8 Conclusion

The Taiwan Greenschools, which includes the Greenschool Partnership Network, Sustainable Campus Partial Renovation Plan, are independent but related. Greenschool provides the concept of whole-school operation and environmental education, and provides a "unique" environmental education platform for teachers to share. The sustainable campus project provides funding to enable the school to implement the concept of sustainability in campus space, life behaviour and teaching, so that teachers and students can experience the real experience, also integrate their achievements into the curriculum to create a lesson plan and share Greenschool network. These two projects have been implemented for a long time. Although the policies of these two projects are justified, more dialogue is needed to clarify what constitutes a quality environment and sustainable development education. In addition, the external environment, such as the reform of Twelve Year National Basic Education, the encouragement of international exchanges, the practice and teaching related to Greenschools and sustainable campuses, must be linked to the 12-year national education core literacy. Through inquiry, implementation, the problem-based and program-oriented teaching approach, and with environmental and sustainability issues as the theme of the curriculum, teachers and students can combine with parents and communities to jointly create Greenschools and promote cross-regional or cross-border class exchanges.

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Chapter 19

Impact of the Eco-Schools Program on “Education for Sustainable Development” in Turkey



Mehmet Fatih Taşar

Abstract TÜRÇEV (Environmental Education Foundation of Turkey) has been running a ‘green schools program’ named ‘Eco-Schools program’ in Turkey since 1995. TÜRÇEV complies with the regulations of the Foundation for Environmental Education (FEE). The Eco-Schools program aims at pre, elementary, and middle schools in order to educate the children about environmental consciousness, environmental management, and sustainable development. Studies conducted on eco-schools since 2005 report that, both in Eco-Schools and non-program schools, children are learning about the elements of Education for Sustainable Development through a variety of approaches but there are problems in reflecting them in behaviours.

19.1 The Legacy of the Blue Flag

The Turkish tourism industry has developed rapidly in recent decades. From only a few million foreign visitors in the 1980s, in 2018 there were nearly 40 million visitors (Trading Economics 2019). Becoming aware of the advantages offered by this industry for economic development, the Turkish government provided incentives for the investors and also took measures to make the country a worldwide popular tourist destination inspired by other neighbouring countries in the Mediterranean area like Spain, Italy, and Greece. One of those measures was to join the Foundation for Environmental Education’s (FEE) Blue Flag Program in 1993. Today the number of blue flags awarded in Turkey even challenges the top contender Spain: “Among 50 countries, Turkey ranked second in the 2015 Blue Flag program, with 436 blue-flagged beaches, following Spain with 578 beaches, according to results announced by the International Blue Flag jury” (Doğan News Agency 2015).

M. F. Taşar (✉)
Gazi University, Ankara, Turkey
e-mail: mftasar@gazi.edu.tr

TÜRÇEV was established in 1993 in order to start the “blue flag program” in Turkey with a motivation to develop the tourism industry. From the beginning, TÜRÇEV complied with the regulations of the Foundation for Environmental Education (FEE), the originator of the Eco-Schools program. Today, TÜRÇEV is the sole representative of FEE in Turkey and has been running the Eco-Schools program in the country since 1995 as the only ‘green schools’ program available to schools. The Eco-Schools program involves pre, elementary, and middle schools in order to educate the children about environmental consciousness, environmental management (as defined by ISO 14001/EMAS), and sustainable development. Children’s active role in outreach programs towards their immediate community is encouraged throughout the program.

Currently, there are 1087 schools (466 public and 621 private) implementing the Eco-Schools program in cooperation with TÜRÇEV (see Fig. 19.1). With the latest statistics obtained from TÜRÇEV a total of 369,246 students are enrolled in these schools (53.5% in public and 46.5% in private schools). Considering that in the country there are about 12,250,000 students in K-8 schools, Eco-School students make up roughly 3% of their peers. The number of eco-schools is increasing steadily year by year and the interest is still keen after 24 years of implementation.

Number of Schools Enrolled in the Eco-School Program in Turkey according to Years

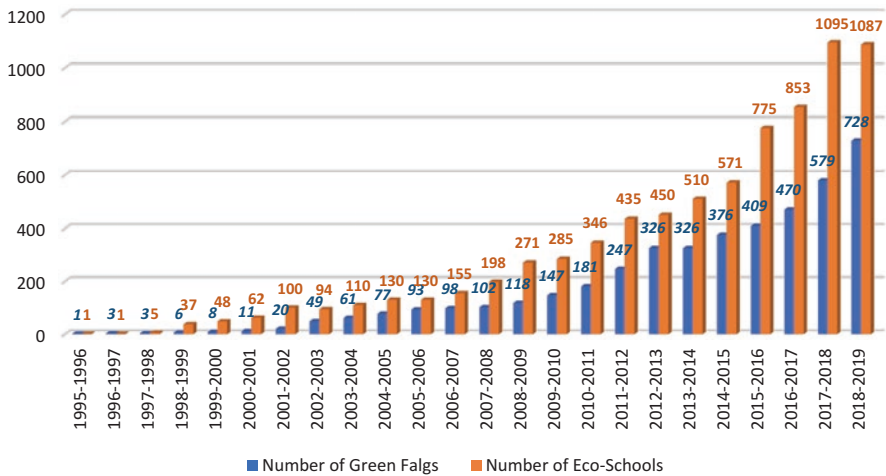


Fig. 19.1 Origin and growth of the number of eco-schools in Turkey. Green flag schools are a portion of the eco-schools, which are awarded a green flag after at least two and a half years remaining in the program and fulfilling the requirements of FEE

19.2 Environmental Literacy in Eco-Schools and Other Schools

One of the main problems with Education for Sustainable Development (ESD) is to evaluate how the impact on students’ knowledge, attitude, and behaviour is measured. There is also debate in the literature about whether ESD is successful in increasing knowledge and raising awareness and whether it creates positive changes in attitudes, and behavior (e.g. Boeve-de Pauw and Van Petegem 2011; Boubonari et al. 2013; Özsoy 2010).

In a survey study (Akin et al. 2006) that probed Turkish eighth graders attitudes towards selected environmental issues, we found that they attained highest attitude in the affective domain. Among the six main environmental issues covered in the survey (i.e. animals, energy, general issues pollution, recycling, and water), the highest and lowest positive attitudes were found to be towards water and recycling respectively. We related the cause of this finding to the fact that in Turkey there were not even moderately visible official efforts to inform citizens and schoolchildren and to encourage/force them to recycle whenever possible. Compared with developed countries, actual efforts for recycling are still at a minimum level. For example, in most of the municipalities, household waste is not required to be sorted and collected separately for recycling purposes. Recycling activities in workplaces, schools, and public places such as parks, shopping malls, public transport stations etc. are usually conducted on a voluntary basis and not done as a coordinated and organized, deliberate efforts.

Education for Sustainable Development (ESD) is a broad and complex concept (Eilks 2015). Its history, relevance to and implementation in Turkey has been discussed elsewhere (Öztürk 2018) in detail. As documented in Öztürk’s recent investigation, it is now evident that there has been a lot going on from policy making to implementation regarding ESD in Turkey. More importantly, for the purposes of this chapter, there has also been significant effort put forth in researching and evaluating those efforts. Turkish researches mostly associated ‘education’ with the words “environmental, social, gender, human rights, democracy, character, peace, moral and multicultural”. On the other hand, “the concept of ‘sustainable development’ was mostly used with the concepts of environmentalism, environmental education, consumption and future” (Öztürk 2018, p. 579) When Öztürk analysed the published studies, he found that the ones that fall under the category of “environmental aspects” comprise 45% of the total. The analysis revealed that, as a weakness, environmental education showed a tendency “to focus more on knowledge, rather than skills, values and perspectives.” (p. 582). The most striking assertion stemming from the available body of research is that “a discrepancy between environmental attitudes and behaviours was common in all groups of the society; in particular students’ environmental sensitivity was hardly reflected on their actions.” (p. 582). However, this investigation did not have a focus on Eco-Schools as the literature review covered only “the papers published with a focus on ESD themes between the years 2005 and 2014 in only three high-impact educational journals in Turkey”

(p. 573). There are only 13 studies conducted on Eco-Schools in Turkey, and these are in the form of thesis (10) or dissertation (3) studies and these were not been published in any one of those journals.

The aim of this chapter is to discuss the impact of the Eco-Schools program in Turkey. In order to achieve this goal, I reviewed relevant studies by searching both on the Internet and in the national database of theses and dissertations in <http://tez.yok.gov.tr> with the keywords “eko okul,” “eko-okul,” and “education for sustainable development.” The search yielded a total of 13 theses and dissertations. These studies were conducted between 2005 and 2016 and they mostly attempted to compare Eco-Schools with non-program schools (NPS).

The first comparison study was conducted in 2005 on the state of environmental education in Eco-Schools and NPS (Aktepe 2005; Aktepe and Girgin 2009). In general terms, grade 8 students' (n = 178) sensitivity to environmental issues and their views about sufficiency of environment related activities in their schools were investigated. Findings from a survey instrument composed of three sections revealed that students in NPS were better at knowledge related questions like ‘how acid rains are formed’ or ‘in what way toxic waste released to water or soil reaches human beings.’ At sensitivity level no difference was detected between the two groups. They both showed interest and effort at the same level for keeping the environment clean and saving resources but also thought that people in general were not behaving in the same way. As to the related activities, it was found that Eco-School students were engaging more in activities like environmental protection competitions, recycling applications, creating posters to raise awareness, and also environment club activities. So, the impact comparison comes down to opportunities to learn about more and engage in activities and do more. NPS students were better at the former, while Eco-School students were better at the latter.

Similar results were revealed in another study (Yüksel 2009), also conducted in Ankara in a mixed group of public and private schools. Although a different survey instrument was used, students in NPS scored better on the knowledge probing test. But again, in the number of activities organized by the schools and students and in engagement, Eco-School students were better.

One cannot help but only wonder why this difference occurs (i.e. why Eco-School students are not as good as their peers in NPS on the knowledge and reasoning tests). Obviously, Eco-Schools should take this finding seriously and try to close the gap. From a counter point of view, evidently, both Eco-Schools and NPS have things to learn from each other.

Özsoy (2010) conducted a systematic and detailed pre-test/post-test hypotheses testing study to investigate the impact of her Eco-School implementations on students' environmental literacy (i.e. improvements in environmental knowledge, attitudes, concerns, and using the environment). The study took place in 3 private schools in Aksaray, a small town 200 km south of Ankara which is mostly an agricultural area but also home to the biggest truck production plant in Turkey. This time Eco-School students performed better in all four dimensions of the environmental literacy scale. In her dissertation Özsoy explains in length how the Eco-School program was conceived and implemented together with school administrators

and teachers to ensure the highest degree of student engagement (the treatment group). In the first two studies reported above researchers were not involved in the implementation of Eco-School action planning. They only performed data collection to see if there was an impact created in the Eco-Schools. However, Özsoy’s study makes one to think if there were flaws in the implementation of the Eco-School program in the schools visited by Aktepe and Yüksel. Shortly later, Özden (2011) also found that Eco-School students had better environmental knowledge and attitudes as compared to NPS students. Özden’s study was conducted in Istanbul (a mega city with over 15 million population) and proved to be the most comprehensive one since there were 12 schools (10 Eco-Schools), 22 teachers (11 female, 11 male) and 2007 students participated. Another feature was that schools were from lower, middle, and upper socio-economic levels and not from one level only.

Other non-uniform findings emerged from another study (Bozdemir 2011). This study measured and compared Eco-School (ES) and Non-Program Schools (NPS) students’ environmental knowledge, attitude, friendly behaviours, and consciousness levels in Ankara. Participating students were from 3 ES (n = 315, 48%) and 3 NPS (n = 341, 52%), 304 boys (46.3%) and 352 girls (53.7%), 254 (38.7%) from grade 6, 195 (29.7%) from grade 7, 207 (31.6%) from grade 8. I summarize the findings in Table 19.1.

Although there were no statistically significant differences in learned environmental knowledge among grade levels (i.e. no improvement as grade level increased), when all three grade students are taken together in aggregate in respective Eco-Schools and NPS there was a slight difference in favour of Eco-School students. Moreover, as Table 19.1 shows, there were some non-uniform differences when grade level and knowledge are counted together. Eco-School students in grades 6 and 7 performed better than their peers in NPS for learning knowledge, while grade 8 students in NPS performed better than their peers in Eco-Schools.

For attitude and environmentally friendly behaviours similar results were obtained: no difference in grade 6, better performance in Eco-School students in grade 7, but better performance in NPS students in grade 8. The picture was more or less the same for environmental consciousness but a slight difference in grade 6 in favour of Eco-School students was detected. As to gender differences, on the other hand, girls performed better than boys in all four dimensions.

Table 19.1 Comparison of Eco-School (ES) and Non-Program Schools (NPS) students’ knowledge, attitude, environmentally friendly behaviours, and environmental consciousness

Grade	School type	Knowledge	Attitude	Behaviour	Consciousness
6	ES	↑	≈	≈	≈↑
6	NPS	↓	≈	≈	≈↓
7	ES	↑	↑	↑	↑
7	NPS	↓	↓	↓	↓
8	ES	↓	↓	↓	↓
8	NPS	↑	↑	↑	↑

A different type of comparison study was conducted to investigate if there were any differences with respect to environmentally friendly behaviour and knowledge in Eco-Schools and Eco-Schools awarded a green flag (Batak 2011). TÜRÇEV regulations mandate that a school must stay in the program at least for two full consecutive school years and execute and complete at least the two thirds of the action plan in order to be able to apply for a green flag award. This gives sufficient time for teachers and students to adapt to the program, progress adequately in the action plan, and raise environmental awareness in their close neighbourhood area. A green flag award is given for 2 year term and at the end of the second year applications can be renewed.

With regard to behaviour (action) students in both school types did not show desired outcomes such as not using disposable plastic shopping bags, participating in activities for preventing environmental pollution, and placing complaints/warning authorities when necessary. However, students in both school types engaged in actions like recycling, turning off idle devices and appliances, and environment club activities. On the other hand, the environmental knowledge of green flag Eco-School students was found to be better than their peers in Eco-School students in the multiple choice test. As such, results of this study do not lead to a decisive conclusion as to the impact of green flag schools being more favourable than other Eco-Schools.

The last comparison study available focused on Eco-School and NPS students' environmental attitudes and activities (Er 2015). Although no difference was reported in students' knowledge, it was reported that Eco-School students conducted a variety of activities while in NPS no environment related activity was conducted. Eco-team students in Eco-Schools had developed desired attitudes and associated behaviours but their Eco-School and NPS peers were far behind in adopting such behaviours in their daily lives as they reported in interviews. Another finding was that girls showed better attitudes than boys.

19.3 Researching Other Aspects of Eco-Schools

Kahriman (2016) took a different approach in research focus and investigated early childhood teachers' views and practices together with their knowledge and attitudes about ESD. For that purpose she formed a large sample ($n = 838$) from four cities in Turkey. The teachers were from both NPS (63 preschools, 489 teachers) and Eco-Schools (48 preschools, 349 teachers). They mostly taught 37–48 month olds ($n = 264$, 32.6%) and 49–60 month olds ($n = 484$, 59.8%) children (total number of these two age group teachers in the sample were 784 (92.4%). Teachers in both Eco-Schools and NPS had an above 90% consensus that ESD was necessary for the age groups they were teaching with “the most important purpose of ESD” being “awareness of SD/ESD issues” (p. 98) and they used variety of teaching methods and techniques.

When Eco-School and NPS early preschool teachers' knowledge, attitudes, and practices about SD were measured and compared it was seen that Eco-School

teachers outperformed their NPS colleagues in all three of these domains but the difference was biggest in the ESD practices. The ESD related practices that were asked adapted a whole environment approach and covered issues of environmental pollution, consumption habits, plants and animals, elderly and the needy, social equity, and promoting environmental friendly practices and awareness, etc. (24 Likert type questions). A noteworthy finding is that teachers felt they needed more resources and training for teaching ESD issues more effectively.

In the same set of preschools data analysis showed that although Eco-School preschools had better facilities that can be used in ESD teachings, teachers in both Eco-School and NPS allocated same amount of time for ESD related lessons/activities since they all followed the national curriculum (Kahriman-Pamuk and Olgan 2018).

This study is also interesting one since teachers’ childhood experiences with nature was investigated to see if it was related to their views. For this purpose, their childhood location type (urban or rural) and accommodation type (house or an apartment building) were factored to see if they had any effect on their views about the importance of ESD. Results revealed that teachers who were raised in rural areas scored higher than those grew up in urban areas. Likewise, during childhood participants who lived in a house (possibly in a garden) rather than in a several storey apartment building scored higher (Kahriman-Öztürk and Olgan 2016).

Apart from these impact comparison studies, Turkish researchers’ interests and perspectives regarding Eco-School began to diversify. Although the first seven studies aimed to compare schools in terms of their impact on students’ gained environmental knowledge, attitudes, behaviours, and consciousness, later studies had all different foci to investigate.

The researcher in the first of these diversified studies went to a preschool instead of middle schools (Cengizozğlu 2013). She developed and implemented a series of activities for 4 weeks to young children (60–66 month olds) in a public pre-school which was also an Eco-School. She found that even these younger children could learn a lot about the environment and the negative impact created by human beings on it during this short period of implementation. The researcher asserted that “the practical considerations and action-oriented approach should be highlighted” (p. 107) while teaching such topic to young children. In that way children could learn quickly about relevant issues even though that was their first ever encounter with those such as “the components of a forest ecosystem, the process of recycling, polar bears and penguins in the Arctic and what sustainability is.” (p. 108). Another aspect brought up by Cengizozğlu was to emphasize to teach to think critically at this young age and that learning did not had to be just memorizing some environmental related facts.

Another pre-school oriented study investigated the ESD practices and features of the school environment in 4 public and 4 private Eco-School preschools with green flags in Ankara (Korkmaz 2014). The findings indicate that although there are differences between public and private schools as to the practices and changes of what ESD entails, in all 8 school teachers and administrators are beginning to engage in professional development activities, formal or informal, and that ESD related

learning is happening that also permeates into the whole school atmosphere eventually. Forming a need and raising awareness can be a good start for motivation to learn and teach. This was also seen in these green flag preschools.

School grounds can and should be organized in order to improve children's well-being and the environment in which they spend most of their daily times. From that perspective, researchers compared kindergartens (N = 18) according to their ground features in both Eco-Schools and NPS (Huz 2015; Huz and Cevher-Kalburan 2017). As a result, they found that Eco-School kindergartens had more variety of natural and fabricated objects, resting places, pergolas, and play stations. However, the time spent in both school types by students were equal, 30 min on the average. This study vividly portrayed the school grounds in the 18 schools by including pictures and teacher narratives. In conclusion, no difference could be found in the two types of schools in terms of supporting ESD, but the importance of teacher education for ESD was highlighted.

Investigating grade 7 students' mental models regarding environmental issues (Arik 2014) was one of the other research topics. Here, students' conceptions and misconceptions were investigated. Powerful assertions and criticisms were made while evaluating the results of this study (pp. 83–84):

An international environmental education program, Eco-Schools, fell behind its essential objectives according to the results of this study. Therefore, environmental education programmers should design outcome-oriented, effective, appropriate programs that are capable of instilling abstract and complex environmental topics.

(...)

Moreover, curriculum planners are responsible for students' misconceptions as much as teachers, environmental education programmers and media. National Turkish science and technology curriculum fails to provide efficient ESD to students. In order to improve quality and effectiveness of the courses, ESD should be integrated into curriculum more excessively and deeply. Students' motivation through environmental topics can be raised by associating them with their lives. Therefore, while representing such topics to students, it can be stressed that how environmental problems and humans affect each other. In this manner, students have responsibility toward environment and change their attitudes and behaviors in a more environmentally-friendly way. All environmental topics are interrelated; therefore curriculum should link to each other but do not let them to be jumble in students' minds.

Ceylan (2015) focused on Eco-School teacher's leadership characteristics and found that her participating teachers showed four styles of leadership as outlined in the literature: instructional, transformational, moral, and participative. And apart from these, all school leaders showed eco-leadership characteristics, because they integrated not only the school related issues but also all sorts of environmental problems into the curriculum and the school culture and by focusing on ecological problems by means of projects. But these eventually created a temporal and financial problems for handling these extra topics in the curriculum.

Eco-Schools have to prepare a self-report by documenting their yearly activities after each school year they remain in the Eco-School Program and submit them to TÜRCÇEV. Another way to see the impact created in the program schools is to view

and analyse some of these reports. Below are analyses of six Eco-School yearly reports.

Ceylan (2015) also found that Eco-School leader teachers were informed about Eco-School for the first time through a variety of sources like an announcement from the Ministry of Education or school administrators. But, what is noteworthy is that their personal interests and sensitivity towards environmental issues had been their prime motivation to assume those roles. Being self-motivated Eco-School leaders provided them encouragement to close their knowledge or skills gap for running the program in the schools. Some of them had previous professional development experiences or were involved in environment related NGO activities. This finding was consistent with their long time personal interest in the issue. Thus, when it was possible, they took the opportunity to introduce and lead the program in their schools. This was also reflected in their views about integrating the program into education from a general perspective. They did not see the aims of the Eco-School program as extra-curricular activity but rather as part of the essence of school education. Among the advantages, one teacher explained how the Eco-School activities helped her students learn to be creative and act in a team together with the teacher as one of their team mates. While achieving great things with students, one teacher explained how she was stumbled or even sometimes despised by her colleagues, let alone having their support.

This kind of attitude becomes visible when a person in a group is chosen to lead the group for a task. The group members tend to think that it is the leader’s job to perform all the tasks alone and at the end just inform the group briefly. When in a workplace the notion of ‘work sharing’ is regarded as ‘everybody doing a separate thing alone, and not putting them together to form a meaningful whole,’ assumed group members never meet, form or share ideas, make a plan, or do the things and evaluate performance together. In a school setting Eco-School related tasks are sometimes seen as beyond teachers’ job definition and as an extra burden that hinders even their real tasks of teaching the school subjects.

19.4 Findings from School Self-Reports

19.4.1 Kindergarten

In a kindergarten school self-report that was submitted to TÜRÇEV I found rich examples of ESD activities that can no doubt impact children’s learning in key SD areas.

The report gives a detailed account of monthly activities that they conducted throughout the past school year. Happily, these include hazards of plastic bags to the environment, collecting used up batteries, sorting household waste, producing toy cars, musical instruments, winter themed showcase display from recycled materials, and nature walk and rhythm activity. These all had required parental support and

inclusion as well. That feature has the capability of carrying desired awareness and behavioural change outcomes to homes and not have them stay at school only.

The month of March marks World Water Day (March 22), World Tree Day (March 21), World Meteorology Day (March 23), and the Forest Week. Therefore, the school performed many activities and field trips to celebrate these special days and to emphasize the importance of saving and recycling water, solid waste, growing plants and trees, and benefits of forests.

Rain is regular during April in Turkey. During this month students learned ways of collecting, preserving, and using rainwater. During the time of rejuvenation of nature, children took care of their plants that they have been growing in their classrooms. Also, began to plant vegetables in their garden. In June they celebrated World Environment Day and also organized an ‘environmentalists’ march’ by carrying banners and bills giving messages out loud. Each student who showed sensitivity towards environmental issues earned a ‘pride certificate.’

The school regularly organizes a monthly competition among classrooms for becoming the most environmentalist, cleanest, and tidy classroom to earn the badge of the month. They also webcast the monthly progresses and form a picture archive of all related works.

It is evident from the list and associated activity pictures that the school regularly emphasized issues related to water, recycling, waste management, and preserving the nature and the environment. They also tried to promote creativity enhancing activities like designing new and useful objects from recycled materials. These were not only in the form of learning knowledge but mostly learning by doing and taking action, participating in fun activities that continuously encourage children to become responsible citizens.

19.4.2 Elementary School

Analysis of a comprehensive school self-report from an elementary school noted several important findings:

1. ESD related eco school activities are common throughout the school across disciplines (from English to Mathematics, from arts to science, from Turkish language to music, etc.) and across grade levels.
2. Both teachers and students get engaged in ESD related activities. Parental involvement and awareness is encouraged. Types of activities and forms of engagement are diverse. Attention given and precautions taken in teaching such problematic issues for not creating stress in young individuals. When taken all together I understand that emphasis is being given to the positive side by constantly stating and making evident that if humans act in responsible ways, progress can be made and a brighter future can be achieved. Students’ appearances in pictures in the report reveal that they feel confident, doing something important, having fun and liking what they do.

3. Active participation, taking initiatives and assuming responsibility, field trips, social support, creativity promotion, and taking expert opinion supported student learning of ESD issues and themes.

19.4.3 Middle School

In analyzing this school’s self-report, I found more age appropriate themes and activities like “global warming” and “endangered species.” The school integrates ESD theme into the curriculum and while on the topic of Non-Governmental Organizations (NGOs) they also cover NGOs active in environmental issues. Again, an effort across disciplines and grade levels is seen in this school. Students are studying topics like sustainability, impact of various human activities on the Earth, and climate change and its impact on a local lake. While doing these activities they are collecting data, analyzing, interpreting and presenting their investigations. They are also generating ideas and doing projects on environment protection related topics. This school also reported their involvement in the citywide “Eco-Schools Fair” that was held in late May.

A noteworthy activity that this school reported is “Eco-School Twinning” project through which they partnered to a school in Northern Ireland and held skype meetings and exchanged many email messages. This project enabled the students in both school to exchange their ideas and projects and also conduct a project together: A Calendar of Endemic Plants of Turkey and Ireland. The calendar was printed in Turkey and shipped to Ireland for the students and parents there.

19.5 Status of SD in Turkey

So far, I have described the history and development of the Eco-Schools program in Turkey. The available research reports and Eco-School self-reports reviewed shed light on the current status of Eco-Schools in Turkey and helped describe the kinds of activities they have been conducting. I now reflect on the status of SD and ESD and the impact of Eco-Schools in Turkey.

Turkey currently ranks 108th out of 180 countries in the 2018 Environmental Performance Index (EPI) (Ozerkan 2018). However, Turkey tries to follow global initiatives and best practices. For example, there is a dedicated government website in Turkish (<http://www.surdurulebilirkalkinma.gov.tr/amaclari/>) that lists the 17 Sustainable Development Goals (SDGs) as a direct translation. Additionally, the Ministry of Development (MD) has published Turkey’s strategy documents for SD (i.e. MD 2012, 2016).

In November 2018, Turkey launched the Zero Waste Initiative (ZWI) under the auspices of the First Lady and a summit was held with the participation of stakeholders including municipalities, NGOs, government institutions, companies etc.

On the ZWI website (<http://sifiratik.gov.tr/>), guidebooks are available online for implementing the zero waste actions for all kinds of public and private living environments like schools, hotels, hospitals, marinas, housing sites, shopping malls, etc. The goal is to reduce all sorts of waste significantly by also creating economic value out of the wastes that were not utilized at a desirable level so far (Daily Sabah 2019). Policies, regulations, and law enactments are being put in effect to obtain country-wide success for the ZWI. These are critical and instrumental in getting results for SD. Such an exemplary policy has been put in effect recently in Turkey starting January 1, 2019 (Daragahi 2018) which bans shops by law giving free plastic bags to customers. A small fee (Turkish lira .25, or about US\$.05) helped reduce the use of plastic bags up to 70% in about 6 weeks, which is an impressive quick result and close to the 90% reduction rate aimed by the ZWI. The Government of Turkey has also announced that for all types of drink containers a deposit return scheme will be implemented by 2023 (Demirören News Agency 2019).

Box 19.1: Relevant Science – Technology – Society – Environment Understandings for Grades 6–8 (Numbers Indicate the Outcome Number)

18. Understands that in order to prevent the hazards that the wastes (i.e. municipal, industrial, medical, institutional, etc.) can cause they must either be recycled, treated or processed in a convenient way and that the management of wastes produced by technological systems (i.e. chemicals, plastics, metals, etc.) is an important societal problem.
19. Explains how to protect natural resources, living beings and their habitats by using technological products and systems; and how to reduce the amount of wastes resulting from usage of various products and systems.
20. Identifies the relationships between modern technological systems and the global environmental problems and suggests solutions for such environmental problems.
21. Knows the local, national and global environmental problems and discusses possible ways of solution and their consequences.
22. Knows and discusses the methods of protecting the environment and wild life.
23. Knows that in protecting the environment and wild life both individuals and the society are responsible.

(continued)

Box 19.1 (continued)

24. Knows that natural resources need to be protected and developed.
25. Understands that not only the made products but also natural products, depending on conditions, can have negative undesired effects on environment.
26. Knows how individuals and the society effect the environment.
27. Becomes aware of the importance of environmental protection activities and participates in them.
28. Understands that applications of science and technology can have positive or negative effects on individuals, society, and the environment.
29. Understands that it is possible to prevent the negative effects of science and technology by also developments in science and technology and hence such effects can be reduced or stopped.
30. Realizes that individual, societal, or environmental needs are important driving forces in the development of science and technology.
31. Explains with examples how the developed technologies from the past until today have effected the living and working styles of individuals' and societies' and their interaction with the environment.
32. Explains with examples that a scientific or technological development can have positive or negative, predicted or unpredicted effects on individuals, society, and the environment.
33. Understands that while developing or using technology individuals must feel a responsibility towards themselves, society, environment, and laws and regulations.
36. Realizes and explains with examples that technology by itself is neither good nor bad; however, the decisions toward the usage of products and systems can cause desired or undesired results.
37. Knows the duties of national and international quality registration institutions and recognizes their symbols on products.
38. Develops a utility-quality-cost understanding towards foods, everyday tools, devices, and materials at home and school as well as durable goods.

19.6 Status of ESD in Turkey

The 2005 science curriculum for grades 3–8 included a total of 38 Science-Technology- Society (STS) outcomes. Half of them were related to environmental protection and understandings towards sensible use of technology (see Box 19.1).

The 2018 Turkish science curricula show a similar trend (see Tables 19.2 and 19.3), but notably, there is a specific reference to sustainable development in grade 8, and high school biology, chemistry and physics curricula also contain ESD

Table 19.2 Topics, concepts, and outcomes related to environmental protection and sustainability issues in grades 3–8 integrated science curriculum

Grade	Grades 3–8 integrated science course
3	Gaining knowledge, developing attitudes and behavior towards environment: get to know, keep clean, preserve and love the lived environment; efficiency in using natural resources, taking individual responsibility, developing an awareness of healthy life. Dealing with used up batteries.
4	Hazards of use of alcohol and tobacco, noise pollution, being a conscious consumer (use of resources, efficiency, prudence, recycling)
5	Bio-diversity, human-environment relationship (environmental pollution, preserving and embellishing the environment, impact of humans on the environment, local and global environmental problems
6	Thermal insulation, fuel consumption and the impact on the environment, hazards of use of alcohol and tobacco
7	Gaining knowledge, developing attitudes and behavior towards household waste management and recycling.
8	Use of biotechnology applications on the environment; greenhouse effect, global climate change and possible impact, ecological footprint, The Kyoto Protocol. Gaining knowledge, developing attitudes and behavior towards sustainable development.

Table 19.3 Topics, concepts, and outcomes related to environmental protection and sustainability issues in high school science curricula

Grade/ course	Biology	Chemistry	Physics
9	–	Impact of chemical substances on human health and the environment (hazardous effects), environmental chemistry: chemical pollutants, pollution, global warming, greenhouse effect	Global warming, energy resources and using energy efficiently
10	Ecology of ecosystems and current environmental problems, ecological footprint, sustainability	Acid rains, common chemicals in consumer products and hazards on human beings, wrong and unnecessary drug use	Waste control (glasses), environmental cleanliness and preserving the natural habitats
11	Using antibiotic drugs	–	–
12	Sustainability of energy resources, fossil fuels, sustainable life, sustainable development and environmental impact	–	Nuclear energy and impact on environment, renewable energy resources (solar energy)

related outcomes. We see less emphasis in grade 11, since it is reserved for deeper conceptual and computational science learning outcomes.

Having portrayed the current situation in the science curricula, it is also necessary to give place to Öztürk’s (2018) criticism that ESD has four pillars (i.e. societal, environmental, cultural, and economical), but in Turkey ESD and related research literature mostly emphasize the environmental dimension by omitting the other three. These concerns were also shared and voiced by Alkis (2008) who also emphasized that “ESD, however, is not yet a well-known issue and concept in the context of Turkish education” (p. 605).

Surprisingly, both international and national SD documents fail to make meaningful reference to ESD within SD initiatives. In Turkey, SD practices are seen as a goal of the Ministry of Development. The role of the Ministry of Education in contributing to achieving SD goals is restricted to increasing the quality of education in terms of learning outcomes, providing equal opportunities for education and increasing access to education for all. One may find it very odd that a search on the Internet for “sürdürülebilir kalkınma için eğitim” (education for sustainable development) does not yield a single document from websites of Turkey’s government ministries and/or ministerial departments. This may point out that ESD is far from being a policy priority lacking a coherent strategy. Therefore, it is obvious that there is an urgent need for raising awareness for ESD and creating policies towards reaching ESD goals.

19.7 Current Status of Eco-Schools in Turkey and Suggestions for Improvement

The role of education is to raise responsible citizens who care and worry about the environment and the future of our planet for future inhabitants. Ceylan (2015) identified exemplary lead teachers who act as Eco-School program coordinators because they feel personal responsibility in protecting the environment and teaching the young generations its importance. The interview data intensely show how deliberately and sincerely they signed up for those roles in the first opportunity that they had. The two excerpts from teachers below are astonishing and explicit (Ceylan 2015, p. 34):

I have always been an environmentally sensitive human being. I was very active during my school years. I used to organize my classmates all the time to take action in order to green and keep clean our school. To carry my environmental sensitivity and love of the nature to my professional life and in this way to create an impact on future generations was my greatest source of motivation while signing up for this task.

I am much worried about the nature. I cannot stand it when I see the damage humans are giving to the nature. I feel so sad. I have always been thinking the ways of protecting the nature and preventing humans from giving hazards to the nature. Thanks to being involved in this project, I have had the chances of inspiring environmental consciousness besides teaching courses and strengthening the relationships among my students. The idea of rais-

ing a generation loving and preserving the nature is quite motivating for me while also increasing my commitment to my job.

By emphasizing the importance of education to teach sustainable life style researchers (Özsoy 2010; Ozsoy et al. 2012) developed and implemented an Eco-School program in order to investigate experimentally its impact on students. They found that their implementation of the Eco-School program created a significant impact as measured by the Environmental Literacy Questionnaire (ELQ) (Kaplowitz and Levine 2005) together with qualitative data in the forms of interviews and student drawings of environment. ELQ consists of four parts: environmental knowledge, attitude, uses, and concern. The study revealed that the implementation had a significant impact in all four dimensions of EQL.

In Turkey, although very small, the number of Eco-Schools is increasing year by year and the interest is still strong after 24 years of implementation. However, the implementation is not perfect. The studies that investigated Eco-Schools impact revealed mixed results. NPS students were better, in general, in declarative knowledge, while Eco-Schools students showed better attitudes and behaviour and have opportunities to engage in hands on activities. However, this was not a uniform finding across all studies. In this respect, Özsoy's (2010) investigation revealed pivotal results for showing that by careful Eco-School implementation a genuine impact could be created. Studies also show that there exist problems with engagement, adaptation, interpretation of aims, and curriculum integration. Although, improvements in environmental consciousness and environment friendly behaviours are observed in Eco-School students, there is much room for additional improvement both in Eco-Schools and other schools.

19.8 Conclusion

An old Turkish proverb says 'ağaç yaşken eğilir' meaning 'wood can be bent (shaped, especially about children) while it is still green. Deadwood cannot be bent, otherwise it will snap and the desired result cannot be attained.' This is similar to English proverb 'you cannot teach an old dog new tricks.' Hence, the earlier ESD starts, the better.

SD and ESD are not independent of each other, nor ESD is a curriculum issue alone. Curriculum is one important element, but reaching ESD goals needs defining and bringing together stakeholders, resources, policy, action plan, and a full-scale campaign against ignorance. It cannot be confined to the boundaries of schools nor to the efforts of a few self-motivated schoolteachers. Vibrant action needs to be taken also in adult education and informal education.

Citizens can receive education and training in order to learn why sustainable practices are necessary and how to exercise them in daily life at home, school, and workplace. However, experience shows that, without a clear-cut policy and country-wide implementation not much progress can be made. To reach SD goals continued

ESD is necessary but not sufficient unless supported by incentives, restrictions, and penalties where appropriate and necessary. In this way, directed government policies can increase willingness and disposition to act as responsible citizens. In the case of charging a small fee for disposable plastic shopping bags we are witnessing an unprecedentedly sharp decrease in use despite complaints from some people. Perhaps with ESD they would see the necessity of this action and instead of complaining they could support and demand more such actions, too.

The Eco-Schools program is based on voluntary participation of individual schools with the promise to fulfill documented standards and take action to achieve goals. But there exist some obstacles in the implementation: the nature and quality of teacher training in ESD, employment policies and workloads together with teachers’ decision to quit, change location or careers may all effect the quality of program implementation. Besides, for middle school students there is also the reality of teaching for high stakes exams. If a particular school subject is not included in such a test, then students, teachers, and parents altogether tend to avoid those and focus only on the test subjects. School administrators also behave the same way in an effort to try to increase the school’s ranking among other schools.

Overall, Eco-Schools in Turkey portray exemplary cases. Although they only represent a small percentage of schools, they have accumulated a great deal of knowledge and experience about how SD goals can be achieved through ESD. In order to create a greater impact, best practices should be disseminated across the country with the help of the Ministry of Education. In every corner of the country there are teachers willing to go the extra mile and do some good for our only planet, the future, and ourselves.

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Chapter 20

The Ebb and Flow of Environmental and Sustainability Education in UK Schools



Elsa Lee, Paul Vare, and Ann Finlayson

Abstract This chapter describes and reflects upon the recent history and contemporary situation regarding Environmental and Sustainability Education (ESE) in the UK. It discusses how ESE is practised and understood in schools and other educational institutions and describes influencers (e.g. policy) on the practice and conceptualisation of ESE. While the focus is on the situation in England, the chapter also refers to publications and policy about ESE in Wales, Scotland and Northern Ireland; in so doing the chapter illustrates what may be known as the ‘green school movement’ elsewhere. A picture emerges of multi-directional influences including policy, public opinion, civil society organisations and businesses, academic research and schools. To illustrate this varied landscape, the chapter includes three case studies, one from policy, one from school-based practice and one from civil society. The chapter concludes with commentary on the influence of the Sustainable Development Goals, wellbeing and nature connectedness and the potential of social media to shape ESE in schools in the future.

E. Lee (✉)
Cambridge University, Cambridge, UK
e-mail: eul20@cam.ac.uk

P. Vare
University of Gloucestershire, Cheltenham, UK
e-mail: pvar@glos.ac.uk

A. Finlayson
SEEd, Rodborough, UK
e-mail: ann.finlayson@se-ed.org.uk

20.1 Introduction – And a Question of Definitions

While the term ‘green schools’ is more commonly used in the US, the UK has a strong tradition of formal schooling addressing parallel issues. In the UK, schools that tackle ‘green’ issues are most likely to be ‘eco-schools’ or ‘sustainable schools’. Both of these terms are significant because they arise from international policy initiatives and so demonstrate the interplay between practice in schools and the policies of both national and global initiatives. The international Eco-Schools programme, that claims to reach 18 million children worldwide, has influenced the adoption and proliferation of this label. This programme of the Danish-based Foundation for Environmental Education has been particularly successful in the UK, although this varies a little across the devolved parts of the UK. In England, according to current data, around 18,000 schools (approximately two thirds of all schools across England) have registered on the scheme with 12,000 of these holding an Eco-Schools award comprising Bronze, Silver or a Green Flag (Eco-Schools (UK) 2018).

In Scotland 3000 schools are registered with the programme through Keep Scotland Beautiful, which is also about two thirds of all of the schools in Scotland; the programme is also prevalent in schools in Wales and Northern Ireland. Alongside this, the term ‘Sustainable School’ was promoted under the National Framework for Sustainable Schools (NFSS) launched by the Department for Children, Schools and Families (DCSF) in 2005 building on the work of WWF-UK’s Pathways framework (Hren and Birney 2011). This Labour Government initiative was dropped in 2010 when the Coalition Government came to power. The NFSS aimed to respond to the global movement toward Sustainable Development supported by the United Nations and was arguably one of the most forward-thinking environmental education strategies of its time (Scott 2013). Whilst the Framework remains unsupported by the current Conservative Government it is still being promoted by NGOs such as SEED (the Sustainability and Environmental Education charity) and the Sustainable Schools Alliance (SSA) as well as by schools across the UK, so it persists in the ESE landscape nationally. Moreover, the concept continues to be supported in Northern Ireland by their devolved government’s Department of Education (2009), although the strategy is somewhat different to the original NFSS.

These policy initiatives and international organisational approaches were responding in part to pressures from civil society to address urgent planetary problems and so it could be claimed that the labels originate from social pressures rather than policy initiatives. What this demonstrates is the complex, interconnected nature of the interplay between policy and practice at school, civil society and state level. Demonstrating the impact of the green schools movement on the broad and inclusive notion of Environmental and Sustainability Education, as this book sets out to do, involves untangling these multi-directional influences, some of which will inevitably remain obscure because it is impossible to determine in every case where the influence *on* ESE begins, goes and ends. Figure 20.1 below aims to illustrate some of these influencers. We present this as a working model which we hope will inspire research and further development.

While this book focuses on the way that practice influences theory and policy, it is more common to look at things from the other direction; this can mean that the

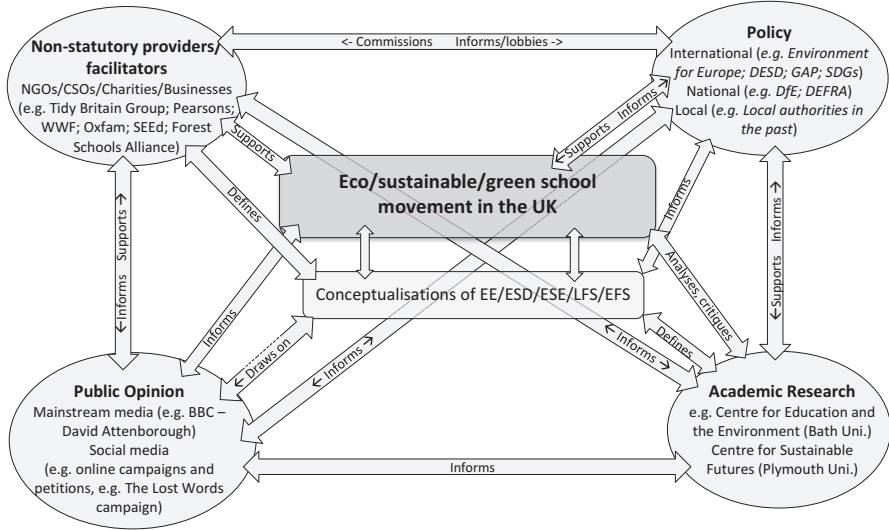


Fig. 20.1 A model of multi-directional influencers and processes underpinning the conceptualisation of ESE in UK schools

conceptualisation (in academic and political circles) of a body of knowledge becomes divorced from its actualisation in practice. In re-establishing these links this book, this chapter included, can make a significant contribution across policy, practice and theory. Of course, this matter has been raised before. In a think piece entitled ‘New Worlds Rising’ Scott (2010, see also Scott 2011) discusses schools as members of learning societies and asks what they might (and do) contribute to sustainability through their work on “supporting young people in the *early* stages of their education, acquiring the wide-ranging understandings, skills and capabilities that they will need to continue to develop for successful and fulfilling engagement with, and living in, the world.” (p. 597). Scott goes on to emphasise the need to keep questioning the purpose of schooling to highlight the tension between education and social change. This is an important question, championed by the work of academics at the Centre for Research in Environmental Education (CREE) based at the University of Bath. The prevalence of this question, alongside government policy and other factors, has been significant as it has meant that the balance between what schools do to educate children and facilitate learning has not been overwhelmed by the agendas of organisations or government departments seeking to inculcate sustainable living practices. Indeed, the development of what might be termed ‘green schools’ in other countries has been shaped by a wide variety of factors, not least the desire of professionals to facilitate learning, the promotion of sustainability by civil society organisations, the policies of government departments in response to international agreements and perceived voter demands (or civil society pressure) and a neoliberal achievement agenda that has promoted competition between schools. Before exploring the historical context further, we set out briefly what we mean by ESE.

ESE has come to be used to refer to what was previously known as Education for Sustainable Development (ESD) and Environmental Education (EE). Whilst we see

EE and ESD to be very close we do not perceive the terms as interchangeable. We understand EE as having a focus on the education that arises from engaging with environmental issues, including social learning, learning that takes place in the outdoors or learning about economic justice, *inter alia*. So the purpose of EE is an educational one, rather than one which enables sustainable development (which is how we think education *for* SD is often viewed (Scott and Gough 2003)). However, we acknowledge the work of Vare and Scott (2007) on the ESD1 and ESD2 model that effectively encompasses a broader conceptualisation of environmental education. We also recognise the many other variants of the concept such as Sustainability Education and Learning for Sustainability. Rather than engage in the long running debates around which term is more appropriate, we choose the ESE variant that acknowledges the diversity of the field by including the terms environment *and* sustainability while acknowledging current global policy debates arising from the United Nations Sustainable Development Goals that are affecting practice in schools and elsewhere. Target 4.7 of Goal 4 explicitly refers to ESD which has been picked up by many governments and organisations around the world and is reinvigorating practice in this arena in the UK. Target 4.7 also discusses Global Citizenship Education (GCE) and this juxtaposition is important as it has highlighted overlaps between the two areas which have been the topic of hot debate within UNESCO and elsewhere (e.g. Parker and Wade 2008; Chung and Park 2016) as we will discuss.

At this point we should emphasise that what we write here is based on reviews of academic and grey literature, policy documents and website searches alongside our own experience of practice in the field. It is not the outcome of empirical research. As a team of authors our experience of working in this area is broad, encompassing practice in schools, higher education, policy and non-governmental organisations, and business and this facilitates our ability to be inclusive. However, we cannot and do not claim to be entirely objective nor completely inclusive. What we present here is a provocation for further discussion and knowledge development and we trust that it will be read in that light.

20.2 ESE History in the UK

Before proceeding with this brief history, it is important to understand that the way the UK is governed, with devolved jurisdictions in Scotland, Wales and Northern Ireland and with English policy decided by the UK Government, has strongly influenced the development of ESE in this country. The changing and increasing devolvement of power to Scottish, Welsh and Northern Irish governments over the past five decades has led to an uneven landscape with a greater or lesser focus on ESE being determined by devolved policies on Education and the Environment under the different jurisdictions. These issues are discussed in depth in Vare's contribution to Jucker (2015) which we draw on here to explain the history of ESE across the UK; hence there is some overlap between this chapter and that one. We also draw on Reynolds and Scott (2011) who discuss the policy context up to 2011 in England and on the UNESCO report on ESD in the UK in 2010 (UNESCO 2010).

Whilst there is a long tradition of Natural History teaching in the UK dating back to before compulsory schooling (1883), which included nature walks and nature drawing, up to the 1960s, Rural Studies, with an emphasis on agriculture, provided the only widespread option for those interested in outdoor or environmental education. This was to change with a growing awareness of environmental issues fired by seminal texts such as Rachel Carson's *Silent Spring* in 1962 which highlighted the environmental impacts of industrial society, focusing on the use of DDT. As concern grew with publications such as *The Population Bomb* (Ehrlich 1968) and *The Limits to Growth* (Meadows et al. 1972), recognition of the need for an educational response to these challenges prompted the emergence of a defined environmental education (IUCN 1970; UNESCO-UNEP 1977; Disinger 1985). The term 'environmental education' (EE) first appeared in the UK parliamentary record in 1968 (Lawson 1968). The mid to late 1980s were characterised by much creativity around environmental education, often led by urban wildlife groups, local school advisors and WATCH (the youth section of the Wildlife Trusts). WWF was active with its *Lifelines* publication and a UK-wide networking NGO, the National Association for Environmental Education had a large membership of teachers and educationalists across the country. The Council for Environmental Education (CEE) brought together local government workers, rangers, NGOs and others and attempted with some success to provide an interface with Government. The Town and Country Planning Association, which published the Bulletin on Environmental Education (BEE) at around this time, was also influential (Burke 2014). Meanwhile another NGO network, the Development Education Association (DEA), was drawing together the work and creativity of educationalists with an interest in development education and international learning.

The second Education Act of 1986 included a ban on 'political indoctrination' forbidding "the pursuit of partisan political activities... and ... the promotion of partisan political views" (HM Government 1986, para. 44(1)). This was important because lobbying for environmental issues was seen as both political and partisan and so it became difficult to incorporate these issues into school curricula without contravening the articles of this act. In 1988 the Education Reform Act in England and Wales instituted the first National Curriculum which set out clearly what schools should be teaching and further exacerbated attempts to include environmental issues in the curriculum. Whilst this process of standardisation and streamlining of Education in schools was taking place in the UK, globally there were moves to try to balance green issues with economic development issues. Indeed, the World Commission on Environment and Development defined *sustainable development* (WCED 1987) in an effort to integrate the goals of expanding economic development and avoiding transgressing environmental limits.

20.2.1 ESE in National Education Policy

Whilst the standardisation arising from the 1988 National Curriculum aimed to ameliorate some of the inequalities in the Education landscape across the country, it also curtailed the professional freedom of teachers through its accountability

procedures. This meant that teachers who wanted to focus on ESE had to find a way to do so within the confines of the curriculum and without contravening the Education Act. All this had to be done in competition with many other subjects that were also not central to the new curriculum and at a time when government had an increasing level of influence. Successful lobbying from inside Parliament (Hansard 1988) and beyond led to Environmental Education becoming one of five cross-curricular themes to be covered by official curriculum guidance (NCC 1990); this version of EE echoed the Tbilisi objectives (UNESCO-UNEP 1977). In line with this thematic guidance there were 400 environmental education advisors in Local Authorities who advised on practice and curriculum integration who influenced school-based practice in terms of ESE. However, by the time publication was achieved “the NCC document itself was perceived as being redundant by many schools” (Palmer 1998, p. 25).

At around this time WWF-UK’s and Oxfam’s influence was important. These two NGOs were championing a whole-school approach that was founded on the work of Stephen Sterling (2001) and John Huckle (Huckle and Sterling 1996). This collaboration between NGOs suggests the validity of our model in Fig. 20.1 and was instrumental in the founding of the London South Bank University (LSBU) Masters course on Learning for Sustainability, which has trained many teachers and run conferences that have supported practice in schools. The LSBU course eventually led to the creation of the extant Teacher Education for Equity and Sustainability Network (or TEESNET) at Liverpool Hope University which continues to influence contemporary school-based practice.

Despite these positive developments in ESE in the 1990s, when questioned about the teaching of sustainable development in 1992, Eric Forth MP replied that it was covered in the ‘orders’ for Geography (Hansard 1992). However, the following year, the Government removed Geography as a mandatory subject from an overloaded curriculum while subsequent Secretaries of State “discouraged any further discussion of cross-curricular work” (Lawton 1996, p. 35). The outcome of these different interventions was to effectively remove ESE from the compulsory curriculum.

In 1997 the New Labour Government declared its support for ‘environment and development education’ (Hansard 1997) and established the inter-departmental Sustainable Development Education Panel (SDEP) (Defra 1998) with a five-year remit. The first SDEP output, the Holland Report, linked education outcomes to seven *sustainable development* principles. While this suggested coherence between ESD and SD, its failure to define ESD in terms of *educational* principles or structures was problematic as it impinged on attempts to integrate it into mainstream education. The SDEP report did provide a broad definition of ESD together with a simplified version for the school sector:

Education for sustainable development enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future. (Defra 1998, np)

The Crick Report (QCA 1998), that was released concurrently with the establishment of SDEP, called for pupils to learn a range of skills, knowledge and values that

would give them the choice to be active in their own communities and nationally. This was an important opening for ESE from an educational perspective as active citizenship is seen as a central goal of an environmental education (Scott 2013). The Crick Report refers to environmental and sustainable development as one of many strands that provides “important contexts and content to support the aim and purpose of citizenship education in schools” (QCA 1998, p. 41) This combination of neoliberal reforms with the communitarian language of sustainable development and citizenship demonstrated New Labour’s wider political discourse, the ‘Third Way’ (Giddens 1998), with its centre-ground political focus on ‘what works’ (David 2007).

The term ‘sustainable development’ appeared for the first time in the National Curriculum for England and Wales in 1999, principally through Geography, Science, Design and Technology and Citizenship (QCA 1999). In an analysis of this first appearance Chatzifotiou (2002) notes how:

subjects that deal with tangible knowledge like mathematics ... have a priority over subjects that deal with general or abstract notions like responsibility, justice or commitment to sustainable development. (p. 291)

If sustainable development was not a priority subject, at least in 2000 it made its way into the stated purpose of education. With the promise of a revised National Curriculum in 2000 came the prospect that schools could opt out of it by becoming ‘city academies’. These academies were funded directly from central Government and independent of local authority control, free to develop their own curricula. This mattered because it enabled more professional freedom to be regained, although the examination boards and league tables still dominated the agendas of the vast majority of schools.

In 2003 the renamed Department for Education and Skills (DfES) was the first government department to publish its Sustainable Development Action Plan (SDAP), the first of its four objectives being *education for sustainable development* with an accompanying framework (DfES, cited in EAC 2004). Meanwhile, the decision by CEE and DEA to run a joint conference in 2004 exemplified the thinking around ESD/EfS at the time. As this educational remit was broadening, Defra published a new UK sustainable development strategy *Securing the Future* (HM Government 2005). This included a chapter on education and featured this pronouncement from the Prime Minister:

Sustainable development will not just be a subject in the classroom: it will be in its bricks and mortar and the way the school uses and even generates its own power. Our students won’t just be told about sustainable development, they will see and work within it: a living, learning place in which to explore what a sustainable lifestyle means. (Tony Blair in HM Government 2005, p. 37)

The schools’ inspection service, Ofsted, responded to this direction with two surveys and a longitudinal research project on ESD practice in schools that led to the publication of a report (Ofsted 2009) that fed into more comprehensive guidance (Ofsted 2010) for schools’ inspectors. This report is an explicit example of where existing practice in schools (that might be termed ‘green schools’ because of their

focus on environmental issues) helped to define policy guidance, and we will elaborate on their study in the next section of this chapter. It was a time when policy makers and ESE activists alike were cognisant of the forthcoming UN Decade for Education for Sustainable Development (DESD) 2005–2014 (UNESCO 2004) while the United Nations Economic Commission for Europe was drafting an ESD Strategy (UNECE 2005) with the involvement of a DfES civil servant (from the UK) on the Expert Drafting Group.

It is worth noting here that the connected notions of ESD and Global Citizenship Education (ESDGCE) were particularly influential in Wales where the Welsh Government provided clear policy support in this area throughout the DESD for schools to teach ESGCE, both within subjects and as a cross-curricular theme (UNESCO 2010; Martin et al. 2015).

In England the *National Framework for Sustainable Schools* (NFSS) (Teachernet 2008a) launched in 2006 by the (re-named) Department for Children, Schools and Families (DCSF) responded to the call from UNESCO's DESD documentation (UNESCO 2005). This development was supported by the UK Sustainable Development Commission and WWF-UK and included 5 regional support networks. This voluntary framework comprised three interconnected sections: (a) a commitment to care; (b) an integrated (whole school) approach linking campus, curriculum and community; (c) eight 'doorways' or thematic entry points. While the second section promoted connected thinking and the doorways provided simplified and achievable targets for schools starting out on the pathway towards greater sustainability, they also proved somewhat problematic:

... there are risks inherent in a doorways approach; for example, presenting sustainability as a series of fragmented and unrelated ideas in what is a rather conservative and limited approach to the issues we face. (CREE 2009, p. 10)

Furthermore, the doorways omitted biodiversity, a crucial ESD component in terms of ecological understanding and pedagogical practice that promotes first-hand experiences of nature. This notion of nature connections has continued to gain in popularity in schools across the UK and elsewhere through its links to wellbeing and mental health (Turtle et al. 2015; Walshe et al. *in press*), as discussed below. Despite concerns about this omission and the tendency towards reductionism, the NFSS did help schools to rationalise and build upon their existing efforts and importantly helped to provide a system of monitoring with the publication of a Sustainable Schools Self-evaluation tool called the 'S3' (Teachernet 2008b).

Global interest in this framework followed with education jurisdictions such as Australia, Canada, Columbia, Mexico City and Cyprus adopting and adapting the framework. Later it became one of five foci for UNESCO's post 2014 Global Action Programme on ESD. It was also around this time that the Eco-Schools programme really took off as the numbers of schools joining it rose, often signed up by their local authorities. The outlook for ESE and for schools and beyond was extremely positive as reflected in the foreword to UNESCO's 2010 report on ESD in the UK in which the then chair of the UNESCO UK's ESD Co-ordinating Group, William Scott, wrote:

there has been a wide range of sustainability-focused interventions within civil society by government, businesses, trade unions, academia, third sector organisations and professional groups. Each group has been focusing, for example, on changes in policy and regulation, in areas such as carbon reduction, in the use of fair trade products, recycling, etc. (UK National Commission for UNESCO 2010, p. 7).

This 60-page report is highly instructive in setting out the intensity of activity around ESE across the country at the time. While not all of the initiatives engaged with schools, both the range and quantity of them demonstrate the way that the ‘green school’ movement in the UK was growing and the way that its growth was mirrored by a rising green consciousness within civil society and amongst Government policy makers. The quote above also points to the role of business and trade unions in ESE. Companies like Centrica and Shell funded and gave ideological support to a number of initiatives across the country during this period. While we have included them in our model (Fig. 20.1) we do not have the space to fully explore their influence here but we note that this has been considerable and merits further discussion elsewhere.

Following the global financial crisis in 2008, and the 2010 General Election, the new Coalition Government’s antipathy towards ESD was demonstrated by the withdrawal of new inspection guidelines (Ofsted 2010) that highlighted ways for schools to address sustainable development. The target of all schools in England to become ‘sustainable schools’ by 2020 was dropped and the NFSS website was deactivated. Whilst this situation represented a significant setback for supporters of ESE, a number of organisations as well as global and national policy incentives began to fill the gap left by the withdrawal of government support. It was also another 5 years before Defra completely phased out its financial support of the Eco-Schools programme.

20.2.2 The Current Landscape of ESE in the UK

The current Conservative and previous Coalition governments that have been in power since 2010 have continued vastly accelerated the rate at which in England schools became academies. While this has been criticised on a number of grounds, the policy held the promise of a return of some professional freedom that had been lost over 20 years of an imposed National Curriculum. However, the limited funding and the continued (arguably even heightened) pressure of standardised, high-stakes testing regimes has made it difficult for teachers and schools to act on this freedom and so it is unlikely to have had a significant positive impact in schools in terms of ESE. One exception here is the recent establishment by the charity: Wildlife Trusts of the Red Kite Academy Trust (MAT), who have used the academisation policy as a mandate to set up Nature Schools. According to their website (<http://www.nature-schools.org.uk/history>) this MAT will set up “schools where learning about, and through, nature will be embedded in the ethos of the schools, and where the natural world runs as a ‘golden thread’ through every aspect of a child’s school-life.”

Conversely, there has been a move towards global citizenship education (GCE) in schools across the UK stimulated in part by Government funding via the Department for International Development (DFID). It is argued variously that much of what characterises ESD also characterises GCE (UNESCO 2010). In fact, this has long been recognised by the Welsh Government (Martin et al. 2015) that has supported the linking of ESD and GC since around 2003 in various policy documents. GCE or global learning has been championed for around 30 years by the UK charity Think Global (formerly the DEA). Until recently, Think Global was part of a consortium running the UK Government funded Global Learning Programme (GLP), launched in 2013 and re-energised in 2015 by the uptake of the United Nations Sustainable Development Goals (SDGs). The SDGs have taken on the baton from the Millennium Development Goals in the drive towards eliminating poverty and raising living standards globally. Target 4.7 of Goal 4 of the SDGs has drawn significant attention to ESD and GCE and in 2018 a UK wide initiative, UKSSD (UK Stakeholders for the Sustainable Development) sought to measure the UK's progress towards these, including Target 4.7. While the report produced by the UKSSD partnership has not had much Government attention to date, a number of schools have become highly active in responding to these goals and integrating them into their curricula, with or without the support of the GLP. The GLP alone has engaged over 7000 schools across the UK. The fact that this has taken place over the relatively short time period of around 5 years suggests that schools recognise the value of global learning and global mindedness and this is having an impact on the way ESE is being addressed. The GLP has now been superseded by the new Connecting Classrooms through Global Learning programme run by the British Council so the work being done on GCE will continue. All of this is likely to have resulted in some refocusing and reframing of the concept; for example, moving it away from its traditional base in local practice and local issues towards more globalised, developmental conceptualisations and shifting the primary focus away from the environment (and thus away from a focus on the more traditional 'green' issues) in favour of human well-being.

Another important aspect of ESE that has burgeoned across the UK is outdoor learning. It is here where the more obviously green issues chiming with the notion of a 'green school movement', are prevalent. The Forest Schools movement and the Government organisation, Natural England, have both contributed significantly to and benefited from this surge in interest, along with many other organisations. Authors put much of this rise in support for learning that takes place outside in natural places down to a global movement in favour of nature connections (re)invigorated by a concern for what Richard Louv (2005) terms *nature deficit disorder* in his popular book, *Last Child in the Woods*. The Institute of Outdoor Learning, a hub that brings together organisations with an outdoor learning focus and seeks to collate research on outdoor learning practice, has in excess of 600 organisational members. The Council for Learning Outside the Classroom (CLOtC), which was initially supported financially by the Government, aims to play a similar role and its Learning in Natural Environments research network (LINE) has relationships with over 20 organisations, many of which are Higher Education Institutions. These figures attest

to the popularity of this strand of ESE in the UK; they also embrace a wide and varied approach to outdoor learning. Some have argued that the quality of outdoor education, and hence its health and learning benefits, varies depending on its purpose and the kind, or quality, of natural space that is engaged with (Dillon and Dickie 2012; Dadvand et al. 2015). Tied to this is the aforementioned Nature Schools MAT. Furthermore, the recent advertisement of a large, collaboratively-designed funding stream to be delivered by Natural England is indicative of the emphasis being placed on outdoor learning by the UK Government. Indeed, the Government's 25 Year Environment Plan (25YEP) includes a commitment of £10 million pounds to support (re)connecting children with nature through school programmes, care farms and community forest education. The Children and Nature programme of the 25YEP is supported by Defra and DfE and aims to support projects that work with schools with the most disadvantaged children to become 'Nature Friendly Schools'. Whilst these two government departments have different foci (Defra's principle objective is the conservation of the natural environment in England whilst DfE's aims are about supporting world-leading education and children's wellbeing), this joint venture has the potential to have significant positive impacts in terms of supporting schools that aim to connect their pupils with nature, especially in areas where children from disadvantaged backgrounds have little access to green spaces and where research shows that the need is greatest (Walshe et al. in print). This governmental initiative builds on a Natural Connections project (also supported by the parastatal Historic England) which worked with schools in South West England (Gilchrist et al. 2017) and claims to have been able to bring over 40,000 pupils outdoors to connect with nature in its four-year lifecycle. Again, this attests to the fact that schools are supportive of and engaging with ESE opportunities provided by external providers (and thus notionally part of the green school movement) and it is their participation in these activities which shapes the way that ESE is defined. In the next section we will elaborate on the Forest Schools movement in the UK, which has been instrumental in both initiating and responding to this trend towards improved nature connections nationally. Again, Fig. 20.1 shows how we think this trend contributes to the conceptualisation of ESE in the UK.

What this contextualisation of ESE in the UK begins to show is that while policy and civil society influences and sometimes drives the activities that are available to schools, once schools adopt an approach, the directions that they then take can have significant implications for the way in which the subject becomes conceptualised and how policy is generated as a result. We now turn to an elaboration of three cases that illustrate this to some degree. One of these is about policy, one about teaching practice and one about civil society activity.

20.2.2.1 Policy

A particularly good example of how school-based practice in England has influenced conceptualisation and policy generation of ESE is evident in the following publications:

- *Taking the first step forward towards ESD*. (Ofsted 2003)
- *Schools and sustainability: A climate for change?* (Ofsted 2008)
- *Improving schools – improving lives* (Ofsted 2009)

Ofsted, the Office for National Standards in Education, is the government body that inspects schools in England to monitor and evaluate the teaching and learning that takes place in them. Far from being a top-down policy initiative, the first of these reports was actually based on a survey of existing practice within primary schools that were engaged in different forms of sustainability education; this helped to inform what Ofsted would understand as ‘good practice’ in ESE. The 2009 report is based on a longitudinal study of 14 schools (eight primaries, one special and five secondaries) across England and involved surveys repeated three times across 3 years from 2005 to 2008 (Gayford 2009). This study provided recommendations for schools starting out on a journey ‘towards sustainability and beyond’ as well as providing ‘stage descriptors’ of schools along their sustainability journey. Besides the fact that all schools improved their grading over the period of the survey, the stage descriptors provided the basis for more comprehensive guidance for schools’ inspectors (Ofsted 2010). This latter report highlights ways in which English schools might address sustainable development and came to influence how sustainable schools were defined in England. For example, the report highlights the importance of leadership for sustainability, a finding that has been echoed in a number of different publications on the matter (e.g. Birney and Reed 2009; UNESCO 2010; Hren and Birney 2011). The report also finds that a whole-school approach is key to achieving success in ESE that has a positive impact on academic achievement across subjects. The judgements of Ofsted inspectors have huge consequences for schools, so this level of interest shown by Ofsted in ESD was potentially a highly influential development. The significance of these changes in inspection policy were highlighted in a DCSF report (Barratt Hacking et al. 2010) that gathered together evidence for the impact of sustainable schools. The report extracts a quote from another report from the UK Sustainable Development Commission about a headteacher’s newly acquired willingness to discuss their work on sustainable schools with inspectors because of the way in which that school leader felt the work had influenced pupils’ caring for others, the environment and their own community. Perhaps more significant for the purposes of this publication is the finding from this report that parents and children attribute the way that they behave at home to the movement towards sustainability in school; making families re-evaluate their lifestyles and use of resources in response to the focus on ESE in schools. Another important outcome of this report is the way it demonstrates how involving pupils in decisions about sustainability in schools (for example, through involving them in designing new school buildings) and local communities (for example, through producing leaflets about energy usage and CO₂ production that resulted in families purchasing energy efficient appliances such as refrigerators) can have an impact on learning through a greater sense of the relevance of the work being undertaken in the classroom. This finding is also highlighted in a similar study done by the Education and Training Inspectorate in Northern Ireland which found improvements to literacy, numeracy

and ICT through studying relatable (environmental) issues (UNESCO 2010), and by other studies carried out in the UK (Alexander 2009; Barratt and Barratt Hacking 2008). These findings point to the way in which giving children the agency to participate in decision-making processes in schools that have a sustainability agenda, can define and determine how ESE is understood and enacted.

20.2.2.2 Practice

Forest Schools are one example of an outdoor education approach which has become a familiar part of the pre-primary and primary school experience in the United Kingdom (Knight 2009). In Forest school sessions, children have regular, repeated experiences of learning in a natural (sometimes wild) setting outside the classroom (usually a local woodland) and it follows a very specific ethos that has developed out of Danish and Scandinavian approaches to learning such as *friluftsliv* or open air culture. Although definitive numbers that track the rise in schools and preschools adopting the approach are not available yet, it has been called a ‘forest schools revolution’ in mainstream media, and from its arrival in one school in Somerset, England in 1993 to mid-2018, in excess of 12,000 practitioners have been trained as Forest School teachers. This development has been encouraged by Government guidance and inspection for outdoor play/experiences in Early Years. Academic research about its impact and theoretical grounding for its approaches are limited, however, a recent study (Harris 2018) comprising qualitative interviews of Forest School practitioners, points to the ways in which the space (the outdoors) influences what is learnt in such educational experiences and this in turn is likely to have shaped how ESE is viewed. Forest Schools is based on child centred, child led, free play approaches to learning (all of which are concordant with participatory learning theory) which involve some risk-taking and tend to enable social and emotional learning, including teamwork skills. These outcomes and the popularity of the movement in the UK has influenced the way that ESE is being conceptualised here. The benefits that are seen to accrue from approaches such as Forest Schools are likely to have informed discussions on addressing concerns related to children’s mental health at the global level, e.g. by UNESCO through the SDGs. This may in turn have influenced national policy such as the 25YEP discussed earlier.

20.2.2.3 Civil Society

Another indicator of this trend towards reconnecting with nature is the growth of literature (and eco-critical studies of that literature) exploring connections to the outdoors and wilderness, written for both adults and children alike. Examples include Roger Deakin’s *Waterlog* (2000) and Helen Macdonald’s *H is for Hawk* (2014). Whilst there is a long tradition of writing in this style stretching as far back as the Romantic Era and before, there is little doubt that it has gained in popularity in recent years and it seems likely that this trend is a response to multiple

environmental crises summed up in the contested concept of the Anthropocene. For schools and learning, Macfarlane and Morris's (2017) book, *The Lost Words* has brought schools and civil society together to deliver (and thus reconceptualise) ESE. The book was conceived in an attempt to conjure back words such as 'conker' and 'bluebell' that have recently been removed from the Oxford Junior Dictionary because they are disappearing from children's language and being replaced by other words with more technological meanings (Flood 2015). Twitter feeds relating to the work are revealing, attesting to the popularity of and affection for the book and its aims. A number of well-publicised crowd funding campaigns arose when the book was published. Perhaps the most notable of these was the (successful) campaign to buy a copy of *The Lost Words* for every school in Scotland which was closely followed by a number of similar campaigns at the county level across England and Wales. A Google search reveals that some of these campaigns were started by civil society organisations whilst others were initiated by individuals. Figure 20.2 is illustrated by Jackie Morris, the book's illustrator, and shows how the story has spread across the UK. It is available online and is continually updated with new drawings when a campaign is successful at supplying a new geographical area with books for its schools.

The following is written by the instigator of one such campaign, Ruth Sapsed, who is the director of the charity, Cambridge Curiosity and Imagination:

This book, *The Lost Words*, brilliantly encapsulates many of the concerns and ideas that we campaign for – the importance of a connection to nature, the crucial way that creativity can build a sense of connection and agency in us and the urgency for us all to wake up to the erosion of children's freedoms. The power of the *Lost Words* book to draw people in both literally and emotionally is extraordinary. Children literally enter it; it is so big but crucially everyone 'gets it'. The simple idea that children might no longer need to know about conkers or brambles or otters stuns people. Their indignation is tangible whenever you explain how and why the book came about. The authors describe it as 'a beautiful protest' and it was crucial to us to support its aims and create the campaign that would see a copy of the book be placed in each of the 270 primary and special schools in the combined authority of Cambridgeshire and Peterborough.

... It is a pleasure to be offering schools a gift of this quality and substance brought about by the generosity of their community. Schools can feel overwhelmed by initiatives and directives outside of their control but our sense is that this one has appealed to schools, rooted as it is in deep concerns for our planet and communities, and it has been inspirational.

This demonstrates the role that civil society organisations and individuals can play in supporting and guiding the direction of a 'green school movement' in the UK, sometimes inspiring new schools to join the movement and sometimes enhancing and deepening their existing engagement with it. This phenomenon is also illustrative of the ways in which contemporary funding strategies (e.g. crowd funding that relies on social media) can play a part in the conceptualisation of ESE. In this case, social media, the very technology that is often vilified for taking children away from nature, is being employed to facilitate their return to it, using a book that was conceived to highlight how technology was intervening into young people's connectedness with nature. The many and varied ways in which children and young



Fig. 20.2 A social media and crowd funding campaign illustration of the spread of the Lost Words. Images from The Lost Words reproduced with kind permission of Hamish Hamilton. Artwork: Jackie Morris, the book's illustrator. (Design by Gorsebush <http://www.gorsebush.co.uk/lost-words.html>)

people can converse through technological methods has the potential to enrich and enliven nature connectedness through the sharing of stories between schools, and this too, is beginning to influence how ESE is conceptualised. The influence of social media on ESE conceptualisation has begun to be explored in a number of different country contexts and its impact appears to be important, associated with pluralism and heightened affect among other features (Andersson and Olson 2014; Typhina 2017).

20.3 Concluding: The Dynamism of Schools Practice Influences ESE

It could be argued from the foregoing discussion that the ‘green school movement’ had its heyday in the decades immediately before and after the new millennium. This period represents a time when practice and policy came together and civil society and government players acted in concert. It would be fair to say that the power of environmental issues to transform policy leading to school-based practice has since waned. The change in Government policy around ESE certainly suggests this, particularly in the narrowing of the national curriculum. This latter issue has now been recognised and a new set of guidance on a ‘broad and balanced’ curriculum (due in 2019) and the time and interest in linking this to the school-based curriculum has begun to re-engage schools. Meanwhile the rise in global and local concerns about diminishing wellbeing and failing mental health amongst children and young adults and the links between this trend and diminishing opportunities for connection to nature are having a significant impact. Championing nature connectedness has steadily risen across the country, attested to by the popularity of the University of Derby’s annual Nature Connections conference (to name but one example where academic interest has played a significant part in supporting the movement) and the rise and rise of Forest Schools and outdoor learning. The way in which social media and technology has the power to spread a message such as the story of *The Lost Words* further exemplifies how contemporary children in schools across the country are keeping a ‘green school movement’ alive. In addition to this, the popularity of school councils that often have environmental foci, the Eco-Schools programme, SEEd’s annual National Sustainable Schools conference, the UN SDGs and now the government’s 25 Year Environment Plan, together demonstrate that ESE remains an influential force in this country, and that ESE is constantly being redefined and refocused to keep up with the changing times and in response to a variety of influences. There are of course tensions between these initiatives; for example, the Government’s enthusiasm for connecting children with nature (via the DfE and DEFRA) is not linked to its domestic and international policy on the Sustainable Development Goals through DfID. This is in contrast to the way that schools often join up thinking about these issues.

What we have tried to show in this chapter is the ways in which school practice, civil society, academic research, governmental policy and non-governmental organisations and non-state providers are all enmeshed and mutually implicated in how ESE has come to be understood. The examples we have used and the literature we have selected represents a tiny sample of what is available and we hope that others will be inspired to develop these themes further. At the time this chapter was originally prepared the Youth Strikes for Climate had not yet taken off and so we have not included them here, but they certainly merit discussion and further research in terms of their impact on how we understand ESE. In the mean time, what is strikingly evident from this discussion is that ESE is a dynamic, contextualised notion which adapts in response to the needs of the time (as one might hope it would) and builds on the foundations laid over many decades of practice and philosophical thinking and writing before that. We look forward to its continued development and its growth in influence as it takes up the ever more pressing challenges of what has problematically, because of its homogenisation of the assignation of responsibility to all sectors of global society for the negative impacts on planetary health of economic development and industrialisation, come to be known as the Anthropocene.

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Chapter 21

Green Schools in the United States



Kevin J. Coyle

Abstract The emergence of the United States Green Schools movement is rooted in a combination of growing acceptance of new green school buildings, improving the environmental performance of the nation's 130,000 existing schools, a growth in popularity of school gardens and outdoor classrooms and, importantly, a green school's ability to provide critical educational benefits to students of science, technology, mathematics, social sciences and community service. United States K-12 education is far from centralized with each state having its own education governance along with some 30,000 privately run schools. The U.S. must, therefore, rely on schools volunteering to become part of a school greening program. Fortunately, education decision-makers are increasingly seeing economic, social, environmental and educational value in making schools greener. They are likewise seeing sustainability education as rising in overall importance. This has meant that as many as 9–12% of U.S. K-12 schools have, as of 2019, school greening programs and more than one third of all K-12 schools use outdoor gardens, natural classrooms and onsite habitats as part of their educational approach. Elective programs such as Eco Schools USA, and other NGO-hosted efforts are proving helpful to schools which also receive encouragement from the U.S. Department of Education, many state education agencies and numerous local public school districts.

21.1 Introduction

Centreville Elementary School is in the State of Virginia, about 25 miles west of Washington D.C. At first glance it seems like most other public schools you would find in a sprawling suburb in many Western cities. It is on a sizable campus with a 25 year old building and a burgeoning and diverse population of nearly 1000 students. Some 100 different languages are spoken in the children's homes. But look at the School's grounds and you will find several pollinator and food gardens, a nature trail, composting, rain capture and more. Look inside and you will observe student

K. J. Coyle (✉)
The National Wildlife Federation, Reston, VA, USA
e-mail: coylek@nwf.org

environmental art on the walls, children conducting energy audits and detailed recycling measurements, avoiding food waste, and engaging in classroom competitions testing which grade level and class can be the greenest. The science, art and social studies syllabi are rich with environmental and sustainability content. Fifth graders are building windmills and modelling the soil runoff impact of the school grounds on the nearby Chesapeake Bay. The school building itself is being run with a smaller environmental footprint in mind. There is excitement in the air and the faculty members are feeling the hum of a high performance school with high performance students. Centerville Elementary is a Green Flag participant in the Eco Schools USA program and Fairfax County's Get2Green program. These programs are among many examples of how American schools, new and old, are becoming green. There are many avenues and many definitions for a green school and they are in play in thousands of schools across the nation.

The growing green schools movement in the United States is helping achieve three important public purposes. These are: helping America's schools to reduce their environmental footprints and costs of operation and be more sustainable, helping students develop knowledge and skills needed for a more challenging and complex environmental future, and helping students and faculty to stay healthy in body, mind and spirit.

The U.S. green schools movement has had multiple origins. Historically, school and public education development followed significant population increases in cities and metro areas before and during the American Industrial Revolution of the late nineteenth and early twentieth centuries and then saw an even greater expansion following the American post World War II "baby boom" of the 1940s and 1950s. Many of the nation's 130,000 schools, serving 55 million students, were developed during these two periods.

In recent decades these older, usually urban, schools have partially given way to more modern schools in suburban and exurban areas across the country. The newer school buildings of the 1970s through today are becoming ever greener but it is really only in the last 15–20 years, with the influence of such organizations as the U.S. Green Building Council, that architects, engineers and developers have placed major emphasis on what today are considered modern green school buildings.

While the United States has a federal Department of Education, the overall pre-K-12 public education system and higher education systems are spread across 57 U.S. state and territorial governments, more than 13,000 local public school districts and more than 30,000 private, independent schools. Funding for U.S. public education comes from states, 45%, local jurisdictions, 45% and the federal government 10% (National Center for Education Statistics 2018).

A majority of schools in the U.S. take measures to reduce their energy use, recycle and conserve water, but green schools, whether defined as just the for the buildings or for a more comprehensive blending of facilities, education and health, comprise an estimated 12–15% of all schools in the nation and this number increases annually.

Estimating how many green Pre-K-12 schools there are in the U.S. is challenging because of the varying definitions and levels of greenness. For starters there are

about 2000 schools that are new or rebuilt and have been certified by the U.S. Green Building Council as meeting LEED (Leadership in Energy and Environmental Design) requirements. But this program mostly refers to the structures. Moreover, many states have green school programs and many large public school districts such as New York, Houston, and Fairfax County, VA have adopted green schools. There are also a number of non-governmental organizations (NGOs) that support green schools such as the National Wildlife Federation's Eco Schools USA, Project Learning Tree Green Schools and the Green Schools Alliance. A preliminary estimate of the number of Pre-K-12 green schools, looking at these various aspects would be between 12,000 and 15,000 schools, accounting for some overlap.

American higher education has also moved in green schools direction and is gradually making its 4500 institutions with their many thousands of buildings greener and more sustainable. One example of how this is becoming a movement can be found in the College and University Presidents' Commitment to Carbon Neutrality which is supported by the NGO Second Nature and has hundreds of campuses pursuing the goal of zero greenhouse gas emissions in a generation. Second Nature also supports a climate resiliency commitment and a combined commitment.

Another example is the Sustainability Tracking, Assessment and Rating System (STARS) program of the Association for the Advancement of Sustainability in Higher Education (AASHE 2019). It is a self-reporting system lets colleges, community colleges and universities take a comprehensive look at their sustainability performance in all sectors, buildings, grounds, procurement and more. The U.S. Green Building Council is likewise active in this arena along with the National Wildlife Federations Campus Ecology program (NWF Campus 2019a).

The operating definition of a green school in the United States does not stop with its building, grounds and supply chain. Most discussions of green schools include their educational impact whether offering applied programs for students or creating an improved physical environment for learning.

In this chapter we describe the story of green schools in the United States from a perspective of school building and campus environmental performance and sustainability and then address green schools as effective educational institutions.

21.2 Environmental Performance and Sustainability of U.S. Schools Buildings and Campuses

The story of green schools in the United States is not exclusively a tale of greener buildings, grounds and facilities but it might help to begin there.

Much of the public interest and discussion around U.S. green schools regards new or rehabilitated buildings defined as structures that are made of certain environmentally-friendly materials and have design and engineering features that lower environmental impact, make them more sustainable and improve their overall physical suitability for learning. The engineering systems of the schools are

innovative and efficient and often include fossil fuel alternatives such as solar or geothermal power and the buildings' overall settings, grounds and schoolyards are also usually greener than an average school with more trees, native plants, gardens and natural landscaping.

The U.S. Green Building Council (USGBC) is a notable leader in this part of the American green schools movement, particularly with respect to new buildings and major building rehabilitations. The Green Building Council's LEED program (standing for Leadership in Energy and Environmental Design) is a widely accepted rating system that scores new buildings, major redesigns, interiors and more. Many U.S. Pre-K-12 public school districts and also colleges and universities in the U.S. adhere to the principles of the LEED program and are designing and developing buildings that are greener and more sustainable, (USGBC 2018).

In public discourse, the cost of a green building compared to one that is less green receives considerable attention particularly when public funds and expenditures are involved. Assessments show that, over the long run, a green building costs about the same as a conventional building but has much less adverse effect on the environment. A study entitled *The Cost of Green Revisited: Reexamining the Feasibility and Cost Impact of Sustainable Design in the Light of Increased Market Adoption* (Morris and Matthiessen 2007) looked at 83 buildings that had achieved LEED certification. When compared to a random sample of traditionally designed buildings, controlling for time, location and cost, the report found that going green does not have to cost a dollar more. And, since 2007, many alternative utility systems and materials have become considerably more cost effective.

Of the 130,000 Pre-K-12 schools in the U.S. the Council reports there are about 2000 that are LEED certified. And there is a similar percentage for of LEED certifications for America's 4000 higher education institutions which have tens of thousands of individual buildings (Katz 2012). Whether LEED certified or not, nearly all new school construction or major overhauls of existing school buildings in the U.S. today have green features such as more efficient heating and cooling systems, modern lighting, automatic light switch timers and more. Still, the bulk of school official efforts are simply aimed at trying to make existing older buildings greener, more efficient and more cost effective through improved management. Education agencies, across the U.S., including public Pre-K-12 school districts and public higher education institutions are increasingly adopting more demanding sustainability standards and programs and are also hiring environmental and sustainability experts on staff. The US Green Building Council verified it through an assessment of school sustainability professionals (Baldwin-Metzger and Gutierrez 2015).

But most U.S. schools are older and are far from meeting LEED standards with drafty windows, antiquated heating and cooling systems, energy intensive lighting, banned building materials (such as asbestos), older plumbing and other less-than-green features. These older buildings and campuses can offer many opportunities for improved efficiencies and significant cost savings if better contained and managed. School officials recognize how antiquated the basic inventory can be and strive constantly to bring these facilities up to date and modern standards of

efficiency. This is particularly true in lower income areas across the U.S. and is most evident in large urban school districts.

Regardless of the status of individual schools, the advantages for making the shift toward greener structures and grounds are manifold and surely include savings on energy and other utilities. The U.S. Environmental Protection Agency points out that utilities are second highest single expense category in U.S. public education next to teacher salaries. The U.S. Environmental Protection Agency also offers a guide to energy efficiency at schools, (U.S. Environmental Protection Agency 2011). There are also many printed and online tools available to schools to help lower their bills and become more efficient. These activities receive an added layer of focus and implementation when the school has become part of an organized green school program such as a comprehensive state-based program. Indeed, state education agencies that provide so much for K-12 public education recognize that they should also be supporting greener and more energy efficient and sustainable schools. States are increasingly adopting more standards that support energy efficiency and sustainability at schools and in school districts. One example is the green school program in Wisconsin (Wisconsin Department of Public Instruction 2019) and there are a dozen others but there is a need for more states education agencies to adopt such approaches.

Green school programs, whether developed by state agencies and local school districts directly or with the help and support of third party public interest organizations, such as the National Wildlife Federation (NWF) are finding that the process of greening older schools can engage students, faculty and facilities staff in many creative and educational efforts such as students auditing energy, water and waste efficiencies or planting trees and educational gardens. NWF is associated with the worldwide organization the Foundation for Environmental Education in operating Eco Schools USA which is part of a global network of schools in dozens of nations. Eco Schools USA has been adopted by thousands of U.S. pre-K-12 schools (NWF Eco Schools 2019c). It is among the efforts to green schools while offering an educational platform that can support student learning while cutting costs and reducing waste.

Another aspect of U.S. green schools is in their role as consumers of products and services. Procurement expenses are also a large budget item for local school districts and it is helpful for a school or district to also engage in green purchasing. School energy and environmental procurement footprints extend to how they purchase their power, furniture, paper, cleaning products and what food and other supplies they acquire. Attention to a school district's supply chain and procurement policies and practices can add significantly to a reduction in overall environmental footprint and foster much more effective sustainability. Again, some public educational agencies do this on their own, such as in California (CalRecycle 2019) while others get the help of private public interest organizations. The non-governmental organization, the Green Schools Alliance, based in New York City has developed and is working with an alliance of dozens of school districts across the U.S. on green purchasing. This effort includes many of the largest public school districts in the U.S (Green Schools Alliance 2019).

As local schools districts make the shift toward sustainability, they are looking comprehensively at the buildings and the grounds and are developing new policy frameworks. There are many examples such as in New Jersey and Fairfax County, Virginia (Fairfax County 2017).

There are also greening opportunities around a school's physical setting and grounds. Greener school grounds can support school district sustainability goals in a number of ways. Well placed trees can help reduce cooling costs and verdant gardens sequester carbon and can serve as laboratories for outdoor science education, teaching about food and providing healthful and stimulating outdoor classrooms. Building designers will point out how critical the school site is to an overall green design such as the positioning of the building on the site to maximize passive solar heat in the winter or conversely, in warmer areas, to help the building remain cooler in the summer. The Sustainable Sites Initiative (SITES) was developed as a collaboration among the American Society of Landscape Architects and the University of Texas, Lady Bird Johnson Wildflower Center (SITES 2019). The effort is also supported by the US Green Building Council. It helps to take advantage of natural features at each location and support ecologically sound development. SITES offers development tools and rating systems for buildings including schools. Rating systems such as for tree siting are also available (ASLA 2019).

School gardens are becoming more common green features at schools today and they are a popular physical attribute of a green school. The Robert Wood Johnson Foundation supported program, Bridging the Gap, has tracked growth in school gardens which are now approaching 30% of all schools (RWJ 2014). There is no firmly established number for U.S. school gardens but most estimates are that between 35,000 and 45,000 of the nation's 130,000 schools have active educational gardens. Most of these gardens grow fruits and vegetables and can teach students about sustainable food. Some focus on creating wildlife habitat such as the National Wildlife Federation's Schoolyard Habitat® program and a similar effort offered by the U.S. Fish and Wildlife Service. Others focus on natural playgrounds for the kids to give them a nature experience and exposure to greenery during school hours and after school. The careful design of outdoor spaces, using natural features, can make a significant difference in supporting health and learning. The Natural Learning Initiative and NWF are also engaged in a program to design nature-focused play spaces for schools and early childhood centres called Early Childhood Health Outdoors (ECHO) (NWF ECHO 2019b).

Every green school building or campus runs the risk of failing to incorporate the technology and innovation represented in its facilities into the school's educational programming and learning environment. Schools want to avoid having, for example, a state-of-the-art solar array or terrific geothermal power generation capability that is nearly unknown to the educators and students on campus. Done right, green school buildings can offer rich and high effective opportunities for learning and skill development.

In 2011, the U.S. Department of Education initiated a new Green Ribbon Schools program to bring awards and recognition to schools that are exceptional in their commitment to sustainability and the environment. The Green Ribbon program is modeled after the Department's popular and long standing Blue Ribbon schools

which lists schools that have performed exceptionally well in their academic achievements. The Green Ribbon Schools program is committed to three basic goals:

1. Reduce environmental impact and costs;
2. Provide effective environmental and sustainability education; and
3. Improve the health and wellness of schools, students, and staff.

This latter goal is in response to concerns that get raised about the environmental health conditions of many schools and the possibility that school buildings and their surroundings could, themselves, adversely affect a child's health and development. Roughly 55 million children and five million adults spend major amounts of time in America's 130,000 schools. As noted earlier, the majority of these buildings, particularly in major cities, are from 40 to 100 years old and, for a number of reasons, are not optimal for supporting human health. Many contain environmental hazards as a result of deteriorating building materials, antiquated heating and cooling systems, poor lighting, poor ventilation, mold, dust, and even some toxic exposures to chemicals from cleaning products, finishes, and landscaping applications. The reduction of environmental and other health risk exposures is a priority for most school districts and school staff. The reduction of these risks and offering other healthful opportunities to children can make them healthier, support long term child development and also boost student performance, (Allen 2017).

One aspect of green schools and health can be found in the green schoolyard movement and the tendency for most green schools to have more field trips. The National Wildlife Federation in its 2010 report *Back to School Back Outside* (Coyle 2010) documented these benefits and their effect on academics. The Federation, which supports children having a daily Green Hour in alignment with recommendations from the Centers for Disease Control and the American Academy of Pediatrics has also documented an impressive set of nature and outdoor benefits:

- Outdoor play increases fitness levels and builds active, healthy bodies, an important strategy in helping the one in three American kids who are obese get fit.
- Spending time outside raises levels of vitamin D, helping protect children from future bone problems, heart disease, diabetes, and other health issues.
- Being outside improves distance vision and lowers the chance of nearsightedness.
- Exposure to natural settings may be widely effective in reducing ADHD symptoms.
- Schools with environmental education programs score higher on standardized tests in math, reading, writing, and listening.
- Exposure to environment-based education significantly increases student performance on tests of their critical thinking skills.
- Children's stress levels fall within minutes of seeing green spaces.
- Play protects children's emotional development, whereas loss of free time and a hurried lifestyle can contribute to anxiety and depression.
- Nature makes children nicer, enhancing social interactions, value for community, and close relationships.

21.3 Sustainability Education and Overall Academics

One of the logical outcomes of having school buildings and grounds that embody principles of environmental quality and sustainability is they would be better places to learn. Indeed, whether a green school is built around a new building or is just trying to improve upon its existing structure and operations, green schools can be highly supportive of many aspects of improved education around the environment, sustainability and skills for the twenty-first century. In simple terms, green schools can support:

- Environmental education and environmental literacy,
- Academic excellence including higher test scores, and
- Development of twenty-first century skills such as team work, applied project-based learning, and problem-solving.

A 2015 study found that with orientation and training of faculty, the physical features of a green school could offer significant opportunities for cross-disciplinary learning, science and technology education, community service education and more (Kerlin et al. 2015). But, making a green school into an effective venue that actually achieves these educational goals can be a real challenge.

One of the largest hurdles was put in places in 2002 when the U.S. Federal government and the states adopted a more focused and specific nationwide accountability system, called No Child Left Behind (NCLB) (Klein 2015) that emphasized subject basics and strictly enforced programs of standardized testing linked to school performance ratings, teacher ratings and more. Even though 90% of public school funding comes from state and local sources, public schools were required to adopt the NCLB approach to qualify for needed federal funds. For many schools and educators, there has been significant concern that any educational approaches that are not tightly focused on student standardized test performance will lower scores and hurt a school's rating. This left less room for environmental and sustainability education and made it particularly difficult to bring innovations, new teaching approaches and added materials to the classroom. Instead many teachers felt they were chained to the rigor of making sure their students do as well as possible on these statewide tests.

21.3.1 *Green Schools and U.S. Environmental Education*

Environmental education (EE) has been a part of larger American education scene for many decades. It started on the road to becoming more mainstream in the 1970s when, well after the first Earth Day celebration, a new professional field of environmental education took on a more consolidated shape particularly as an outgrowth of a seminal international conference in Tbilisi, Georgia in 1977 (UNESCO 1978). One outcome of that conference was a clear commitment from all present to a

definition of environmental education that could achieve the right combination of knowledge, skill and behaviour change. Researchers realized that traditional and somewhat passive pedagogies involving the absorption and regurgitation of information would not be at all workable if the expectation and need was to create people who could become personal and professional stewards of the environment. What some educators describe as the “information deficit” model would simply not be enough. Instead the professional environmental education field adopted a four-step learning framework involving: (1) information and awareness, (2) deeper, more systemic knowledge, (3) skill development and (4) actual application of the acquired knowledge and skills. This four step learning process not only gives students the opportunity to internalize what they learn but to be able to apply these skills with a more critical eye and to different situations and environmental situations and subjects. It helped them learn *how* to think rather than simply *what* to think. This EE methodology was adopted in the U.S. (Monroe et al. 2007). It fits well with inquiry-based and project-based learning and, coincidentally, is especially useful and appropriate in the green school setting. Since the adoption of these principles in the 1970s, the environmental education field, under the auspices and support of the North American Association for Environmental Education and its hundreds of member organizations and agencies has developed Guidelines for Excellence (Simmons et al. 1999 through 2010) that expound on this approach and set out methods for effective teaching and standards for effective materials and their use.

But the environmental education field has still had a challenging time becoming an accepted part of core U.S. K-12 education. One early success was for organizations to develop supplemental curricula and then train classroom educators on how to use these curricula in science, social studies and other classes. Programs such as *Project Wild*, *Project WET*, and *Project Learning Tree* have, over the years, trained hundreds of thousands of teachers on environmental education using first rate, standards-aligned curricula. The basic idea was to infuse the environmental education lessons and curricula into the standard educational offerings. Another early approach was to supplement classroom and lecture activities through partnerships with local nature centres, park agencies, botanical gardens, arboretums, zoos and aquariums. The educators who made the most use of environmental educational materials and venues were not confined to a particular discipline. Many used it to enrich science education while others used it in social studies, service learning and even art. These applications are particularly popular during U.S. Earth Week in April, but have become more challenging as the landscape of overall K-12 education shifted toward higher levels of accountability via standards and testing in the early twenty-first century.

Adding to the challenges of inserting environmental content into core curricula was the overall trend of teaching less geography and earth science in American classrooms in favour of basic life science, physics and chemistry. A promising exception to the tendency for high stakes testing to work against environmental education can be found in the popularity of environmental science as an advanced placement (AP) subject in high schools. The course is taught in thousands of

secondary schools in the U.S. and the number students taking the exam has grown from 75,000 in 2009 to 160,000 in 2017 according the College Board (College Board 2019)

Nonetheless, by the late 1990s, the environmental education field had, via training and orientation, reached more than one half of America's teachers, was present to some degree in a large majority of schools and had the support of an impressive number of non-formal nature and environmental education organizations, such as nature centres, natural history museums, zoos, aquariums, botanical gardens, arboreturns and more. But environmental education was still not penetrating as deeply into mainstream American Education as would be needed for proper pedagogy, scope and sequence to create an environmentally literate graduate.

21.3.2 Green Schools and Sustainability Education

In the 1990s, a more contemporary educational framing was also taking shape that looked comprehensively at dynamic and systemic interfaces among the environment, the economy and social justice and equity in society. This three-part framing, described as education for sustainability, became popular as an all-encompassing way to think about the subject of living prosperously and fairly within the confines of a planet with limited natural resources. Environmental education had always embodied these principles but the explicit three part framing of education for sustainability proved helpful and, it fits well with the overall dynamics and educational platforms offered by green schools. Education for sustainability, according to such leading organizations as the Cloud Institute (<http://cloud-institute.org/>), links knowledge, inquiry and action and helps create a more holistic, cross-disciplinary way of learning involving the school and the community.

Education for sustainability has the potential for significant alignment with green schools. It teaches age appropriate systems thinking and lets students learn about interrelationships. This helps them understand system wide problems and solutions. As with environmental education, education for sustainability supports Inquiry-based learning and real world problem-solving that can be grounded in their school of local community. In many school districts, the school itself is a sustainability learning lab for education around energy, water, carbon, recycling, food, and more.

Environmental education and education for sustainability both share a commitment to systems thinking and learning, civic skills development, etc. and over time – they have blended together in important ways. Both have had a challenging time, however, in finding their place in mainstream K-12 education. The infusion challenges have been around scale, scope, depth, and sequence. This is examined and assessed in a report by the USGBC Center for Green Schools (Barr et al. 2014).

The arguments for increasing the amount of environmental and sustainability education in our schools and overall educational system are very strong. They include: higher levels of student and educator enthusiasm, greater relevance, self-directed learning, higher attendance rates, fewer behavioural discipline issues,

problem-solving skills and more. They also help students meet community service requirements such as volunteering for public service in the community. But despite these attributes and even findings that such programs improve standardized test score results, they have still been slow to go fully mainstream. One study in the state of Washington took this challenge straight on by comparing standard statewide K-12 test scores in Washington State of more than 70 groupings of comparable schools and found that, in a large majority of the groupings, schools with environmental education in the curriculum had higher scoring students even when the subject matter of the statewide tests was not the same (Bartosh 2003).

21.3.3 Environment and Sustainability as Integrating Context for Learning

Another set of researchers think they found the reason environment-based education boosts overall academic performance. In the mid to late 1990s the State Education and Environment Roundtable, an NGO that works with dozens of state education departments, undertook an assessment in 40 schools to determine ways that environmental education could pierce the accountability veil and become more mainstream in K-12 education. In a remarkable 1998 study called *Closing the Achievement Gap*, the Roundtable researchers found that environment-based education offered schools a significant opportunity to expose educators and students to innovative, project-based learning that also improved performance on standard tests and other measures. In its initial study, the Roundtable looked at 39 different performance assessments in the subject schools and found that in 92% of them the EIC students performed better than students in more traditional programs (Lieberman and Hoody 1998). The use of the environment as an integrating context for learning (EIC) became an important concept in strengthening overall education and learning. In looking at the most successful schools, they found some common ingredients. These included team teaching of cross-disciplinary environment-based subject matter. They also helped to confirm that students learned best when they were applying what they learned to real world situations. In some cases the EIC schools were making use of nearby nature areas, streams and more. But in most cases the school itself was the EIC test bed (Lieberman 2013).

A major initial question about the potential widespread application of the EIC approach began to be answered when, over the past 15 years, an increasing number of green schools and green school programs emerged. Green school platforms are turning out to be an exceptional way to implement EIC.

The overall Pre-K-12 American education scene is shifting toward greater acceptance of and reliance on green school programs and educational platforms. This includes some recent rethinking by the U.S. government of too rigid an adherence to the high stakes testing approached of No Child Left Behind. In 2016 the U.S. Congress passed new legislation called the Every Students Succeeds Act

(NASSP 2015). It does not do away with high stakes testing but added a recognition of the value of applied learning, particularly in science and technology, and even expressly included environmental science and field study for the first time. A main reason for this change was a recognition that the full-on standardized testing approach was teaching kids to take tests more than it was preparing them for the real world (NCTE 2014). Students need to understand school work in a real-world context, they need to be able to conduct applied projects and work in teams. In short, they needed skills for the twenty-first century.

The U.S. National Environmental Education Foundation summarizes the benefits environmental education and applied education for sustainability can have on student performance (NEEF 2009). These include: fostering of student enthusiasm for learning, advancing innovative teaching techniques, stimulating critical thinking skills, helping with teamwork, keeping education more relevant, encouraging self-directed learning, equalizing opportunities for academic success among students of different socioeconomic and cultural backgrounds, exposing children to nature and the outdoors to improve health and instilling confidence.

In addition to the groundbreaking work by the State Education and Environment Roundtable and its colleague agencies and organizations, there is a growing body of evidence from other sources pointing directly at green school programs as supporting higher performance on standardized scores. The Maryland Green Schools programs, for example, was assessed in 2014 and researchers found that math and English language arts scores were higher in the enrolled schools (Ghent et al. 2014). The Maryland Green Schools program was modelled, in part, after the global Eco-Schools program (FEE 2019) so this study has some promising world-wide applications.

One of the subjects that did particularly well in the EIC approach was science education. The U.S. has focused on ways to improve science and technology education for decades. As illustrated by Pew research (Desilver 2017), American students are fairly low in international rankings compared to many other Nations. Recognizing that certain key elements were missing from U.S. science education, the National Research Council, in 2011, developed and published a Framework for K-12 Science Education (National Research Council 2011) that began to revolutionize the way that science education occurs and, at the same time, provided new openings for making green schools more mainstream. This framework had, as one of its core concerns the fact that science, technology, engineering and mathematics (STEM) education in the United States was creating people who understood the science but were less prepared to be scientists, or they understood dimensions of technology but were not really skilled technologists. The Council sought to develop dynamic new standards to address this placing much more emphasis on cross-cutting STEM themes and a far greater focus on application.

The Research Council standards were then developed into full scale science standards over the following 4 years with input and hard work from 27 state education departments and were forged into the Next Generation Science Standards (NGSS) which have been adopted, as of 2018, in 20 states and are on their way, according to the NGO Achieve, to adoption in many more. Achieve worked over many years and

is still working to support state efforts to assess and implement the Standards. It is an independent organization dedicated to working with states to raise academic standards and graduation requirements, improve assessments, and strengthen accountability (Achieve 2013).

The new standards focus more on the place of STEM education in the context of the Earth and its resources and thus emphasize learning science in a broad context. They also point out how important it is to actually apply STEM learning and to move beyond theory. This basically means that the environment, energy and natural resources fit well within NGSS framework and are a terrific and popular way to implement the standards. Green school platforms make NGSS implementation even easier.

In addition to supporting applied science learning through though the lens for the environment and sustainability Green schools are also ideal for addressing a long-standing concern by the National Research Council which is a tendency to short change engineering-focused education in the primary and secondary education levels. The NGSS include more educational standards around engineering education and its prerequisites further supporting green school adoption. Green schools are idea for teaching students about engineering and technological principles embodied in school buildings and their grounds and facilities.

21.3.4 Local School District Adoption of Green School Approaches

As noted earlier, there are some 13,000 local public school districts in the U.S. and many of them are placing much greater emphasis on sustainability in their overall goals. Berger (2017) points out that many of these districts are motivated by the cost savings sustainability programs offer but school district superintendents are also attracted to the way that district-wide sustainability goals can enrich student learning and the educational experience. NWF Eco Schools USA is an illustration. Of the several thousand primary and secondary schools enrolled in the program in the U.S., 90% are public schools. Importantly, major public school districts such as Atlanta, Austin, Baltimore, Fairfax County, Houston, Philadelphia, and New York City are using Eco Schools to encourage students to participate in implementing sustainability goals by conducting energy audits, tracking recycling performance, planting trees and gardens for climate mitigation and more. The fact that NWF Eco Schools USA is part of an international network of Eco Schools also helps connect these schools with green schools in other nations. The international network of Eco Schools has, as of 2019, spread to more than 68 nations and over 55,000 schools and nearly 20 million students.

There are also encouraging signs that many of the major education NGOs in the U.S. are supporting green school programming. These include: the American Association for the Advancement of Science, the American Federation of Teachers,

Association for Supervision and Curriculum Development, the Council of Chief State School Officers, the National Association of Elementary School Principals, the National Association of Secondary School Principals, The National Education Association and others.

21.4 Impact of Green Schools in the United States

In looking at the three main goals of the U.S. Green Ribbon Schools program the impact of the green schools movement in the United States becomes clearer.

To begin with, many schools in the United States at the primary, secondary and higher education levels are, in some way going green whether by simply working to lower their energy bills or going so far as to build new green school buildings. But there are many more official green school programs emerging in the United States as public school districts and private schools adopt suitability and environmental goals.

The more comprehensive greening of U.S. Schools is made more difficult by the fact that education oversight is the domain of the various states rather than a more centralized authority such as the federal government. It is also true that individual local public school districts, of which there are more than 13,000, have control of their facilities and much of their educational strategies. School greening is largely and elective process involving winning over state and local administrators and educators to the idea there are significant fiscal, environmental, health and educational benefits to be had by making school greener. While there is no hard count on how many schools in the U.S. might be labelled as truly green, most experts will estimate about 9–12% of the total of 130,000 K-12 schools.

One organization that works to keep track of the growth of the American green schools movement is the Green Schools National Network. Allowing for overlap among programs and multiple players the combined efforts of the U.S. Green Building Councils LEED program, NWF Eco Schools USA, Project learning Tree Green Schools, The Green Schools Alliance, state green school programs in Kansas, Maryland, Oregon, Pennsylvania, Wisconsin, and numerous other states the total count of official green school programs is roughly between 12,000 and 15,000 Pre-K-12 schools and 1000 institutions of higher education. A subset of green schools found in the American school garden movement is working in 35,000–45,000 schools. These programs are shrinking environmental footprints while saving funds that can be used for educators and improved learning opportunities.

Are green schools having an impact? A high-functioning green school will reduce its energy and carbon footprint by 20% or more and reduce its annual utility expenses by \$20,000 to \$60,000. It will cut water usage and can end up recycling as much as 90% of its solid waste. If you were to add up these numbers they come, conservatively, to \$300,000,000 in savings that can go directly back to the classroom. And between 7 million and 8 million students are healthier and are receiving a fascinating, skill-based education that is preparing them for the challenges of the

twenty-first century. The NWF Eco Schools USA program, for example, according to school reporting, saves school districts across the U.S. a total of between \$100 million and \$150 million per year in utility bills.

Moreover, for reasons stated above, green schools in the United States are increasingly contributing to educational goals as embodied in the Next Generation Science Standards, STEM Education, standardized test performance, and the development of critical thinking and team skills needed for a more sustainable future. There is a growing body of research demonstrating that school-based environmental projects and improvements provide significant learning opportunities for students that extend their experiences and skills well beyond what they would learn in classroom lectures.

Finally, green schools are helping children and educators to be healthier by addressing environmental hazards, focusing on education around nutrition and supporting more outdoor classroom and play time.

Public school district administrators at the national, state and local level are paying and increasing amount of attention to the potential of green schools as never before and public policy support for environmental and sustainability goals are being widely adopted and implemented across U.S. states and school districts. In the United States, there has surely been traction for the burgeoning green schools movement at many levels but alignment around the need for a more sustainable future, particularly addressing climate change, along with shifting educational goals paints a bright picture of America's Pre-K-12 and higher education systems, facilities, grounds and the educational experience, becoming greener.

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Chapter 22

A Regional Approach to Eco-Schools in the Western Indian Ocean



Olivia Copsey

Abstract The urgent action needed to prepare communities for climate change impacts on Small Island Developing States (SIDS) is well documented within international policy. Several high-level strategies devote special priority to Education for Sustainable Development (ESD) in SIDS, and contemporary literature on ESD has shed light on the most effective approaches for addressing the types of complex sustainability problems facing islands. As a response, the Indian Ocean Commission ISLANDS project introduced an holistic and student-led Eco-Schools programme as a regional framework to support the development and capacity for ESD in Comoros, Madagascar, Mauritius and Zanzibar, whilst achieving SIDS to SIDS knowledge exchange and cooperation. After a successful pilot programme, Eco-Schools is now being mainstreamed through national education systems, under the oversight of cross-disciplinary committees representing government ministries and non-government organisations. Given the seriousness of the ESD agenda in SIDS, it is vital that the Eco-Schools Indian Ocean programme can perform at a level where the potential positive impacts of ESD on schools and communities can be realised. This chapter sets out to identify how the kinds of transformative learning processes which emphasise community collaboration, sustainable citizenship, and critical reflection and action relate to kinds of transformative change required by the international strategies and the contemporary ESD field and illustrates how this transformative change is recognisable on the ground.

22.1 The Case of Small Island Developing States

Despite their common idyllic paradise image, and view of their indigenous societies as living in an “ecological garden of Eden” (Dunbar 1996, p. 48), small islands face many of the same problems as other developing countries, as well as some unique ones of their own (United Nations (UN) 2014). The history of human habitation on

O. Copsey (✉)
Eco-Schools African Network, Paris, France
e-mail: oliviapopseyesd@gmail.com

many islands is fraught with social, economic and ecological hardships (Ponting 1991). In addition, to which, many communities on Small Island Developing States are operating in the context of climate change at the “sharp end” (Crossley and Sprague 2014), already experiencing its damaging day-to-day effects, including sea-level rise, soil erosion, flooding, water shortages, and high frequency of natural disasters. Remoteness, poor food security, water scarcity, and vulnerable single sector economies, as well as high population densities in coastal zones increase the susceptibility of island communities, and in some cases, threaten their very existence (UN 2005, UNESCO 2005). As a global priority, national governments, with the help of the international community, are scaling up measures for effective disaster reduction and preparedness and working to increase public awareness to help communities build resilience and reduce the potentially tragic impacts of climate change (UN 2005, p. 11).

Education for Sustainable Development (ESD) is being carried out in the context of several International agreements for the sustainable development of SIDS such as the United Nations Barbados Programme of Action (BPOA) adopted in 1994, the Mauritius strategy (2011) and the more recent SIDS Accelerated Modalities of Action [S.A.M.O.A.] Pathway (2014). *The Future We Want* (UN 2012), adopted at The United Nations Conference on Sustainable Development in 2012 (Rio+20) specifically highlighted the unique and particular vulnerabilities of SIDS, and the UN’s 17 Sustainable Development Goals (8 of which specifically mention SIDS) has redoubled momentum. ESD is an integral part of all the above policies, in particular linked to Climate Change Education (CCE) and Disaster Risk Reduction (DRR). In addition, Small Island Developing States are listed and one of the three priority areas for UNESCO’s Global Action Programme on Education for Sustainable Development (UNESCO 2014). It is generally encouraged that SIDS attempt to work regionally to maximise resources and develop cooperation between islands facing common challenges (UNESCO 2012).

22.2 Regional Collaboration on ESD in the Indian Ocean

In countries of the Western Indian Ocean, national governments are supported in the delivery of sustainable development agendas by inter-governmental organisation, the Indian Ocean Commission (IOC). Despite the range of economic differences in the region (Mauritius and Seychelles are middle-income countries, whereas Comoros, Madagascar and Zanzibar are amongst the least-developed countries) (World Bank 2016), the shared geographic proximity, natural resources and common development issues made a strong case for a single unified approach to implementation of ESD.

Between 2003 and 2006 a pilot project of the IOC ‘ARPERGE’ (Appui Régional à la Promotion d’une Education pour la Gestion de l’Environnement) funded by the European Union had already laid the foundations of regional collaboration on ESD. Through professional development sessions and resource packs, ARPEGE

aimed to develop the capacities of teachers to facilitate environmental learning and initiate environmental management projects in schools. A network system was established between schools in the region for exchange of ideas and sharing practices. However, the programme did not progress beyond its pilot phase. After an 8-year funding gap, in 2014 the IOC ISLANDS project (full title: 'Implementation of the SIDS Mauritius Strategy in the Eastern Southern African-Indian Ocean Region') (IOC 2017), again funded by the European Union, commissioned a scoping project to develop the regional successes with ARPEGE and find opportunities for increased cooperation and knowledge exchange between the Indian Ocean countries through a new shared framework for ESD to integrate sustainable development themes into national education systems, and deliver commitments to the GAP and other national and international sustainable development agendas. The aim was to support the development and capacity for ESD in each country, whilst achieving SIDS to SIDS knowledge exchange and cooperation.

22.3 Eco-Schools for the Indian Ocean

Funding for sustainable development in the Indian Ocean (like many other regions) is frequently project-focussed, often with relatively limited timelines and emphasis on short-term pilot programmes. With only 4 years remaining on the ISLANDS project, the question of long-term sustainability was paramount in the design of the new ESD programme, and for this external cooperation was key. The international Eco-Schools programme of the Foundation for Environmental Education (FEE) (www.ecoschools.global) is the largest sustainable schools programme in the world, involving 67 countries and 51,000 schools. The programme is run in each country by national NGOs, with a focus on community involvement, partnership and collaboration. The partnership opportunities offered by the broad membership of Eco-Schools, its status as Key Partner of UNESCO's GAP, and internationally recognised Green Flag standard of excellence for ESD in schools, seemed to offer a secure basis on which to build a new regional model which could achieve 'buy-in' from the key education partners and ministries in each country, whilst bringing new supportive partnerships from overseas.

If an organisation wishes to establish the Eco-Schools programme in a country, they must first gain membership with the Foundation for Environmental Education. The case of the Indian Ocean Commission presented some new questions and challenges for FEE. The statutes of FEE stipulate that members must be NGOs, and IOC is an inter-governmental organisation. A regional membership including several countries was also a first. The proposal of IOC required several special exceptions to be made and somewhat of a 'leap of faith' on the part of FEE. Close communication, regular reporting and collaborative planning was required from the beginning of the scoping project in order that the model would be acceptable to all parties concerned.

The Eco-Schools scoping project involved in-depth interviews in schools, ministries of education and environment, and national NGOs in each of the five countries. Diversity found in ESD implementation amongst the five Indian Ocean countries was usually linked to the stage of development of national sustainable development strategies. In some cases, there had been limited progression in the intervening years since ARPEGE, while others demonstrated exemplary mainstreaming of ESD through education systems. For example, the Seychelles had worked with the South African FEE member, Wildlife and Environment Society of South Africa (WESSA), to develop their own national Eco-Schools programme involving every government school, coordinated by a specialist Environmental Education Unit within the Ministry of Education with support from the Ministry of Environment and other partners such as non-governmental organisations (Emilie 2015).

The levels of ESD development between the countries raised questions as to the feasibility of a regional approach to ESD implementation. In addition, aside from different languages, there were large differences between the condition of schools across the region, and levels of urgency of some of the sustainable development issues they face. For example, whilst diabetes and obesity is a growing threat in Mauritius, one of the most prevalent issues facing the schools visited in Madagascar was malnutrition, to the point where children regularly pass-out in class, lack of clean for drinking, and little capacity to grow food for the children. Schools in Zanzibar had such extreme problems with soil erosion that some school buildings were collapsing, severe over-crowding, and lack of sanitation to the extent that a school of 2000 pupils shared one toilet. All countries are badly affected by increasing severity of cyclone season causing flooding and damage to school buildings and even loss of life. And there are other natural threats: a school visited in Seychelles was mercifully empty when it was hit by the 2004 Boxing Day Tsunami.

Such depth and urgency of the challenges facing Indian Ocean communities called into question the suitability of the Eco-Schools framework, which was originally developed to combat sustainability issues in European schools. For example, how could a programme designed to stop wastage of resources, help schools who have no resources to begin with? However, the head teacher of one of the poorest Malagasy schools included in the scoping project, EPP Tsilazaina outside Antananarivo, persuaded me; “Yes! If you have a programme about water, energy, food, health – that is what we need!”. In fact, the flexible nature of the Eco-Schools seven step framework, and freedom to determine themes relevant to each country and school allowed it to be adapted to every context. The scoping project found clear demand for the Eco-Schools programme within national governments, primary and secondary schools, and NGOs. The chief benefits were seen to be increased practical guidance and cooperation on ESD within the region, and international participation to bring further support and recognition. The main message from the consultations was “We are ready for Eco-Schools”.

22.4 A Bottom-Up Programme Design

However, the diversity in challenges and levels of ESD implementation still presented a challenge for design of an Eco-Schools programme which could support the various needs and range of challenges of all schools in the region.

It was clear that a traditional educational programme, which focuses on providing information and raising awareness of key sustainability issues in order to change behaviours, would have little value. The ISLANDS team recognised that a more ‘bottom-up’, context sensitive approach was required in order to support schools to address the complex nature of the sustainability problems they faced. It is also by now well-known that there is a lack of correlation between increased knowledge, awareness, and behaviour (Vare and Scott 2007; Peters and Wals 2016; Lotz-Sisitka et al. 2015; Huckle and Wals 2015; Tilbury and Cooke 2005). These principles rendered a traditional top-down instrumental/behaviourist educational process with pre-set educational outcomes obsolete. Instead, it was decided that the Eco-Schools Indian Ocean programme should use social, collaborative, multi-disciplinary learning approaches which promote discourse, debate and reflection for a deeper, more transformative response to community transformation (Wals et al. 2009; Wals 2010; Huckle 2014; Jickling and Wals 2008; Lang et al. 2012; Lotz-Sisitka et al. 2015). The Eco-Schools Indian Ocean programme was designed according to an ‘emancipatory’ ESD approach which emphasises nurturing qualities within the learner (Wals 2010; Sterling 2010;), with a view to the development of the critical sustainability competencies outlined by Peters and Wals (2016) (Box 22.1).

Box 22.1: ESD Competencies Within the Eco-Schools Seven Step Framework

Step One: Forming an Eco-Committee

- Multi-stakeholder approaches
- Incorporation of local knowledge

Step Two: Informing and involving

- Working to green the institution itself
- Reorienting existing curriculums around Sustainable Development themes

Step Three: Environmental Review

- Participation
- Critical enquiry

Step Four: Eco-Code

- Socially critical orientation
- Reflexive learning

(continued)

Box 22.1 (continued)**Step Five: Curriculum linking**

- Sustainability literacy
- Systems thinking
- Questioning norms/power

Step Six: Action plan

- Systems thinking
- Social Learning
- ‘Learning as connection’

Step Seven: Monitoring and evaluation

- Meaning making
- ‘Participative’ worldview
- Building agency and empowerment

The international seven-step framework of Eco-Schools follows a Plan-Do-Check-Act (PDCA) Cycle which readers familiar with ISO 14001 and other international Environmental Management Standards will be familiar with. Countries setting up Eco-Schools are free to determine the order of the steps themselves. In the Indian Ocean, focus on community collaboration, and incorporation of local expertise was key in order that the programme was adaptable to all school environments. Therefore, the setting up of a student-led, multi-stakeholder Eco Committee, and the immediate involvement of the whole school and wider community were steps one and two. The school then carries out an environmental review around ten key themes (again chosen according to regional context) which enables them to identify key areas for learning and action. Having chosen priority challenges, the students will then gather available information and local expertise to help. In this way the programme incorporates local and indigenous knowledge alongside existing education materials provided by experts, curriculums, and governments, and can actually help to legitimise it, in the sense that all information is viewed critically and learners become free to make up their own minds, developing solutions based on given facts combined with other forms of local knowledge (Sterling 2010).

22.5 Implementation

The Eco-Schools Indian Ocean pilot programme was launched in February 2015 by the IOC ISLANDS project at a regional workshop in Mahe, Seychelles to representatives of national ministries of education and environment from Comoros, Madagascar, Mauritius and Zanzibar, and in partnership with the government of Seychelles existing Eco-Schools programme.

The first step in implementation was the setting up of inter-disciplinary ‘National Eco-Schools Committees’ (NESC)s which include government officials, non-government and civil society organisations, (for example, Ministries of Education, Environment, and National Parks, NGOs and UN agencies) who are responsible for the delivery of national, regional and international objectives and goals for ESD. Each NESC chose a lead NGO who was contracted as ‘national operator’ by the IOC. These national operating NGOs were WWF (and latterly Madagascar National Parks) in Madagascar, MAEECHA in Comoros, Reef Conservation in Mauritius, and ZAYEDESa in Zanzibar. Working closely with the Foundation for Environmental Education at this point was vital because the IOC contract required a long-term commitment from each NGO that they would become FEE members in their own right by the end of the 3-year project period.

Together with the national operator, each National Committee developed Eco-Schools pilot schemes which ran between February and December 2015. A total of 72 pilot schools of all kinds took part across the region. The pilot scheme was reviewed at the second regional meeting for Eco-Schools, held Mauritius in October 2015. At this meeting the regional team made several recommendations for the future development of the programme, including the mainstreaming of Eco-Schools as the single national framework for Education for Sustainable Development (ESD) into education systems in Comoros, Mauritius and Zanzibar, and amongst several in Madagascar.

22.6 Monitoring Eco-Schools Indian Ocean

As the primary programme for ESD in each country, Eco-Schools has to support the practical and urgent demands of on the ground and also deliver specific objectives of national policies, and international strategies for ESD. These objectives were interpreted differently according to individual priorities of those implementing the programme (some 88 NESC members), influenced by country and organisational context, political and micro-political variabilities, culture and ideological perspectives.

So many varied drivers and interpretations for the Eco-Schools Indian Ocean programme, meant that the objectives were somewhat ambiguous. For instance, during the third regional meeting held in Zanzibar in September 2016, the national committee representatives refined overall goals. While the Madagascar NESC discussed a deeper level of social change needed; *“Develop students’ ability to acquire knowledge, skills and know-how so that they are autonomous and responsible for a better future”*, Mauritius chose to focus on policy recommendations; *“Eco-Schools should be used as the single national framework for ESD. It should be aligned with the SDG goals. There is need to coordinate and harmonize activities of various stakeholders under one common framework for ESD.”* The Union of Comoros remained cautious in their hopes for programme influence; *“By 2030, 50% of children and young people in Comoros are effectively adopting more responsible*

behaviours in favour of sustainable development”, while Zanzibar’s overall goal was straightforward; “*By 2035, 100 % of our schools in Zanzibar should be working on the Eco-Schools Program*”. However, as Eco-Schools Indian Ocean is used by some countries as the single national framework for ESD, it is important that the programme was able to deliver ESD to meet all requirements and perform at a level where the potential positive influence of ESD on communities could be realised. This would be especially important if the marker of ESD implementation in some countries became the percentage uptake of the Eco-Schools programme.

Clearer understanding of ESD objectives for Eco-Schools Indian Ocean was vital to be able to recognise with confidence if the required changes were taking place. In fact, this need in our programme reflected a wider need for high quality and effective monitoring and evaluation tools to track the changes and impacts of ESD globally (Down 2009). As we begin to understand the true complexity of addressing ‘wicked’ environmental problems, monitoring and evaluation systems need to follow a more open-ended process whereby outcomes depend on future unforeseen decisions and unforeseeable circumstances, with indicators defined in ways that are contextually and culturally relevant (Down 2009, p. 8).

This challenge became the basis for a qualitative Masters research study with NESO members from NGOs and government from the five participating countries to elucidate the types of tangible changes that the implementing partners are expecting to see. The results showed that the Eco-Schools IO implementing partners fully grasped and valued the holistic ‘whole institution approach’ to ESD (Down 2009), looking for changes within the formal teaching pedagogy and curriculum, practical and physical changes to the school buildings and grounds, and change within the wider community. The content and consistency of the research results allowed the Eco-Schools IO programme outcomes to be categorised to some extent into the four Dimensions of ESD set out in UNESCO’s GAP Roadmap (2014, p. 12).

22.7 Programme Outcomes

22.7.1 Dimension One – ‘Learning Content and Pedagogy’

The first domain of ESD according to UNESCO is ‘Learning content’. However, within the Eco-Schools Indian Ocean framework, learning content is inextricable from pedagogy as the formal content itself is generated through a bottom-up, multi-disciplinary learning approach. Therefore, for the purposes of monitoring Eco-Schools, dimension One is renamed ‘Learning content and pedagogy’ and dimension two (previously ‘Pedagogy and learning environment’) is ‘Learning environment’, although dimension two also has a strong pedagogical element.

The role of the formal curriculum within the Eco-Schools IO programme in guiding the development of knowledge and balanced understanding around sustainable development issues was seen to be critically important in the programme

success. This mainly takes place through the reorientation of existing subjects around critical issues. There were many examples whereby the Eco-Schools programme inspired new creativity in the teaching methods used and re-energised existing curriculum subjects. To ensure that students were exposed to different and conflicting perspectives, inclusion of learning content from local and indigenous knowledge was also important. This entailed a revival of cultural knowledge to inform understanding of local challenges, and integration within the solutions developed to address them (e.g. Laurie et al. 2016; UNESCO 2012). The concept of contextualisation of sustainable development principles was also a crucial factor at the level of schools, with many of the implementing partners defining ESD itself as a process of linking their learning at school to their own environmental contexts. This reinforces concepts of sustainable citizenship and Lotz-Sisitka's 'Learning as connection' model of quality education (2013). As an NESC member from Zanzibar said,

In Zanzibar more than 90% of the population is Muslim, much water is being used because in the mosque before you pray you have to have a wash from religious water. So much water is being used because we pray 3-5 times a day. Then most of the water just goes away. So the students are using the waste water from the Mosque for irrigation of the garden. They have fresh water for irrigation of their garden, their fruit trees, their vegetables, they have more trees in their land. So I think if this is very important and if it can be implemented in Zanzibar everywhere then more water can be reused and more products can be obtained towards Zanzibar Island.

22.7.2 Dimension Two – 'Learning Environments'

'Learning Environments', which was the second dimension of ESD guiding Eco-Schools IO objectives was both a pedagogical dimension and a practical one. A learning process was observed whereby development of knowledge taking place within the formal curriculum was contextualised via the testing of ideas, and the learning of practical skills and everyday behaviours to address priority challenges in the school grounds and the surrounding area.

The implementing partners emphasised the benefits of learning outside the classroom, and engagement with real-life challenges at school level. Description of pedagogies which were consistent with place-based (Gruenewald and Smith 2008), problem-based learning (Wals and Nolan 2012), and sustainable citizenship (Huckle 2014) encouraged students to consider the social and ecological wellbeing of the places they inhabit, and their roles in shaping and nurturing them (Huckle and Wals 2015). Developing practical projects and activities were an important part of the learning process, and lead towards a sense of ownership and responsibility.

It was generally accepted that for the ESD to be successful, the whole school must be aware of the programme, contributing to the success of school-based projects and adopting the new behaviours and skills in line with the priority challenges. This also has implications for issues of gender and participation. Similarly, the need

for multiple stakeholders and community members to be involved as an integral part of the ESD programmes was vital in order to bring skills and knowledge to support real-life problems facing schools.

Such positive action inevitably leads to visible improvements in the physical appearance of the school. This was expressed very clearly as a desired outcome of the Eco-Schools IO process. Initially, focus on the physical appearance of the school could suggest a more instrumental view. However, it was justified in some interesting ways. For example, improvement of school appearance was seen to be a sign of whole-school engagement, and key to the achievement of the learning outcomes themselves in terms of creating a psychological and valuative shift within the learning environment and having fundamental impacts to the way that education and learning as a whole are viewed, not only by students, but by the whole institution. In addition, implementation of practical projects which address sustainable development challenges on the school campus often have important benefits to the students in terms of improved quality of life at school and general wellbeing. This may also have an impact on attendance. As an NESC member from Comoros noted,

In Comoros many students are not motivated to go to school because their future is not bright. They don't see the point for life. If schools are more attractive because of the quality of the land, the quality of the toilets, because of the quality of the way they learn at school. My conclusion is that as the students are involved, they start to see a way forward for the future, so it is attractive for them to learn.

22.7.3 Dimension Three – ‘Societal Transformation’

There was general agreement that, for the process to be successful, the knowledge and skills gained at school must move ultimately into action and tangible impacts in the local area. One person challenged the question ‘How can we recognise these changes at school level?’, saying they believe the change required is actually not in the schools.

It is expected that as part of the ESD, there should be transference of the knowledge and skills learned at school into the wider community. Several people mentioned the important first step of students passing on their learning to family and friends, and one person went on to speculate on a deeper educational role of engaging children who don't attend school.

The role of the wider community within the ESD process through Eco-Schools IO was seen as vital at every level and every dimension of the Eco-Schools IO programme. In fact, the learning processes seemed to play a key role in uniting schools and communities on sustainable development issues, leading to individual and collaborative action. The relationship with the community is a two-way process, with community members being invited into schools to support curriculum learning and school-based projects, and schools to take part in wider collaborations with multiple stakeholders to solve the real-world problems facing communities. The Eco-Schools IO outcomes were consistent with recent literature on social learning, the

collaborative and multi-disciplinary processes whereby people of various backgrounds and with different values, perspectives, knowledge and experiences are brought together to co-create solutions for adapting to complex ‘wicked’ sustainability problems (Wals et al. 2009). As a NESC member from Madagascar explained,

We have to give the local context, what is happening in Madagascar now and what is our problems in terms of environment, economic and social issues. That there are some solutions for these problems and these solutions we have to look at together. The solution is found together and in common resolution. And everybody will be involved in these solutions, the authority, the actors, the operators, the genders, all people. In Madagascar at the end of the school year just only 50% continue to go to school. For many reasons, maybe the parents can't afford food for them to take to school, there are no books, but the main reason is that they are very poor. In fact, they have to collaborate every time, every day with the local community. To sell their products, their handcrafts, food products. They should have a relationship with the community all the life of the school. They should be autonomous in terms of food, when they have many partnerships they can survive even if there are problems, they can have sufficient food, the children also can come into the school everyday. There is less absence and more results.

22.7.4 Dimension Four – ‘Learning Outcomes’

Focussing on educational outcomes of the pedagogical processes mentioned in dimensions one to three provided an opportunity to shed some light on what might be the desirable values and attitude changes, or “new kind of thinking” (Wals and van der Leij 2007, p. 17) which leads to the kinds of community and educational transformation being asked of ESD.

The concept of ‘critical thinking’ was implicit within much of the discussion and evaluation of the Eco-Schools IO programme, complimenting views on critical reflection and action (Mezirow 1990; Finlay 2008; Huckle 2014) and aligning with notions of agency (Lotz-Sisitka 2016). The processes observed, whereby critical reflection and action (Huckle 2014) are applied to real-world situations, and skills developed to address the problems being faced by society, are believed to be an essential aspect of education for citizenship (Jeevanantham 2005). An Eco-Schools Seychelles team member explained,

Looking at individuals as an active contributor, an active participant, not because I'm a girl or I'm a boy, not because of cultural constraint. It's not only boys who are allowed to dig a hole and plant, or only girls who are allowed to collect fruits or collect water, but looking at all individuals as having the same rights and be given equal opportunity to also play an active role toward making the school a bit more sustainable, and at the same time moving this back into the community

22.7.5 Eco-Schools Indian Ocean ESD Indicators

Achievements were noted against each of the four indicators.

22.7.5.1 Perceptions of Change (Indicator One – Learning Content and Pedagogy)

Most of the implementing partners made reference to the need to see transformation in the mindset of students, teachers and communities, and in particular, to identify positive attitudes towards the role of Eco-Schools IO in building agency to address critical challenges. The term ‘seeing the benefits’ came up with surprising regularity in relation to the ability of students, teachers and community members to articulate the importance of ESD. Ongoing evaluation can be carried out through participatory dialogues and ‘most significant change’ type stories (Davies and Dart 2005) in which members of the school community articulate what might be called their ‘Perceptions of change’ during the course of programme implementation. This area of evaluation will help to identify transformative change primarily within the ‘Learning Content and Pedagogy’ Dimension of ESD.

22.7.5.2 There Have Been Physical Improvements to the School Grounds (Indicator Two – Learning Environments)

The whole school community should be working together to manage resources inside the school, and showing some innovation in the addressing of the schools’ particular challenges. A clean environment, evidence of renovation, sanitation and green spaces in the school are seen as important indications of educational transformation, including whole-school and community engagement, place-based learning, sustainable citizenship and agency. Although not exclusively, change in this area closely links to the ‘Learning environments’ dimension of ESD.

22.7.5.3 There Have Been Physical Improvements in the Wider Community (Indicator Three – Societal Transformation)

The ESD process is not complete without eventually impacting the wider community around the school. By observing the state of the local area, it is possible to see if the ESD programme has reached the community, either through transference of learning, involvement of the students in real-world local challenges, collaborative problem-solving involving community members, social learning or societal transformation.

22.7.5.4 There Are Improvements to School Attendance Records over Time (Indicator Four – Learning Outcomes)

The implementing partners mainly discussed qualitative evaluation, emphasising observation and listening to people in schools. However, the number of people who mentioned the potential of the ESD outcomes to positively effect school attendance,

suggests that it would be valuable to track this over time as a quantitative indicator of transformation within schools, communities and educational systems.

22.8 Programme Continuation

According to the agreement with FEE, and funding period of the ISLAND programme, responsibility for the Eco-Schools Indian Ocean programme was handed over to the national operating NGOs who had meanwhile become officially FEE members in each country at the end of 2017. At the final regional meeting held in Fort Dauphin, Madagascar, the countries had made a commitment to continuation of regional collaboration with the creation of a Regional Eco-Schools Indian Ocean Network (RESION) to be managed on a rotational basis by the Eco-Schools IO national operating NGOs, starting in 2018 with Mauritius. The cooperation within this network takes the form of a shared website (www.eco-schools.io) which allows schools across the region to share their projects and ideas on shared themes, regional meetings when funds allow for peer to peer support and learning, and collaboration on funding proposals.

In addition, the regional approach to Eco-Schools captured the attention of other organisations running Eco-Schools in the wider African region. At the International Eco-Schools National Operators meeting held in Paris in November 2017, the Eco-Schools African Network was formally established involving ten African countries including the new members from the Indian Ocean. The Eco-Schools African Network was developed as a result of a first meeting at the Eco-Schools NOM 2017 in Paris, France. The Eco-Schools programme in Sub-Saharan Africa and the Indian Ocean involves over 1.6 million students and 55,000 teachers in more than 3500 schools in nine countries. The members are

1. Mouvement Associatif pour l'Education et l'Egalité de Chance (MAEECHA), Comoros
2. Center for Sustainable Transformation, Ghana
3. Kenya Organisation for Environmental Education (KOEE), Kenya
4. Madagascar National Parks, Madagascar
5. Reef Conservation, Mauritius
6. Mohammed VI Foundation for Environmental Protection, Morocco
7. Wildlife and Environment Society of South Africa (WESSA), South Africa
8. Tanzania Forest Conservation Group (TFCG), Tanzania
9. Conservation Efforts for Community Development (CECOD), Uganda
10. The Zanzibar Youth Education Environment Development Support Association (ZAYEDES), Zanzibar

The Eco-Schools African Network works together to exchange good practices and build regional synergies to support the achievement of the SDGs and GAP goals through increased funding, collaborative networking and a concerted approach on shared contexts, agendas, and challenges. Collaborative projects instigated through

this network include Disaster Risk Reduction, Green Economies, Eco-Campus for universities and the role of Eco-Schools within the wider Universal Education agenda.

During the biannual FEE General Assembly, held in Latvia in 2018, the FEE presented its plans to focus on a more strategic alliance of the regional FEE members in Africa and the Indian Ocean Island states. This alliance has a broad focus on FEE and ESD related topics, and held its first meeting in April 2019.

22.9 Lessons Learned

The chief benefits of the programme were primarily found within the development of connections, collaborations and networks which ultimately contextualise ESD learning and knowledge to the real environments and communities in which they are based. As well as regional SIDS-SIDS cooperation on common challenges, and increased contextualisation of regional approaches within the international Eco-Schools network, the primary impact of this is seen within the uniting of schools and their local communities. The two-way collaborations resulted in improved pedagogies and learning outcomes, development and transference of critical skills, and ultimately, practical improvements to conditions in the schools and local communities, reinforcing the widespread movement towards multi-disciplinary approaches in Education for Sustainable Development.

The Eco-Schools IO programme implementation and outcomes have helped to demonstrate that a shift within mainstream education towards bottom-up processes which involve discourse, critical reflection and action are a viable means to addressing community level sustainability challenges. The success of the transformative and emancipatory educational model chosen for Eco-Schools IO has wider implications for ESD policy and practice in the Western Indian Ocean region.

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Part III

Conclusion

Chapter 23

Transforming Education Through Green Schools: Trials, Tribulations and Tensions



Annette Gough

Abstract This chapter discusses the impact of the various green school programs on education for sustainable development in the countries included in this volume and how this impact needs to be problematised in terms of measurable and unmeasurable outcomes. It also discusses the challenges and opportunities experienced by the various green school programs and the possibilities of a green future for schools.

23.1 Introduction

The stories told in Part II provide some insights into what is happening with the development, implementation and impact of green school movements in a number of countries. In many ways these are just the tip of an iceberg. The Foundation for Environmental Education's Eco-Schools program is in 68 countries (see Table 3.1), and several countries (for example, Aotearoa New Zealand, Australia, Austria, Israel) have developed their own similar green school programs. The Green Buildings Councils in some countries (for example, Australia, Canada, Hong Kong, United States of America) have developed green school programs and accreditation which are focused on classroom design, air quality and ventilation, acoustics, thermal quality and lighting to improve student health and well-being, staff morale, and school operational costs as well as have environmental benefits (Emirates Green Building Council 2019; Green Building Council of Australia 2010). In addition, in several countries there is more than one green school program in operation. For example, in England and Australia there are Eco-Schools and Sustainable Schools, in the USA there are National Wildlife Federation Eco Schools USA, Project Learning Tree Green Schools and the Green Schools Alliance as well as Green Building Council certified Green Schools. Mexico and India have also had several green school related programs over the years.

A. Gough (✉)
School of Education, RMIT University, Melbourne, VIC, Australia
e-mail: annette.gough@rmit.edu.au

The brief for the authors of the stories was that they discussed the history of the green school movement in their country, its current status, achievements, obstacles and broader impact on education for sustainable development in their country. The stories that are included in this volume demonstrate a wide range of experiences, ranging from the strong influence that the Eco-Schools program has had on education for sustainable development policy in Kenya (Otieno et al. 2020), to the frustrations experienced in Mexico (as discussed by González-Gaudiano et al. 2020). Then there is the promise of the Eco-Schools Indian Ocean program that has helped to demonstrate how a shift within mainstream education towards bottom-up processes which involve discourse, critical reflection and action are a viable means to addressing community level sustainability challenges (Copsey 2020), and the uncertain future for green schools in Hong Kong with the imminent demise of the twenty year old Green School Award (Tsang et al. 2020).

The country stories have highlighted the challenges and opportunities for green school programs, and these are discussed in Section 23.3, but first I will review the program impacts.

23.2 Program Impacts

Determining the impact of a program is a problematic task. While some impacts would seem to be measurable, there also needs to be a nuanced understanding of what is an impact, as impacts cannot always be precisely measured, and some impacts cannot be measured at all.

At a simplistic level, one way of measuring broader impact is by the number of schools involved in a green school program. This varies between countries, but seems to plateau at around one third of all schools, with a domination by early childhood and primary schools. Indeed, impact is easier to measure at an individual school level, and there are many stories of impact here at a quadruple bottom line level – economic, educational, environmental and social. Gough (2005, 2006) investigated these impacts in Australian Sustainable Schools and Rickinson et al. (2014) investigated ResourceSmart Schools in Victoria, Australia. All of these studies found a wide range of impacts in each of these dimensions. Many schools, even those that do participate in green school programs, have often achieved measurable economic benefits from adopting green school practices to save resources (water, energy) and reduce waste, and in so doing have also achieved environmental impacts, which cannot be precisely measured. The social impacts of such experiences on teachers, students and their families cannot be measured at all, or are very difficult to measure, but parents and teachers report significant impact on children's self-esteem, confidence and well-being, as well as their reduced absenteeism and increased engagement with schooling (Gough 2005; Green Schools Alliance n.d.; Henderson and Tilbury 2004; Rickinson et al. 2014).

Educational impacts can include changes in the curriculum, enhanced student engagement with schooling and improvements in student literacy and numeracy,

some of which can be measured, but not necessarily directly correlated with the green school program. For example, Elsa Lee et al. (2020) note that school leaders in the United Kingdom feel that sustainability guidelines have influenced students' caring for others, their environment and the whole community. The broader impacts reported in the country stories indicate similar findings. For example, Huang Yu and John Chi-Kin Lee (2020) report that the green school project in China has become an outstanding platform for promoting students' participation in environmental protection and becoming a potential guide for building a resource-saving and environmentally friendly society. The program also can have an educational impact on teachers. Eureka Rosenberg (2020) writes that, because the Eco-Schools program is situated inside schools, learning opportunities have to be created by their teachers. Participating teachers find that they learn a lot, about the environmental content of the curriculum and about innovative teaching practices.

In many countries, there is evidence of the impacts of green school programs on organisational change in schools and in development of more sustainable practices (waste, energy and water use), more sustainability content in the curriculum, and improvements to the physical surroundings of the school. For example, Kevin Coyle (2020) reports that, in the United States of America, the greening of schools is reducing environmental impact and costs; providing effective environmental and sustainability education; and improving the health and wellness of schools, students, and staff. He also notes that many schools are, in some way, going green whether by simply working to lower their energy bills or going so far as to build new green school buildings. Also, by involving students in decision making about school buildings and involving them in the local community has broader impacts on their understanding of ESE and participation.

Franz Rauch and Günther Pfaffenwimmer (2020) report that the Austrian ECOLOG program has changed teaching methods, increased the integration of topics, changed the design and organization of school building, raised the images of schools. It has also helped schools develop their individual identities, and inspired an inservice teacher education course and collaborations. Edgar González-Gaudiano et al. (2020) discuss how, over the years, the green schools movement has not only reactivated many environmental education programs that had suffered cuts in funding, but also that it has strengthened their approaches by focusing on building ecocitizenship in Spain.

Various country stories do report broader impacts of their green school programs, ranging from increased individual actions by students to influences on government policy. For example, the high level of participation by students in protests for action on climate change in Australia have been related to the work of sustainable schools (Larri and Colliver 2020). Similarly, in Sweden Niklas Gericke et al. (2020) report that students are taking private eco-action such as becoming vegan. In South Africa, Eureka Rosenberg (2020) reports that Eco-Schools engage learners in relevant livelihood activities such as rainwater harvesting and food gardening, as well as motivating them to do better at scholastic tasks like reading, and suggests that the program contributes to a variety of learning outcomes relevant to livelihoods outside *and* inside the formal economy.

Some country stories highlight the impact that their green school program has had on government policy. For example, Rauch and Pfaffenwimmer (2020) note that, because of its strong links with the Education Ministry, the Austrian ECOLOG program has influenced other developments. Dorcas Otieno et al. (2020) in Kenya, report that the Eco-Schools program manager, the Kenya Organisation for Environmental Education (KOEE), played a notable role in developing the official Kenyan ESD Strategy, advocating for mainstreaming ESD in the school curriculum and for Eco-Schools as best practice in the Strategy, and for the integration of environmental concerns into national development education action plans. In addition, the East African Community used some of the experiences of the Eco-Schools program in Kenya in drafting their ESD policy. There have been other inter-country collaborations too. The Eco-Schools Indian Ocean program highlights inter-country collaboration that is now spreading even wider with the creation of the Eco-Schools African Network (Copsey 2020).

Overall, the green school program in each country is contributing to children's understanding of and participation in sustainability related issues – to greater and lesser extents. The program is also seen by many as encouraging inter-generational learning transfer, re-evaluation of lifestyles and resource usage, and changes home behaviours. School gardens and green schoolyard movements are also becoming more common. Where the whole school community has embraced the green school program there is evidence of wider community impact. However, implementing ESD in schools involves approaches to teaching and learning that integrate goals for conservation, social justice, appropriate development and democracy into a vision and a mission of personal and social change. It also involves developing the kinds of civic virtues and skills that can empower all citizens and, through them, our social institutions, to play leading roles in the transition to a sustainable future. As such, ESD encompasses a vision for global society that is not only ecologically sustainable but also one that is socially and economically sustainable. Thus, the key areas identified with the concept of ESD, and interlinked through the dimension of culture, are society, environment and economy. Achieving such a vision through schools is problematic, especially as many green school programs seem to mainly focus environmental aspects, with only superficial attention to the economic and social dimensions of ESD.

The impact of green school programs also needs to be considered within the context of the overall uptake of environmental education/education for sustainability in various countries, which is still a work in progress as ESD is still not being mainstreamed by most governments. This can be tracked through UNESCO documents. In their final report on the United Nations Decade on Education for Sustainable Development (2005–2014) Carolee Buckler and Heather Creech (2014, p. 10) concluded,

Despite the successes that have been achieved during the DESD, Member States and other stakeholders have indicated considerable challenges remain in realizing the full potential of ESD: the need for further alignment of education and sustainable development sectors; the need for more work towards institutionalizing ESD to ensure strong political support for implementing ESD on a systemic level; and finally, the need for more research, innovation,

monitoring and evaluation to develop and prove the effectiveness of ESD good practices. While much has been done to advance the ethos and values of ESD, a full integration of ESD into education systems has yet to take place in most countries.

The next international effort to grow ESD was the UNESCO (2014) *Roadmap for implementing the Global Action Programme on Education for Sustainable Development* (GAP) for the period 2015–2019. Building on experiences during the Decade, the priority action areas were (p. 15):

1. *Advancing policy*: Mainstream ESD into both education and sustainable development policies, to create an enabling environment for ESD and to bring about systemic change
2. *Transforming learning and training environments*: Integrate sustainability principles into education and training settings
3. *Building capacities of educators and trainers*: Increase the capacities of educators and trainers to more effectively deliver ESD
4. *Empowering and mobilizing youth*: Multiply ESD actions among youth
5. *Accelerating sustainable solutions at local level*: At community level, scale up ESD programmes and multi-stakeholder ESD networks.

However, the 2017 mid-term review of GAP implementation revealed that “there had been insufficient visibility of the engagement made by governments” (UNESCO 2019, Annex 1, p. 1). Around the same time, the Mahatma Gandhi Institute of Education for Peace and Sustainable Development, (MGIEP) (2017) reviewed curriculum documents from 22 Asian countries across 4 regions in an attempt to benchmark the current status of education as reflected in SDG Target 4.7 so that progress towards 2030 could then be measured. They concluded that (p. xviii):

- The countries reviewed generally emphasise the instrumental role of education in fostering national identity and developing human resources for economic development.
- Concepts associated with gender equality, peace, and global citizenship were found to be widely absent from national education policy and curricular documents analysed, with some exceptions.
- Concepts related to economic sustainability, such as ‘limits to growth’ and ‘green economy,’ were either absent or rarely featured.
- Environmental aspects of sustainable development were widely cited, with an emphasis on conservation. However, ‘climate change’ and ‘renewable energy’ rated little coverage in the documents analysed.

These Asian countries are not alone. In some places like Australia, the uptake of the local green school program, the Australian Sustainable Schools Initiative (as discussed by Larri and Colliver 2020), can be seen as having more of an impact in schools and on students than the trivialising of sustainability in the Australian Curriculum as a non-examinable cross curriculum priority (Gough 2016, 2017, *in press*).

Given that a requirement for joining the Eco-Schools program is government endorsement of the host organisation, the lack of government engagement with ESD can be a limiting factor, so in many ways it is surprising that green schools movements have grown to the extent they have, but even without government engagement with ESD, endorsement of a green school program can be seen as an easy way for governments to tick the box on implementing ESD for external reporting. This is apparent in the sidestepping around a government commitment to ESD that is included in the Australian *Report on the Implementation of the Sustainable Development Goals* (Department of Foreign Affairs and Trade 2018, p. 39):

Many Australian schools and universities have implemented sustainability programs to teach children and young people about resource sustainability and to improve resource management within their institutions. Sustainability is one of three national cross-curriculum priorities and has been incorporated in programs like ResourceSmart Schools in Victoria. Many Australian universities are actively incorporating the SDGs into their curricula and student activities.

The Australian Education Council, comprised of the Commonwealth and all State and Territory Ministers of Education, recently moved to distance itself even further from sustainability. The *Alice Springs (Mparntwe) Education Declaration* (Education Council 2019), which sets out the national education goals for young Australians, omitted the resolution that “a focus on environmental sustainability will be integrated across the curriculum” that had been in the previous national goals statement (MCEETYA 2008, p. 14). It also removed any reference to climate change that had been in the previous statement (Gough 2020). In addition, while the Commonwealth Department of Environment (under several names) was once quite active in supporting environmental and sustainability education:

- publishing *Today Shapes Tomorrow: Environmental Education for a Sustainable Future – A discussion paper* (Environment Australia 1999), *Environmental Education for a Sustainable Future: National Action Plan* (Environment Australia 2000) and *Living Sustainably: the Australian Government’s National Action Plan for Education for Sustainability* (DEWHA 2009),
- hosting the National Environmental Education Council (2000–2010)
- sponsoring *Educating for a sustainable future: A National Environmental Education Statement for Schools* (Gough and Sharpley 2005) and the Australian Research Institute in Education for Sustainability (ARIES) (2002–2010)
- leading Australia’s response to the United Nations Decade of Education for Sustainable Development.

There is no longer any support for education forthcoming from the Department, and the Department of Education has never really owned environmental education outside of the Curriculum Development Centre (1974–1981) projects and token mentions as a cross curriculum priority in the Australian Curriculum (ACARA 2019).

Attaining government commitment to ESD is an ongoing challenge, but there are many others, as discussed in the next section.

23.3 Challenges for Green Schools

One major challenge for the green school movement is the engagement of all schools, and the sustaining of their involvement in the green school programs. The stories in this volume indicate that generally a third or less of the number of schools in a country are participating in green school programs, and these participants tend to be more primary than secondary schools.

Even within the schools that are participating in the programs there can be a lack of ability and willingness of teachers to embrace new pedagogical practices, in particular a socially-critical pedagogy, and so achieve socially-transformative education (Edwards 2016). Jane Edwards (2016) and Paul Vare (2020) also found contradictions (rhetoric-reality gaps) that the teachers in sustainable schools do not recognise. And not all schools adopt a whole school approach. This is often related to the commitment of school leadership to supporting and sustaining the program, and the availability and cost of professional development sessions to support the teachers. Programs can often not succeed or be sustained when there is a lack of ownership of the program by the whole school community, or when the program leaders in the school burn out or leave. Another complicating factor is competition from other similar programs that are available and may cost less to join and operate.

As noted in the previous section, a related challenge is the environmental education or education for sustainable development is not seen as an educational priority by most governments. Indeed, responsibility for environmental education or education for sustainable development related matters in many countries is the responsibility of the environment rather than the education ministry. In addition, in many countries, environmental education or education for sustainable development is not recognised as a subject or discipline in the school curriculum so there is no mandated associated curriculum that schools need to follow. As Tal (2020) notes about the situation in Israel, lack of recognition of EE as a discipline has many consequences in terms of the lack of a recognized curriculum, insufficient professional development for teachers, and ambiguity regarding the continuous development of the field, which, unlike other school disciplines, depends strongly on the financial and professional support of the Ministry of Environmental Protection rather than the Ministry of Education. Thus, it can be difficult to argue for a school to join a green school program, and engage with education for sustainable development.

Another related challenge is obtaining and sustaining government support for the program. The Eco-Schools model operated by the Foundation for Environmental Education (FEE) allows only one member organisation per country and all members need an endorsement from their national Ministry of Education or Environment. The member organisation can be a keep X tidy group (as in Australia, New Zealand, England, Scotland, Wales, Northern Ireland and Sweden), a wildlife association (as in the United States of America, South Africa, Morocco, Cyprus and Iceland), a green buildings council (in Qatar and Saudi Arabia) a specific FEE group (in France, Germany, Portugal, Mexico) or something else. Government support can also be fickle. For example, the UK Department for Education and Skills (2006) wanted all

schools to be sustainable schools by 2020, but in 2010, the government announced that they would no longer directly support the Sustainable Schools initiative in England “based on the belief that schools perform better when they take responsibility for their own improvement” (Hill 2010, p. 1). A similar situation has happened in Australia where national funding for the Australian Sustainable Schools initiative was discontinued by the Australian Government in 2013, although some states are continuing to fund the state level programs (Gough 2016; Larri and Colliver 2020). However, the Australian Government, through the Department of Environment and Energy, has been supporting the much smaller Eco-Schools Australia program, run by the Keep Australia Beautiful Council, since 2014. In the United Kingdom, Lee et al. (2020) report that outdoor learning is a growth area with Forest Schools and Nature Schools being established to better (re)connect children with nature, and this has government funding. There is a different but related challenge in Israel (Tal 2020) where, in addition to the Green School certification, the two ministries have launched an Integrated Program for Education for Sustainability (EfS). The program consists of school-based professional development of 30 hours delivered by two NGOs, in which 80% of the schools’ teachers must enrol, including the principal. However, this is seen as an imposition by some principals and teachers, and EfS programs are not being implemented after this professional development.

A further challenge is to get many of the green schools to move beyond an environmental focus and engage an education for sustainable development agenda. There are many examples of programs engaging with environmental related issues (such as energy, water, waste and biodiversity) but fewer examples of engaging sustainable lifestyles, human rights, gender equality, or culture of peace or cultural diversity issues. For example, Patrick Howard (2019) reports that the focus of Green Schools Nova Scotia is on environmental issues and energy conservation, and, significantly, it does not explicitly reference education for sustainable development. Instead, education programs that link environmental education that to the health, well-being, and economic prosperity of communities in Nova Scotia are provided by NGOs, such as the Ecology Action Centre and the Atlantic Coastal Action Program. Henderson and Tilbury (2004, p. 29) argue that as programs develop they grow in scope and “tend to broaden from a narrow environmental management or practical greening focus to a more holistic focus of sustainability”, but there the stories in this volume do not seem to support this contention. Numerous research studies, and the experiences of the green school programs discussed in this volume, show that students are interested in the environment and learning about and in it, and are willing to take actions to reduce their impact on the environment and protect it. This will continue to be an important component of green school programs.

A contributing factor to this narrow perspective could well be that teachers do not understand “education for sustainable development”. As González-Gaudiano et al. (2020) illustrate in Fig. 15.6, not even on a global level has the concept of “Education for Sustainable Development” become as relevant as the concepts of “Environmental Education” or “Educación Ambiental” in the framework of a comparative analysis of the evolution of searches for these three terms. They then argue

that there is a low degree of relevance and limited penetration of the discourse of Education for Sustainable Development in Latin American countries.

A number of other research studies (for example, Borg et al. 2014; Cebrián and Junyent 2015; Gough 2016, 2018; Öztürk 2018; Reed 2014; Summers et al. 2003) indicate that teachers do not understand education for sustainable development and that, as a result, education for sustainable development programs are developed and implemented as environmental programs. This is a major challenge. However, as noted above and in other country stories, by participating in the professional development activities associated with green school programs, participating teachers find that they learn a lot, about the environmental content of the curriculum and about innovative teaching practices.

Other research studies have investigated the impact of the eco-school certification systems on environmental education in many countries. As discussed by Gericke et al. (2020), some studies – in the Czech Republic (Cincera and Krajhanzl 2013), the region of Flanders in Belgium (Boeve-de Pauw and van Petegem 2011, 2013), Israel (Goldman et al. 2017) and the U.S. (Warner and Elser 2015) – have shown that the effects of what comes out at the student level are limited. However, other studies have found positive effects on students. For example, Jelle Boeve-de Pauw and Peter Van Petegem’s (2018) study in the Flanders region found that, as the schools progress in becoming a certified eco-school, there is a positive educational impact on their students’ theoretical knowledge, and to a lesser extent, applied knowledge improve, and their amotivation declines. Jan Cincera et al.’s (2019) study in the Czech Republic found that students’ perceived participation in decision-making in the Eco-School program leads them to be more satisfied with the program and more empowered by their work.

These challenges are reflected in the critical success factors for whole school sustainability programs identified by Henderson and Tilbury (2004, p. 6):

alignment with national government priorities; access to expertise in EE and/or EFS during program design and implementation; significant and continuous funding; alignment with EFS approaches; investment in professional development of program team as well as school partners; creating links with EE initiatives already in operation; establishment of multi-stakeholder partnerships.

These critical success factors also throw up their own challenges. National government priorities are not necessarily aligned with the Sustainable Development Goals, as attested by the report from the United Nations (2019, np): “despite progress in a number of areas over the past four years, on some of the Goals, progress has been slow or even reversed. The most vulnerable people and countries continue to suffer the most and the global response has not been ambitious enough.” There is also not necessarily sufficient funding made available nor professional development for teachers. Other issues include lack of support for community partnerships and competition between various initiatives within the school.

In addition to the abovementioned factors, reflecting on the country stories in this volume, some of the limiting factors that the authors report include the following. A major one is that the school leadership needs to be committed to sustaining the

program, and it needs to be owned by the whole school community. In addition, the programs often rely on dedicated individuals who may burn out or leave the school. Teachers and students also often report eco-fatigue (as well as eco-anxiety). The teachers and students also need access to external experts to support the programs.

Curriculum documents often do not support green school programs and they end up being offered as extracurricular activities rather than as a core program with a whole school approach. In many countries the absence of a genuine ESD curriculum hinders the effectiveness of the green school program.

23.4 Opportunities Afforded by Green School Programs

The green schools programs also provide opportunities. Because of the whole school approach which underpins the programs there is an opportunity to connect teaching and learning processes, school organization and collaboration with external partners. For example, in Israel (Tal 2020) the certification process is carried out in collaboration with the local municipalities and focuses on five components: a curriculum, an action plan for a sustainable lifestyle, green visibility, community involvement, and green leadership – and Schools certified as Green Schools receive small government grants to support the “greening process”. The networking opportunities between schools also enable other developments to be fostered.

The financial opportunities offered to schools through savings on energy, water and waste management expenses, and through selling produce from school gardens provide opportunities for students to learn small business and entrepreneurial skills.

González-Gaudiano et al. (2020) discuss how in some countries, introducing green school programs has provided opportunities to not only reactivate many environmental education programs that had suffered cuts in funding, but also to strengthen their approaches by focusing on building eco-citizenship. They also provide opportunities to introduce new structures into schools, such as environmental committees, that open participation to all levels of the educational community, but they can clash with the models of school organization still prevailing. A related comment comes from Rosenberg (2020), regarding South Africa where incorporating the program into the formal education system may increase resources and motivate expansion. However, such a move may ironically reduce the programme benefits, if it becomes yet another compliance criterion, and loses its novelty value for teachers and learners alike.

Green school programs also provide opportunities to engage potentially disengaged students with their schooling and the wider community. For example, Lee et al. (2020) report that school leaders in the United Kingdom feel that sustainability guidelines have influenced students’ caring for others, their environment and the whole community. Similarly Coyle (2020) reports that, in the United States’ context, green school programs, whether developed by state agencies and local school districts directly or with the help and support of third party public interest organizations, are finding that the process of greening older schools can engage students,

faculty and facilities staff in many creative and educational efforts such as students auditing energy, water and waste efficiencies or planting trees and educational gardens.

23.5 From Environmental Education to Global Citizenship

That green school programs are embracing the SDGs either in their philosophy (as with Eco-Schools) or through naming the program Sustainable Schools, can create some tensions with the actual content of the programs and their focus on environmental issues. Education is important in achieving environmental protection and sustainable development, but the nature of that education has changed over the years.

The importance of education at all levels in achieving a sustainable future has long been recognised in United Nations documents (United Nations 1993, 2002, 2012; World Commission on Environment and Development 1987). Documents and conferences in the period after the 1972 United Nations Conference on the Human Environment referred to environmental education, such as the Intergovernmental Conference on Environmental Education held in Tbilisi (USSR) in 1977 (UNESCO 1978). Even the education chapter of *Agenda 21*, states that “[t]he Declaration and Recommendations of the Tbilisi Intergovernmental Conference on Environmental Education organized by UNESCO and UNEP and held in 1977, have provided the fundamental principles for the proposals in this document” (United Nations 1993, para. 36.1). The goals from the Tbilisi conference (UNESCO 1978, p.26) to which these documents refer are:

1. The goals of environmental education are:
 - (a) to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
 - (b) to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment;
 - (c) to create new patterns of behaviour of individuals, groups and society as a whole towards the environment.

The focus here is on the total environment and its improvement and protection as well as not having “harmful repercussions on people” (UNESCO 1975).

There was a transition in terminology between the Belgrade Charter (UNESCO 1975), the Tbilisi Declaration (UNESCO 1978) and later reports in that *environmental education* increasingly was replaced by *education for sustainable development* in both *Agenda 21*, the report of the 1992 Earth Summit held in Rio de Janeiro (United Nations 1993), and the report of the 2002 United Nations World Summit on Sustainable Development held in Johannesburg (United Nations 2002).

For example, *Agenda 21*, the strategy plan from the United Nations Conference on Environment and Development, (United Nations 1993) states:

Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues... It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development, and for effective public participation in decision-making. (paragraph 36.3)

In this instrumentalist view, education for sustainable development (ESD) is seen as the means by which schools and communities can (and should) work towards creating a sustainable future. This is consistent with the SDG's approach to ESD, but a long way from how environmental education was initially conceptualised.

The Johannesburg World Summit declared education as critical for promoting sustainable development. However, the vision from *Agenda 21* was broadened from a focus on “the role of education in pursuing the kind of development that would respect and nurture the natural environment” to encompass “social justice and the fight against poverty as key principles of development that is sustainable” (UNESCO 2004, p. 7), as is evident in this statement from the World Summit report:

We recognize that poverty eradication, changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development (United Nations 2002, p. 2).

This statement is significant because the environment is now represented as a ‘natural resource base for economic and social development’, and notions of improving the quality of the environment, contained in earlier statements, have disappeared. Silences around the intrinsic value of the environment continued into the outcomes report of the Rio+20 United Nations Conference on Sustainable Development (United Nations 2012) where the thematic areas and cross-sectoral issues are summarised as: poverty eradication, food security and nutrition and sustainable agriculture, energy, sustainable transport, sustainable cities, health and populations, and promoting full and productive employment, decent work for all, and social protections.

As a result of proposals from Japan and Sweden, and following the Johannesburg Plan of Implementation, the United Nations General Assembly, at its 57th Session in December 2002, adopted a resolution to start the Decade of Education for Sustainable Development (DESD) from January 2005. UNESCO was designated to be the lead agency for the Decade and it developed an International Implementation Scheme for the DESD (UNESCO 2004, 2005). As discussed previously, since the Decade there has been the *Roadmap for implementing the Global Action Programme on Education for Sustainable Development* (GAP) for the period 2015–2019 (UNESCO 2014), and now the *Framework for the Implementation of Education for Sustainable Development Beyond 2019* (UNESCO 2019). The GAP had two objectives: “to reorient education and learning so that everyone has the opportunity to acquire the knowledge, skills, values and attitudes that empower them to contribute to sustainable development” and “to strengthen education and learning in all agendas, programmes and activities that promote sustainable development” (UNESCO 2014, p. 14).

The UNESCO Decade Scheme brought together a range of international initiatives that were already in place – in particular the Millennium Development Goals (MDG) process, the Education for All (EFA) movement, and the United Nations Literacy Decade (UNLD) – with education for sustainable development (ESD). However, somewhere between the environmental education statements from Tbilisi (UNESCO 1978) the education for sustainable development statements from Johannesburg (United Nations 2002), the Decade (UNESCO 2004, 2005), and the more recent documents, a concern for the environment disappeared and the whole focus became the human condition.

During the Decade there were two reviews of progress that recognise that ESD is being interpreted in many different ways in different contexts and that ESD has replaced environmental education in some instances in formal education (Wals 2009; Wals and Nolan 2012). However, in the first review it is also noted that “many countries have a tradition in addressing the environmental dimension of sustainability and are quite comfortable in doing so, this is less the case when it comes to the social, economic and cultural dimensions” (Wals 2009, p. 71). In the next review Wals and Nolan (2012) found that “ESD appears well positioned to play a synergizing role among a wide variety of sub-fields of education. These include environmental education, global citizenship education and, more recently, consumer education, climate change education and disaster risk reduction” (p. 65). This latter statement links to the UN Secretary-General’s Global Education First Initiative (2012–2016), which investigated global citizenship education as an emerging perspective that encompasses sustainability (UNESCO 2016). Global citizenship was also closely linked to ESD in the Aichi-Nagoya Declaration on Education for Sustainable Development which emerged from the November 2014 conference marking the end of the Decade. This Declaration states that

ESD can empower learners to transform themselves and the society they live in by developing knowledge, skills, attitudes, competencies and values required for addressing global citizenship and local contextual challenges of the present and the future, such as critical and systemic thinking, analytical problem-solving, creativity, working collaboratively and making decisions in the face of uncertainty, and understanding the interconnectedness of global challenges and responsibilities emanating from such awareness. (UNESCO 2019, Annex II, p. 1)

UNESCO launched the Global Action Programme (GAP) on Education for Sustainable Development (UNESCO 2014) which aimed to actively integrate sustainable development into education at the Nagoya conference. The GAP acknowledges that “sustainable development challenges have acquired even more urgency since the beginning of the Decade and new concerns have come to the fore, such as the need to promote global citizenship” (UNESCO 2014, p. 33). It built on the outcomes document of the United Nations Conference on Sustainable Development (Rio + 20) (United Nations 2012, p. 45) where Member States resolved “to promote education for sustainable development and to integrate sustainable development more actively into education beyond the United Nations Decade of Education for Sustainable Development”.

While the GAP could be read in a positive light insofar as it acknowledged the need to achieve sustainable development, it also reflected the changes in orientation between environmental education and ESD when it is compared with one of the goals for environmental education stated in the Tbilisi Declaration (and noted earlier): “to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment” (UNESCO 1978, p. 26). The Tbilisi goal at least acknowledges the need to protect and improve the environment and not just focus on human society.

The *Framework for the Implementation of Education for Sustainable Development Beyond 2019* (UNESCO 2019) shifts the focus even further from the environment, though there is also confusion in the statements. In the Framework ESD is seen in instrumental terms:

- ESD [is] an integral element of Sustainable Development Goal 4 (SDG 4) and a key enabler of all the other SDGs (UNESCO 2019, p. 1),
- ESD should promote development as a balancing act, which implies adapting to changes while respecting the values of conservation, sufficiency, moderation and solidarity (UNESCO 2019, Annex I, p. 2), and
- ESD for 2030 therefore proposed to strengthen ESD’s contribution to all SDGs, with particular focus on helping the SDG 4 – Education 2030 agenda place greater emphasis on the contribution of learning content to the survival and prosperity of humanity. (UNESCO 2019, Annex I, pp. 1–2).

However, it also states that “ESD has to outgrow its topical understanding and work more proactively at the systemic level as a part of SDG 4 on education, and Target 4.7 in particular” (UNESCO 2019, Annex II, p. 3) which seems to be conjuring a different ESD from one that promotes “development as a balancing act”. This change in thinking about ESD in a UNESCO context is evident in the recent renaming of the ESD Team at UNESCO Bangkok to the Future of Learning Team.

23.6 The Future for Green Schools?

As interpretations of ESD move further from concerns about the environment it is perhaps timely for green school programs to consider their relationships and foci. The traditional structure for green school programs has been on energy, waste, water and biodiversity and students have responded well to these. Focusing on the SDGs more broadly is more difficult for these programs, particularly when schools in many places are struggling to even implement the traditional structure due to the range of challenges discussed earlier.

Nevertheless, as the School Strike for Climate movement has demonstrated in the past couple of years, millions of school children around the world are concerned about the state of the environment and climate, and their futures. This augers well for the future growth of green school programs and challenges schools who are not already involved to confront their obstacles and join in. It is also time for

governments to listen and take ESD seriously, incorporating it into education policies and curriculum statements rather than leaving its implementation to ministries for environment. ESD is not just a political issue, it is an educational priority.

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