
The Role of Solution-Oriented Knowledge Transfer Programme and Networking in Charting a New Course in University-Stakeholder Engagement

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Abstract

Two major initiatives aimed at enhancing University-Stakeholder Engagement (U-SE) are addressed here. First, we discuss an innovative Knowledge Transfer Programme (KTP) introduced by the Ministry of Education in Malaysia in 2011 for which Universiti Sains Malaysia (USM) serves as the Secretariat. Since the beginning, KTP has committed approximately USD20 million to the programme split between industry 70 % and community 30 %, with a caveat of 30 % or more input from the partners. Since its inception, 349 projects (industry 219 and community 130) have been implemented throughout Malaysia, with the participation of more than 1400 academic staff, 650 graduate interns, and 3500 employees from Industry and Community. Secondly, we highlight the role of four international/regional Networks USM supports as Secretariat. In this context we wish to provide our experience and best practices involving, APUCEN (Asia-Pacific University Community Engagement Network), SEASN

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(South-East Asia Sustainability Network), ALKN (ASEAN Local Knowledge Network) and RSEN (Regional Sejahtera ESD Network). This paper will, thus, cover one major knowledge transfer programme partnership involving ‘university-industry/community’, and four specific ‘network’ initiatives designed to promote university-stakeholder engagement at a variety of levels. The range of knowledge transferred, approaches used, and the support provided by the university will hopefully provide replicable ideas to other aspiring higher educational institutions as they position themselves to be more proactively engaged.

Keywords

University-Stakeholder engagement • Knowledge transfer • Networking • ESD • Sustainability

1 Introduction

In keeping with the changing mindset sweeping through most modern universities that urges them to be more proactively attentive to the needs of the communities they serve, in addition to their normal academic quests, Universiti Sains Malaysia (USM) has been involved in a number of University-Community engagement initiatives aimed at promoting use-inspired and solution oriented knowledge production, dissemination and technology transfer. This transition is partly demand-led and partly relevance driven (Omar et al. 2012; Corcoran and Koshy 2010).

In this process, the university has learned that there are changes that must be made internally and externally to ensure a deep commitment to sustainable development in higher education that enables a lasting stakeholder engagement. This involves initiatives that universities should be doing themselves and also those involving higher education institutions and key stakeholders. In terms of implementation this recognizes usually three groups: (i) higher education institutions in-country; (ii) the disciplinary and professional networks of academics, professionals, and administrators, and (iii) the external stakeholders—particularly government, foundations, private sector, NGOs, media, parents, and students. From the turn of the century, USM has been following a somewhat similar approach by moving away from a ‘project to a programmatic’ approach for its stakeholder engagement. This requires on the one hand, modern scientific knowledge and skills, and on the other an altered perspective to see stakeholders as partners for their locally relevant knowledge and dexterity. Our experience is that universities will usually respond only weakly to stakeholder needs unless adequate financial support is available, the subjects involved command prestige in academic circles and a conducive policy environment that places stakeholder engagement in a structured larger context. Through our policies and practices, we have been trying to create such an environment where everyone sees value in partnerships and networks.

It is anticipated that the sustainability model used by USM (Sect. 2), and the practical examples presented under Sect. 4 on the Knowledge Transfer Programme (KTP) partnership, and Sect. 5, the Network engagement, will contribute directly to the thematic area, ‘*implementation of institutional strategies aimed at partnerships and networks for ESD*’ of the book.

2 Background

By the turn of the new millennium, Universiti Sains Malaysia (USM) embraced a ‘whole-institution’ vision aimed at ‘transforming higher education for a sustainable tomorrow’. In pursuit of this future, USM travels two parallel pathways. First, one that takes it on a competitive lane to attract quality students, competent staff, and adequate finances to achieve excellence, and the other that integrates major global sustainability challenges as highlighted by the Brundtland commission’s report and its triple bottom line approach—environment, economy and society into its core mission activities. As a university that strives to support national development initiatives and human wellbeing right from its establishment in 1969, USM is convinced that the current development paradigm that depletes natural resources, increase pollution, change climate, and widen the rich-poor gap is simply not sustainable. This is the basis for the university’s strong sustainability commitments (Clugston and calder 2014). This calls for interdisciplinary approaches that require a whole-system enterprise. Strategically, the sustainability choice of USM is its answer to the larger question of the university’s ‘relevance’ to address major development challenges and the plight of the poor by reorienting the curriculum, promoting solution-oriented research, and engaging in knowledge transfer programs and networking involving stakeholder communities (Dzulkifli et al. 2010).

While all universities try to be relevant for competitive reasons, it may be argued that USM is ‘selectively relevant’, trying to excel, among others, in the strategically chosen area of sustainability. In order to achieve this ambitious goal we need an education that allows every human being to acquire the knowledge, skills, values and attitudes that empower them to contribute to sustainable development and take responsible actions for environmental integrity, economic viability, and a just society for present and future generations. This requires skills like critical thinking to understand complex systems, ability to imagine future scenarios, and capacity to make decisions in a participatory and collaborative way. Such an educational curriculum should, as contained in the outcome document of Rio+20, include the interrelated issues of poverty reduction, climate change, disaster risk reduction, biodiversity, and sustainable consumption and production in a locally relevant way (Kamarulazizi et al. 2015).

The type of education that meets these demands has come to be called Education for Sustainable Development (UNDES 2005) and USM has been an ardent supporter of ESD through its Kampus Sejahtera Programme (Campus Well-Being 2000), Membership of the Regional Centre of Expertise (USM-RCE 2005) for

education for sustainable development programme, University in a Garden scenario (a metaphoric expression for a sustainability-led university 2006), Research University status (RU 2007), the Accelerated Programme for Excellence (APEX 2008) award from the Ministry of Higher Education, Malaysia and associated activities. In the implementation of these initiatives USM is influenced by the strategies and action plans of the United Nations Decade of Education for Sustainable Development and its post-2015 successor, Global Action Programme (GAP) on ESD (UESCO GAP Roadmap 2014).

Acknowledging that the integration of sustainability into the core of a university's mission areas requires a whole-institution enterprise that links major sustainability challenges on one hand with different educational approaches on the other, USM developed a model (Fig. 1) for mainstreaming sustainability across the university. In this model the interlocking circles on the left represent the three pillars of sustainability while the three circles on the right represent the common mission areas of Higher Educational Institutions and their ESD focus. The central box shows USMs priority areas for sustainability studies as represented by WEHAB+3 (water, energy, health, agriculture and biodiversity + climate change/disaster risk management, production/consumption and population/poverty). University-Stakeholder Engagement (U-SE) is seen within this model that contextualizes the social responsibility of universities in addition to their traditional role of generating and disseminating knowledge (Zakri et al. 2009).

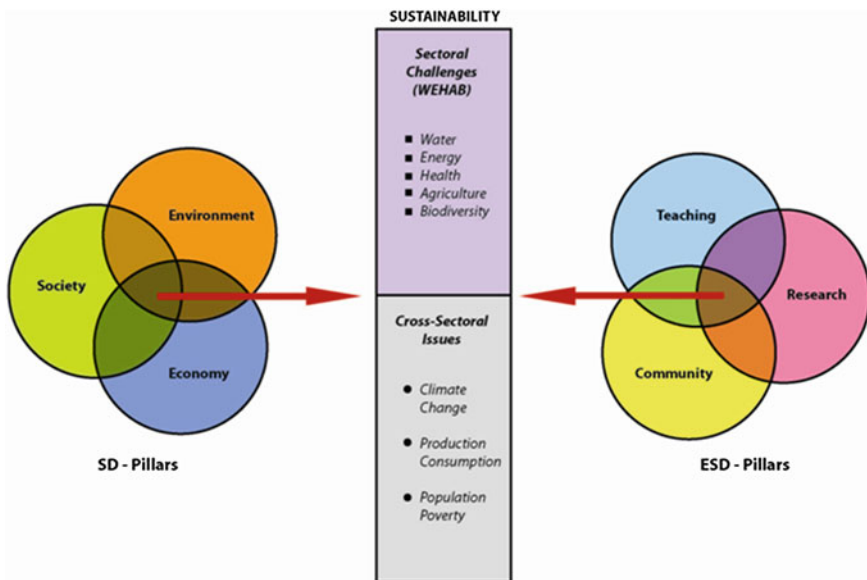


Fig. 1 An integrated approach to mainstreaming sustainability at USM. *Source* Centre for Global Sustainability Studies, USM

This model provides equal credence to U-SE as teaching and research and enables USM to view all forms of stakeholder engagement in that light. This negates the assumption that universities are the ‘givers’ of *knowledge* and *skills* and stakeholders are the ‘receivers’ that create a kind of rift not conducive for effective partnership. Further, ‘engagement’ suggests a different sort of relationship; that communities need to be active than passive partners if solutions are to be rooted in the stakeholders perception of needs and issues. While universities are up-to-date with the latest researched information, stakeholders are more practically oriented, often backed by years of experience and traditional knowledge. They are able to see issues in *perspective* and take decisions which are sensitive to the cultural *values* and ethics (Koshy et al. 2012). It is this symbiosis that strengthens U-SE through their mutual interest and influence. This is why ‘educational administrators are increasingly recognizing what businesses have long understood: customer satisfaction matters’ (Gross and Godwin 2005).

3 U-SE in Action

Within the context of universities, stakeholders are people, groups or institutions who have both interest and influence in a project or are those influenced by a project one way or the other. Since this would include a host of stakeholders, some degree of prioritisation has to be made for effective engagement. If the vertical axis in Fig. 2 represents interest and a horizontal axis the influence, we could consider four

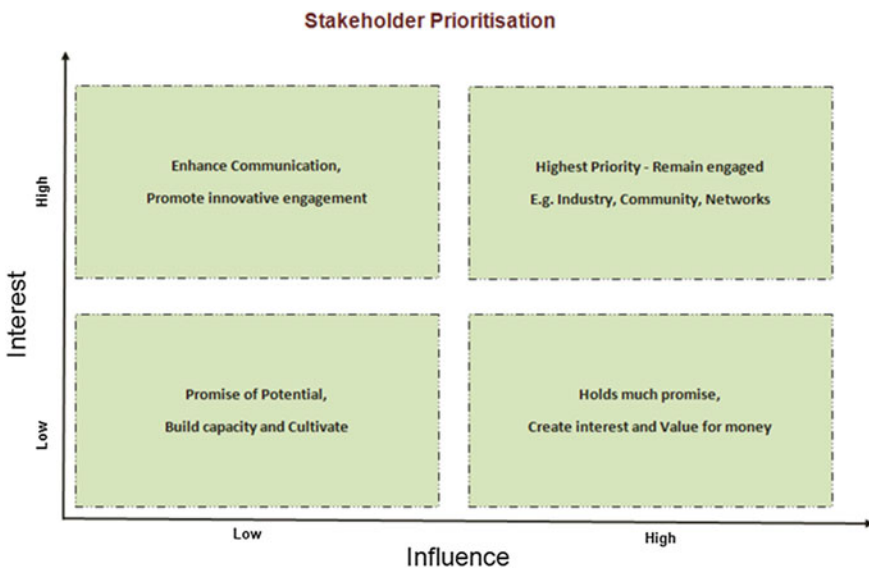


Fig. 2 Matrix to evaluate stakeholder interest and influence. *Source* Centre for Global Sustainability Studies, USM; Indebted to: Gross and Godwin (2005)

resultant quadrants (high/high, high/low, low/high, and low/low) (Gross and Godwin 2005). It is clear from this that while all stakeholders appear on the chart; those with both the greatest interest and influence are of the highest priority in competitive project implementation. This is the situation with the KTP initiative we wish to highlight in this paper. In addition, every stakeholder community comprises those in the other three quadrants as well. As networks are coalitions of the willing, everyone listens and learns from each other and improves their interest and influence. This way, universities would have created relationships with industries and employers who are willing to employ their students, while the external stakeholders who are willing to work with educators would achieve a match between what academia can provide and what the 'community' demands.

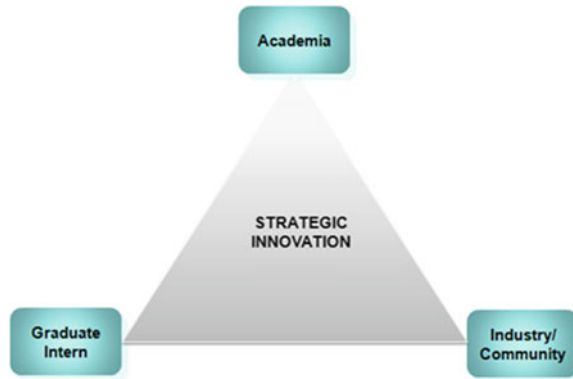
This recognition took a consolidated expression in USM with a number of focused initiatives, two sets of which that featured most for university-stakeholder engagement will be discussed below: (i) the Knowledge Transfer Programme (KTP) introduced by the Ministry of Higher Education in Malaysia in 2011 for which the National Coordinator and Secretariat are based at USM, and (ii) four regional/international Networks of professional stakeholders USM supports as Secretariat.

4 The Knowledge Transfer Programme (KTP)

The Knowledge Transfer Programme (KTP) is a partnership initiative by the Ministry of Education (MoE) under the Critical Agenda Project (CAP) of National Higher Education Strategic Planning (NHESP) for the 10th Malaysia Plan (2011–2015). The programme is funded by the Economic Planning Unit (EPU) under the Prime Minister's Department with an allocation of approximately USD20 million for the 5 years duration. USM is the National Secretariat for this programme and the USM Vice-Chancellor, Omar Osman, its overall Coordinator.

The KTP provides a platform for the collaborative work between academia and industry/community. The form of interactions may include consultancy, education, training, graduate development and placement, capacity building and sharing of physical facilities. Propriety, undiffused and formal relevant knowledge generated by the 20 public universities is transferred to targeted industry/community based on their specific needs. The industry can utilize the resources of public universities to enhance their business capability and economic activities, such as development and improvement of the quality of products and services, while the community can benefit from university-based knowledge to improve quality of life. In addition, the knowledge is transferred by Graduate Interns (GIs) so as to enhance their personal and professional development, such as gain experience, improve entrepreneurial skills and increase employability. Thus, the basic model for the KTP is based on strategic innovations involving academia, GIs and industry/community as shown in Fig. 3.

Fig. 3 The tripartite model of KTP involving academia, graduate interns and industry/community. *Source* Knowledge Transfer Programme Secretariat, USM



The funding from EPU is split between industry 70 % and community 30 %, with a caveat of 30 % or more input from the partners. Five Key Results Areas (KRAs) have been identified for the KTP that will spur industrial growth, community development and improve quality of life as a whole. These are,

- (a) Education—raising the level of education in certain areas
- (b) Economy—economic gain in identified sectors
- (c) Sustainability and Green Technology Initiatives
- (d) The Disadvantaged Groups
- (e) Developing Industry/Community Relevant Curriculum (for High Impact Sectors)

Since its inception, 349 projects (industry 219 and community 130) have been implemented throughout the country, with the participation of more than 1400 academic staff, 650 GIs, and 3500 employees from Industry and Community (Haslan et al. 2014; Mohd Wira and Liyana 2015). Some successful projects which have shown positive outcomes and impacts are worth mentioning here.

First we highlight the seaweed cultivation management in the state of Sabah. The programme involves the transfer of knowledge related to the management of seaweed cultivation in a modern, systematic and proper manner to the management and staff of a local company. The knowledge transferred included farming technology and office management, human resources and financial management. After 18 months, farms have been better managed and organized, the harvest period has been reduced from 60 to 45 days, production was increased from 500 to 1300 kg per cycle and the sale has been increased. In addition, a standard operating procedure related to seaweed farming management was developed for use by any seaweed operator. Direct impacts of the programme are related to the improvement of the industry partner management, facilities and increase in sales.

The second successful project, related to sustainability and green technology, was the vermi-composting of vegetable wastes in a wet market, partnering with a local council in the state of Selangor. The project transferred valuable knowledge on how to convert municipal organic waste into bio-fertilizer using special worms.

The project created public awareness in urban waste management and promoted the use of vermi-compost recycling practices. Transfer of technology involved setting up training and construction of a pilot scale vermi-compost centre at the wet market. Using the technology transferred, all vegetable waste could be turned into bio-compost in a single step in a shorter time (30 %) compared to conventional composting process, thus eliminating bad smell too. Around 60 % waste reduction was achieved using this technique, and in return valuable compost product was sold as bio-fertilizers for the city landscape.

The third project was related to the concept of green building, which involved the detoxification of indoor air pollutant with nano-TiO₂ photocatalyst under visible light, partnering with a local company. In this project, knowledge and technology related to production of nano-TiO₂ solution were transferred to the industry partner. The nano-TiO₂ solution is sprayed on the inside walls of a building where it decomposed toxic air pollutants (consisting of various volatile organic compounds—VOCs) in the building through oxidation. An improvement in air quality of up to 70 % was achieved using this technology.

The final project was related to energy audit and best practices in energy efficiency with teacher education institutes. The relevant knowledge was transferred to staffs and students of two institutes, through training, workshops for master trainers, awareness campaigns, continuous monitoring and audit of monthly energy usage. Energy savings of up to 22 % have been achieved through zero cost best practices in energy efficiency.

In 2013, the KTP projects related to vermi-composting, air pollutant detoxification and energy audit have been selected by Performance Management Delivery Unit (PEMANDU) of Malaysian Prime Minister's Department and Project Management Office (PMO) of MoE to be implemented in the state of Malacca to drive the green technology agenda of the state, collaborating with Malacca Green Technology Corporation (MGTC). Vermi-composting is located at the Malacca Central Market, air pollutant detoxification at the Malacca General Hospital and energy audit at 30 secondary schools.

Several issues and challenges have been identified during the implementation of the first phase of KTP under the 10th Malaysia Plan. Among these are projects which are still heavily based on research thus preventing immediate transfer of the required knowledge, and graduate interns without the relevant background of the knowledge to be transferred thus requiring some retraining. Also some industries are unwilling to participate due to the 30 % compulsory monetary contribution to the program. These issues will be addressed by the 11th Malaysia Plan (2016–2020) KTP, which will serve and maintain the current KTP objectives with additional models added for improvement. The additional models will allow the exchange of knowledge between academia and industry/community, and a larger expert academia network involvement from various public universities. The amount of funding could be increased if a project has the capability to produce high technology impact, especially for high end industries.

In future, KTP will focus on projects related to the nine (9) National Priority Areas (NPAs) that contribute to the Economic Transformation Programme (ETP)—Biodiversity, Cyber Security, Energy Security, Environment and Climate Change, Food Security, Medical and Healthcare, Plantation Crops and Commodities, Transportation and Urbanization, and Water Security. It will move towards demand driven problem statement by the industry and the selection of suitable public university solution to match the problem statement, through a bidding process. It is also recommended that Green Technology approaches be used to address the sustainability issues relevant to the NPAs.

5 The Networks

5.1 APUCEN: Asia-Pacific University-Community Engagement

Motivated by the belief that Institutions of Higher Learning and the community can unite to co-create knowledge to enhance the social, economic, health, education, culture/heritage and environment of the community, the Asia-Pacific University-Community Engagement Network (APUCEN) was initiated by Universiti Sains Malaysia in 2010, with 25 interested universities from 3 countries. APUCEN was officially launched on 13 July 2011 at the APUCEN Summit, with 43 founding members from 10 countries. The general objective of this regional network of Institutions of Higher Learning is to promote the culture of university-community engagement in a proactive, inclusive, holistic and participatory way.

To realise this general objective, APUCEN pursues specific objectives, which aim to:

- promote and instill university-community engagement concepts and values to staff and students of Institutions of Higher Learning
- create capacity building for university-community partnerships
- disseminate and share information, knowledge, resources and good practices in community engagement
- implement joint flagship projects
- collaboratively develop resources to support regional flagship projects

In order to achieve these objectives, APUCEN provides an ideal platform through collaboration among its members and by connecting network-to-network from different regions. In so doing, it is moving towards building cross-functional and cross-institutional collaboration to improve the quality of life for individuals and communities. A series of national and regional meetings have been conducted with the aim of promoting the implementation of community-engagement at both national and regional levels. Initiatives have been started to share knowledge, resources and good practices in community-engagement through capacity building workshops and publication of its APUCEN Bulletin. APUCEN had begun

positioning itself as an international network by co-organising international events and establishing strategic partnerships with prominent international organizations such as International Science Shop Network, DVV International (Germany), Global Knowledge Initiatives, Engagement Australia, Engagement Thailand and Pascal International. Working closely with non-governmental organizations, governmental agencies, multinational corporations and student volunteer foundations, it is contributing to societal transformation and development.

As in April 2015, APUCEN has 73 members across 18 countries, namely Australia, Bangladesh, Brunei, Cambodia, Fiji, Germany, Hong Kong SAR, Japan, Lao PDR, Indonesia, India, Malaysia, Nepal, Pakistan, Philippines, Taiwan, Thailand and United States of America (Fig. 4). This is a reflection that APUCEN has not only built its presence in the Asia Pacific Region but also formed strategic alliances with network from the United States and European regions. APUCEN members enjoy benefits such as:

- having greater opportunities to network, collaborate, and form sustainable alliances in university-community engagement activities, projects and research;
- leveraging of resources, knowledge and expertise amongst its members to apply for competitive grants and funding;
- building and strengthening members' knowledge on university-community engagement

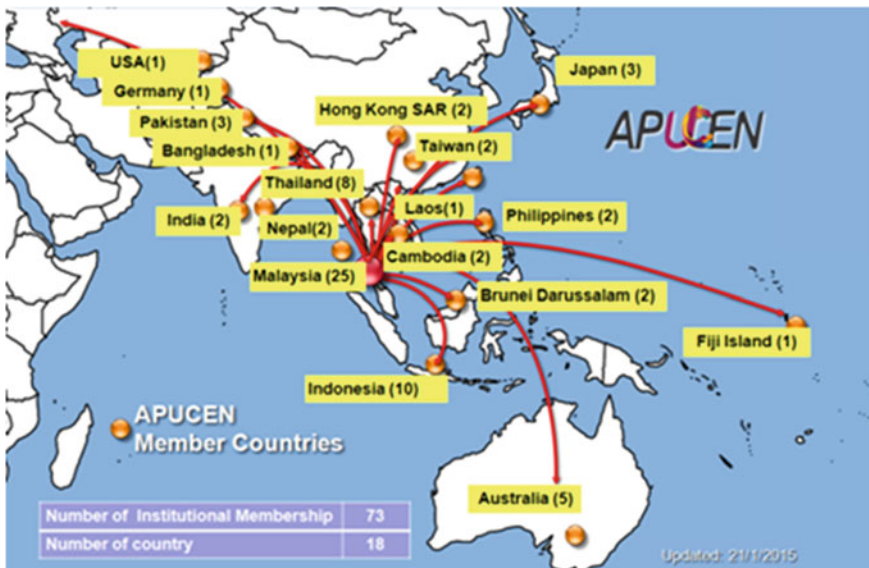


Fig. 4 The member countries of APUCEN and the number of approved membership in brackets. *Source* Asia-Pacific University-Community Engagement Network, USM

- showcasing best practices and niche areas of each member in community engagement; and
- disseminating and sharing of information on seminars, conferences and summit on community-engagement at the regional level.

Strategically, APUCEN has mobilized and shared expertise and resources to implement impactful community-engagement projects at the national and international levels. For example, APUCEN had mapped and profiled a total of 663 university-community engagement projects carried out from October 2012 to September 2013 by 11 universities from APUCEN@Malaysia members. More than one third of the university-community engagement projects are focused on three areas, Education (36.10 %), Economic (8.00 %) and Social (33.48 %). The remaining projects focused on Health (8.00 %) and Environment (5.80 %). Less than 5 % of the projects have multiple focus area (3.10 %) and cultural was the least focus aspect (2.72 %).

One of the successful university-community engagement projects conducted is the school project in Cambodia, which involved three universities, namely the Kyoto University of Foreign Studies (KUFS), the Sultan Idris University of Education (UPSI) and Universiti Sains Malaysia (USM), where all three universities are committed to improve the educational outcome and the wellbeing of the under-privileged communities in Cambodia. In this regard, APUCEN plays crucial roles to initiate and strengthen networking among members and leverage on each other's resources, knowledge and expertise for a common mission to improve the educational outcome and wellbeing of Cambodian children.

A leadership capacity training project involved the development of a module on university-community engagement for the university staff and students. The module was developed through a series of workshops and the project was funded by the Higher Education Leadership (AKEPT), Ministry of Education, Malaysia. Using the module, APUCEN had conducted a regional workshop for capacity building entitled "Constructing the Leadership Canvas in Community Engagement" in Padang, Indonesia on 11 November 2013. APUCEN members and community engagement experts from seven countries, namely Thailand, Germany, United Kingdom, Australia, Brunei, Indonesia and Malaysia attended this workshop. Experiences and knowledge were shared, and the workshop made a significant contribution to community engagement capacity building at the regional level.

With top management involvement, APUCEN as a concerted force will be able to lead and create a significant impact in community transformation in the Asia-Pacific region. Its sustainability depends on the fact that the President/CEO is the lead of the Member Institution and the Secretariat is permanently placed in Universiti Sains Malaysia with the Vice-Chancellor allocating an operational budget in managing the network (<http://apucen.usm.my/>).

5.2 SEASN: South East Asia Sustainability Network

The sustainability agenda in Southeast Asian region is not well championed compared to other parts of the world (e.g. EU, USA,). Realising this need, the Centre for Global Sustainability Studies (CGSS), USM, has taken the initiative to establish a regional network of higher educational institutions and others interested in sustainability promotion. This new set-up is called South East Asia Sustainability Network (SEASN), the membership of which is open to SE Asian countries. The vision of the network is to integrate sustainability at the core mission areas of the partner institutions and to lead by example. SEASN was launched on 28 October 2013 (Fig. 5) in connection with the International Sustainability Conference (29–30 October 2013) organised by the Centre for Global Sustainability Studies (CGSS), Universiti Sains Malaysia. SEASN provides a platform to support higher education institutions and other related sustainability centres in SE Asian countries by focusing on WEHAB+3—Water, Energy, Health, Agriculture, Biodiversity (WEHAB)+3; Climate Change and Disaster Risk Management, Consumption and Production and Population and Poverty. Although in the early stages of development, SEASN has already completed the following important activities:

- (a) *The book project: (WEHAB+3 Compendium)*: In order to catalyse sustainability research and teaching under the umbrella of SEASN, USM took the initiative of a book project on WEHAB+3. In connection with the inauguration of SEASN, USM published and distributed three books (Fig. 6): (i) *A selected literature review of USM research publications on WEHAB+3*, (ii) *Post Rio+20 on WEHAB+3: A Southeast Asian perspective* and (iii) *Disaster risk*



Fig. 5 SEASN was launched on 28 October 2013 at Vistana Hotel, Penang, Malaysia. *Source* Centre for Global Sustainability Studies, USM

Fig. 6 Book launch at SEASN, 28 October 2013, Vistana Hotel, Penang, Malaysia. *Source* Centre for Global Sustainability Studies, USM



management for sustainable development (DRM-SD)—An integrated approach (Koshy et al. 2013). The first is a literature review that summaries Universiti Sains Malaysia’s Sustainability research output on WEHAB+3, mainly during the new millennium. The second is a compilation of articles by different authors from SEASN member institutions on the process and practice of sustainability integration in Universities within the context of WEHAB+3. The third is a comprehensive reference for community leaders and practitioners that treats progressive risk reduction through reactive and proactive approaches to address both natural disasters and major sustainability challenges as both types present themselves first as a risk and then disaster. (Books 1, 2 & 3 2013).

An E-book series, *A selected compendium of SEASN members research publications on WEHAB+3*, has also been published with contribution from several of the network members on each of the five sectoral and three cross-sectoral themes (www.seasn.usm.my).

- (b) *Sustainability Training*: Under the ambit of SEASN two special training sessions on DRM-SD were conducted in Penang (2013) and Kuala Lumpur (2014) and training on sustainability with a special focus on a new Sustainability Assessment Methodology (SAM) developed by CGSS@USM was also conducted in Penang (2014).
- (c) *Regional meeting on WEHAB+3 thematic Working Groups*: Based on a SEASN Board decision that Thematic Working Groups on WEHAB+3 needs to be made for more effective promotion of solution-oriented research in sustainability a special regional meeting is organised for November 2015 when thematic groups will consider country specific issues for targeted consideration.

There are numerous and diverse groups of individuals in colleges, universities and research centres across southeast Asia currently pursuing innovative strategies in environmental and sustainability education. However, existing efforts too often occur in isolation, remain small scale and provide little opportunity for

cross-fertilization. Although it is this need SEASN is trying to address, we admit there are both perceived and real barriers in terms of staff awareness, attitudes and institutional commitment to accelerating the network activities. It is also our experience that no grandiose idea will fly in the absence of sufficient and predictable funding. This is an area we are actively addressing through joint proposal development, exploring value addition possibilities to on-going activities and by approaching regional foundations.

5.3 ALKN: ASEAN Local Knowledge Network

Worldwide, there is increasing recognition of the intrinsic importance of indigenous knowledge and local cultures in sustainable development. A society's knowledge and its system for generating and maintaining that knowledge are cornerstones of its culture and these have strong communal elements. However, this knowledge is seldom codified and documented. In keeping with the world-wide efforts to reverse this trend, Universiti Sains Malaysia initiated 'Regional Conference on Local Knowledge' in 2011 (RCLK 2011) to be held in Malaysia. This conference with a theme of 'Retracing Tradition for a Sustainable Future' brought together practitioners, experts and scholars to its inaugural meeting in Langkawi, 10–11 October 2011.

Since this meeting where local knowledge itself was defined as knowledge and expertise which originate from local and indigenous cultures that have developed over time and from which practices that are absorbed naturally and effortlessly into the local communities. It is an accumulation of collective knowledge from lived experiences over long periods of time. Such wisdom traces its origins from local Malaysian cultures specifically, and cultures of the Malay Archipelago in general. The study on local knowledge is aimed at enabling social transformation through a paradigm shift that forefronts local epistemology.

During the second annual meeting of RCLK in 2012, Jerejak Rainforest, Penang, Prof. Omar, Vice-Chancellor USM, 6th from right in the rear row of Fig. 7, said that 'ever since the first conference, the secretariat has successfully published five books which are relevant to Local wisdom'. Out of the five books, two were written in English; 'The Relevance of Science to Local Knowledge and Retracing Tradition for a Sustainable Future: the Malaysian Experience'. The other books were written in the Malay language and are entitled 'Meneliti Khazanah Sastera, Bahasa dan Ilmu (Examining the treasure of Arts, Languages and Science); Meneliti Kosmologi' and 'Adat Istiadat (Researching Cosmology and Customs); Berasal dari Akar' (Derived from the root). The two-day conference with the theme 'Engineering of Local Wisdom towards New Knowledge' witnessed the presentation of 107 papers covering a variety of topics under the framework of local wisdom. The latest of the annual conference was held in Kuching 12–13 October 2014, with a theme of 'Local Knowledge: Synergy—Sustainability—Dynamism'.



Fig. 7 Local knowledge book launch during RCLK in 2012, Jerejak Rainforest, Penang by Prof. Omar, Vice-Chancellor, USM; 6th from right in the rear row. *Source* Regional Conference on Local Knowledge 2012, USM

Given the increasing popularity of the Conference and the need to sustain local wisdom, USM established a stage for like-minded people to engage, called ASEAN Local Knowledge Network and is directly placed under the Secretariat of the Local Knowledge Group at USM.

ALKN is thus a major platform to facilitate researchers sharing and applying relevant local knowledge, values, ethics, cultures, and practices into current societal lifestyles with the goal of sustaining the positive, impactful and inclusive past practices for the future. Sustainability of conditions that permit humans and nature to co-exist in harmony without denying the environmental, economic and social needs of the present and future generations also create new knowledge in a world that is changing fast biophysically and socio-economically. The importance of such knowledge and its synergy to current sustainable development strategies attest to the fact that the relevance of local knowledge is timeless.

Knowing what local knowledge contains, how it is acquired and held is fundamental to being able to make good use of it and to encourage all parties to be aware of the added value its use will bring. This may find expression in traditional songs, stories, legends, dreams, dramas, methods and practices as useful means of transmitting specific elements of traditional knowledge. In virtually all of these, knowledge is transmitted directly from individual to individual. One of the major challenges of ALKN, therefore, will be to accurately codify this wealth of knowledge to sustain and make available for future generations.

(<http://rclk.usm.my/index.php/en/>).

5.4 RSEN: Regional Sejahtera ESD Network

Regional Sejahtera Education for Sustainable Development Network or RSEN is one of the key projects of RCE-Penang. RCE Penang (Regional Centre of Expertise on ESD), one of the seven foundation RCEs of the United Nations University's UNDESSED initiatives, has been working with local and international education communities and engaging teachers in embedding sustainability principles in the school curriculum for over 10 years (Zainal and Hamoon 2008). It has set up the Regional Sejahtera ESD Network consisting of over 40 members (educational institutions, local government agencies and non-governmental organizations), which are committed to sustainable development. RSEN is unique because it brings together a variety of members who might not usually work together, but are capable of finding solutions to sustainability challenges. Working in collaboration and using active and social learning approaches, RSEN supports community stakeholders to integrate ESD across all aspects of education and learning.

RSEN has a Council of Members that meet at least once a year to discuss strategic priorities and activities. Furthermore, a roundtable discussion among all the members identified the following common ESD areas—Teaching and learning approaches, Climate Change Education, Traditional Knowledge and Ecosystem, Healthy/Sustainable Lifestyles and Water Education. Youth and schools were recognized as the target groups. Among the various on-campus and off-campus activities of RSEN (Fig. 8) are:



Fig. 8 RSEN activities involving on-campus and off-campus students, 2014. *Source* Regional Sejahtera ESD Network, USM

i. The Sejahtera Club: Sejahtera Club is a co-curricular education initiative led by RCE Penang. Schools which are members of the Sejahtera Club take part in leadership capacity building programmes in ESD. RSEN provides 1–1 support and guidance to schools and teachers to develop ESD projects and resources for the clubs. Among the modes of establishing successful Sejahtera Clubs are approaches to make all students of a school members of the club and starting new Clubs merging ‘green’ or environment clubs as appropriate.

ii. ESD Webinar Series 2015: This webinar series aims to introduce the concept of ESD at the school level and showcase good practice examples that can inspire schools and teachers to engage in sustainability.

iii. The RSEN Carnival: The focus here is on transferring ESD knowledge and skills to teachers through networking and action learning approaches.

iv. Network of networks: Since RCE Penang is one of the 130 RCEs in the world; it has been promoting international partnerships with other RCEs with similar mindset. For example, through its collaboration with RCE Greater Western Sydney, it organizes the Youth Eco Summit (YES), which seeks to develop students’ leadership in sustainability. Schools in Penang connect virtually to the summit held in Australia and share their sustainability projects and initiatives. YES, is an award-winning global education event that is hosted annually in Sydney, and it showcases sustainability achievements in both primary and secondary schools. In another milestone event, RSEN/RCE-Penang was declared the ‘RCE of the Year 2015’ by the new Sejahtera Centre at RCE-Tongyeong, South Korea. It was at USM that the idea of Sejahtera first emerged in early 2000 as *Kampus Sejahtera* to ignite transformational changes in embracing the concept of sustainable development through education, even before UNDESD (2005–2014). It is satisfying to see, therefore, a Bahasa Malaysia word translated into a form of social innovation called the Sejahtera Forest which is a US\$20 million ecopark supported by the Ministry of Environment, Korea. RCE-Tongyeong is part of this Sejahtera Forest (Dzulkifli 2015).

(<http://www.rce-penang.usm.my/>)

In spite of these achievements, RSEN faces its own set of challenges especially as a network involving many leaders from different organizations. It is also pertinent that in promoting various activities, RSEN reflects on the sustainability of the activities themselves. One mitigative measure we are taking is by organizing joint events which provide a common platform for stakeholder engagement. This is further enhanced through social media such as facebook and twitter. In addition, we are engaging school clubs with proper organizational structure within the Malaysian Educational system. In Malaysia, it is compulsory for students to be a member of at least one school club as part of co-curricular activities, and involvement in such activities contributes to ‘good mention’ in their school leaving certificate.

6 Conclusion

At the global level, the United Nations Decade of Education for Sustainable Development has been successful in raising awareness regarding ESD, has mobilized stakeholders across the globe, created a platform for international collaboration, has influenced policies and has generated large amounts of concrete good practice projects. At the same time, considerable challenges remain in that ESD policies and practices are often not properly linked and ESD has not yet been fully integrated into education and sustainable development agendas [UNESCO Report 2014]. Consequently, the global ESD commitment gained further strength when the UNESCO World Conference on ESD launched the Global Action Programme (GAP) on ESD. This post-2015 action agenda has identified five priority action areas: Policy support, Whole-institution approaches, Educators, Youth and Local communities to accelerate the search for sustainable development solutions among a variety of stakeholders through ESD.

USM's sustainability journey has a lot in common with the UNESCO experience globally. We too are convinced that multi-stakeholder dialogue and cooperation, involving industries, communities, education and research institutions, and government as we have described in this paper, are key to success in promoting ESD among all its stakeholders. While it is possible to leapfrog best practices of certain stakeholders, others benefit more from solutions to their professional challenges while for yet others, better awareness and enhanced capacity building would be the attraction. Through these interaction universities also stand to gain a lot about ways in which knowledge gets applied, knowledge preferences of stakeholders and the practical and intrinsic value of knowledge. For example:

The three KTP projects related to vermi-composting, air pollutant detoxification and energy audit have been adopted by the Performance Management Delivery Unit (PEMANDU) of Malaysian Prime Minister's Department and Project Management Office (PMO) of the Ministry of Education to be replicated in the state of Malacca to drive its sustainability agenda. Having spent USD20 million during Phase I (2011–2015),

In phase II the KTP concept and framework will be expanded and integrated in terms of its coverage and stakeholder engagement as part to the 11th Malaysia Plan (2015–2020). Stakeholder engagement with KTP is expected thus to contribute to national green development and to alleviate poverty by specifically addressing the issues of the bottom 40 % of the population (B40).

Through KTP, EPU of the Prime Minister's Department, MoE and HEIs are seriously working together to improve the performance of small and medium enterprises and the living standard of the nation.

All the four networks that we discussed have one thing in common and that is, universities engaging meaningfully with a variety of parties implementing projects relevant for the stakeholders. Since these projects are not one-off activities but are part of a long-term programme, we are also learning that university-stakeholder

engagement is a two-way process that by design yields beneficial results often through interactive engagement and interactive learning. This requires an abiding commitment to the process, financial backing and institutional support.

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