ENVIRONMENTAL EDUCATION AND EDUCATION FOR SUSTAINABLE DEVELOPMENT: EVOLUTION AND GLOBAL TRENDS

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I. INTRODUCTION

Environmental Education (EE) has several definitions, perhaps the most important of which was given by UNESCO: “A learning process that increases people’s knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action” (Borah, 2007). Today, a distinction is rarely made between EE and Education for Sustainable Development (ESD), where both terms are used interchangeably with little note to their fundamental meanings and the differences between them. Arguably, there are many similarities between EE and ESD, particularly with reference to their purpose, mechanisms and the direction of their evolution. However, while in its strictest terms EE encompasses issues related to natural resources such as water, energy, agriculture, biodiversity, rural development, sustainable urbanization and disaster prevention and mitigation, the environmental aspect is only one dimension of ESD. ESD also encompasses socio-cultural issues that tackle human rights, peace and human security, gender equality, cultural diversity, and others, in addition to economic issues that address poverty reduction, corporate responsibility and accountability and re-orienting the market economy.

EE predates ESD and is a term used to identify the process through which individuals get to explore issues on the environment in an interactive and objective manner. EE can be considered a continuous process of open education in order to respond to the world’s growing awareness about environmental problems. The term is often used to imply education within the schooling system, from primary to post-secondary. It is also sometimes used in a broader sense to encompass all efforts made to educate the public and other audiences (Karama, 2016). This chapter presents the history of EE, its development as well as its evolution to be an integral part of ESD.

The aim behind ESD was to modify education to enable a more sustainable and just society for all, by encouraging positive change in knowledge, skills, values and attitudes. There is no single definition of ESD, but most definitions today encompass integrating sustainable development in interdisciplinary learning methodologies, covering social, economic and environmental aspects of formal, informal and non-formal curricula in order to safeguard the wellbeing of present and future generations. ESD supports holistic and transformational education, but it has not always been understood in such terms and has evolved since its initiation in the late 1980s/early 1990s, going through several key changes and milestones over the years. The history of ESD, along with the major milestones, is discussed while addressing global trends.

This chapter aims at providing an understanding of EE and ESD, their evolution through the years, their incorporation in education systems, as well as current trends. This chapter thus presents, discusses and analyses the following topics:

- EE and ESD and their evolution throughout the years, including key milestones worldwide.
- The relationship between EE and ESD, as well as successful case studies.
- Current trends in ESD, education content and competency based education, including the various pillars for achieving sustainable performance.

II. ENVIRONMENTAL EDUCATION AND ITS EVOLUTION

According to the United States Environmental Protection Agency (EPA), EE is a process that allows individuals to explore environmental issues, engage in problem solving and take action to improve the environment. This ultimately helps individuals gain a deeper understanding of environmental issues. EE consists of five main components:

- Awareness and sensitivity to the environment and environmental challenges.
- Knowledge and understanding of the environment and environmental challenges.
- Attitudes of concern for the environment with a motivation to improve environmental health.
- Skills to identify and resolve environmental challenges.
- Participation in activities that help resolve environmental challenges.
Some EE experts agree that EE may have its origins in the 18th century, starting with philosophers such as Jean-Jacques Rousseau (1712-1778) who felt that education should focus more on the environment. Shortly after, came educators such as Louis Agassiz (1807-1873) who believed that students should “study nature, not books” (McCrea, 2006). Today, some environmental scientists and engineers consider these as milestones for the development of EE.

Other EE experts believe that EE started during the movement to study nature, which started in the early years of the 20th century, or as a result of the 1930s’ education program on the conservation of the environment called the “Dust Bowl” era; both originating in the USA (McCrea, 2006). Researchers in the field often refer to this era (that covers the mid-decades of the 20th century) as the era of conservation. From that point forward, the movement on EE kept growing and developing diversely. It is important to note that EE was primarily an American concept that gained international traction with time, particularly in the 1970s, when the United Nations Education, Scientific and Cultural Organisation (UNESCO), in cooperation with the United Nations Environment Programme (UNEP), held an intergovernmental conference on EE in Tbilisi, the Republic of Georgia, in 1977.

The evolution of EE can be addressed by discussing four main eras:

**A. Initial inspiration (18th century to 1920s)**

Starting from the 18th century until the 1920s, philosophers and educators such as Jacques Rousseau and Louis Agassiz respectively wrote on nature and the importance of learning about nature and the environment. Another significant author, Wilbur Jackman, wrote his book Nature Study for the Common School, where the movement on nature study was first defined by the end of the 19th century (1891) (McCrea, 2006).

With the start of the 20th century and specifically in 1905, the use of the term ‘environmental
education’ was first rejected in the USA by Liberty Hyde Bailey, a noted botanist, writer, college administrator, and educator, “because he thought it was imprecise, theoretical, pompous, and would always need to be explained” (McCrea, 2006). A significant movement by John Dewey was recognized at that time, which promoted learning by experience. The goals and mechanisms suggested by Dewey, were the same as the ones promoted and reinforced in EE and later in ESD.

In 1908, another movement sprang with Bailey, who established the American Nature Study Society and became its first president. Later in the 1920s, the field of Ecology, or the study of nature, became a scientific field of study (McCrea, 2006).

B. Conservation education era (1930s to 1954)

During the early 1930s, the US experienced an environmental crisis known as ‘Dust Bowl’, a name that was given to a state of drought that struck the region after several years of over-cultivation in the 1920s and improper land management. Dust storms swept the country, causing wind erosion that forced thousands of families to leave, especially during the ‘Great Depression’ (early and mid-1930s) (McCrea, 2006). Consequently, the need for better natural resource management arose, which emphasized the importance of the concept of ‘conservation’.

In 1935, the National Education Association presumed a leading role in school education on conservation. At that time, the state of Wisconsin became a role model for schools nationwide and required its pre-service teachers to have suitable backgrounds in conservation education. In 1946, the University of Wisconsin offered a degree in conservation (McCrea, 2006).

In 1948, the term ‘environmental education’ was first used publicly by Thomas Pritchard at the International Union for the Conservation of Nature in Paris. By the 1950s, the concept of conservation had spread, and conservation education seemed to be taking a more formal role in the Americas, leading to the launch of the
Association of Interpretative Naturalists (what is today known as the ‘National Association for Interpretation’) in the US (McCrea, 2006).

C. The foundation for modern EE

The 1960s mark the beginning of the modern era, which continued until 1989. During this period, the concept of EE gained popularity through policies, conferences held by the UN, and nations’ responses to suggested paths. The following are considered to be the most significant events/initiatives that led to changes in the perception, spread and evolution of EE during the modern era (McCrea, 2006):

- In 1969, the National Environmental Policy Act was passed in the USA (P. L. 91-190) which aimed to: “Encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.” At the same time, the Journal of Environmental Education was founded, and the term “environmental education” was given a formal definition.

- In 1970, the National Environmental Education policy act was redeveloped and passed by the US congress (P. L. 91-516). It created the institutional infrastructure within the USA to support integrating EE in the education system. Additionally, in 1971, the National Association for Environmental Education (now the North American Association for EE) was founded (McCrea, 2006).

- In 1972, the UN held the first major international conference on “Human Environment” in Stockholm, Sweden, which demonstrated a major drift in the development of policies related to global environmental issues. The conference resulted in the Stockholm Declaration, which was made up of 7 proclamations and 26 principles, meant ‘to inspire and guide the peoples of the world in the preservation and enhancement of the human environment’. Moreover, the Belgrade Charter (1975) resulted from the International Workshop on EE built on the Stockholm Declaration and added goals, objectives and guiding principles for EE programs.

- In 1975, UNESCO and UNEP led the international EE programme, which ended in 1995.

- In 1976, soon after setting out a vision and giving practical guidance on how to mobilize education for environmental awareness, UNESCO launched the EE newsletter.

- In 1977, another major international conference was held by UNESCO in cooperation with UNEP on EE. This was the first in a series of International Conferences on EE (ICEE) in Tbilisi, Georgia, and resulted in the Tbilisi Declaration. Essentially, the Tbilisi Declaration updated and clarified the Stockholm Declaration and the Belgrade Charter, by including new goals, objectives, characteristics and guiding principles for EE (McCrea, 2006).

- 1987 witnessed two major events: The first was the formal introduction of the concept of sustainable development (SD) in the Brundtland Report by the World Commission on Environment and Development (WCED), entitled “Our Common Future”. The report made clear that SD entails environmental conservation, social development, and economic development (WCED, 1987). In this sense, it created the first inexplicit link between EE and what will later be termed ESD. The introduction of SD became a turning point in the development of education, and this will be introduced in more details in section 3.1. The second event was the 2nd ICEE held in Moscow, organized jointly by UNESCO and UNEP. The conference covered the concept of EE and environmental training, and addressed the concept of SD that had been introduced in the Brundtland Report.

D. Present programs and building for the future (1992 to 2002)

Debates on environmental education started soon after the concept of sustainable development was formally introduced and continued to
The Programme for International Student Assessment (PISA) tests the extent to which 15-year-old students, near the end of their compulsory education, have acquired key knowledge and skills that are essential for full participation in modern societies. The assessment examines how well students can apply their knowledge and skills in unfamiliar settings, both in and outside of school. In addition to the assessments in reading, mathematics, science and innovative domains, PISA asks students, school principals, parents and teachers to complete a background questionnaire. Students and parents answered questions about the environment in PISA 2006 and 2015 cycles.

As part of PISA, students were asked how informed they are about seven environmental issues: the increase of greenhouse gases in the atmosphere, the use of genetically modified organisms, nuclear waste, the consequences of clearing forests for other land use, air pollution, the extinction of plants and animals, and water shortage. On average in 2015, across the OECD countries, the share of students who reported that they are informed (“I know something about this and could explain the general issue”) or well-informed (“I am familiar with this and I would be able to explain this well”) was the highest for air pollution (83 percent) and the extinction of plants and animals (79 percent), and lowest for the use of genetically modified organisms (42 percent). Despite global efforts to address global warming, such as the Paris Climate Conference and agreement, only 64 percent of students reported to be informed about the increase of greenhouse gases in the atmosphere.

Comparing these results with those of PISA 2006 shows that environmental awareness is increasing moderately among 15-year-olds. In the nine years from 2006 to 2015, and for three of the four environmental issues cited in both cycles of PISA, the share of students who reported that they are environmentally aware increased moderately. For instance, the percentage of students who stated that they are informed or well-informed about the increase of greenhouse gases in the atmosphere rose from 57 percent in 2006 to 64 percent in 2015, and a similar percentage-point increase was observed when students were asked about the use of genetically modified organisms.

However, students are not much more optimistic about the environment today than they were a decade ago. Across OECD countries, the share of students who are optimistic about the fate of the planet – those who reported that the problems associated with environmental issues would get better over the next 20 years – remained relatively stable. In 2015, 15-year-olds were slightly more optimistic than their counterparts in 2006 about the problems associated with the clearing of forests, nuclear waste and air pollution, but more pessimistic about the availability of water in the future.

That a greater awareness has not led to greater optimism is hardly surprising given that students who reported being knowledgeable about environmental issues were considerably more likely to consider that these problems would get worse in the future. For instance, 15-year-old students who claimed to be informed about the increase of greenhouse gases, water shortages and air pollution were about 40 percent more likely to believe that these problems would worsen over the next 20 years.

While teenagers are not becoming more environmentally aware, they are becoming more informed about environmental issues. This suggests that the education system is failing to convey the urgency of environmental problems to students. However, this does not mean that students are not concerned about the environment. On the contrary, students who are informed about environmental issues are significantly more likely to believe that these problems would get worse in the future.
optimistic, they are more optimistic than their parents, at least in the majority of the countries/economies that distributed the PISA parent questionnaire. In all but three of these 15 countries/economies, PISA data show that students were more optimistic than their parents about people’s ability to solve problems related to five major environmental issues. Only in Hong Kong (China) and Macao (China), students were more pessimistic than their parents about the environmental outlook over the following 20 years.

Environmental awareness and optimism is in many ways affected by the characteristics of students and schools. For instance, scientifically-minded students – that is, high-performing students who participate in science activities, expect to pursue a career in science and are interested in broad science topics – and those in schools offering science activities showed greater environmental awareness. For its part, boys were more optimistic than girls about the environment, and high-achieving students more pessimistic than low-achievers. The number of science activities in which students participate and their exposure to enquiry-based teaching were also positively related to environmental optimism.

Most people agree that the environment has deteriorated over the past few decades, even if there is an ongoing debate about the magnitude and consequences of this degradation. Fortunately, there are plenty of public and private initiatives to protect the environment, and students around the globe are increasingly aware of the most important environmental problems affecting the planet today. If we want to preserve the environment for future generations, it is essential that students become more aware of the threats to the environment and use this knowledge to adopt sustainable lifestyles, that we lower the cost of action and search for innovative solutions to environmental problems.

References


spread. It was in Agenda 21 (that was published after the UN Conference on Environment & Development in Rio de Janeiro in 1992) that the means of implementing SD was suggested through education. Moreover, it was then that EE first began to be viewed as being contained within ESD (The United Nations Conference on Environment and Development, 1992).

Agenda 21 resulted in a conceptual shift in the understanding of EE from a stand-alone notion to one that can be fully integrated in ESD (presented in detail in section 3). The main reason is perhaps that ESD considers the environment as a “resource for economic development or shared resource for sustainable living” (Kopnina, 2012). ESD has since become the goal for global programs, such as the Decade of Education for Sustainable Development (DESD) spanning between 2005 and 2014. DESD was declared by the United Nations in 2002, resulting in a transformation from EE to ESD. But despite the fact that a global trend of convergence between EE and ESD can be seen, it has not been fully reflected in all global programs, projects and initiatives. Instead, it has been applied in varying degrees by different nations and regions. Figure 1 presents a timeline indicating key milestones for the evolution of EE.

III. EDUCATION FOR SUSTAINABLE DEVELOPMENT AND ITS EVOLUTION

Education was linked to sustainable development shortly after the introduction of the term and its most widely accepted definition, published in the Brundtland Report: “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). The association between education and SD was not made right away, but was rather presented in terms of knowledge sharing, increasing public awareness, and innovation. This was clear in three out of 27 principles listed in the Rio Declaration on Environment and Development (1992) on sustainability:

- Principle 10: Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

- Principle 16: National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment. Sustainable development requires better scientific understanding of the problems. Nations should share knowledge and innovative technologies to achieve the goal of sustainability.

- Principle 21: The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.

The document defines four drives of ESD as follows:

1. Improving access to quality basic education.
2. Reorienting existing education to address sustainability.
3. Increasing public understanding and awareness of sustainability.
4. Providing training for all sectors of the economy.

Many researchers believe that the SD concept can be transformed from theory to practice by integrating it into education. It is subsequently believed that SD calls upon the educational community to endorse SD as the concept that holistically incorporates environmental stewardship and other similar concepts (Venkataraman, 2009). In that issue, the UN has clearly addressed education as key for the implementation of sustainability in Chapter 36 of Agenda 21, released following the Rio Declaration (The United Nations Conference on
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Environment and Development, 1992). It was also stated in the identification of DESD that ESD can help all individuals reach the knowledge, prospects, values and skills they need to actively incorporate in the process of improving the quality of life both on the local and global scale. (DESD, 2008; Venkataraman, 2009).

Today, ESD is seen as a key enabler for SD and an integral element of quality education. It is presented, explained and endorsed by many institutions and organizations, led by UNESCO (UNESCO, 2019). According to UNESCO, the purpose of ESD in the long run is an ultimate transformation of the educational systems in such a way as to reorient societies in the direction of SD. ESD cannot be seen as a mere add-on to existing curricula or educational practices, but should rather entail major adjustments in the teaching and learning systems and structures of education globally (Buckler & Creech, 2014).

Fourteen global milestones relating to the progress and development of the ESD have passed, which are discussed through three phases (Figure 2): pre-DESD i.e. the timeframe which predates the UN Decade of Education for Sustainable Development (DESD), the timeframe covering the DESD and the Global Action Program (GAP) and the timeframe after the DESD and GAP.


- **1992**: According to the UN knowledge platform, more than 178 countries collaborated, through a global partnership, to follow Agenda 21 as a “comprehensive plan of action” achieving sustainable development in both human lives and the environment. This occurred in the Rio Earth Summit in June 1992, after which the UN Secretary-General then appointed the UNESCO responsible for Chapter 36 of Agenda 21. In the next few
years, UNESCO established the conceptual framework needed to reorient the currently existing education, public awareness and training systems entirely towards the concept of ‘sustainable development’, instead of merely adding ‘sustainability’ as another field or subject in education.

- **1994**: UNESCO launched a project titled *Environmental and Population Education and Information for Human Development* (EPD). EPD was planned with the aim of reaching “people-centred equitable and sustainable development, through an integrated approach to environment, population and development issues” (Leicht, er, & Julia, 2018).

- **1997**: The third ICCE conference was held in December 1997 titled *Environment and Society: Education and Public Awareness for Sustainability* at Thessaloniki, Greece. The conference resulted in a declaration which reaffirmed that sustainability could only be achieved through exerted efforts by involved sectors being co-ordinated, integrated, and directed towards the goal. Proper and quality education and public awareness are required to accomplish rapid and radical change of behaviour and lifestyle, which also includes alteration in the patterns of consumption and production. It was declared that education and public awareness are necessarily “one of the pillars of sustainability, together with legislation, economy and technology” (UNESCO, 1997).

- **2000**: The *Dakar Framework for Action, Education for All: Meeting our Collective Commitments* (2000) was published and adopted at the World Education Forum held in Senegal during April 2000. It is based on an
extensive evaluation of the state of basic education around the world.

- **2002**: The World Summit on Sustainable Development (WSSD) convened in Johannesburg, and since then it has been widely recognized that education plays a major role in the realization of the ‘vision of sustainability’, and through which the message of SD, including all its pillars, can be reached (UNESCO, 2015). Nations agreed that more ESD progress was needed, and creating a UN Decade of Education for Sustainable Development (UNDESD) was discussed and endorsed by many nations. In February 2003, the UN Decade (starting on 1 January 2005) was declared through a resolution by the UN General Assembly (57/254) reaffirming the UNESCO as the lead agency for promoting the decade, and entrusting it with developing a draft international implementation scheme, clarifying the relationship of UNDESD with existing educational processes, particularly the Dakar Framework for Action. As the decade neared its ending, nations called for UNESCO to design an enduring strategy that renders the continuation of the ESD work that had already started.

- **2003**: The UN, as proclaimed in its 56th session, launched The United Nations Literacy Decade (UNLD). The aim was to aid the DESD through “sustainable literate environments”, with a goal set that literacy ought to be extended globally through Education for All (EFA), a necessary step for ESD. Education was therefore to be provided to 860 million illiterate adults and the 113 million children not attending school, starting with the most disadvantaged groups. The UNLD ended in 2012 (UN Press Release, 2003).

### B. DESD (2005 – 2014)

- **2006**: 44 countries had national ESD coordinating bodies that included representatives from governments, formal education, NGOs and in some cases the private sector. By the end of 2008, at least 78 countries had such bodies. The scope covered by these national coordinating bodies varied from country to country, and included coordinating ESD in formal primary and secondary education, streamlining it with existing EE programs, addressing non-formal and informal learning, professional development of teachers, etc. (Wals, Kieft, Tröfen, & Westin, 2010). It is worth noting that even though this was considered a significant achievement in a short period of time, the presence or absence of national bodies did not necessarily correlate with a strong, non-existent or weak development of ESD.

- **2007**: In November 2007, the fourth International Conference on EE was held at the Centre for EE in Ahmedabad, India, sponsored jointly by UNESCO and UNEP. The conference aimed to track the development of EE since the Tbilisi conference in 1977 and its role within ESD. The Ahmedabad declaration was drafted in the context of DESD, with a ‘call for action’ and a banner of ‘education for life’. The UN International Implementation Scheme for DESD reinforced recommendations that had been reached in the third ICEE (SAGE, 2007). It is worth noting that the third ICEE focused on ESD in terms of a global roadmap/agenda with sectorial strategies and action plans to facilitate progress towards achieving the objectives of ESD. It created an effective forum for stakeholders to share their experiences and create wider and stronger networks.

- **2009**: The Bonn Declaration was issued after the World Conference on Education for Sustainable Development (WCESD) held in Bonn, Germany in 2009, endorsing ESD as a necessary shift for education to reach actual change. It was also highlighted that persistent global crises such as poverty, inequality, climate change and economic crises are still indicators of unsustainability, and ESD key to addressing such problems (SAGE, 2009).

- **2012**: UN member states agreed “to promote ESD and to integrate sustainable development more actively into education beyond the UNDESD” (UNESCO Member States, 2014).

- **2013**: In November 2013, UNESCO, as the lead agency of ESD, endorsed a follow-up educational program to the DESD, namely
The evolution of humankind is largely dependent on the quality of the environment and the resources it provides, with the natural environment playing a vital role in ensuring the survival of present and future generations. Our obligation as a society is to leave behind a better world for our children. At the UN Environment Programme, we believe that the best way to ensure a better, healthier planet is to equip today’s youth with the knowledge and leadership skills to meet tomorrow’s environmental challenges.

The 2030 Agenda for Sustainable Development, adopted by all United Nations member states in 2015, provides a shared blueprint for peace and prosperity to achieve a better and more sustainable future for all. The 17 Sustainable Development Goals (SDGs) underscore that improving health and education, reducing inequality, and spurring economic growth go hand in hand with tackling climate change and preserving our oceans, ecosystems and forests. It has become undoubtedly apparent that a vital aspect of this drive for a sustainable and prosperous future lies in the integration of environment and sustainability at all levels of education.

SDG 4 (Quality Education) stipulates that obtaining a quality education is the foundation to creating sustainable development and environmental security. In addition to improving quality of life, access to inclusive education can equip people with the tools required to develop innovative solutions to the world’s greatest problems. With a world population of 7.5 billion and limited natural resources, we, as individuals and societies, need to learn to live together sustainably. We need to take action responsibly, based on the understanding that what we do today can have implications on the lives of people and the planet in the future.

Education on environment and sustainability empowers people to change the way they think and work towards a sustainable future. There is growing international recognition of environmental education being an integral element of quality education and as a key enabler for sustainable development. This can be seen in SDG Target 4.7, which commits that by 2030 “all learners shall 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”.

Moreover, SDG 12.8 aims to “ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.”

The environmental legacy of today’s youth will be determined by the lifestyle choices they go on to make. This means that it is imperative that starting from a young age, Arab youth are encouraged to adopt behavioural changes through the integration of environment and sustainability into their education. This can be done by raising awareness on food waste reduction, the impact that single-use plastics have on our ecosystems, and the benefits of sustainable consumption and production. Importantly, this education needs to not only inspire a behavioural shift, but should enable it by teaching youth what to do and how to get there.

Some countries in the Arab region have already adopted the above approach in a multi-dimensional manner, allowing environmental education to benefit their economies and inspire their people. The United Arab Emirates, for example, recently announced a new program aimed at raising public awareness on preserving the local environment, with the joint objectives of ensuring the sustainability of its biological diversity and natural resources, whilst creating new economic growth by positioning the UAE as an important ecotourism destination globally. Additionally, UN Environment Programme worked with the government of Bahrain to integrate climate change and environmental education into the elementary level school curriculum. This was done in response to public opinion polls that found that 85 percent of the population believed climate change was a severe issue that deserved to be addressed, and that there was not enough public awareness on the phenomenon.

The integration of environmental education into school
curricula will highly impact the growing youth population. One out of every five persons in the Arab region is between 15 and 24 years old, and more than half of the population is below the age of 25. This represents an important wealth for the region, especially if these young people can be equipped with the skills to engage with the growing green economy. UNEP has estimated that up to 60 million new jobs in the green economy could be created by 2030. Renewable energy generation, building and energy efficiency, roll out of electric vehicles and other low-carbon industries open up the potential for 24 million jobs for 2030. Opportunities in these sectors are predicted to offset job losses of 6 million in sectors like oil drilling and coal mining, creating a net gain of 18 million. On top of this figure, a further six million jobs are expected to result from the growth of the Circular Economy.

The promotion of environment and sustainability in tertiary educational institutions in the Arab region can provide an opportunity to address the youth employment challenge whilst simultaneously preserving the environment and increasing climate resilience. But a sustained and determined push is needed to achieve this goal. The quality of higher education in the Middle East and North African (MENA) region is amongst the lowest in the world. Only three Arab universities are on the list of the top 500 universities in the world, and none are in the top 200. Employers in the region complain that university graduates lack the skills needed to work in the global marketplace. As such, it is imperative that universities adapt and offer curricula that will prepare the future workforce with the skills and knowledge needed to pursue green jobs and boost the green economy through the integration of environment and sustainability into education.

UN Environment Programme has been working towards the integration of environment and sustainability into tertiary education systems for 30 years and has created a Global University Alliance, linking and supporting over 800 universities around the world. The Alliance creates and offers educational content, courses and materials that can be shared with student populations and technical staff. Regionally, the Youth and Education Alliance (YEAI), formerly known as GUPES, was launched in 2016 and offers great potential. The program, which aims to promote the integration of environment and sustainability concerns into teaching, research, community engagement, the management of universities, and the greening of university infrastructure and operations, was developed in such a way as to allow regionally-specific thematic areas become priorities in implementation. For the Arab region, for instance, one of the core pillars within YEAI is ‘Greening University Curricula’. It entails the coordination of environment and sustainability seminars for universities, business and industry communities with the aim of inspiring curriculum review and realignment towards sustainable development in response to job market demands for green skills. The tools are therefore available for the integration of environment and sustainability in education. What appears to be lacking in the Arab region is the sustained drive to make these changes.

Education on environment and sustainability is core to the United Nation’s holistic approach to ensure a better and more prosperous future for all. Whilst the current trends displayed by policy makers and leaders within the Arab region are positive, the integration of environment and sustainability into education at all levels needs to be acted upon as an operational priority, with the understanding that the benefits it produces not only contribute to the global fight against environment degradation and climate change, but can also be felt at home with shrinking youth unemployment and growing national economies.
Due to their importance in shaping ESD, both the DESD and the GAP are discussed in more detail in the following subsections.

### 1. Decade of Education for Sustainable Development

The UN declared the DESD as the ten years of global action from 2005 to 2014. It was the decade in which the world was “sought to mobilize the educational resources” in such a way as to reach a sustainable future worldwide (UNESCO, 2015). ESD at that time was primarily understood as changing curricula to contain sustainable development as a major topic. However, by the end of the decade, a deeper and richer understanding of ESD was attained and including SD as a stand-alone subject was no longer enough.

In addition to efforts exerted through legislation, action research was also implemented as an initiative to mobilize progressive advancements through education. In the period from April 2012 to December 2013, researchers and the State University of Maringa (UEM) graduate students launched the “program for communication, environmental education, and social mobilization” taking the river basins in Brazil as the theme. Three major goals were set for this program; 1) continuing education for teachers; 2) awareness and training of the various segments of society; and 3) preparation of teaching aids and promotional material (Obara et al., 2015).

Research on this program showed the urgent need for the education and necessary training of educators and civil society, for them to be actively involved in achieving progress. Nowadays, progress relating to EE and ESD in Brazil is perhaps correlated with initiatives in terms of policies, strategies, and plans intended to address the issue of climate change through EE and ESD.

In 1997 and 1998, the Ministry of Education implemented National Curriculum Parameters (PCN) for elementary and secondary education, in which environmental issues were highly recommended to be incorporated in all subjects covered under basic education in a “cross sectional” manner. This includes using interdisciplinary approaches with diverse themes so that all educators may share their experiences in the field and none would be left unaware or short of knowledge on all EE related issues and updates (Obara et al., 2015). Most importantly, in 1999, the National EE Policy, aka PNEA, was established by the Brazilian government through Law 9795/99 in an effort to advance EE and with the aim of reaching sustainability through EE (Obara et al., 2015; Trajber & Mochizuki, 2015).

In 1981, the Brazilian government issued the ‘National Environment Policy’, or Law 6938/81, which addresses EE stating that “EE at all levels of education, including community education, intends to enable them [Brazilian citizens] to participate actively in environmental protection” (Trajber & Mochizuki, 2015). Later in 1988, the Brazilian government declared, through Chapter VI and Article 225 of the Brazilian constitution, citizens’ right to a healthy environment and a healthy living. It emphasized the role of the public authorities and the need for education to tackle the issues of a balanced environment and healthy living by promoting EE for public awareness.

### Brazil

In 1997 and 1998, the Ministry of Education implemented National Curriculum Parameters (PCN) for elementary and secondary education, in which environmental issues were highly recommended to be incorporated in all subjects covered under basic education in a “cross sectional” manner. This includes using interdisciplinary approaches with diverse themes so that all educators may share their experiences in the field and none would be left unaware or short of knowledge on all EE related issues and updates (Obara et al., 2015). Most importantly, in 1999, the National EE Policy, aka PNEA, was established by the Brazilian government through Law 9795/99 in an effort to advance EE and with the aim of reaching sustainability through EE (Obara et al., 2015; Trajber & Mochizuki, 2015).

In addition to efforts exerted through legislation, action research was also implemented as an initiative to mobilize progressive advancements through education. In the period from April 2012 to December 2013, researchers and the State University of Maringa (UEM) graduate students launched the “program for communication, environmental education, and social mobilization” taking the river basins in Brazil as the theme. Three major goals were set for this program; 1) continuing education for teachers; 2) awareness and training of the various segments of society; and 3) preparation of teaching aids and promotional material (Obara et al., 2015).

Research on this program showed the urgent need for the education and necessary training of educators and civil society, for them to be actively involved in achieving progress. Nowadays, progress relating to EE and ESD in Brazil is perhaps correlated with initiatives in terms of policies, strategies, and plans intended to address the issue of climate change through EE and ESD.

In 1981, the Brazilian government issued the ‘National Environment Policy’, or Law 6938/81, which addresses EE stating that “EE at all levels of education, including community education, intends to enable them [Brazilian citizens] to participate actively in environmental protection” (Trajber & Mochizuki, 2015). Later in 1988, the Brazilian government declared, through Chapter VI and Article 225 of the Brazilian constitution, citizens’ right to a healthy environment and a healthy living. It emphasized the role of the public authorities and the need for education to tackle the issues of a balanced environment and healthy living by promoting EE for public awareness.

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The active commitment of Danish educational policy makers and teachers has greatly affected Danish education, making Denmark one of the lead countries in ESD today. In the early stages, and during the eras of EE, this was manifested by the involvement of autonomous teachers concerned with the environment who were able to convince other teachers to incorporate environmental issues in their objectives and curricula (Rolls, Madsen, Roug, & Larsen, 2015).

For EE to formally be at the core of education, relevant objectives and curriculum guidelines needed the backing and involvement of the Ministry of Education. In 1976, the Educational Act addressing curriculum guidelines for geography and biology stated: “The teaching shall contribute to students’ understanding of people’s living conditions and opportunities and in that way provide a basis for deciding about local and global environmental problems” (Rolls et al., 2015). Educational policy makers were concerned with exposing Danish citizens to Danish society and environment, emphasizing the need for collaborative decision-making. The same Act also introduced modern/contemporary studies as a subject, which addresses contemporary issues of high significance.

After the declaration of the DESD in the UN Summit in Johannesburg in 2002, the Danish government established its own national strategy for sustainable development, entitled A Shared Future — Balanced Development, in which the role of the educational sector in achieving SD in Denmark was outlined through progressive active involvement of educators in reaching the objectives of ESD. It also explicitly showed a slight drift from a prioritization of critical thinking and democratic learning to the teachers’ role (Rolls et al., 2015; The Danish Government, 2002).

Since 2005, SD has been incorporated through effective stakeholders in the Danish educational sector through revision of goal descriptions, curricula and guidelines for primary, secondary, and vocational educational and training programmes. These changes intend to strengthen “the pupils’ interest in the individual subjects and their mutual interconnection.” (The Danish Ministry of Education, 2009). In other words, teacher and educators in all education programmes must cover the concept of SD scientifically, socially, in a humanistic manner and from a democratic perspective. Today, most Danish schools are recognized as ESD schools (Rolls et al., 2015; The Danish Government, 2002; The Danish Ministry of Education, 2009).

ii. Global Action Program

With the DESD nearing its end in 2014, UNESCO introduced a Global Action Plan (GAP) to carry ESD into a next era. The GAP was formulated in coordination with the UN Member States as well as other stakeholders, addressing two major objectives (Buckler & Creech, 2014; UNESCO Member States, 2014):

1. To reorient education globally with the entire process of teaching and learning so that everyone worldwide gets “the opportunity to acquire the knowledge and skills, values and attitudes that empower them to contribute” to sustainable development.

2. To strengthen education and learning in all agendas, programmes and activities that promote SD. In other words, GAP aims at enhancing action worldwide throughout all levels of education with the help and cooperation of governments and societies in order to accelerate the process of reaching sustainability worldwide. Accordingly, the action within the GAP is centralised and focussed on five action areas called GAP strategic objectives, which includes policy support, whole institution approaches, educators, youth and local communities.
C. Post–DESD (2014 – present)

- **2015**: The ministers of education adopted a global education strategy at the World Education Forum (WEF) held at Incheon, Korea, to implement the fourth Sustainable Development Goal dedicated to education (SDG 4, Education for All) by 2030. By merging the concepts of EFA and ESD, as was initially envisioned in Agenda 21 – both initiatives emerged simultaneously in different forums in the late 1980s – the new overarching vision of ESD was developed and detailed in the 2030 Agenda. At the WEF, ministers approved the yearly publication of the Global Education Monitoring Report (GEMR), requiring nations to submit annual reports on their progress regarding SDG 4 (York University, n.d.). Today, ESD is internationally recognised as being a fundamental pillar for the achievement of the 17 SDGs, while ensuring a sustainable future.

- **2016**: The UNESCO General Assembly requested a review on the implementation of ESD and the GAP. Following that request, surveys relating to the ESD and GAP were sent to key partners (90 stakeholders of high political influence and outreach) involved in the GAP. The Global Monitoring Report for 2016 was prepared based on their replies. The report found that there was a clear interconnectedness between education and other SD outcomes in the SDG Agenda, which demonstrates the necessity of integrating quality education in the Agenda for community development. It also found
that the scope of the Agenda needed to be reflected based on the suggested target outcomes (UNESCO, 2016)."

- **2030**: Deadline for the implementation of the 2030 goals, including education. If proper guidance is provided, governments and partners can indeed implement the new education agenda and “translate into practice the commitments made at the country, regional and global levels” (UNESCO General Assembly, 2017). It can be interpreted that the agenda set for 2030 concerning education demands sustainable and committed action by all partners involved worldwide, to guarantee “inclusive and equitable quality education and promote lifelong learning opportunities by 2030” (UNESCO General Assembly, 2017).

### IV. RELATIONSHIPS AND SELECTED CASE STUDIES

Even though ESD is connected to many global education initiatives such as EFA and UNLD, it also has a strong relationship with EE, as presented earlier in this chapter. In theory, EE and ESD can be integrated better, but in practice, the integration of the two has been trivial.

The way the relationship between EE and ESD is interpreted depends on whether the historic role of EE in a country is significant or insignificant, and on the way it is interpreted. Interpretation can be narrow by only including environmental aspects, or broad by also including socio-economic and political aspects. With this in mind, three models exist, as shown in Figure 3: The first occurs in countries with strong EE traditions that
In 1994, Lebanon introduced a developed educational plan that aimed to build an integrated educational system, based on specific philosophy and objectives. The general educational curricula in 1997 and the environmental education curricula in 1998 confirmed the importance of sustainable development in general and environmental education in particular. The educational programs were meant to demonstrate competencies, achieve objectives and measure outcomes.

In 2012, the Center for Educational Research and Development (CERD) developed the National Strategy for Environmental Education in Lebanon, in cooperation with the Association for Forests, Development and Conservation (AFDC). CERD subsequently developed an environmental education curriculum for each of the first and second cycles of the basic education, and a knowledge guide that included concepts of environmental education and its techniques, in addition to a training document and assessment rubrics in 2014 and the paperless project in 2019.

In 2019, CERD set new standards for school buildings and classroom facilities, which are environmentally friendly and in line with a set of green school directives. CERD also launched the green demonstration project in the teachers’ training center in Jounieh and reparations are underway to spread this project to other regions as well.

In 2018, CERD adopted a plan to integrate the Sustainable Development Goals (SDGs) and launched its vision towards Education 2030. This requires transformational approaches and the development of educators’ skills, in addition to the development of partnerships between multiple and diverse stakeholders at the national and international levels to achieve the SDGs, namely those relevant to the environment: Goal 3 (Good Health and Well-Being), Goal 4 (Quality Education), Goal 6 (Clean Water and Sanitation), Goal 7 (Affordable and Clean Energy), Goal 11 (Sustainable Cities and Communities), Goal 13 (Climate Change), Goal 14 (Life Below Water), Goal 15 (Life on Land).

The basic approach of CERD to achieve the SDGs by 2030 focuses on the quality of education and providing equal opportunities to enable learners to achieve all goals in a holistic way. This would allow them to become active citizens in the educational learning environment, as well as in the communities in which they live.

Environmental education seeks to enhance the overall individual learning vision within its surroundings at all levels. This requires concerted efforts, which are synchronized and consistent and that promote cooperation and partnership between different sectors including government institutions, public education, vocational education, higher education, parents and non-governmental institutions. This is necessary in order to prepare the learners to meet the requirements of the labor market and to devise effective solutions for environmental problems.

The CERD vision on environmental education is based on three assumptions:

1. Environmental education seeks to ensure people’s well-being and to take care of their mental and physical health. This can be achieved by sensitizing and engaging learners, teachers, parents, society and government (LEPCG) to be responsible for the conservation of nature and increase the opportunities to access it.

2. Environmental education seeks to enhance the power of learners to solve life problems through the attitude of “building the leader within you”. It provides people with the opportunity to explore the natural world and learn from it, and thus enables them to communicate their political voice and to look at matters from different perspectives.

3. Environmental education is best achieved through a triangle of partnership between school, community and government.

Based on these postulates and the belief that advocacy of the local and global environment is a public responsibility, it is imperative to transform environmental education into a culture that is reflected in the basic profile of children. It can then be passed on through socialization, and by integrating it into the general school curricula and extra-curricular activities.
Vision and mission

CERD is responsible for the development of educational plans, curricula of public education, publications and educational approaches, in addition to training the workforce in the educational sector. It also handles research and educational statistics, school equipment and building specifications, among others.

CERD’s vision focuses on the integration of environmental education into all the educational system components, in view of achieving a healthy society and a vigorous, open-minded and environmentally minded citizen.

The environmental mission of CERD is developing and updating green strategies for environmental education based on scientific research, as well as developing public education curricula and all supporting educational services to enhance the role of the green school in a flexible and sustainable manner.

This can be achieved through the dissemination of environmental education culture in the community and the development of comprehensive, interactive curricula. It can be additionally supported by extracurricular activities that integrate 21st century skills, lifelong learning for learners and teachers, and that provide quality education services for learners, teachers, parents and the community in order to achieve the desired educational goals.

Through the development of curricula, CERD seeks to develop a green citizen who is committed, an initiator, active, innovative, reflective, a critical thinker, researcher, cooperative, collaborative and an interrogative learner interlinked with his natural environment. This learner’s profile is paired with what the environmental education seeks to achieve: an environmental proficient learner – a citizen who is environmentally knowledgeable and aware, and ultimately ready to translate these qualities into positive behaviour.

Education is the foundation of any development, based on the man’s responsibility as a custodian of natural resources and protector of the environment. For this reason CERD finds it necessary to:

1. Develop the educational curriculum in all its components – including human resources and technical requirements – to be interactive and reflect the needs of the modern age, taking into account the standards of a green culture, green school environment, green society, and green citizen.

2. Develop purposeful programs, specialized training courses, learning guides and resources, and establish environment clubs to support this culture in schools.

3. Develop strategy and standards of the Green School, in cooperation with relevant institutions, to ensure the development of a safe environment that is in harmony with the needs of learners and society.

4. Place special attention to green culture in early childhood education.

5. Expand the experience of the prototype green demonstration room at the Teacher Training Center in Jounieh to other parts of the country.

6. Issue laws and operational decrees to ensure the realization of the above goals.

With the advances in the sustainable development concepts in education, the interconnection between school and the environment is no longer a luxury, but rather an educational necessity that requires a comprehensive approach based on the foundations of sustainability.

This approach involves a package of values, knowledge, skills and attitudes within activities and programs both inside and outside the classrooms, for all learners, families and the school staff. It brings multiple benefits, spanning from physical and psychological health, to the safety of the planet, based on safeguarding natural resources and rationalizing consumption patterns.
interpret it broadly and where EE is seen to be synonymous with ESD. There are two responses to this model: 1) EE continues to evolve since people can identify better with it than with ESD, such as in the United States or; 2) EE is integrated in ESD and thus terms such as EE for SD and EE for sustainable societies emerge as is the case in Taiwan and Brazil, respectively. The second model views EE as part of ESD, where EE is interpreted narrowly focusing on environmental issues with no reference to socio-economic, political and cultural dimensions. In this case, ESD replaces EE since it is seen as a more up-to-date version, such as Denmark and Vietnam. It is worth noting that the shift from EE to ESD gives an opportunity for the development of new structures and potentially allows countries to ‘catch-up’ to countries that started implementing EE at an earlier stage (UNESCO & Wals, 2009). The third model acknowledges that EE and ESD have elements in common but are distinct. In this case, the old EE infrastructure will remain and government support for ESD is given, but not at the expense of EE. Consequently, parallel policy streams and support mechanisms exist such as in Canada, the Netherlands and Greece (Wals et al., 2010).

It can be seen that nations worldwide reacted differently to the concepts of EE and ESD, with some showing more levels of commitment and positive involvement than others. Also, as discussed, there are regional differences in the interpretation of the meaning of EE, ESD and their relationships and which and what should be strengthened. It has been reported that innovative and promising approaches to sustainability have emerged from institutions and schools, ranging from hybrid, cross-boundary forms of learning around local issues, to educational sustainability applications for smartphones (Jickling & Wals, 2012). On the whole, successful progress demands practical approaches that result in major educational transitions. As an illustration, three case studies have been selected and presented in accompanying boxes.

V. THEMES AND TRENDS IN ESD

The adoption of the 2030 Agenda for Sustainable Development has made Education for Sustainable Development instrumental in accomplishing SDG 4. Under SDG 4, one of the most challenging targets, number 4.7, aims to: “By 2030 ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through ESD and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development.” With governments and international communities embracing these objectives, this creates an enabling environment for ESD. It is important to note that the 2030 goals are reinforced with strong policy support for ESD, resulting from the active involvement of education stakeholders in the process of their formulation and their concern for SD as well as its incorporation in education.

A. Educational content and key competencies

With the increasingly complex nature of world challenges such as climate change, there is a current trend for education stakeholders to pay
more attention to relevant education content that addresses contemporary challenges and not just focus on access to education and basic skills. This changes the notion of education from merely acquiring knowledge and skills, to one that focuses on teaching and learning as transformational tools, enabling people to implement SD concepts as an integral part of their daily lifestyle. Focusing on transferable/transverse skills and socio-emotional skills to achieve required outcomes and decrease social and educational gaps in society is an example.

Moreover, ESD does not only address the learning content; it also tackles outcomes, pedagogy and the learning environment. It creates a learner-centred, interactive environment that is competence based, utilises self-directed learning, is participatory and collaborative, problem-oriented, inter and transdisciplinary and links both formal and informal education (Leicht et al., 2018).

Many stakeholders, including the GAP and ESD researchers, emphasize key competencies (learning outcomes) that need to be present to enable individuals to transform their lifestyles towards sustainability. While there are differences between various presented models, most agree on the following eight competencies:

- **Systems thinking competency:** This includes the ability to understand relationships, analyse complex systems and deal with uncertainty.

- **Anticipatory competency:** The ability to understand and evaluate multiple scenarios including what is possible, probable and desirable, and create a vision for the future. This also includes applying the precautionary principle and to deal with risks and changes.

- **Normative competency:** The ability to understand the underlying principles and values that fuel peoples’ actions, to negotiate SD values, principles, goals and targets in complex and uncertain contexts.

- **Strategic competency:** This includes the ability to create and implement innovative actions.

- **Collaboration competency:** This includes the ability to learn from others, understand and respect their needs and views, be involved in collaborative and participatory problem solving and deal with conflicts in a group.

- **Critical thinking competency:** The ability to question practices and opinions, reflect them on personal principles and values and take a position in the debate.

- **Self-awareness competency:** This includes being aware of one’s role in society and globally.

- **Integrated problem-solving competency:** This includes applying different problem-solving techniques to complicated sustainability problems to develop viable equitable solutions (Leicht et al., 2018).

To transform these learned skills into action, individuals require corresponding values and motivational drivers. Sustainability driven action can manifest in an individual’s environment, i.e. when individuals find an opportunity for action to better the environment and act on it. By utilising sustainable, key competencies in the context of the environment (opportunity)
There is growing awareness about environmental issues amongst stakeholders, individuals and communities. This upsurge in knowledge and awareness has been, by and large, the result of campaigns and education programs run by major public interest groups concerned with the environment. These include NGOs at the international, regional and national levels, as well as organizations focused on the empowerment of marginalized groups in society and other community-based organizations. Such organizations have worked to foster grassroots-based approaches towards the protection and preservation of the environment. Much of this effort has been reinforced by NGOs, which are playing a critical role in disseminating environmental information. Moreover, environmental non-governmental organizations (ENGOs) are playing an important role in environmental education and they provide a very valuable channel for feedback.

Environmental education should provide opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment. It should be interdisciplinary in its approach and should include major environmental issues from local, regional and national points of view to provide insight into environmental conditions in other geographical areas.

NGOs can be a valuable source of information on the state of the environment. They can also form action groups to help in the implementation of action plans, act as pressure groups to force action where the political and administrative systems are inactive or ineffective, can advise the government on the weakness of existing legislation and recommend measures for strengthening or improving these systems or their performance. One main role of NGOs is to bring environmental knowledge to the general public, and provide a range of educational and motivational aids.

All general education at the primary, secondary and higher secondary levels should inevitably have a strong component of environmental content. Such courses will provide awareness and sensitivity of environmental sustainable performance can be achieved. Figure 4 illustrates the inter-relationship between key competencies, knowledge and skills, values and motivations, and opportunities.

It is worth noting that efforts to prepare teachers to deliver/implement ESD have not advanced inline with the other improvements in ESD. Thus, competencies for educators have not received as much attention as for those being educated, despite global demand, support and policies. Changes still need to be made to pre-service and in-service teacher education to align with the key competencies required for teacher educations with ESD as a core element.

E. Themes and topics

The choice of topic and content in ESD will greatly depend on the competencies that need to be developed. While many agreements and programs provide information on important ESD topics – such as the United Nations Framework Convention on Climate Change and the Hyogo Framework for Action 2005 – 2015 – key ESD themes must align with SD processes, such as the 17 fields of action identified by the SDGs. Moreover, the GAP prioritises four key areas: climate change, biodiversity, disaster risk reduction and sustainable production and consumption (Buckler & Creech, 2014). The Bonn Declaration reiterates these topics and adds a few more, covering water, energy, climate change, disaster and risk reduction, loss of biodiversity, food crises, health risks, social vulnerability and insecurity (UNESCO, n.d.).

In a report on issues and trends in ESD, published by UNESCO in 2018, six key themes or topics were chosen to be discussed in detail,
ENVIRONMENTAL EDUCATION IN ARAB COUNTRIES

Environmental education has its own importance in view of the present state of affairs, where human population is facing a great threat of environmental pollution and depletion of natural resources, which threatens survival itself. The situation in this regard has been well demonstrated in AFED’s 2012 report on ecological footprint, entitled Survival Options. The report shows that Arab countries’ consumption and waste production are twice what nature can locally regenerate and assimilate. NGOs can help disseminate knowledge on this matter to the public, to realize the enormity of various environmental problems in view of taking personal action to help alleviate the threats and support adequate policies.

Environmental sustainability education, comprising the dissemination of environmental education for sustainable development into the community, should be a lifelong process and not one restricted to a learner’s years in higher education. Informal environmental sustainability education, including personal involvement in NGO environmental action, can be an effective way of increasing the understanding of environmental and sustainability issues. NGO initiatives and field projects help provide practical environmental education to people who have built their careers in other areas. In the process, they help environmental awareness trickle into areas of life where it would not yet ordinarily impinge.

Engagement in practical work and action research may help overcome some of the negativity linked to many assessments of the human impact on the environment and, working together, universities and NGOs can more effectively ‘think globally and act locally’. NGOs may provide the best hope for helping to change the destructive aspects of modern society, but they are vulnerable because of their financial dependency on sponsors, volunteers and donors.

Environmental research is another area in which NGOs can contribute usefully. The Arab Foundation of Young Scientists (AFYS) has been playing an important role in this respect, especially in the field of air, soil and water quality. AFYS has been established to enhance the voice of young scientists in decision-making and action for environmental education, science and society. The main goals of AFYS are to encourage environmental education, scientific research, increase the impact and utility of scientific knowledge, and to build a scientific network for young scientists to contribute to the advancement of environmental science and society.

VI. CONCLUSION AND RECOMMENDATIONS

Enviromental Education and Education for Sustainable Development have proved to be integral for the sustainable development of nations. While there are many similarities between them both in terms of their objectives, mechanisms and the direction of their evolution, both EE and ESD are not interpreted in the
same way across the globe. Each manifests itself differently depending on local histories and political and cultural traditions. Although contextual differences are likely to remain, there is still a need for inter-regional learning, as there are globalizing forces and systems that affect all regions. Those can be understood better when discussed inter-regionally.

There has been a clear effort to integrate EE and ESD into existing SD and SD-related national policies and legislation. However, few policies explicitly refer to ESD. Moreover, countries participating in the DESD reported a notable presence of ESD in national policy. These policies mainly address broadening participation in ESD and its integration in national educational policies and curricula, especially at the primary and secondary levels.

Many governments have committed themselves to supporting the inclusion of ESD in formal education, most notably in primary and secondary education. This involves the re-designing of curricula, teaching and learning, in addition to making adjustments to the existing system to create more space for sustainability issues. ESD in non-formal education and informal learning is on the agenda of most countries participating in the DESD. With regards to the integration of EE and ESD at the university level, several international pre-DESD meetings have been held to integrate sustainability on campus and in curricula, alongside involving the university communities. Still, there is much room for improvement, and the same applies to early childhood education, technical and vocational education (UNESCO, 2009).

In terms of educational content, a strong trend is seen in making education more relevant to the social, environmental, and economic challenges that the world faces today and in the future. The process of reorienting education policies, curricula and plans towards SD is well underway, according to the GAP progress reports, although progress remains uneven.

In most countries, the availability of public budgets and/or economic incentives for ESD is either non-existent or minimal. Similarly, ESD research and development does not receive much funding and is not very well developed around the globe. The vast majority of countries do not provide ESD scholarships and do not report financial support for ESD innovation and capacity-building. The existing ESD-related research is mostly focused on formal education and on the policy and regulatory measures related to ESD implementation (UNESCO, 2009).

It is worth noting that to date there is not enough information on the quality of ESD programs, the degree of their implementation and their effectiveness in achieving the required outcomes. Assessments should be performed on several levels, including national, individual and large-scale assessments to monitor learning outcomes. This feedback will help improve performance and address shortcomings in order to enhance progress towards achieving the ESD goals.

EE and ESD-related professional development should focus on strengthening people’s capacities
with a focus on teachers, managers and facilitators, to initiate and enhance new ESD-inspired forms of learning in schools, universities, workplaces and neighborhoods. With teacher education and training opportunities in place, there is also a need for strong educational leadership of principals and teachers, including high expectations towards teachers and management support (Laurie et al., 2016).

Raising funds for ESD activities and projects is key to ensuring the successful achievement of the ESD objectives. Support for ESD-related research is needed to enhance both the quality and the evidence base of ESD. The creation of ESD-related research funds with the help of international donors and national research foundations may help advance the quality and quantity of ESD research by both academics and practitioners. Furthermore, support should be given to initiatives that enable teachers to become ESD researchers themselves in their own schools and classrooms. The provision of financial resources for ESD should not be left to governments alone. Multilateral and bilateral donors and the private sector can be significant contributors.

The way forward in all regions depends in part on the development and utilization of inter- and intra-regional networking. Current regionally networked ESD initiatives around the world need to be supported by active ESD focal points, ESD national coordinating bodies, the UNESCO Regional Bureaux for Education, UNESCO National Commissions and UNESCO Chairs, in collaboration with SD-oriented NGOs, the private sector and civil society. Furthermore, capacity-building for ESD policy development within all relevant ministries and at other levels of government is essential for realizing inter-sectoral synergy and improved coordination.
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