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## The Implementation of SDG 4 - Achieving the Sustainable Development Goals through Education on the Environment

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## **Chapter for Book - Implementing the Sustainable Development Goals (SDGs) - Strategies for a Livable World**

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## **Chapter 4 - The Implementation of SDG 4 - Achieving the Sustainable Development Goals through Education on the Environment**

**Lye Lin-Heng<sup>1</sup>**

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### **Abstract**

This chapter examines the implementation of Sustainable Development Goal (SDG) 4, which calls on states to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. It focusses in particular, on Environmental Education, its meaning, implementation and evolution into Education for Sustainable Development (ESD) which is specifically mentioned in SDG 4-7. It gives some examples of effective implementation in developed and developing countries and suggests measures that can advance the more effective implementation of ESD. It includes a discussion on the impact of corona virus Covid-19 which is a major obstacle to the attainment of the SDGs by 2030. It ends with a case study of a multi-disciplinary program on the environment – the Masters in Environmental Management (MEM) at the National University of Singapore, which involves the collaboration of nine faculties/schools, as an example of an effective program in ESD.

### **A. Introduction**

The 17 Sustainable Development Goals (SDGs) were adopted by the UN General Assembly in September 2015. They built on the eight Millennium Development Goals (MDGs) signed by 189 countries at the UN Millennium Summit in September 2000 “to secure a sustainable, peaceful, prosperous and equitable life on earth for everyone now and in the future”. Its foremost aspiration was to “Leave no one behind”.

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While the MDGs<sup>2</sup> were aimed at developing countries, to eradicate extreme poverty, hunger and disease by 2015; the SDGs are an urgent call for action by all countries - developed and developing - in a global partnership for a sustainable world. The SDGs recognize that ending poverty and other deprivations must be integrated with strategies that improve health and education, reduce inequality, provide job opportunities and facilitate economic growth, while preserving our forests and oceans and tackling climate change.<sup>3</sup> A holistic approach must be taken and many synergies can be found in the 17 goals. The timeline for achieving these goals is 2030. SDG 4 with its focus on education is a clear recognition by the world community that education is a powerful driver for sustainable development.<sup>4</sup>

This paper seeks to analyse the implementation of SDG 4 in the year 2020, ten years before this 2030 deadline. SDG 4 states: “Quality Education - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. This paper focuses on Environmental Education (EE) in particular, and its evolution into Education for Sustainable Development (ESD). It will look at some examples of ESD implementation in various parts of the world and will make recommendations as to how its implementation both globally and nationally may be strengthened.

## **B. Environmental Education – Meaning, History and Evolution**

Environmental Education in the twentieth century appears to have been first conceptualised in 1969 by a group of scholars in the School of Natural Resources, University of Michigan. Their paper entitled “The Concept of Environmental Education”<sup>5</sup> asserted that “There is a vital need for an educational approach that effectively educates man regarding his relationship to the total environment”, and called for environmental education to “reach citizens of all ages.” It declared that “Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to solve these problems and motivated to work towards their solutions.” It emphasized that conservation education must be transformed to community-based environmental education.

At the global level, the environment first appeared in the education agenda at the Stockholm Conference on the Human Environment in 1972). Principle 19 of the *Stockholm Declaration on the Human Environment* (1972) declared that:

Education in environmental matters, for the younger generation as well as adults, giving due consideration to the underprivileged, is essential in order to broaden the

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<sup>2</sup> The eight SDGs were: (1) Eradicate extreme poverty and hunger (2) Achieve universal primary education (3) Promote gender equality and empower women (4) Reduce child mortality (5) Improve maternal health (6) Combat HIV/AIDs, malaria and other diseases (7) Ensure environmental sustainability (8) Global partnership for development. See <https://www.un.org/millenniumgoals/bkgd.shtml>

<sup>3</sup> See <https://sustainabledevelopment.un.org/?menu=1300>

<sup>4</sup> “Education is key to the global integrated framework of sustainable development goals. Education is at the heart of our efforts both to adapt to change and to transform the world within which we live” per Irina Bokova, Director-General, UNESCO, *Rethinking Education: Towards a global common good?* UNESCO 2015 at p. 3)

<sup>5</sup> William B. Stapp, et. al, “The Concept of Environmental Education”, *The Journal of Environmental Education*, Vol.1, No. 1, 30-31, 1969.”

basis for an enlightened opinion and responsible conduct by individuals, enterprises and communities in protecting and improving the environment in its full human dimension. It is also essential that mass media of communications avoid contributing to the deterioration of the environment, but, on the contrary, disseminates information of an educational nature on the need to protect and improve the environment in order to enable man to develop in every respect.

Recommendation 96 of the Conference Report<sup>6</sup> called on the UN Educational, Scientific and Cultural Organisation (UNESCO) and other international agencies to “take the necessary steps to establish an international programme in environmental education, interdisciplinary in approach, in-school and out-of-school, encompassing all levels of education and directed towards the general public, in particular the ordinary citizen living in rural and urban areas, youth and adult alike, with a view to educating him as to the simple steps he might take, within his means, to manage and control his environment.”

Three years later, the *Belgrade Charter: A Framework for Environmental Education* (UNESCO, 1975)<sup>7</sup> called for a new global ethic, listing six objectives of environmental education: awareness; knowledge; attitude; skills; evaluation ability; and participation.

In 1977 the Tbilisi Declaration<sup>8</sup> emphasized that Environmental Education should constitute a comprehensive lifelong education for all persons, to prepare the individual for life through a holistic understanding of the major problems of the contemporary world, including its biological, physical, social, economic, cultural and ethical aspects. Thus, environmental education seeks to create new patterns of responsible behaviour of individuals, groups, and society as a whole, towards the environment.

Environmental educators, led by UNESCO and UNEP implemented the International Environmental Education Program as from 1975. The UNESCO-UNEP program does not call for environmental education to be made a specific subject. Rather, it seeks to integrate and co-relate environmental education within existing educational systems and programs. Educators who attended these international meetings sought to implement EE in their home countries. Developed economies also emphasized a need for understanding the political process so that individuals can push politicians, government agencies and corporations to make the right decisions in the context of the environment.<sup>9</sup>

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<sup>6</sup> *Report of the UN Conference on the Human Environment*, Stockholm, 5-16 June, 1972 -see <http://www.imo.org/en/KnowledgeCentre/ReferencesAndArchives/HistoryofMARPOL/Documents/A%20CONF.48%2014%20Rev.1.pdf>

<sup>7</sup> <https://unesdoc.unesco.org/ark:/48223/pf0000017772>

<sup>8</sup> UNESCO First International Conference on Environmental Education, 1977 – see <https://unesdoc.unesco.org/ark:/48223/pf0000032763>

<sup>9</sup> See US EPA “What is Environmental Education?”, emphasizing “skills to identify and help resolve environmental challenges, and participation in activities that lead to the resolution of environmental challenges.” <https://www.epa.gov/education/what-environmental-education>. The US also passed the Every Student Succeeds Act (2015) which provides funding for environmental education as an enrichment activity that supports a ‘well rounded education’ and student health and safety programs, as well as environmental literacy programs and STEM (Science, Technology, Engineering and Mathematics) activities

A useful and aspirational guide is found in the 2011 *Treaty on Environmental Education for Sustainable Societies and Global Responsibility*, drafted in preparation for the Rio+10 Summit.<sup>10</sup> It contains 65 principles, which emphasize *inter alia* that environmental education must be holistic and interdisciplinary, must recognise, respect, reflect and utilise indigenous history and local culture, develop an ethical awareness of all forms of life, respect all life cycles, and impose limits on humans' exploitation of other life forms. It calls for the media to be one of the main channels of education, and for the creation in each university of interdisciplinary centres for the environment.

In the context of the use of the media for environmental education, mention must be made of India and the very laudable judgments by India's Supreme Court, in advancing environmental education and in protecting the environment.<sup>11</sup> India started its Centre for Environmental Education in 1984. In the 1991 decision of *MC Mehta v Union of India*<sup>12</sup>, the Supreme Court, convinced by the petitioner MC Mehta (an environmental lawyer), of the importance of public education on the environment, ordered that as from 1 February 1992, all cinema halls, touring cinemas and video parlors must exhibit at least two slides/messages on the environment in each show. The Ministry of Information and Broadcasting was also ordered to start producing documentaries on various aspects of environment and pollution, and one such film should be shown, as far as practicable, in each cinema venue, each day. There must also be daily radio programs of five to seven minutes on the environment and once a week, a longer program.

### C. Education for Sustainable Development

The concept of sustainable development came to the forefront in 1987 with the World Commission on Environment and Development's Report entitled *Our Common Future*,<sup>13</sup> commonly known as 'The Brundtland Report'. This defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Following the Brundtland Report, there was a slow but perceptible shift in environmental education, from a focus on the environment to a focus on sustainable development.<sup>14</sup>

In 1992, at the Earth Summit in Rio de Janeiro, *Agenda 21*, a non-binding Action Plan for the Earth, was introduced. It contained very detailed statements on education. Chapter 36

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<sup>10</sup> <http://rio20.net/en/documentos/treaty-on-environmental-education-for-sustainable-societies-and-global-responsibility/>

<sup>11</sup> See Sylvia Almeida and Amy Cutter-Mackenzie, "The Historical, Present and Future-ness of Environmental Education in India" *Australian Journal of Environmental Education*, Vol. 27, No. 1, Special Issue: (2011), pp. 122-133, [https://www.jstor.org/stable/44668283?read-now=1&seq=2#page\\_scan\\_tab\\_contents](https://www.jstor.org/stable/44668283?read-now=1&seq=2#page_scan_tab_contents). See also Indian Institute of Ecology and Environment - <http://www.ecology.edu/environmentaleducation.html>

<sup>12</sup> <https://elaw.org/content/india-mc-mehta-v-union-india-wp-8601991-19911122-environmental-education-case>

<sup>13</sup> <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>.

<sup>14</sup> Jo-Ann Ferrera et al. *Learning to Embed Sustainability in Teacher Education* (2019) Springer Briefs in Education, 2019 at p. 12

– *Promoting Education, Public Awareness and Training* has 26 paragraphs on education, focusing on three areas:

- (1) Re-orienting education towards sustainable development
- (2) Increasing public awareness
- (3) Promoting training

Paragraph 36(3) cogently expresses the aims and methods of education for sustainable development, emphasizing that both formal and informal forms of education are important, and that ethical values and awareness are needed, together with the need for public participation.<sup>15</sup>

#### Sustainable Development Goal 4-7

It is clear that the 17 SDGs can only be achieved if all countries ensure that the education of its population is linked with education on environmental sustainability. Thus, SDG 4.7 reads:

“Ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and nonviolence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development.”

UNEP implemented a Global Action Plan on Sustainable Development from 2015-2019. ESD is reinforced in the 2017 UNESCO Report *Education for Sustainable Development Goals - Learning Objectives*, which emphasized that “People must understand the complex world in which they live. They need to be able to collaborate, speak up and act for positive change”.<sup>16</sup> Education for Sustainable Development seeks to help them develop “key competencies for sustainability”. Again, the Report emphasized that each nation must strive to address these issues. As each country seeks to implement ESD, much has been written on the many challenges.<sup>17</sup>

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<sup>15</sup> “36.3. Education, including formal education, public awareness and training should be recognized as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. While basic education provides the underpinning for any environmental and development education, the latter needs to be incorporated as an essential part of learning. Both formal and non-formal education are indispensable to changing people’s attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making. To be effective, environment and development education should deal with the dynamics of both the physical/biological and socio-economic environment and human (which may include spiritual) development, should be integrated in all disciplines, and should employ formal and non-formal methods and effective means of communication.”

<sup>16</sup> <https://www.sdg4education2030.org/education-sustainable-development-goals-learning-objectives-unesco-2017> - at p.10 para 1.1.

<sup>17</sup> These include: J Salmon “Are We Building Environmental Literacy?”, [2000] *Journal of Env Education* Vol. 31 No.4, pp 4-10. Stewart J Hudson, “Challenges for Environmental Education: Issues and Ideas for the 21<sup>st</sup> Century”; *BioScience* April 2001/Vol. 51 No. 4 pp 283-288; David Grunewald “A Foucauldian Analysis of

So, what then, is the difference between Environmental Education (EE) and Education for Sustainable Development (ESD)? There is a continuing debate on this but it can be said that ESD goes beyond a focus on the biophysical environment and its inter-connection with humans.<sup>18</sup> It seeks to improve the capacity of the people to address environment and development issues, enhance their awareness of environmental and ethical issues as well as develop their values, attitudes, skills and behaviour so that they can play an effective role and make the right decisions in their work and in the way they live, to ensure a sustainable planet. Each nation will have to craft its education on the environment to ensure that it addresses the issues of sustainable development. It is best expressed in the Bonn Declaration (2009):

ESD helps to change societies to address different priorities and issues, *inter alia*, water, energy, climate change, disaster and risk reduction, loss of biodiversity, food crisis, health risks, social vulnerability and insecurity. It is critical for the development of new economic thinking.

ESD contributes to creating resilient, healthy and sustainable societies through a systemic and integrated approach. It brings new relevance, quality, meaning and purpose to education and training systems. It involves formal and informal education contexts, and all sectors of society in a lifelong learning process.<sup>19</sup>

Some examples of ESD projects and programs taken from round the world include:

#### 1. The Global Schools program

This is an initiative led by the *UN Sustainable Development Solutions Network - Youth Initiative (SDSN Youth)* in support of UNESCO's Global Action Program on Education for Sustainable Development (GAP-ESD). The program provides the necessary tools and resources for schools and teachers to educate their students on the SDGs. In working with educators, the program aims to transform learning environments globally to empower students to prioritize sustainable development in their lifestyles, behaviors, education and professional careers. Currently, the Global Schools Program is being conducted in North

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Environmental Education: Toward the Socioecological Challenge of the Earth Charter" in *Curriculum Inquiry* 34(1):71 - 107 · March 2004; John C Smyth "Environment and education: A view of a changing scene", (2005) *Environmental Education Research*, Vol. 1 (1) pp. 3-20; D T Blumstein & C Saylan The Failure of Environmental Education (and How We Can Fix It)" May 2007 *PLoS Biology* Vol. 5, Issue 5, pp 973-977; R B Stevenson, "Schooling and environmental education: contradictions in purpose and practice", (2007) *Environmental Education Research*, Vol. 13 No. 2 (April 2007, pp 139-153); Arjen E J Wals et al "Convergence Between Science and Environmental Education", *Science*, Vol. 344, 9 May 2014.

<sup>18</sup> See eg. D Tilbury "Environmental Education for Sustainability: defining the new focus of environmental education in the 1990s", *Environmental Education Research* Vol 1, 1995, issue 2; M Bonnett (1999) "Education for Sustainable Development: a coherent philosophy for environmental education?", *Cambridge Journal of Education*, 29:3, 313-324; Bob Jickling & Arjen E. J. Wals (2008) "Globalization and environmental education: looking beyond sustainable development", *Journal of Curriculum Studies*, 40:1, 1-21; H Kopnina "Education for Sustainable Development (ESD): the turn away from 'environment' in environmental education?" (2012) 18 *Environmental Education Research* Vol. 2, Issue 5 pp 699-717.

<sup>19</sup> UNESCO World Conference on Education for Sustainable Development, Bonn (2009), Paragraph 7. <https://unesdoc.unesco.org/ark:/48223/pf0000185055>

America, South America, Asia, Africa, Europe the Middle East and Australia with hundreds of schools participating<sup>20</sup>.

## 2. Australia, New Zealand, UK and US

Various jurisdictions have started to promote sustainable or green schools. The United Kingdom has a *Green Schools* project.<sup>21</sup> Australia started its Australian Sustainable Schools Initiative.<sup>22</sup> This is a partnership of the Australian Government and the States and Territories that supports schools to develop a whole school approach to *Education for Sustainability (EfS)*. This program encourages schools to be 'sustainable schools', so as to embed sustainability within the culture of the school, as well as connect with other cultures including aboriginal cultures. New Zealand has an *Environmental Education for Sustainability Strategy and Action Plan 2017-2021*<sup>23</sup> with a strong focus on understanding indigenous (Maori) culture and ethics on the environment. Green schools are just starting in New Zealand.<sup>24</sup>

In the United States, the National Association for Environmental Education (NAEE) was established in 1971 and later renamed the North American Association for Environmental Education (NAAEE), with members from the United States, Canada and Mexico.<sup>25</sup> Environmental education is strongly supported by the Environmental Protection Agency (EPA) which was mandated by the National Environmental Education Act (1990) to provide national leadership to increase environmental literacy.<sup>26</sup> EPA established the Office of Environmental Education to implement the National Environmental Education Training Program for teachers.<sup>27</sup> The US also passed the *Every Student Succeeds Act* (2015) which provides funding for environmental education<sup>28</sup>.

## 3. The Philippines

The Philippines is a developing country that has made considerable effort in environmental education. In 2008, the National Environmental Awareness and Education Act

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<sup>20</sup> <https://www.globalschoolsprogram.org/current-schools>

<sup>21</sup> <https://www.greenschoolsproject.org.uk/about-us/>. See also the UK National Association for Environmental Education at <http://naee.org.uk/>

<sup>22</sup> This followed the Federal Government's 2009 National Action Plan for Education for Sustainability entitled *Living Sustainably* <https://sustainability.ceres.org.au/resource/australian-sustainable-schools-initiative-act/>.

<sup>23</sup> See <https://www.doc.govt.nz/about-us/our-policies-and-plans/education-strategies/environmental-education-for-sustainability-strategy-and-action-plan/strategy-and-action-plan-20172021/>. See also <https://nzcurriculum.tki.org.nz/Curriculum-resources/Education-for-sustainability/Tools-and-resources/Guidelines-for-Environmental-Education-in-New-Zealand-Schools#collapsible4>

<sup>24</sup> <https://educationcentral.co.nz/green-school-is-coming-to-new-zealand/>

<sup>25</sup> See <https://naee.org/>.

<sup>26</sup> <https://www.epa.gov/education>. The US also has a Centre to promote Green Schools -see <https://www.centerforgreenschools.org/about>. See also Doris Zhang "The Roots of Environmental Education in the US (5 May 2017) <https://commons.trincoll.edu/edreform/2017/05/the-roots-of-environmental-education-in-the-us/>

<sup>26</sup> <http://rio20.net/en/documentos/treaty-on-environmental-education-for-sustainable-societies-and-global-responsibility/>

<sup>27</sup> <https://www.epa.gov/education/national-environmental-education-training-program>

<sup>28</sup> See n. 9 above.

(2008)<sup>29</sup> was passed “to promote environmental awareness through environmental education”. November of every year is "Environmental Awareness Month" throughout the Philippines. The Philippines also passed its Climate Change Act (2009) “mainstreaming climate change into government policy formulations...”<sup>30</sup> Encouraged by these very supportive laws and policies, many environmental education programs and activities have been initiated in the Philippines.<sup>31</sup> The NGO *Fostering Education & Environment for Development, Inc.* (“FEED”) supports sustainable education & tree-planting/nurturing, aiming to inclusively grow, preserve and protect Philippine biodiversity – marine and terrestrial – through integrated social forestry programs, community development & livelihood initiatives, and scientific and practical research into agricultural, environmental, farming, forestry, fisheries and sustainability studies.”<sup>32</sup>

#### 4. India

In the 1991 decision of *MC Mehta v Union of India*<sup>33</sup>, the Supreme Court gave directions that the environment should be taught as a compulsory subject at every level of education, and that all universities should prescribe a compulsory course on environment. The National Policy on Education of 1986 states the “paramount need to create a consciousness of environment which must permeate all ages and all sections of society beginning with the child” and recommends the integration of environmental consciousness into the entire educational process. The National Council for Educational Research and Training confirms that Environmental Studies has been inducted into primary, secondary and higher secondary stages.<sup>34</sup>

UNEP has showcased five landmark and diverse ESD Initiatives from India, set in five different locations across the country, and culled from five different organisations - Centre for Environment Education (CEE), The Energy Research Institute (TERI), Wildlife Institute of India (WII), Dusty Foot Productions, and WWF.<sup>35</sup> The Report concluded that “Hunters were now wildlife educators in Chizami, Nagaland; village boys and girls from Sagar Islands, Sunderbans turned fearless filmmakers as they staunchly defended their vision of

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<sup>29</sup> Republic Act No. 9512. See [https://lawphil.net/statutes/repacts/ra2008/ra\\_9512\\_2008.html](https://lawphil.net/statutes/repacts/ra2008/ra_9512_2008.html)

<sup>30</sup> Republic Act 9729 - <https://www.officialgazette.gov.ph/2009/10/23/republic-act-no-9729/>

<sup>31</sup> A. Galang, “Environmental Education for sustainability in high education institutions in the Philippines”, (2010) *International Journal of Sustainability* Vol. 11 No. 2 pp 173-183; see also [Gaudencio M. Alaya-ay | Rolando C. Cuizon | Exequiel Tadeo Tagum](#) “Teaching Environmental Education in Raising Pupils' Environmental Awareness: A Process Approach, (2012) *IAMURE International Journal of Social Sciences*, 2(1); [Annelies Andringa-Davis](#), “Environmental Education at Local Schools” - <https://www.marineconservationphilippines.org/environmental-education-local-schools/>

<sup>32</sup> <https://feed.org.ph/directory-of-environmental-education-institutions-in-the-philippines/philippine-environmental-education/>

<sup>33</sup> <https://elaw.org/content/india-mc-mehta-v-union-india-wp-8601991-19911122-environmental-education-case>

<sup>34</sup> See recent critique by Pratik Phadkule, “Facilitate learning about the environment” <https://www.deccanherald.com/opinion/panorama/facilitate-learning-about-environment-806638.html>, Feb 20, 2020

<sup>35</sup> *Good Practice Stories on Education for Sustainable Development in India*, UNESCO 2014, IN/2014/SC/67..

sustainability; school children in Mysore, Karnataka turned untiring saviours of their lake; in Chandigarh, Punjab a young girl took the message of recycling to semi-urban areas, and in Bharatpur, Rajasthan the son of a rickshaw puller now aspires to be a nature guide. The one guiding force: the ESD approach being followed in their respective schools and communities which empowered them to make a change in their lives and surroundings so that nature could be nurtured".<sup>36</sup>

## **5. Regional Initiatives – ASEAN**

An example of regional initiatives on environment education is the Association of South-East Asian Nations (ASEAN). It has established an ASEAN Working Group on Environmental Education (AWGEE). Three Environmental Education Action Plans were developed for the periods 2000-2005, 2008-2012 and 2014-2018. Key activities included the ASEAN Eco-Schools Program, the ASEAN Green Higher Education Program (led by the Philippines) and Regional Communication, Education and Public Awareness Initiatives – these include the ASEAN Plus Three Youth Environment Forum, the ASEAN Youth Eco-Champions Award and the ASEAN Environment Year which is celebrated every three years.

## **6. UNESCO Awards for ESD**

The UNESCO-Japan Prize on ESD started in 2015 to recognize the role of education in connecting the social, economic, cultural and environmental dimensions of sustainable development.<sup>37</sup> There are three winners each year, each receiving US\$50,000. The first award was made in 2015.

One of the most interesting is the Kalabia Foundation's programme 'Environmental Education for the Heart of the Coral Triangle' (2018 winner).<sup>38</sup> The Kalabia is a 34-metre long ship that brings interactive marine conservation education to more than 100 remote coastal villages of Raja Ampat, West Papua, Indonesia. Its rich marine resources are under threat from destructive fishing and poaching as well as emerging threats, such as improper waste disposal, and compounded by climate change. The Kalabia teaches whole communities that by using unsustainable practices they are undermining their own future. Staffed with local educators, this innovative floating platform tours the islands offering 4-day intensive education programmes to children, while involving the communities.

### **D. Evaluation**

Notwithstanding the above examples of laudable implementation of ESD, the 2009 meeting at Bonn reported that "The progress of ESD remains unevenly distributed and requires different approaches in different contexts."<sup>39</sup> In 2016, a special report on Target

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<sup>36</sup> Ibid, at p. 9. Another laudable initiative is the Uttarakhand Seva Nidhi Environmental Education Centre, which has worked with village communities in Uttarakhand since 1987, undertaking environmental education in schools and villages in these mountain districts. See <http://www.sevanidhi.org/aboutus.html>

<sup>37</sup> <https://en.unesco.org/prize-esd>

<sup>38</sup> <https://en.unesco.org/prize-esd/2018/kalabia>

<sup>39</sup> Ibid n 20 above, paragraph 15.

4.7 commissioned by UNESCO examined 94 country reports and concluded that “sustainable development” is a growing concept in education policies, reported by only 51% of member states. Only 12% prioritized sustainable development with a dedicated or stand alone policy, plan or law as a guiding framework.<sup>40</sup> This is a most disappointing record. This paper advocates the following actions to strengthen efforts at attaining SDG 4-7 in ESD by 2030:<sup>41</sup>

### 1. Constitutional protection for the Right to Education

It is firstly essential that everyone has access to education. The right to education has been recognised as a human right in Article 26 of the Universal Declaration of Human Rights (1948)<sup>42</sup> and Articles 13 and 14 of the International Covenant on Economic, Social and Cultural Rights (1966)<sup>43</sup>. This right should be enshrined in the Constitution of each country, so that all persons, especially females and the disadvantaged, will have equal access to education. This must be reinforced with a clear statement in the Constitution for gender equity.

### 2. Government policies and integration with civil society

Governments must prioritize ESD into national policies on education to increase public awareness and understanding about ESD through formal and informal learning. The Ministries of Education worldwide must work together with teachers to ensure the incorporation of ESD into mainstream education in both formal and informal programs, at all levels, from pre-primary to university levels. ESD policies and training should be implemented through government and inter-agency policies that involve civil society including non-government organisations, unions, religious and community groups, as well as the business and corporate sectors.

### 3. The media as partners in ESD

More efforts should be made to use the media (television, radio, the internet, etc) to reach all sectors of society and provide on-going education in environmental issues.

### 4. Transforming the learning environment

The learning environment provides an ideal first setting for the practice of ESD. Thus, governments should encourage and support sustainable learning environments such as eco-schools, and green campuses incorporating sustainability practices into campus operations, policy and management. These reduce the institution’s ecological footprint and serve as a

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<sup>40</sup> Claire McEvoy, *Historical efforts to implement the UNESCO 1974 Recommendation on Education in light of 3 SDG Targets* - see <https://unesdoc.unesco.org/ark:/48223/pf0000247275>. This report also focused on SDGs 12.8 and 13.3.

<sup>41</sup> See also the Call for Action in the 2009 Bonn Meeting

<sup>42</sup> <https://www.un.org/en/universal-declaration-human-rights/>

<sup>43</sup> <https://www.ohchr.org/en/professionalinterest/pages/cescr.aspx>. The meaning of a right to education is explained in this UNESCO site - <https://en.unesco.org/news/what-you-need-know-about-right-education>. This right has also been affirmed in the UNESCO Convention against Discrimination in Education (1960), the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) (1981), the Convention on the Rights of Persons with Disabilities (2006), and the African Charter on Human and Peoples’ Rights (1981).

practical model for students. Ideally, tertiary institutions should have a dedicated School for the Environment, but where this is not possible, efforts should be made for the effective collaboration of different faculties to mount multi-disciplinary and inter-disciplinary programs on the environment. The learning environment should also go beyond the classroom. Outdoor classes and field trips to nature sites or even to a field nearby, should be mandated. This is especially important for students in the urban environment.

#### 5. Building capacities of educators

Educators and trainers are agents that facilitate ESD. Each nation must therefore invest in first educating their educators and trainers in ESD. Capacity-building of teachers must be a continuous process to ensure they keep abreast of new teaching tools and technology. The international community should provide scholarships for teachers from developing countries as well as assist in building schools and facilities for a sound learning environment. Participation at international and regional workshops and conferences, and collaboration with other institutions should be encouraged and facilitated by international funding for developing states.

#### E. Challenges presented by Covid-19

The corona virus Covid-19 has shown the world its vulnerability to global pandemics. Offices and schools have had to be closed, and classes conducted remotely via video-conferencing and the use of virtual platforms. This requires students to possess computers and laptops in their homes. However, these are not available to many developing states, some of which even lack access to electricity. These are glaring inequities in the global community and call for effective national and international governance and management to help developing states build the infrastructure as well as provide students with the hardware for e-learning.

#### Conclusion

ESD has an extremely important role to play in the achievement of the SDGs as it ensures that all persons will understand the fragility of the earth and will be inspired to be its stewards, even as each nation seeks economic development. Traditional systems of education must be revised to ensure incorporation of environmental perspectives and changes in pedagogy, as well as a constant upgrading of skills in technology and innovation. The environment can be restored through sustainable education programs that are cross-disciplinary, involving science, technology, social studies, economics, public policy, culture and ethics. The multi-disciplinary Masters in Environmental Management (MEM) program at the National University of Singapore is one such model. Emulating such programs through inclusive education will secure a more sustainable future for all.

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**Actions needed :**

- Constitutional protection for the Right to Education
- Cogent and consistent Government policies and integration with civil society
- The media as partners in ESD
- Transforming the learning environment
- Building capacities of educators

**CASE STUDY – IMPLEMENTING SDG 4 –  
EDUCATION IN SUSTAINABLE DEVELOPMENT  
THE MASTERS IN ENVIRONMENTAL MANAGEMENT (MEM) PROGRAM,  
NATIONAL UNIVERSITY OF SINGAPORE**

The Master of Science (Environmental Management) [MEM]<sup>44</sup> program at the National University of Singapore (NUS) is a unique and innovative program involving the collaboration of nine faculties/schools at NUS. These are: the Faculties of Arts and Social Sciences; Engineering; Law; and Science; the Lee Kuan Yew School of Public Policy, the NUS Business School, the Saw Swee Hock School of Public Policy, the Yong Loo Lin School of Medicine, and the School of Design and Environment, which hosts the program. It was the result of the realisation of a core group of teachers from different disciplines, that while each faculty /school had specific courses on the environment in their discipline, there was no one program to put these specialties together, to form a coherent and integrated whole. As the environment has many dimensions, it is essential that students from different disciplines are well informed and educated on the many components that comprise the environment, their inter-dependence, and their synergies. This is particularly important as countries acknowledge the need for development to be integrated with a sustainable environment. The MEM program seeks to provide students with both a multi-disciplinary perspective as well as an inter-disciplinary perspective. This will ensure that graduates from this program can play a leading role in protecting the environment as well as enhancing earth's natural resources, while engaged in development and economic activities.

The program is targeted at senior and mid-level managers and officers in corporations, government and non-government organisations in Singapore, South-east Asia, the Asia-Pacific region, and beyond. It focuses on managing the environment sustainably, from the perspective of different disciplines, as well as from the national, international and regional perspectives. As this is a graduate program, students must first have a college degree at the Bachelor level, with Honors, from a reputable university. They can come from any discipline – this in itself is a strength of the program, as students can learn from each other in class discussions and projects. Many students have a first degree in engineering or the sciences (especially biological science), but there are also graduates from law and the arts (geography, economics, English), business, computer science and even veterinary science. Thus, the program has engineers, scientists, lawyers, journalists, teachers and even a veterinary surgeon among its graduates.

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<sup>44</sup> Ideally this program should not be an M.Sc. as it traverses other disciplines beyond the sciences. However, an industry survey was conducted prior to its launch, as part of preliminary studies on its marketability, and it was found that while the MSc degree was well recognised and readily acceptable, the title “Masters in Environmental Management” was unfamiliar to most at that time (2001). So a decision was made to call it the M.Sc. (Environmental Management) but we refer to it as the Masters in Environmental Management or MEM for short. Nineteen years later, it is now an opportune time to discuss whether to rename this program, the Masters in Environmental Management without ascribing a Science focus which in fact, is rather misleading.

## **Program Structure**

The program can be undertaken either full-time (two semesters - one academic year) or part-time (four semesters, two academic years). Those who work in Singapore often choose to do it part-time. The program facilitates this by conducting all classes in the evenings, from 6.30 pm to 9.30 pm. Classes are taught by academic staff members, senior persons in industry, the professions and government, as well as visiting professors from partner institutions, particularly the Yale School of Forestry & Environmental Studies.<sup>45</sup>

The main components of the program are a group of **seven core modules** taught by staff members from six of the nine faculties/schools. These are :

- (1) *Environmental Science* - taught by professors from the Faculty of Science
- (2) *Environmental Law* – taught by professors from the Faculty of Law
- (3) *Environmental Technology* - taught by professors from the Faculty of Engineering
- (4) *Business and the Environment* - jointly taught by a team comprising professors from the School of Design and Environment (SDE), the Business School, leading practitioners and a professor from Yale FES.
- (5) *Environmental Economics and Public Policy* – taught by a professor from the Lee Kuan Yew School of Public Policy; previously taught by a professor from the Department of Economics, Faculty of Arts and Sciences
- (6) *Environmental Management and Assessment* – taught by specialists from the private sector
- (7) *Environmental Planning* – taught by professors from SDE

Students who have a background in one or more of these modules in their earlier studies may not be allowed to do a similar module, and will be required to pick another module relating to the environment -eg, a graduate from environmental engineering, may not be allowed to do the module on Environmental Technology.

Apart from these seven modules, there is a **compulsory research component**. Each student must complete either a Dissertation of 20,000 words, or a Study Report of 10,000 words, and an elective module from any of the nine partner-faculties and schools. This includes modules from the other partners in this program – the Medical School, School of Public Health and the Faculty of Arts and Social Sciences. Students must also attend a **non-examinable module on Environmental Ethics** as well as a **series of Seminars** held every fortnight which features talks on different themes related to the environment, conducted by guest speakers from different professions, non-government organisations, and industry, including visitors from abroad. Indeed, teachers and faculty representatives take special

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<sup>45</sup> The program has signed Memoranda of Understanding (MOUs) with Yale's School of Forestry & Environmental Studies and Duke University's Nicholas School for the Environment.

pains to invite interesting persons that they meet socially or at networking sessions, to speak at these seminars. The seminars are open to the NUS community as well as members of the public, as part of the program's efforts to educate the general community and raise awareness on environmental issues.

### Pedagogy

Classes are taught using various pedagogies, including interactive lectures, case studies, seminars, workshops and field trips to relevant environmental sites and projects in Singapore and overseas. Each teaching session is three hours in duration, and classes are held in the evening; most classes start at 6.30pm.

### Assessment

The performance of a candidate on each of the modules on the MEM programme is assessed through a combination of continuous assessments and final examination. Continuous assessment may take the form of Assignments, Projects on which reports are prepared and Presentations made, by individual candidates or groups of students, term papers and tests. There is also a strong research component mentioned earlier, with supervisors coming from the different disciplines depending on the topic chosen. It is not unusual for students to write on an area that traverses different disciplines, in which case co-supervisors would be appointed from different faculties/schools. The best student papers are published every few years in the series *Environment Matters*. To date, there are six volumes in this series, edited by staff members from the different disciplines.<sup>46</sup>

### ***Program Management***

The program's Director and Deputy Director are from the School of Design and Environment (SDE), which hosts the program. The program is administered by a *Program Management Committee* (PMC) which comprises a representative from each of the nine faculties and schools that are involved in this program.<sup>47</sup> The PMC meets from time to time to discuss policies and future directions for the program. Its individual members participate in the interview process to select students for admission, as well as help find supervisors and examiners for the research papers, which are a core component of this program.

### Evaluation

The program draws on the strength of Singapore's experience as a city state in an urban environment. It focusses on managing the urban environment in a sustainable way, to ensure that all development processes and projects are implemented without damaging the environment. In the course of some 18 years, some 330 students have graduated, coming from some 28 countries. While about half are from Singapore, the other students have come from India (51), China (including Hongkong) (20), Malaysia (12), Vietnam (12), Philippines (10), Bangladesh (10), Indonesia (6), Sri Lanka (6), Pakistan (5), Myanmar (5), USA (5), England

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<sup>46</sup> The latest volume was published in 2018, entitled *Sustainability Matters: Environmental Management in the Anthropocene*. It comprised 15 chapters in the fields of Biodiversity and Conservation, Environmental Science, Environmental Governance and Management, Energy, and Urban Studies; Lye Lin-Heng, Harvey Neo, Sekhar Kondepudi, Yew Wen-Shan and Judy Sng GK (eds), World Scientific.

<sup>47</sup> This writer, from the Law Faculty, has chaired the program since its inception in 2001, to 2019. The new chair is a professor from the Business School.

(4), Thailand (2), Japan (2), Korea (2), Germany (2) and one student each from Norway, Canada, Maldives, Mauritius, Iran, Greece, Serbia, Czech Republic, France and Sweden.

These graduates came from different disciplines and from different parts of the world. They are now capable environmental managers and, being possessed of a keen understanding of the many dimensions and perspectives that relate to the environment, are in a position to take leadership roles in their organisations. Our graduates are now employed in government ministries and institutions in a multitude of countries, as well as in international, regional and national organisations, corporations, non-governmental organisations, universities, schools and other institutions of learning. Many of our graduates from abroad have joined international NGOs such as WWF and TRAFFIC (which monitors wildlife trade), IUCN in Pakistan, UNDP in Jakarta, Nepal and Vietnam, and USAID and Freeland in Bangkok, Thailand, which works with ASEAN's Wildlife Enforcement Network to monitor wildlife trade in the region. Those who have obtained PhDs are teaching environment-related courses at leading universities in the region.

The success of the MEM program led to the conceptualisation of a new multi-disciplinary and inter-disciplinary program at the undergraduate level in NUS, with the collaboration of the same nine faculties/schools. This is the **Bachelor in Environmental Studies (BES) program**,<sup>48</sup> launched in 2011. The BES program is jointly hosted by the Faculty of Arts & Social Sciences (FASS), and the Faculty of Science, with the collaboration of the other seven faculties/schools as are involved in the MEM program. It is a **four-year direct honours** program. Its interdisciplinary nature requires students to acquire a strong foundation in environmental issues through a two-year, broad-based curriculum, as they complete modules in biology, chemistry, economics, geography, law, management, math, policy, public health and statistics.<sup>49</sup> Students then choose to specialize in either the Science or Social Studies theme in their 3<sup>rd</sup> and 4<sup>th</sup> years, whereupon they go to the Department of Biological Sciences at the Faculty of Science or the Department of Geography at the FASS respectively. Some BES students have proceeded after graduation, to do the MEM program.

### **The Future – Lifelong learning**

As the MEM program is approaching its 20<sup>th</sup> year (in 2021), it is timely to review the program and this is being done now. We see clear synergies with the UN's Education for Sustainable Development. In recent years, Singapore has moved to facilitate "lifelong learning", which is emphasized in SDG 4, to ensure it remains competitive in a globalised interconnected world. This requires its workforce to be nimble, and able to adapt to new challenges by developing new skills and mindsets.<sup>50</sup> NUS has established a School of Lifelong

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<sup>48</sup> <http://envstudies.nus.edu.sg/>

<sup>49</sup> <http://envstudies.nus.edu.sg/programme/requirements/>

<sup>50</sup> See Robert Kamei, "How Singapore encourages lifelong learning and workforce resilience", <https://thediomat.com/2017/10/how-singapore-encourages-lifelong-learning-and-workforce-resilience/>. A Committee for the Future Economy was established in January 2016 to develop strategies for long term economic growth (see <https://www.mti.gov.sg/FutureEconomy/Resources>). Educational institutions are now encouraged to work closely with industry to ensure that programs are matched to market needs, and to encourage "modular" programs based on short courses or targeted certifications, using new technologies and pedagogical methods such as flipped classrooms. The Singapore Ministry of Education's *Skills Future Singapore* offers direct financial subsidies of SGD\$500 to all Singapore citizens above 25 years of age, to pursue a pre-approved list of courses. (see <https://www.skillsfuture.sg/AboutSkillsFuture#section2>)

and Continuing Education (SCALE)<sup>51</sup>. Its vision is “To provide opportunities for lifelong learners to stay relevant and competitive in the global workplace, through innovative continuing education offerings.” Courses in both the BES and MEM programs may be open to the public in the near future. This is being discussed now. Indeed, new modules should be developed, such as data analytics, the internet of things, public health and the environment (“well and green”), sustainable finance, smart & sustainable urban environments, climate change justice; human rights and policies, religion and the environment etc.

Finally, returning to the SDGs and environmental education, it is submitted that multi-disciplinary and inter-disciplinary programs like the MEM should be taught in every college and in every country, at both undergraduate and postgraduate levels. While it is difficult for a tertiary institution to have a dedicated school for the environment, most institutions of higher learning would have various faculties and schools in the different disciplines, and courses / modules relating to the environment in their respective fields. The teachers in each discipline should combine their efforts and start a program that takes a holistic look at the environment. This requires initiative on the part of individual staff members, as well as support from the deans and the university’s administration. This was found in the NUS team that started the MEM program, and the administration was supportive. In turn, the teachers have found their lives enriched by the warm friendships built across disciplines, and both staff and students have enhanced their knowledge and understanding of the vastness and intricacies of the earth and its environment and the inter-connection of the different disciplines. Indeed, there should be more partnerships with other tertiary institutions for staff and student exchanges and NUS should expand their partnership links. This then, is the way forward for environmental education in the 21<sup>st</sup> century.

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<sup>51</sup> <https://scale.nus.edu.sg/programmes/faq>