

Chapter 9

Crisis and Recovery in Environmental Education: The Case of Greece

Constantinos Yanniris and Myrto Kalliopi Garis

Abstract The challenges posed by the global economic slowdown are being felt by environmental education (EE) providers worldwide. In Greece, the national framework of EE was severely affected by the localized effects of the Eurozone debt crisis. Notwithstanding the loss in materials, school projects and educational programmes, this catastrophic event offers a rare window of opportunity to study and improve the systemic strength of EE infrastructure. This chapter explores the institutional, structural and pedagogical characteristics that contribute to the resilience of EE frameworks. Resilient systems are more likely to survive future socio-economic perturbations in a world of growing uncertainty.

During the last three decades, a number of countries have introduced environmental education (EE) in their national contexts (Palmer 1998). As international guidelines were absorbed by diverse educational systems, a multitude of approaches appeared (Sauvé 2005). This chapter examines the case of Greece, where an institutionalized, school-based version of outdoor EE has taken effect since the early 1990s (Katsakiori et al. 2008). The focus is on the effects of the global financial crisis on local EE frameworks and infrastructure in the country. The Greek experience may prove didactic for countries that seek to enhance the resilience of their own systems.

In Greece, EE projects are implemented at the school level by environmental teams that typically involve one or two teachers and a group of 20–25 students. These environmental teams are formed on a voluntary or elective basis and require a year-long commitment (Tsaliki 1998). In each team, the topic of their study is

C. Yanniris (✉)

Department of Integrated Studies in Education, McGill University,
3700 McTavish Street, Montréal H3A 1Y2, Canada
e-mail: constantinos.yanniris@mail.mcgill.ca

M.K. Garis

Faculty of Environmental Planning and Design, Université de Montréal,
2940 Côte-Sainte-Catherine, Montréal H3C 3J7, Canada
e-mail: myrto.gari@umontreal.ca

decided by consensus; thematic content spans from biodiversity and resource management to local history, oral traditions and outdoor living (Greek Ministry of Education 2010). This interdisciplinary approach permits and moreover requires the participation of teachers from various backgrounds and disciplines. The EE projects can be realized in various ways, including guided inquiry, interviews and place-based and cooperative learning, but an outdoor component is essential (Georgopoulos 2014). Towards the end of the school year, these environmental teams are expected to present the deliverables of their projects, often in a public event open to the local communities (Mavrikaki et al. 2004).

9.1 Historical Development of Environmental Education in Greece

The first steps of EE in Greece were taken in 1977 when the National Council for Planning and Environment formed an interdisciplinary team that, in tandem with the Council of Europe, UNESCO and the European Commission, started to work on the introduction and development of EE within the Greek educational system. In 1980, the first EE seminar held in Athens was organized under the auspices of the Council of Europe. Following that event, 24 teachers from Greece went on EE training courses in Environment Initiative Centres (CPIE) in France between 1980 and 1983 (Flogaitis and Alexopoulou 1991). At the same time, four Greek schools implemented the first EE projects in the country inspired from a Council of Europe campaign for seashore protection (Gardeli 1983). During the mid-1980s, EE projects started to disseminate within the Greek public school system (Gardeli 1986).

Since the early 1990s, the Greek Ministry of Education enacted legislation which provided administrative and infrastructural means in support of EE within the schooling system. Initially, each of the country's 52 administrative districts acquired two EE counsellors selected from the pool of in-service schoolteachers who have had previous experience with EE. As a result, 104 EE counsellors were appointed to encourage, support and oversee environmental school projects in primary and secondary schools (Greek Ministry of Education 1990). Their actions included the organization of EE seminars for in-service teachers and which required that they co-operated with educational authorities at the local level (Ntarzanou 2008).

The same legislative act allowed the Greek Ministry of Education (1990) to establish Environmental Education Centres (EECs). Local municipalities were encouraged to convert out-of-use peripheral school buildings into EECs. In parallel, the Ministry committed to cover the running costs and provide educational personnel to the newly established centres. Indeed, the country's first Environmental Education Centre was launched in 1993, at the mountain village of Klitoria in Achaia (Katsakiori et al. 2008), and it developed its educational programmes based on local ecological resources, such as the surrounding mountain forest and the adjacent Vouraikos Gorge National Park (Kontaras 2004). Despite its remote location, this



Fig. 9.1 Spatial distribution of the 53 Environmental Education Centres (EECs) operating in Greece (© Yanniris 2016)

centre was soon overwhelmed by an increasing demand from student environmental groups which lined up to visit its facilities (Faragitakis as cited in Kontaras 2004).

In the following years, Environmental Education Centres (EECs) proliferated all over Greece to accommodate a rising number of student environmental groups (Fig. 9.1). A multilateral agreement between local governments, the national government and the European Union secured the accommodation, staff and funding of EECs (Ministry of Education and European Union 2010). Indicatively, between 2009 and 2013, Greek EECs were credited 15,362,258 € from the European Social Fund (Greek Ministry of Education and European Union 2013), which were used to expand their activities and meet their needs of continuing education of the local communities.

Using the ecosystem as an open laboratory, EECs developed interdisciplinary programmes for primary and secondary school students, teachers and adult learners. During the 2014–2015 school year, 471 one- to three-day long educational programmes were offered by the 51 EECs operating in the country (Greek Ministry of Education 2014). As an example, we present an educational programme offered by the EEC of Krestena to grades 7 and 8 of local middle schools. The programme is about the effects of river damming and was developed over the 2011–2013 school years when the first author of this chapter was a member of the centre’s pedagogical team.

A single-day educational programme offered by the EEC of Krestena to secondary school students includes a visit to a local hydroelectricity dam and its environs, where students are invited to observe the apparent and implicit effects of damming on the natural environment. Through this process the students realize that a hydro-dam is an intervention with cross-scale, interconnected and ambivalent consequences. A hydro-dam disrupts the local ecosystem, but it also generates electricity and thus saves fossil fuels and restrains global carbon emissions. Dams can cause the displacement of local populations, loss of cultural heritage and soil erosion; yet, they serve as reservoirs of freshwater necessary for irrigation and urban use. At the closing of the educational programme, students are asked to debate and reach an informed decision on a hypothetical proposal for the construction of a similar dam in their area of origin. The hydro-dam programme draws on diverse disciplines (i.e. geography, geology, engineering, ecology) to expose the complexity of environmental issues and the role of conflicting interests in any major or minor environmental intervention.

Other EE programmes in Greece have ventured further to incorporate local knowledge about the evolution of the ecosystems and human communities, following the guidelines of UNESCO on cultural and ecological diversity (UNESCO–UNEP 2002). Recently, these efforts to integrate history, culture, mythology and ancient spirituality into a holistic approach of EE have attracted the interest of international organizations such as CEDEFOP (2012).

9.2 The Impact of the Economic Crisis on EE Infrastructure

As the EEC network is an organic and inextricable part of the modus operandi of EE in Greece, their phases of expansion, crisis and recovery reflect the comprehensive history of EE in the country (Fig. 9.2). During the lag phase, between 1993 and 2004, EECs functioned within selected administrative districts, and their dissemination was not enough to cover the EE needs of the educational community. However, this period was critical for the development of their institutional, operational and educational characteristics. Then, a phase of exponential growth fuelled by a favourable politico-economic environment saw the number of EECs increase fourfold within 5 years (2004–2009). During this period, EECs disseminated their work through peripheral, national and international thematic networks (Greek Ministry of Education 2005). A peripheral thematic network connects schools and institutions to address a peripheral issue, such as pollution in the Corinthian gulf. Respectively, an international thematic network works on an international environmental issue, such as overfishing in the Mediterranean.

Shortly after the global financial crisis of 2007–2008 and its effect on the Greek economy, EE was targeted by policymakers as an ideal field for cutbacks. Promptly, the Greek government abolished the positions of EE counsellors, closed 40% of the EECs and curtailed the staff of the remainder (Greek Ministry of Education 2011). As a result, only half of the EE positions were retained after the cutbacks (Yanniris

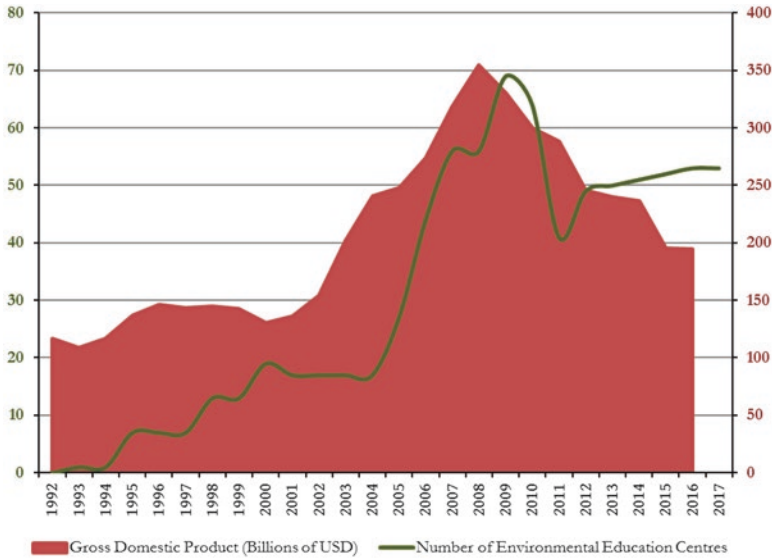


Fig. 9.2 Juxtaposition of the Greek GDP (World Bank 2017) with the number of Environmental Education Centres (EECs) in operation

2012). The political decision for the shrinking of EE waged criticism throughout the media, local governments and the national parliament (Notharos 2010). Overall, it was unclear whether the cutbacks have had a positive net effect on the public budget because the closure of EECs entailed an immediate loss of the respective EU funding. Following 2011, this trend began to reverse; the EE infrastructure started to show signs of recovery despite the continuing decline of the national economy (Fig. 9.2). Advocacy and political pressure resulted in the reopening of one-third of the EECs that were abolished in the wake of the crisis (Kouvelis et al. 2010); moreover, new EECs that were held in the pipeline started to appear (Greek Ministry of Education 2015). This positive outcome resulted from a broader mobilization in support of EE that involved teachers’ associations, education officers, local communities and political parties. Local governments also lobbied against the closure of EECs, which they viewed as hubs of educational and economic activity for their localities (A. Xylokota, Greek Ministry of Education EE office director 2010–2015, personal communication, January 29, 2015).

9.3 Structural Characteristics of Resilient Systems

Ultimately, from a global perspective and within the purpose of this book, it is important to go beyond the local politics of the Greek case of crisis and recovery to identify what kind of multilevel governance and strategic choices have contributed to the resilience of this particular EE framework. If we are able to indicate that

Table 9.1 Systemic properties of environmental education infrastructure

Organizational scheme	Central	↔	Peripheral
Content	Science based	↔	Interdisciplinary
Practice	Indoor	↔	Outdoor
Economic model	Private	↔	Public
Access	Restricted	↔	Open
Systematic assimilation	Embedded	↔	Extracurricular
Participation	Required	↔	Elective
Consistency	Continuing	↔	Intermittent

certain structural characteristics add to the resilience of EE frameworks, other national contexts can capitalize of the Greek experience to avoid a similar loss in EE materials, know-how and infrastructure and build resilient EE systems. Resilience is described as the ability of complex systems to absorb external disturbance and to recover from disruptive change (Ehrlich 1986). According to David Orr (1992), resilience requires small, locally adaptable, resource-conserving and culturally suitable solutions. He proposed the following six criteria as prerequisites of resilience for any composite system: (i) modular, dispersed structure, (ii) multiple interconnections between components, (iii) short linkages, (iv) redundancy, (v) simplicity and (vi) loose coupling of components in a hierarchy (Orr 1992, p. 34).

The measure for resilience of any composite system is its ability to recover after its exposure to a major perturbation (Myers 1996). Respectively, the institutional EE framework that operates within a national context can be viewed as a composite system with its own structural properties that enhance or undermine its resilience. In the following section, we seek to parameterize the elemental properties of national EE frameworks through the systematic classification of eight bipolar qualities (Table 9.1). Then, we go over these parameterized systemic properties as applied to the Greek case and attempt a qualitative correlation with Orr's criteria. Based on the parameters of Table 9.1, we discuss the effects of the Greek EE systemic properties on its ability to recover from disruptive change. Eventually, this chapter aims to provide a more general insight to the strategic choices that enhance the resilience of EE providers.

9.4 Strategic Choices for Resilience in Environmental Education

Since its very beginnings in the early 1990s, EE in Greece has followed a decentralized organizational scheme. Provision was made for the horizontal appointment of EE counsellors throughout the country's 52 administrative districts (Greek Ministry of Education 1990). Furthermore, small, equally sized EECs were dispersed throughout the country (Fig. 9.1). Even though 40% of the EECs were closed after

the crisis (Fig. 9.2), the remaining centres retained the resources and connections needed for the system to recover. Thus, the infrastructure of EE survived the crisis event and regenerated its damaged components. The geographical dispersal and redundancy of EE providers in Greece alleviated the risk of a generalized collapse. According to Orr (1992), a modular, dispersed structure is an essential requirement for resilience (criterion i). Moreover, Orr (1992) projected that the redundancy of components (criterion iv) is equally important for resilience as it diminishes the chance of an entire class of systemic components becoming extinct.

Furthermore, decentralization as a strategic choice entails a return to the local level (re-localization) and enables the use of locally available resources and local knowledge. Through re-localization and the shortening of food and energy supply lines, the system saves energy and resources (criterion iii). The strategic choice of dispersing EECs to the country's periphery enabled them to form shorter – and stronger – connections with local natural and human resources. Short linkages are less vulnerable and hence systemic resilience was enhanced (Orr 1992). Autonomy is an additional derivative of re-localization. The condition of autonomy is equivalent with a loose coupling of components in a hierarchy (criterion vi), an organizational scheme in which each of its components has, or makes use of, little or no knowledge of the definitions of other separate components (Weick 1976). In Greece, EECs enjoy an enhanced level of pedagogical autonomy, and each centre is free to develop its curricula, funding sources and affiliations (Tsaliki and Paradeisanos 2000).

Related with autonomy is the ongoing discussion on whether EE should be offered as part of the science curriculum or as a separate entity, entirely interdisciplinary in content (Brügger 2004). In the Greek system, an interdisciplinary approach to EE is enacted through legislation that regulates the implementation of EE programmes and procedures of EEC staffing. Specifically, each EEC is staffed by (five to six) teachers of various specialties from both primary and secondary education (Greek Ministry of Education 2011). The educational staff of EECs is encouraged to find thematic connections between disciplines and use these in the development of their educational programmes. Also, thematic networks between EECs, schools, non-governmental organizations and other environmental education providers create multiple interconnections between EE providers (Greek Ministry of Education 2005). According to Orr (1992), multiple interconnections between components is a prerequisite of resilience (criterion ii). In the event of crisis, it is the rearranging of these connections that compensates for any lost information and enables the system to retain its homeostasis.

As an educational philosophy, outdoor learning is essential to several of the currents of EE (Sauvé 2005). Accordingly, EE in Greece has a strong outdoor component that entails simplicity of pedagogical praxis. In the outdoors, teachers and students are disconnected from the transportation and energy grids and have to rely on simple and modest means and materials. Simplicity is a prerequisite for resilience according to the fifth (v) criterion set by Orr (1992).

During the last decade, there has been a growing understanding on the importance of cultural identity, local knowledge and place-specific skills in the field of EE (Yanniris 2016). Outdoor, place-based pedagogy connects local environmental

issues with students' direct experience of their region and community. The knowledge of how to live (and how to live sustainably) in a particular place includes elements of local history, arts, culture oral tradition and, when applicable, indigenous heritage (Traina 1995, p. 2). Hence, outdoor practice is believed to allow students and instructors to make interdisciplinary links and to reconnect with their immediate natural environments.

A critical issue for EE is the funding sources for its activities. In Greece, EE is publicly funded through a multilateral scheme that involves local governments, the national government and the European Union (Greek Ministry of Education and EU 2010). A cross-level diversification of funding concurs with Orr's (1992) resiliency criteria i, ii and vi. Indeed, the multilevel sharing of funding has played a positive role in the resilience of EE frameworks in Greece. A strong argument used against the abolition of EECs has been that any savings at the level of the central government would be immediately cancelled by the loss of EU funds directed to the local economies through the EECs (Yanniris 2012).

Further diversification of funding sources could include a stronger presence for the private sector. Yet, there is no guarantee that a scheme based exclusively on private initiative would result in more resilient EE systems. For example, privatization of EECs in the UK has led to a decrease in the number of specifically trained and qualified staff (Higgins and Kirk 2006). A possible solution would be a scheme that retains public control over the guidelines and policies of EE while ceding operational services such as lodging and transportation to the private sector. Such a model could enhance the diversity of funding sources and protect the system from recurring crises. However, a certain level of participation by the public sector is desired in order to act as a safeguard of equitable access to EE (Yanniris 2015).

Uninhibited access to EE is important for vulnerable groups that experience physical, cultural, conceptual and financial barriers to their participation in outdoor educational programmes (Ham and Sewing 1988). Choices of inclusion or exclusion from EE ultimately depend on the policies and finances of EE providers. In Greece, lodging, alimentation and educational services are provided free of charge for the recipients of EE (Greek Ministry of Education and European Union 2010). EE is covered by a constitutional provision for free and open access to all levels of education (Greek Constitution art. 16, § 4). The extent of access to EE correlates with the effectiveness and resilience of EE systems. On a social level, open access amplifies the connections between the stakeholders of EE and relates with Orr's (1992) ii, iii and iv criteria for resilience. Hence, uninhibited access to EE, apart from being a right, an obligation and a choice of self-preservation, has a positive impact on the resilience of EE frameworks.

Two schools of thought have emerged with respect to the systematic assimilation of EE: those who see EE best provided as an extracurricular subject and those who advocate an embedded approach (Lynch et al. 2004). The embedment of EE as a standard subject of the curriculum would render it a more enduring status. Nevertheless, there is the counter argument that the incorporation of EE might jeopardize its innovative character and reduce it to just another indoor course deprived of the momentum or the sense of urgency that is needed to tackle the environmental

problem (Russell et al. 2000). In Greece, EE continues to be taught as an independent, special topics subject (Yanniris 2015). Recently, the Pedagogical Institute of Greece (2011) has proposed a plan for the embedment of EE in the standard curriculum of secondary education. A qualitative analysis based on the table of systemic properties (Table 9.1) suggests that the choice of embedment would initially increase the resilience of EE as it would be directly connected with the permanent structure of the national education system. However, in the long-term EE could lose the resilience generated by autonomy of its components (criterion vi). Hence, with respect to the embedment of EE to the standard curriculum, there are two conflicting effects on the resilience of EE systems. Overall, it is questionable whether EE can retain the autonomy of its components as embedded in the standard curriculum. Much will depend on the strategy of embedment and how this will affect the other systemic properties of EE.

Despite all the institutional and financial support that EE has received, it has only involved a minority of students. A lack of teachers eager to include EE in their teaching has been reported. In Greece, pertinent research indicates that only one-third of in-service teachers included EE during instructional time (Mavrikaki et al. 2004). Teachers cite increased workload (52%) and their lack of training on EE (28%) as their major deterrent (Yanniris 2015). At the same time, 64% of the same sample of in-service teachers calls for EE to become compulsory (ibid). A shift of policy towards compulsory attendance to EE programmes for students would enhance participation and thus the resiliency of EE systems in accordance with Orr's (1992) criteria ii, iii and iv. However, this should be done in a manner that would protect the autonomy of EE, as described by criterion vi.

The last of systemic properties that we explore refers to the thematic, topic and temporal continuity of EE. Presently, there are no safeguards in the Greek system for the consistency of EE between grades, practices or subject matters. Environmental projects are initially identified by teachers that introduce EE to their students, and then the students complete a specific project. These projects are completed within one school year, and their continuation depends on the availability of eager teachers. Hence, the present modus operandi of EE in Greece ingrains the risk that any class of students who followed EE in a single grade of primary school may either never encounter EE again in their schooling time or may re-engage in EE sporadically in higher grades or in secondary education. Orr (1992) has not included temporal or conceptual consistency as a criterion of systemic resilience, but it is understood that any educational process needs to be continuous in order to be effective. The fragmented delivery of EE in Greece suggests that certain steps need to be taken to ameliorate its coherence and secure the advances made in the field.

9.5 A Way Forward: Recommendations for the Greek Environmental Education System

The bibliography we consulted indicates that during the last three decades, Greece has acted as an experimental field for EE where different pedagogical techniques, practices and policies were tested. However, EE in Greece has spent excessive time in an experimental phase that restricted its practice to a finite group of committed teachers (Tsaliki 1998, pp. 188–189). Student participation in EE was affected by the reluctance of the country's political order to embed its content to the standard curriculum. Part of this lag can be attributed to the strict timetable and the centralized nature of the Greek educational system that have inhibited the integration of EE as an overarching and comprehensive activity (*ibid*).

Overall, in order to broaden the audience and enhance its resilience, EE needs to be ushered under the protective umbrella of formal schooling. The introduction of EE in the standard curriculum will allow it to become a required subject with universal participation. This also enables provision on the continuity of EE from grade to grade. After more than 25 years of systematic practice in Greece, EE is ripe to become an embedded, required and consistent course for primary and secondary schools. The distinct character of EE can be protected by observing the qualities of decentralization, interdisciplinarity and outdoor practice. Equitable access must be preserved, yet the transfer of a limited scope of EE services to the private sector can be considered as a way to strengthen its relationship with the local communities.

9.6 Conclusive Remarks

This chapter examined the structural components that contributed to the resilience of EE infrastructure in Greece. For all its weaknesses on the issues of participation, content assimilation and continuity, EE in Greece displays important assets, including an innovative network of small, independent, locally adaptable Environmental Education Centres. These characteristics generated the resilience of the EEC network through a severe economic crisis that caused the interruption and discontinuity of several structures in Greece. Overall, the practice of EE in the country meets the major theoretical requirements for resilience, which explains the heretofore recovery. The future behaviour of the Greek system will depend on its capacity to settle the following dilemmatic questions: (a) secure the funding of EE without jeopardizing equitable access for its recipients and (b) embed EE into the standard curriculum without ceding its innovative character. These dilemmas bear existential threats for EE and are very similar to the challenges that the field faces internationally. As the present chapter shows, EE can overcome difficulties if it adheres to its core principles. Resilience derives from the qualities of outdoor practice, decentralization and interdisciplinarity. Thus, for EE, the resilience of its infrastructure is a measure of consistency between theory and praxis.

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Questions

Discussion questions that could help instructors and students to engage in meaningful conversation about the ideas presented in this chapter.

1. According to the provided experiences, how is the EE infrastructure affected by the cycles of economic growth and recession? Does this pattern relate to your situation in any way?
2. Which strategic choices can enhance the resilience of EE infrastructure?
3. How can EE programmes become embedded into the standard curriculum without ceding their innovative character?
4. How can the funding of EE be secured without jeopardizing equitable access for its recipients?
5. Which parts of the article suggest political involvement in EE decision-making? Do you think it is possible (or desirable) to keep politics out of decision-making in education?

References

- Brügger, P. (2004). 25 years past Tbilisi: Environmental teaching or cheating? In W. L. Filho & M. Littledyke (Eds.), *International perspectives in environmental education* (Vol. 16, pp. 129–138). Frankfurt: P. Lang.
- CEDEFOP. (2012). Study Visit Group Report: *Environmental education centres: Supporting actions towards sustainability*. Retrieved from http://studyvisits.cedefop.europa.eu/assets/upload/documentation/SV_Group_reports/74_GR_GroupReport_Oct12.pdf
- Ehrlich, P. R. (1986). *The machinery of nature*. New York: Simon & Schuster.
- Flogaitis, E., & Alexopoulou, I. (1991). Environmental education in Greece. *European Journal of Education*, 26(4), 339–345.
- Gardeli, S. (1983). The protection of our coasts. *Milieu*, 15, 6–7.
- Gardeli, S. (1986). Education et environnement en Grèce: une expérience pilote “école et communauté”. *Pour une Éducation à L’environnement*, 2, 56–65.
- Georgopoulos, A. (2014). *Environmental education: Identity issues*. Athens: Gutenberg.
- Greek Ministry of Education. (1990). Act 1892/1990 (ΦΕΚ 101 τ. Α), article 111 par. 13 (in Greek).
- Greek Ministry of Education. (2005). *Thematic networks in environmental education*. Decree 66272/Γ7/04–07–2005/ΥΠΕΠΘ (In Greek).
- Greek Ministry of Education. (2010). *Update of the programs provided by environmental education centers for the 2010–2011 school year*. Directive 157598/Γ 713–12–2010 (In Greek).
- Greek Ministry of Education. (2011). *Procedures of appointment and responsibilities of teachers in environmental education centers*. Ministerial Decree 83691/Γ7/22–7–2011 (In Greek). Retrieved from https://www.minedu.gov.gr/publications/docs2011/diadiakasies_kpe_ya_110725.pdf
- Greek Ministry of Education. (2014). *Update of the programs provided by environmental education centers for the 2014–2015 school year*. Directive 208971/Δ2/22–12–2014 (in Greek). Retrieved from <https://app.box.com/s/ix0va5iyf8kkuap7a>

- Greek Ministry of Education. (2015). *Establishment of the environmental education center of Delta, Thessaloniki*. Ministerial Decree 133936/Δ2/27–08–2015 (In Greek). Retrieved from <http://dide.koz.sch.gr/tmsdr/wp-content/uploads/kpe-delta.pdf>
- Greek Ministry of Education and European Union. (2010). *Call for proposals for the operational plan 'Environmental education centers: Activities for students'*. Document 11941/23–8–2010 (In Greek).
- Greek Ministry of Education and European Union. (2013). *Lifelong learning actions for sustainability education*, Act 19791/27–9–2013, ΑΔΑ: ΒΛ9Α9–ΟΝΡ (in Greek). Retrieved from <http://www.edulll.gr/?p=16144>
- Ham, S. H., & Sewing, D. R. (1988). Barriers to environmental education. *The Journal of Environmental Education*, 19(2), 17–24.
- Higgins, P., & Kirk, G. (2006). Sustainability education in Scotland: The impact of national and international initiatives on teacher education and outdoor education. *Journal of Geography in Higher Education*, 30(2), 313–326.
- Katsakiori, M., Flogaitis, E., & Papadimitriou, V. (2008). *Present condition of environmental education in Greece—Environmental education centres*. Athens: EKEBY. (In Greek).
- Kontaras, V. (2004). Identification of the basic characteristics of environmental education centers. Post-graduate thesis, Environmental Studies, University of the Aegean, Mytilene (In Greek).
- Kouvelis, F., Leventis, A., & Tsoukalis, N., Psarianos, G. (2010). *Question to the minister of education in relation to the lack of funding for environmental education centers*, session B, period ΙΓ, Greek Parliament Proceedings.
- Lynch, P. M., Leonard, R. L., & MacDonald, I. (2004). Identifying environmental education content in higher education: A New Zealand perspective. In W. L. Filho & M. Littleldyke (Eds.), *International perspectives in environmental education* (pp. 138–152). Frankfurt and Main: Peter Lang.
- Mavrikaki, E., Kyridis, A., Tsakiridou, E., & Golia, P. (2004). Greek educators' attitudes and beliefs about the application of environmental education in elementary school. In W. Leal Filho & M. Littleldyke (Eds.), *International perspectives in environmental education* (pp. 29–36). Frankfurt and Main: Peter Lang.
- Myers, N. (1996). Environmental services of biodiversity. *Proceedings of the National Academy of Sciences*, 93(7), 2764–2769.
- Notharos, M. (2010). Padlock on green schools, *Eleftherotyia Newspaper*, (in Greek). Retrieved from <http://www.enet.gr/?i=news.el.article&id=200007>
- Ntazanou, K. (2008). *Environmental education in the second grade*. Unpublished undergraduate thesis, Harokopio University, Greece, 20–25 (in Greek).
- Orr, D. W. (1992). *Ecological literacy: Education and the transition to a postmodern world*. New York: State University of New York Press.
- Palmer, J. (1998). *Environmental education in the 21st century: Theory, practice, progress and promise*. New York: Routledge.
- Pedagogical Institute of Greece. (2011). *Guide for the implementation of the 'Education for the Environment and Sustainability' program of studies in junior high school*. Retrieved from http://users.sch.gr/organopoulos/ekpaideytiko_yliko/odigos_eaa_gymn_2011.pdf
- Russell, C. L., Bell, A. C., & Fawcett, L. (2000). Navigating the waters of Canadian environmental education. In T. Goldstein & D. Selby (Eds.), *Weaving connections: Education for peace, environment and social justice* (pp. 196–217). Toronto: Sumach Press.
- Sauvé, L. (2005). Currents in environmental education: Mapping a complex and evolving pedagogical field. *Canadian Journal of Environmental Education (CJEE)*, 10(1), 11.
- Traina, F. (1995). What is bioregionalism. F. Traina, S. Darley-Hill, Perspectives in bioregional education (1–12). Troy: North American Association for Environmental Education.
- Tsaliki, E. (1998). The global scene: Greece. In J. Palmer (Ed.), *Environmental education in the 21st century: Theory, practice, progress and promise* (pp. 188–190). New York: Routledge.
- Tsaliki, E., & Paradeisanos, A. (2000). The environmental education centres in Greece: The case of the Thessaloniki Centre in promoting environmental education in an urban industrial area. *Journal of Environmental Protection and Ecology*, 1(4), 429–435.

- UNESCO–UNEP. (2002). Cultural diversity and biodiversity for sustainable development. World Summit on Sustainable development, Johannesburg, Retrieved from <http://unesdoc.unesco.org/images/0013/001322/132262e.pdf>
- Weick, K. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly*, 21(1), 1–9.
- World Bank. (2017). *Gross domestic product indicator*. Retrieved from <http://data.worldbank.org>
- Yanniris, C. (2012). Is there a future for environmental education? *En Ethria Environmental Journal*, 226, 8–9. (In Greek).
- Yanniris, C. (2015). 20+ years of environmental education centers in Greece: Teachers' perceptions and future challenges. *Applied Environmental Education and Communication*, 14(3), 149–166. <https://doi.org/10.1080/1533015X.2015.1067578>.
- Yanniris, C. (2016). Place-based learning as a catalyst for change. *Pathways: Ontario Journal of Outdoor Education*, 29(1), 11–15.