

Environmental Ethics Education

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Acronyms

AuSSI	Australian Sustainable Schools Initiative
DEEC	Department of Environmental Education and Communication
DESD	Decade of Education for Sustainable Development
DEWHA	Department of the Environment, Water, Heritage and the Arts
EE	Environmental Education
EEE	Environmental Ethics Education
EEREE	Environmental Ethics and Renewable Energy Education
ES	Environmental Science
IEEP	International Environmental Education Program
NSW DET	New South Wales Government Department of Education and Training
RE	Renewable Energy
SDG	Sustainable Development Goals
UDBHR	Universal Declaration on Bioethics and Human Rights (UNESCO 2005)
UN	United Nations
UNEP	United Nations Environmental Program
UNESCO	United Nations Educational Scientific and Cultural Organization
UNU	United Nations University

Executive Summary

This report aims to promote a greater understanding of the diverse approaches to teaching environmental ethics. It seeks to define concepts, sample programs and identify good practices in environmental ethics teaching, as well as to encourage communication and collaboration through the sharing of diverse experiences. This book hopes to build a conceptual framework for understanding the nature of environmental ethics teaching and learning.

There is no standardized approach to teaching environmental ethics, no single “appropriate” method, nor is there a “correct” view of what is environmentally ethical behavior. This book will highlight some of the diverse strategies used in teaching and fostering ethical development among different countries and communities, providing a discussion of the various frameworks used in the planning, organization and education on the subject of environmental ethics.

Environmental ethics is an important component of bioethics, and both are interdisciplinary. Environmental Ethics Education (EEE) should be considered an essential component of Environmental Education (EE). EEE is found in both formal and non-formal education, and is critical to implement the Sustainable Development Goals (SDGs).

After general analysis the later half of the book presents illustrative case studies of Environmental Ethics Education (EEE) in India, Vietnam, the Philippines, and Thailand. The case studies present examples of the roles that law and society can play in EEE, for example, the case of Animal Ethics and Promoting Sea Turtle Conservation demonstrates EEE with examples of materials that can be used. The case study of bioethics education in Thai secondary schools is linked to the concept of sufficiency economy. Through linkage of practical examples and theoretical concepts, we hope that this book will stimulate readers to apply innovation to sustainable change to love life and the environment.

1. Humans and Nature

1.1. Humans are a part of Nature

Humans are part of nature and must learn how to behave towards one other and interact with the environment. There are three distinct levels or systems of being in nature, including social, biological and physical. Each level or system of being obeys its own laws in addition to other levels. "They are, in reverse order: (a) the physical planet, its atmosphere, hydrosphere (waters), and lithosphere (rocks and soils), all of which obey the laws of physics and chemistry; (b) the biosphere, all living species, which obey the laws of physics, chemistry, biology and ecology; (c) the technosphere and sociosphere, the human created world of buildings and machines, governments and economies, arts and religions and cultures, which obey physical, chemical, biological and ecological laws, and also further laws of human design." (Connect, 1991). All environmental phenomena obey the same underlying physical laws; therefore, they behave much the same everywhere, although their complexity can lead to local variation.

The world consists of elements, interconnections and a function or purpose. There are a variety of world views of nature (Rai et al., 2010), but everything is connected in some ways. Systems are organized into hierarchies, including natural systems, which are finely tuned, stable and resilient. Diversity usually increases this resilience. For example, matter cannot be created or destroyed, such as that the material of the planet stays on the planet, undergoing continuous transformations, powered by the energy of the earth and sun. The materials necessary for life – water, carbon, oxygen, nitrogen, etc. – pass through biogeochemical cycles that maintain the quantity and availability of these materials for living organisms.

1.2. Environmental Ethics

There are common rules to instruct human behavior, as well as professional ethics for a range of professions such as doctors (medical ethics), businesses (business ethics), or teacher's (teacher's ethics), for example. Environmental ethics is a system of values that people express in relation to each other and to nature (Stappand and Cox, 1979). Environmental ethics was mentioned long time ago, for example, "*Self-improving to such an extent that being merged with heaven and earth, in harmony with others means having morals*" Lao-tzu.

Modern western environmental ethics, a field of applied ethics, can be traced back to the writings of Aldo Leopold (1949) who proposed a "land ethic" that included human responsibilities within community to the ecosystem as a whole (Bosworth et al., 2012). Interest in environmental ethics has been spurred on by the growing environmental movement that reflects growing recognition in the limitations of reductionist scientific methodology and technological approaches to dominate or control the natural environment. Rachel Carson, who wrote *Silent Spring* in 1963, brought legitimate concerns regarding the long-term or indiscriminate use of certain pesticides to the attention of the public. This initiated an era of investigative writing for the purpose of

awareness raising as a step in instigating change in the public perception of the “cure all” expectations of the 20th century scientific revolution.

From the second half part of the 20th century, many environmental issues appeared and caused many disasters; therefore, the interest in environmental ethics increased and has become more systematic. It grew sufficiently in the 1980s to see the publication of a journal *Environmental Ethics* and other educational books and resources devoted to environmental philosophy.

Contemporary environmental ethics is built upon diverse viewpoints (Bosworth et al. (2012). In 1973 Arne Naess’s thinking initiated the deep ecology movement that strives towards a biocentric approach where humans are perceived as merely a node or player within the biotic community; the emphasis being placed upon the interdependency of all organisms in the biosphere. Peter Singer wrote *Animal Liberation* in 1973 that urged consideration of sentient animals within ethical frameworks, giving inspiration to the animal rights movement. Holistic approaches to environmental concerns have gained support in the *Gaia* hypothesis put forward by James Lovelock, which draws an analogy between the cyclical changes within the biosphere, atmosphere and lithosphere of the Earth and the homeostatic self-regulation of living organisms. During the 1980’s issues of environmental justice such the location of toxic waste disposal sites gained momentum as civil rights groups highlighted the fact that poorer, possibly voiceless or minority groups were frequently exposed to greater environmental hazards than affluent or powerful communities. Since the 1990’s ecofeminism has stressed a link between the twin oppressions of women and nature; abstract and universalist approaches are generally rejected in favour of relationships founded on care, sensitivity and emotion. More recently some psychologists such as David Kidner in *Nature and Psyche* (2001) have proposed a link between deterioration in human psychosociological wellbeing and a growing distancing from nature.

Collectively these alternative standpoints all urge for an increased level of awareness on the interdependency, fragility and vitality of our natural environment, challenging traditional values and principles of economic growth. Indeed the oft quoted World Commission on Environment and Development report *Our Common Future* (WCED, 1987) definition of sustainable development:

“Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

has been criticised as being both anthropocentric and based upon a classical economic perspective of the meaning and value of development. The positive aspects of this book are that intergenerational responsibility and sustainability were identified on the international agenda. However, true sustainability may require a reassessment of consumerist values and economic systems that do not place the environment at the centre of accounting procedures rather than include it as a commodity that can provide services than be can measured in monetary terms.

Ideas of whether an environmental crisis exists—and to what extent there is such a problem—will differ. Views of nature and its value guide these ethical decisions. According to one perspective, human concerns come before those of the environment,

and the ecosystem can be regarded as a valuable resource for humans. By another view, humans are only one aspect of the greater ecosystem, one species among many. Perhaps we view the environment through a biocentric or anthropocentric perspective. Environmental ethics can be alternatively considered from the utilitarian perspective, by considering intrinsic rights and wrongs, or according to virtue ethics. We could believe that all natural objects deserve to be treated fairly, justly, or equally. Guided by different notions of morality, notions of what is environmentally ethical are certainly diverse.

Environmental ethics is important for all who live on the Earth, inclusive of rich, poor, religious, old, young. Environmental ethics points out not only responsibility among people, but also human responsibility to other creatures or even whole ecosystems in the natural environment. Seeing the value of a creature and recognizing its meaning to ecology is of great importance to environmental ethics. People must be aware of that they are ecological citizens, so that they have to live harmoniously with each other and with nature, following the regulations of nature (in accordance with the laws of nature).

The concepts of *instrumental value* and *intrinsic value* are fundamental to environmental ethics discussions. The two ideas ask: does the natural environment hold value because it allows us to achieve other ends, or does the environment have value in and of itself? Does a natural object such as a fruit have value, by virtue of being a natural object, or does it hold value when it becomes a food to humans and animals? Jameson (2002) argues that since environmental objects have *intrinsic value*, humans, as moral agents, have a duty to protect it. This differs drastically from the view that human beings have intrinsic value, and that all other elements in nature have instrumental value.¹ In this view, the environment has value insofar as being useful to humans, and environmental degradation is instead important because it can impact humans' quality of life in an adverse way (Norton et al., 1995).²

Beyond the value of natural objects, many alternative frameworks guide ethical thinking. The environment can have economically quantifiable value on one hand, or perhaps its value cannot even be quantified in monetary terms—it is invaluable. The environment can be thought of as having costs and benefits, with each environmental decision being calculable (Costanza et al., 1997). We may be concerned with the legal rights of natural objects (Nash, 1989).³ Or perhaps the environment exists only in the human mind, as part of a phenomenological experience. The United Nations' *World Charter for Nature* (1982) states that "every form of life is unique, warranting respect regardless of worth to man." Such a view considers nature to be important, even without being assigned a value by humans.⁴

¹ The "Deep Ecology" movement, started by Naess in 1973, proposed that all living things in the ecosystem have equal intrinsic value.

² Yet, harm towards the environment even when it is an instrument can lead to the loss of humans' moral well-being (Kant). There are many variations to beliefs towards the environment. As one school of thought, deep ecology argues that humans do not have more rights than other forms of life, so therefore it does not have a right to exploit nature. Perhaps in this time, a formal ethics towards nature emerged in the public.

³ This report does not give an exhaustive discussion of environmental ethics.

⁴ For more discussion of views towards the environment, please refer to the Worldviews of Nature project, available on <http://www.eubios.info>

“Right” and “wrong” actions towards the environment will vary according differing traditions, cultures, societies, and institutions. The environment may have sacred value, with rules of conduct towards the environment being referenced in religious texts and beliefs, and for this reason, not imposing harm to the environment is often a belief in many religions. Many environmental ethics programs in the region may have been initiated by religious education institutions, because religious doctrines often guide ethical values. Nature is often considered to have intrinsic value because it was created by a God, a deity or divine power—or nature itself may also be divine. Yet perhaps is not divine at all, only the creation of a divine being.

1.3 Environmental Ethics on the Educational Agenda

While learning and thinking of the human impact on the environment have certainly taken place in many cultures, in the 1960s and 70s, formal education focusing on “environmental ethics” began to develop as a discipline. In 1962, Rachel Carson’s *Silent Spring* raised alarms of the danger caused by chemical pesticides on the human food supply, warning the public that this environmental condition could have negative impacts on human welfare. Though not the first to call attention to this concern; Carson was able to generate widespread awareness among the greater public of an environmental crisis. Several years later, the consequences of human development on the natural environment became the subject of Ehrlich’s *The Population Bomb* (1968) as it alerted the public of the environmental devastation caused by human population growth. Subsequently, many more thinkers called attention to environmental issues, giving rise to environmentalism and forcing a reassessment of the relationship between humans and the environment—both from the perspective of the human impact on the environment, and the environmental impact on humans.

A sense of crisis may be enough to bring about educational attention. Environmental changes that once appeared abstract are now becoming increasingly tangible to our daily lives. Recent crises such as frequent occurrence of flooding, wild-fires and landslides have heightened the value of environmental ethics in the public consciousness, pushing ethical questions to become part of the educational agenda in many countries. Natural disasters, resource scarcities and climate change have all prompted a reexamination of the consequences of human activities on our natural ecology.⁵ Teaching environmental ethics can be considered as a kind of response to environmental crises.

Ministries of Education can mandate the teaching of environmental ethics within the national curricula. On the other hand, teachers may choose to initiate environmental ethics discussions in their classes, integrating the topic even when there is not an explicit curricular focus.⁶ Accordingly, the impetus to teach environmental ethics can come from many sources, as seen in the 1993 International Bioethics Education Survey in Australia, Japan and New Zealand (Macer et al., 1996).

⁵ Several events can give rise to discussions of environmental ethics: resource crises, climate change, industrial advancement, global insecurity as the result of environmental pressures.

⁶The policy for teaching environmental ethics education may come from a variety of sources.

While a religious institution may place emphasis on students' moral development, a secular university's course on environmental ethics in an environmental science program may instead concentrate on decision-making and management of the ecosystem. Environmental ethics teaching can also occur in the context of moral education, as part of "values education" or philosophy education. Environmental concerns have social, political, economic, technological, spiritual and aesthetic dimensions, so environmental ethics can be taught from a variety of academic contexts. Environmental ethics can be taught as a cross-curricular discipline or taught across and within many subjects.

The media and news can be useful tools in the education of environmental ethics (Kirac, et al. 2012). However it is important that news do not direct the curriculum, but are used as discussion tools, and as opportunities to discuss topics that will generate greater impact among learners.

Environmental education is a path for global sustainability (Teixeira, 2013), which is just as relevant for the SDGs as it was for the MDGs. Unless lifestyles change human action on the planet, our life is not sustainable. This brings us to consider sustainable development.

1.4 Environmentally sustainable development

Human beings are still learning how to design a complex, modern, high-productivity industrial economy that more closely follows the planetary requirement of ecological cycles and sustainability. Organic wastes from crops and cities can be composted and returned to the soil. Metals, paper, glass, plastics and exotic chemicals can be reclaimed, re-fabricated and reused, often at great economic and environmental benefit.

Populations of living organisms tend to grow exponentially, when they are able to grow. The limit to the rate of production of any renewable resource base puts an upper boundary, called the carrying capacity, on the number of organisms that can be sustained on that resource base. Carrying capacities can be enhanced or degraded by human activity. Efficient use of resources increases the number of organisms, and people, that can be carried on a resource base. Restoration of a degraded carrying capacity is far more difficult than preservation; prevention of damage is cheaper than the cure.

Sustained development is simply impossible if environmental degradation is allowed to continue. The earth's resources may be considered sufficient for all living creatures' needs, if those resources are widely managed and equitably distributed. Both poverty and affluence can cause environmental problems.

Economic development and care for the environment are compatible, interdependent and necessary. High productivity, modern technology and economic development can co-exist with a healthy environment. They must co-exist, or the development will not be sustainable or humanly livable.

The key to development is the participation, organization, education and empowerment of people. Socially sustainable development is not production-centred; it is people-

centred. Sustainable development must be appropriate not only to the environment and resources but also to the culture, history and social systems of the place where it is to occur. Development must be equitable and fair. Development involves the continuous balancing of opposites and breaking down of barriers and separations between freedom and order, groups and individuals, work and leisure, settlements and nature.

Environmental ethics education can foster a way of creating awareness of sustainable development issues and enhancing knowledge and skills to work individually and collectively for the solution/prevention of environmental problems. It also involves development of cognitive, affective and skill-behavior processes, especially for the development of attitudes and values that motivate people to become involved in environmental problem solving (Hart, 1981). Under the Philippines National Environmental Education Action Plan (NEEAP), EE is considered as a process which promotes learning that leads to action. EEE influences values and attitudes and encourage more responsible behavior and promotes stewardship in which nature has its own value regardless of its value to humans and that humans are morally responsible for decisions relating to the environment (Guzman and Guzman, 2000). Therefore EEE is an integral part of EE in this educational system, which is mirrored to a greater or lesser extent in other South East Asian (SEA) countries.

The study of environmental science can in itself be concerned with the ethics of environmental change. Science education often involves the teaching of implicit ethical values, and to study something as a science is already to place value on its existence (Reiss, 2006). *Environmental science* identifies that a problem exists in the natural environment, and when studying environmental science, students predict, analyze, solve and prevent the ecological and social crises faced in the environment (Macer et al., 2005). Thus, the study of the environment *as a science* already exists within an ethical framework which has identified that there is the extent of the environmental problem.

Scientific inquiries merit ethical assessment. The necessity to find ways of maximizing crop yields, for example, reflects the belief that there may not be a sufficient quantity of crops—it is an ethical statement. According to Reiss, we cannot teach science without teaching ethics. Scientific education cannot be devoid of ethical dimensions, because science itself has privileged certain ethical choices, and because scientific knowledge has been formulated within specific social contexts (Fuller, 1997). Cobern (1998) similarly argues that the separation of science from values have been a relatively recent phenomenon, necessitating the teaching of environmental ethics to bring ethics and science together.

2. From Environmental Education to Environmental Ethics Education

2.1 Global Mandate

It is important to note that much of the international literature concerning environmental education focuses on formal education contexts. While attempts have been made to include all types of environmental education in this section, many sources cited refer exclusively to formal settings.

Environmental education is context specific and depends upon varying cultural understandings and interactions with the natural environment. It is thus, hard to define in a way that encapsulates all the activities that take place under its broad spectrum. All people are engaged with environmental education, although all people do not necessarily agree with each other's understandings of what it is (Barraza et al, 2003). For the purpose of this book it is important to have a starting point to discuss environmental education. In this respect, we can understand that the ultimate aim of environmental education 'is to enable people to understand the complexities of the environment and the need for nations to adapt their activities and pursue their development in ways which are harmonious with the environment' (UNESCO and UNEP, 1978, p. 12).

Within the framework of the above aim, general consensus (Fien and Gough, 1996; Thomas, 2005; Strife 2008; Kassas, 2002; and Lucas, 1980) dictates there are 3 types of environmental education; education *in* the environment, education *about* the environment and education *for* the environment. Education *in* the environment provides direct contact with the environment and aims to increase the learner's awareness of particular environmental issues. Education *about* the environment encourages behaviour change and action by developing the learner's knowledge and by encouraging critical thinking and participation in informed debates. Finally, education *for* the environment aims to 'promote a willingness and ability to adopt lifestyles that are compatible with the wise use of environmental resources' (Fien and Gough, 1996, p.205).

Since the mid 1990s, the term environmental education has increasingly been superseded with terms and concepts such as 'education for sustainable development (ESD)', 'sustainability education' and more recently 'climate change education' and 'education for sustainable societies'. This shift is indicative of the conceptual reconstruction which is 'underpinned by the complexity of the social and political changes occurring throughout the world as consequences of environmental crises and the different perspectives through which they are understood in different contexts' (Barraza, et al, 2003, p. 347). Accordingly, the language used by the UN and international community when referring to programs, activities and publications within the broadening scope of environmental education also reflects and influences these changes. The fact that the UN continually renews the call for environmental education is evidence that there is a global mandate for education of the environment, and the new terms are intended to enliven the efforts of the many governments that have included this in national curriculums and public campaigns.

The background of such changes in terminology can also be linked to a number of recorded debates amongst the international community. In 1972, environmental education was identified as a key agenda item of the UN Conference on Human Environment held in Stockholm, Sweden. As a result of the conference and the subsequent Plan of Action adopted,⁷ UNESCO, UNEP and other interested international bodies set out to establish an international program on environmental education. Worldwide consultations took place from 1975-1977 and provided information and data for the 1977 Tbilisi conference, which launched the International Environmental Education Program (IEEP). The IEEP was active over the next fifteen years and produced a series of resources for a range of audiences.

The Earth Charter (1982) article 14 stated:

“Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life.

a. Provide all, especially children and youth, with educational opportunities that empower them to contribute actively to sustainable development.

b. Promote the contribution of the arts and humanities as well as the sciences in sustainability education.

c. Enhance the role of the mass media in raising awareness of ecological and social challenges.

d. Recognize the importance of moral and spiritual education for sustainable living.”

In 1992, at the UN Conference on Environment and Development held in Rio de Janeiro, Brazil, a shift in how environmental education was viewed and discussed became apparent. The UN Framework on Climate Change also mentions an article on education, training and public awareness. It also says we should promote for climate change, the development and implementation of educational and public awareness programs, and public participation in addressing climate change, training of scientific, technical and managerial personnel. Chapter 36 of Agenda 21⁸ highlights how environmental education was re-orientated towards sustainable development with additional emphasis being placed on public awareness and the promotion of training. In this instance, environmental education became included under the sustainable development umbrella (UNESCO, 1993; Kassas, 2002; Jennings, 2008 and Payne, 2006).

More recently, the UN Decade of Education for Sustainable Development 2005-2014⁹ (DESD) and its affiliated Climate Change Education for Sustainable Education¹⁰ initiative place more emphasis on the economic, social and cultural components of the environment, reaffirming environmental education's place within the sustainable development and/or sustainability agenda. UNESCO and United Nations University (UNU) were the lead UN agencies tasked to work with many countries and academics,

⁷ See: UNESCO and UNEP. 1978. *Intergovernmental Conference on Environmental Education, 1977, Tbilisi, Russia, Final Report*, UNESCO, Paris, France.

⁸ See: UNESCO.1993. *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, UNESCO, Paris, France.

⁹ See: UNESCO.2005a. *United Nations decade of education for sustainable development 2005 - 2014*, UNESCO, Paris, France.

¹⁰ See: UNESCO.2010. *The UNESCO climate change initiative climate change education for sustainable development*, UNESCO, Paris, France.

schools and NGOs on the UN DESD and the Climate Change Education for Sustainable Education.

For the purposes of this book, the term 'environmental education' is used when referring to activities and issues concerning education *in, about* and *for* the environment, which may or may not be categorized as environmental education, ESD, climate change education or education for sustainable societies.

The importance of environmental education is well documented in international literature (Riordan & Klein, 2010; Thomas, 2005; Story & Torres De Oliveira, 2004; Curti & Valdez, 2011, Phelps et al, 2008, Hale, 1993 and Jennings, 2008). It is also a significant part of many traditional Indigenous knowledge systems, although it is usually not referred to as environmental education, nor is it recorded in written form (Jones, 2000 and Ikupu & Glover, 2004). Cited as the 'most powerful mechanism to address the world's environmental challenges' (Cutter-Mackenzie & Smith, 2003, p.502), as the 'key to ensuring economic, cultural and ecological vitality' (Jennings, 2008, p.24) and 'essential to [the] process of social change' (Hale, 1993, p.131) environmental education can play a vital role in changing behaviour and creating action which is favourable to a sustainable future.

The following is a limited overview of recent policy activities, curriculum models and the related results of environmental education initiatives from varying global contexts.

2.2 National Policies

Some literature argues that despite varying levels of support, policy expectations of environmental education are rarely met and when implementation does take place, it seldom produces the outcomes expressed in policy documents (Cutter-Mackenzie and Smith, 2003). Environmental education is highly contextualized and should relate to people's distinct priorities that have arisen from a set of unique circumstances. Thus, it is not possible to provide a 'one size fits all' strategy to environmental education policy development and implementation. Ideally, environmental education should be based upon or at least complemented with local content and policies should reflect this (Curti and Valdez, 2011; Strife, 2008; Phelps et al., 2008).

The UN DESD has reinvigorated the development and implementation of policies concerning environmental education, albeit under the sustainable development banner. Policies and practices have been revisited, revised and created at community, school, regional, national and international levels. Specifically in the Asia Pacific region, a number of states have utilized both UNESCO's International Implementation Scheme for the UN DESD¹¹ and the Asia Pacific Regional Strategy¹² to develop national action plans which address environmental education within broader policy frameworks.

¹¹ UNESCO. 2005b. *United Nations decade of education for sustainable development 2005 -2014: international implementation scheme*, UNESCO, Paris, France.

¹² UNESCO. 2005c. *Working paper: Asia Pacific regional strategy for education for sustainable development*, 2nd edition, UNESCO, Bangkok, Thailand.

However, Fien (2002) suggests that there is an international trend of issuing statements and guidelines supporting the reorienting of environmental education towards sustainable development but concrete policies and plans are rarely realized. Many states have steering committees to drive policy development and implementation, the responsibility of managing such committees and intended plans and policies usually falls under the jurisdiction of either the Ministries of Education or the Ministries of Environment (Payne, 2006; Bhandari and Abe, 2000 and Jennings, 2008).

The following provides an example of various policies and plans which address environmental education.

Living Sustainably: the Australian Government's National Action Plan for Education for Sustainability (Australian Government DEWHA, 2009) is a nationwide policy which 'seeks to ensure that educational activities to promote sustainability use a coordinated, holistic approach to address sustainability's social, economic and environmental dimensions' (Australian Government DEWHA, 2009, p.16). It builds on the first action plan launched in 2000¹³ and represents Australia's contribution and participation in the UN DESD. The plan outlines a whole of government approach to achieve the vision of all Australians having 'the awareness, knowledge, skills, values and motivation to live sustainably' (Australian Government DEWHA, 2009, p. 17).

At a state level in Australia, the New South Wales Government, Department of Education and Training (NSW DET) has had an environmental education policy in place since 1989. A number of revisions have taken place, the latest version being implemented in 2006. The policy 'supports effective environmental education programs...provides guidelines on the management of school resources... and is a starting point for addressing global environmental issues' (NSW DET, 2006). While many schools and teachers in NSW address environmental education it is often done inadvertently, with little or no pre-service or in-service training in environmental education and without any knowledge of the state level policy (Cutter-Mackenzie and Smith, 2003 and Phelps et al, 2008). A similar situation was also evident in the state of Queensland, where a survey revealed that most teachers were not familiar with the state level curriculum guide for environmental education (Cutter-Mackenzie and Smith, 2003).

The Department of Environmental Education and Communication (DEEC) falls under the jurisdiction of the Ministry of Environment and is the most relevant government body for environmental education within Cambodia. Despite being in their infancy, these government bodies have set ambitious plans. Specifically, the DEEC has a work plan to achieve outcomes in four main areas; human resources development, environmental education and training, environmental information and dissemination, and writing and research on environmental information. The DEEC have implemented and achieved a number of environmental education related goals, these include public awareness raising, capacity building and education activities in the formal, non-formal, and informal sectors. However, despite intended plans and these efforts, policy documents have yet to be developed and implemented (Smith and Bunthan, 2006).

¹³Australian Government, Environment Australia, Department of Environment and Heritage 2000. *Environmental education for a sustainable future*, online resource, available: <http://www.environment.gov.au/education/publications/nap/pubs/nap.pdf>

In line with international discussions regarding environmental education, the Korean Ministry of Education has valued the importance of environmental education since the mid 1970s. The necessity of an effective environmental education policy was first cited in the *4th National Curriculum of Elementary, Middle and High Schools* in 1982 and was also cited as one of the 8 key education areas in the *5th National Curriculum of Elementary, Middle and High Schools* in 1987. Since then, the importance of environmental education has been emphasized and revisited in the 6th and 7th national curricula. The inclusion of environmental education in the national curriculum has had a significant impact on the generalization and development of school based environmental education in Korea. However, a specific and/or stand alone national environmental education policy is yet to be realized (Ho Shin, 2008).

In the Philippines, the *National Environmental Awareness and Education Act of 2008*¹⁴ promotes environmental awareness through environmental education. Specifically, the Act adopts a multi-agency approach to ensure environmental education is integrated into curricula across all education sectors (formal, non-formal and informal) and levels (early-childhood through to professional level). Prior to the Act's inception though, there were a number of local and regional levels initiatives that were integrating environmental education into curricula and also raising public awareness of environmental issues. A particularly well established example of such an initiative is the Miriam College Environmental Studies Institute¹⁵ (formerly Miriam Public Education Awareness Campaign for the Environment and the Environmental Education Centre) which has been active in developing curriculum resources for schools, establishing non-formal training programmes, implementing research projects and housing higher education study programmes.

There are a number of associations supporting EEE around the world, and some of these also have guidelines for the teaching of EEE. The North American Association for Environmental Education (NAAEE) has guidelines for the preparation of environmental educators. These guidelines contain a clear statement of some values NAAEE feels environmental educators should follow. According to the guidelines, environmental educators should engage in education that is "appropriate and helpful to the community (item 3.1), and "Model responsible, respectful, and reasoned behavior during instruction." Item 3.2 reads as follows:

"3.2 Emphasis on education, not advocacy. Pre-service educators understand that their commitment as environmental educators is to provide accurate, balanced, and effective instruction - not to promote a particular view about environmental conditions, issues or actions."

The guidelines say that educators should do things like select materials that cover a variety of viewpoints, interpretations or opinions (including those regarding

¹⁴Republic of the Philippines.2008. National Environmental Awareness and Education Act. Republic Act 9512

¹⁵ Miriam College. 2011. *Environmental Studies Institute*, online resource, available: <http://www.mc.edu.ph/esi> <http://philssa.org.ph/members-list/145/public-education-and-awareness-campaign-for-the-environment-miriam-p-e-a-c-e/>

scientific explanations), and weigh evidence based on the validity of data. They should encourage learners to explore these different views, and form and explain their own judgments. To do otherwise undermines the credibility of the educator, in much the same way as we have discussed bias does in science.¹⁶ The call for diversity is something also seen in bioethics education (Macer, 2016).

2.3 Goals of Environmental Education (EE)

Ensuring greater knowledge of nature is a basic goal shared by environmental educators around the world.¹⁷ Ecological ethics education can be made even more effective with understanding of actions played out at the ecosystems level and group level (Pollard, 2016). Environmental citizenship is one of the important aspects of mature citizens, and EE also includes a focus on changing the behaviour of learners.

In some countries there are goals of environmental education enshrined in law. For example in Philippines Republic Act 9512, the Environmental Awareness and Education Act of 2008, stipulates that the state shall promote national awareness on the role of natural resources on economic growth and the importance of environment conservation and ecological balance towards sustained national development. Under this law, it mentions the scope of the environment education, invariably in this manner...inclusion of environmental education in school curricula to reflect all levels, whether they be in private or private schools, the barangay day care, pre-school, non-formal, technical, vocational, professional level, indigenous learning and even the out-of-school youth courses and programs. It talks about a whole range of environmental concepts and principles, environmental laws, the state of international and local environment, what are local best environmental practices, the threats of environment degradation and its impact to human beings, responsibility of the citizenry to the environment, value of conservation, protection and allocation of natural resources in environment and economy in the context of sustainable development. It also includes adapting various models in, waste minimization, segregation, recycle, composting tree planting, freshwater conservation, forest management and conservation, relevant work, opportunities and economic s and other helpful programs for the environment.

The RA 9512 also mentions that environment education needs to be part of the National Service Training Program where the education department in the higher education level and the technical education level must include environmental education and awareness programs under the Republic Act No. 9163, or the NSTP Law, the National Service Training Law which is in our collegiate level. And this serves as part of the civic competency service component required for all collegiate students and education courses with a curriculum of at least two years. It likewise declares November under the law as being National Environment Awareness Month.

Most secondary school curricula include topics, within Science and Geography, addressing environmental issues. For this reason and the fact that many issues are raised in the media, the majority of students could readily list many environmental concerns such as deforestation, climate change, human population growth, energy use

¹⁶ <http://faculty.wwwu.edu/gmyers/ehe/edvalues.html>

¹⁷ <https://www.nature.com/scitable/knowledge/library/environmental-ethics-91387464>

and fuel resource depletion. These science curricula often promote the development of evaluative and analytical thinking skills by encouraging students to predict the consequences of the above through the extrapolation and interpretation of current data. Students are required to weigh up the merits and disadvantages of using different technologies or environmental management procedures as solutions or to seek minimal environmental damage. These higher order skills do not necessarily transcend into modified behaviour, shifts in values or consumer practice. This is the gap that Environmental Ethics Education has the potential to bridge. A significant point to stress here is that there is arguably a moral responsibility that education about such matters of global significance should do more than raise awareness or preach doomsday scenarios, but go further and empower learners to make active and valued contributions to the solutions.

2.4 Methods

It is not the intention of this book to examine the countless understandings and many terms commonly associated with education. Within this paper the following terms are understood to mean:

Formal education:

Education activities and/or programmes which are recognised and endorsed by the government in educational institutions, although not necessarily government institutions e.g. government run organisations and privately run organisations.

Non-formal education:

Education activities and/or programmes which are outside of the government structure, but are often recognised by the government e.g. community run activities, and

Informal education:

Activities which are outside of the government structure and are not recognised by the government e.g. care and education provided in homes usually by families/caregivers.

These terms do not necessarily represent a universal opinion of such issues and in many cases are not used in developing country contexts.

The methods for teaching environmental education varying significantly and like curriculum content should be context and audience specific. Some examples are outlined below. Hale (1993) suggests that environmental education needs to be addressed and delivered through formal and non-formal sectors of education. The Tbilisi agreement¹⁸ encourages teachers to use a broad range of teaching and learning practices which emphasize firsthand experiences and practical activities (Thomas, 2005). Similarly, Riordan and Klein (2010) suggest that students and teachers should work together in finding solutions to real life environmental issues and problems. By placing emphasis on problem solving and critical thinking skills, students are encouraged to become active environmental citizens and decision makers (Strife, 2008).

¹⁸ UNESCO and UNEP. 1978. *Intergovernmental Conference on Environmental Education, 1977, Tbilisi, Russia, Final Report*, UNESCO, Paris, France.

Community involvement is also viewed as the key to the success of environmental education. Cooperative links are considered holistic, integrative and participatory mechanisms which can contribute to community development practices (Acar, 1993; Hale, 1993; Jennings, 2008 and Patterson, 2009).

There is also a strong case for mainstreaming environmental education into the 'everyday' curriculum rather than teaching it as separate subject area. In many situations environmental education is integrated into subject areas such as science and technology and/or the social sciences (Cutter-Mackenzie and Smith, 2003 and Acar, 1993). Although, some suggest that there is still scope for a more comprehensive integration which sees all subject areas contributing to the development of environmental awareness (Hale, 1993 and Phelps et al, 2008).

Many environmental education efforts are school-based programs and although necessary, may not be sufficient in raising the environmental awareness in existing adult populations (Peters and Matarasso, 2005). Patterson et al (2009) cites a successful community-based adult education program in Tuticorin, India where localized environmental education was integrated with literacy and computer applications. This instance highlights how integration of environmental content can also be used in non-formal and adult education settings.

Electronic dissemination of information and the press are also vitally important methods of delivery for environmental education. Electronic distribution of information is often an inexpensive and effective way of enhancing people's environmental awareness, although Phelps et al (2008) warn that web based resources in particular, should only be used as an introduction or supplement to community-based and experiential learning activities. The press can also play a significant role for environmental education in general. In rural and developing areas, radio has often been a principle means of non-formal education. In developed regions, the internet, television, cinema and written press are now widespread modes of media and have significant potential to raise the general population's level of environmental awareness (Kassas, 2002). The widespread and critically acclaimed success to the 2006 film *An Inconvenient Truth* has been credited with raising international public awareness of climate change and is thus, an example of the significant role media and the press can play in the delivery of environmental education.

2.5 Content

The importance of and priority given to context specific content is a common theme in literature regarding environmental education (Strife, 2008; Curti and Valdez, 2011 and Barraza, 2003). Phelps et al (2008) suggest that the use of locally relevant environmental education resources is of vital importance. If pupils are able to relate to environmental issues in their own context, they have the opportunity to see the roles community groups can play and the impact they can have. By encouraging pupils to take responsibility within their home and within the community they can further investigate issues, take action, and see the effectiveness of their actions. Environmental education in this local context also promotes a 'bottom up approach'. Specifically, changes in understandings, attitudes and actions at a community level can bring about radical changes which filter up and through various community levels and/or sectors.

Education itself takes place in varied settings—it is not limited to the learning that takes place within science classrooms. Educators can consider that ethics teaching takes place not only in the classroom, but across subjects and outside of the school. Family factors are influential, but so are communities. Schools may practice environmental ethics teaching by encouraging students to engage in environmental activities, such as tree planting or beach cleaning. Outside of the formal school setting, individuals may learn of environmental ethics through public campaigns to conserve electricity. They may engage in a community activity to recycle materials. What the child or individual learns in the home, from society, or from the media can be equally important to learning of environmental ethics.

Teachers have varying degrees of independence to choose what and how they teach. In the context of each country, teachers in some education systems may be expected to strictly follow the national curricula, while others may have the autonomy to plan lessons and to set their own learning objectives. Ministries of Education in some countries could provide training and assistance in teaching environmental ethics. In other countries, planning a lesson in environmental ethics may require the teacher's own initiative.

Some content areas often taught as part of environmental ethics include sustainability (or sustainable development), environmental justice, environmental management, environmental science, the precautionary (or responsibility) principle, climate ethics, religious environmental ethics, agricultural ethics and environmental decision-making. So clearly EEE may be explored in a variety of subjects such as accountancy or business studies to science or theology and may include a wide range of perspectives.

2.6 Objectives of Environmental Ethics Education

Environmental ethics education (EEE) addresses questions of how to live, how to make environmental choices and how to reflect upon the consequences of our activities.

There are many possible objectives to teaching environmental ethics. Throughout the incredibly varied educational contexts of different countries, many cultural and social values guide the curriculum planning and teaching of environmental ethics. Differing educational systems will place various objectives and emphases in the teaching of environmental ethics. This section of the book aims to outline the various possible aims of environmental ethics education—in the classroom and beyond, at the early childhood education level through the university level.

Environmental ethics curricula and courses can confront several key dilemmas:

- Do natural objects and living things have moral status? Are they worthy of ethical concern?
- Do natural objects have intrinsic value or moral value because they exist? Or do they only have instrumental value?
- What “ecological services” does the natural ecosystem provide? Are clean air, food, water to be considered as resources for human use?
- Should human beings be considered merely as another species, as part of nature?

In a less academic or theoretical sense and in a more practical sense environmental ethics education can have many possible aims, which have relevance to individuals and society as a whole:

To build conceptual knowledge
<ul style="list-style-type: none"> • To sensitize students to environmental ethics issues • To gain familiarity with ethics tools and vocabularies • To identify moral issues related to the environment • For students to recognize an ethical dilemma • To build awareness of normative dimensions of the environment • For students to identify ethical choices and ethical decisions • To understand ethical consequences • To gain knowledge of environmental ethics dilemmas • For students to understand their role in environmental change
To build procedural knowledge / to develop skills and capacities
<ul style="list-style-type: none"> • To encourage critical reflection on the relationship between the environment and humans • To quantify and assess the implications of human development on the environment • To separate scientific facts (what is) from moral issues (what should be) • To evaluate environmental facts, to detect bias in the scientific method • Teach students to interpret data, to judge environmental indicators • To develop philosophical skills • To know how to make good arguments, to develop reasoning skills • To identify ways to ethically manage our actions towards the environment • To make well-informed environmental decisions • To develop analytical tools such as methodologies for environmental policy analysis • To understand the ways in which environmental issues are interrelated • To understand or adopt others' perspectives • To understand the principle of informed choice • To balance risk and benefit
To encourage personal development
<ul style="list-style-type: none"> • To clarify personal values • To develop personal ethical values • For personal moral development • To increase morality • To develop a nation of moral citizens • To encourage analysis, argumentation and reasoning to form moral decisions • To weigh environmental risks and harms • To learn of new perspectives, to question preexisting views

<ul style="list-style-type: none"> • Understand mechanisms for bringing about environmental change • To change future behaviors towards the environment¹⁹ • To integrate scientific facts into moral reasoning • Learn the consequences of their actions • Learn that moral actions have both short and long-term consequences • For environmental respect • Taking other organisms' best interests into environmental decision-making • Adopting multiple perspectives
As an educational intervention
<ul style="list-style-type: none"> • To promote an immediate change in behavior towards the environment • To instill good environmental conduct • To encourage environmental activism • To encourage environmental leadership • To encourage environmental protection • In order to apply environmental science solutions to real world problems • To act with other organisms' best interests in mind
To develop attitudes and beliefs
<ul style="list-style-type: none"> • To adopt ethical views towards the environment • For the student to understand his or her own views towards the environment (values clarification) • Encourage critical reflection on the subject of the environment • To promote environmental respect • To promote a greater sense of moral obligation towards the environment

2.7 Monitoring and Evaluation of Environmental Ethics Education

The evaluation of outcomes and reflection of teaching and learning practices is of vital importance to all teaching professionals. For that reason, monitoring and evaluation are key strategies for assessing the impact of environmental education (UNESCO, 2005b; Macer, 2008). Fien and Tilbury (1996) suggest that a teacher's ability to develop skills for critical thinking, self-evaluation and reflection are contributive factors toward the success of environmental education initiatives. Curti and Valdez (2011) lend support to this notion and suggest that environmental educators need to constantly evaluate their actions in order to generate positive results.

Education researchers and policymakers can begin to monitor and evaluate the programs to determine their effectiveness, and in order to make continued improvements. Environmental ethics education can have many kinds of impact. When assessing programs, several indicators can be used, for example:

- *Inputs:* Were the environmental science teachers prepared to teach the "environmental ethics" lesson?
- *Processes:* Did teachers follow the planned curriculum?

¹⁹Objectives of ethics education include: 1. Building awareness of normative dimensions, 2. Moral sensitivity, 3. Good conduct, 4. Identify moral issues, 5. Gain knowledge or information, 6. Developing understanding and explanation, 7. Analysis and reasoning, 8. Justification and argumentation, 9. Critical reflection.

- *Student outcomes:* Did students change their attitudes towards the environment?

There are many indicators, which can be used to analyze the changes as a result of a particular education initiative, and countries can devise frameworks for assessing the effectiveness of education. Monitoring and evaluating these changes can help countries learn from experiences and improve their programs. The table below also lists the many possible “outcomes” of environmental ethics education programs.

Teacher-level/School-level	Student-level	National or Global-level
Teacher content knowledge	Sensitization	Environmental consciousness among national citizens
Teacher motivation	Ethical maturity	Feeling of membership in a global community
Teachers’ perspectives on EEE	Moral development	Legitimacy
Improvements in course design, lesson planning	Change in values	
Teacher experience	Conceptual knowledge	
	Factual knowledge	
	Procedural knowledge	
	Change in student attitudes	
	Years of exposure to EEE	
	EEE across the curriculum	
	Access to EEE education (<i>quantity</i> of lessons)	
	Quality of EEE courses	

Before programs can be fully monitored and evaluated, standards and criteria for assessing programs must also be developed. What is important to include when teaching environmental ethics? What are the expected results? Education can be seen as an “intervention,” to produce a change in behavior such as to reduce littering. Or a program may have more unobservable objectives, such “to foster environmental consciousness.” Some countries may simply want students to be cognizant of the ethical dimensions of environmental problems; others may want students to act in an environmentally conscious way.

It is often difficult to agree upon how to assess teaching and learning in ethics. Measuring gains in students’ knowledge and understanding—especially changes in attitudes—is an uneasy task. There are various instruments used to measure educational outcomes, with differences in reliability and validity. Across countries, data is not always reliable and comparable, especially with subjects such as “environmental ethics”, which may not have a common core curriculum.

The evaluation of ethics in education research is less common when compared to the evaluation of literacy and mathematics test scores, as common educational indicators. The adoption of values and changes in behaviors cannot be captured by numbers alone, so a combination of qualitative and quantitative methods can be used (UNESCO,

2004).²⁰ Additionally, students can be tracked over time, or assessed at one point in time, depending on whether we aim to assess long-term or present outcomes.

Research has attempted to quantify the effect of ethics courses on students' moral development—in psychological research, ethical reasoning can be measured. Psychological instruments have been used by educational and developmental psychologists to assess the level of “moral maturity” and the stages of “moral reasoning” among students.²¹ As one example, Kohlberg's Typology assigns six stages to moral development, with each stage being increasingly complex. Such instruments are imperfect, and some are more statistically reliable than others. Ethics courses are oftentimes evaluated using these tools, and environmental ethics courses can certainly be evaluated according to this methodology.

As an additional point of consideration, assessments of ethics programs are sometimes difficult when ethics topics are not assigned the same grades as science content. Grading can play a role in the importance placed on ethical concepts, thus effecting the validity of scores measured. When student assessments place little priority on ethical learning, students may not understand their importance.

Interpretation of results from monitoring and evaluating programs will depend on the initial objectives. One critical question to ask is, “did the program produce outcomes as intended?” If an objective was to “increase students' exposure to environmental ethics issues”, then the output will be an increased number of students who have been involved in environmental ethics discussions, or those who have engaged with the topic in classes.

- Did the teachers teach in the way the curriculum intended?
- Did students' knowledge, attitudes, and skills change (as intended)?
- What was the overall quality of programs?
- Was the program implemented as intended?

Increasingly environmental ethics education is being taught as a formal subject, so having a method of monitoring and evaluation will be necessary to improve and expand environmental ethics education.

There have been similar calls around the world for teaching of environmental ethics. The World Commission on the Ethics of Science and Technology (COMEST, 2009) stated that,

“The main aim of the teaching of Environmental Ethics is to develop the students' ability to identify and analyze ethical issues in policies and actions related to environment, nature, and nonhuman forms of life in order to be able to make ethically correct decisions and to act ethically.”

²⁰ Quantitative methods such as: psychological instruments and educational statistics. Qualitative methods such as: discourse analysis of discussions, classroom observations, use of pre and post-course questionnaires, multiple choice questions, interviews, focus groups, measurements of moral development (Kohlberg's Stages), or textbook analysis.

²¹ Instruments such as the Development Theory and Moral Maturity Index (DTMMI), the Defining Issues Test (DIT) and others can be used.

As a result of studying Environmental Ethics students should:

increase their awareness of environmental-ethical issues;

be able to provide ethical justification for decisions regarding the environment, nature, and nonhuman forms of life;

be able to apply ethical principles to policies and actions related to the environment, nature, and nonhuman forms of life.”

As discussed later in this report there are a wide range of examples of topics that are included, target subjects and grades of education. The Eubios Ethics Institute bioethics education materials have been used in numerous school trials since the beginning of the millennium to address topics of environmental ethics in many different countries (Macer, 2016). There are some open access materials available, various case studies, and some research has been conducted. We make some further suggestions below.

In 2006 a Joint Plan of Action for Regional Networking in Bioethics Education Towards Better Bioethics Education was adopted by the participants at the UNESCO Asia-Pacific Conference on Bioethics Education, held 26-28 July 2006 in Seoul, Republic of Korea, with Eubios Ethics Institute.²² The action plan includes a number of issues in environmental ethics, since the view of the regional experts is that the term “Bioethics” includes environmental ethics. The action plan and some of the materials are available in several languages, including English, Chinese, Indonesian, Japanese, Khmer, Korean, Thai, Urdu, and Vietnamese. The materials (and additional teaching resources and teacher references), are available in MS Word format for users to modify for local needs, and they were developed by authors in Asia and the Pacific region (Macer, 2016).²³

2.8. Suggestions for Future Research

More research is needed to better understand EEE, perhaps starting with investigating some of the following:

- The teaching of ethics in environmental science, geography or business studies courses, or the presence of ethics coverage in the respective textbooks.
- Mapping whole school curricula for EEE coverage
- Existing courses and programs can be monitored, surveyed and evaluated to disseminate best practice for the further development of wider programs and to develop mechanisms for increasing capacity in teaching environmental ethics

The methods used to perform the analyses and evaluation may include: longitudinal study of learners/students, spot visits (learners practice outside school, check lists, formal and informal interviews, teacher and learner feedback analysis, reports, summative tests, questionnaires, monitoring individual environmental action, consumer patterns or institutional environmental policies basing indicators of success in direct relation to the objectives of the program concerned.

²² http://www.unescobkk.org/fileadmin/user_upload/shs/BEfiles/BioethicsActionPlan.pdf (Available in [**English, Indonesian, Chinese, Khmer, Thai, Urdu, Vietnamese**]).

²³ http://www.eubios.info/bioethics_education

3. Approaches to Teaching Environmental Ethics

3.1 Ethics and Critical Thinking

Teachers deeply influence *what* and *how* the student learns. In addition to subject knowledge, the teaching style, philosophies, and abilities of the teacher shape the kinds of ethical capacities students develop. The teaching process is dynamic and constantly changing, with lesson planning often being unpredictable (Darling-Hammond et al., 2005; Conner, 2010). When designing curriculum and lesson plans, teachers can consider several objectives: the kind of learning environment to be facilitated, the sequence of topics, or what learning processes will be most useful to the students (Sims, 1996). Since the objectives of ethics teaching will differ from history, science or art, classroom strategies must also differ accordingly.

Literature in educational psychology and learning science can contribute to effective teaching, with some aspects of teaching practice being specific to ethics. The following section outlines some considerations that may be especially pertinent to environmental ethics teaching and curriculum planning.

One goal of environmental ethics teaching may simply be to “sensitize” students to the fact that environmental problems have ethical dimensions (Bell, 1995). If this is an objective, teachers can give students basic familiarity with ethical tools and perspectives. They can correct any misinformation of the concept of “ethics”, for example, as students may believe that ethics is a set of correct, uniform and inflexible rules to guide environmental behaviors; they may understand that the purpose of environmental ethics is to influence students to act in a certain manner towards the environment. The teacher can open students’ minds to the possibility of using “ethics” as a valuable tool.

In many cases, *ethics education* is essentially the teaching of critical thinking strategies, rather than the transmission of factual knowledge. One possible aim of ethics education is for students to develop the ability to produce a well-reasoned argument, and in this case, for students to critically think about the environment (Toulmin, 1984). Kohlberg (1969) emphasizes that the reasoning behind why an ethical decision is “right” or “wrong” is what matters most. Through exposure to environmental ethics in the classroom, students begin to become aware that human activities have impact on the environment, and that these actions have an ethical dimension. They learn that other living species can be affected by humans. They develop a disposition for ethics and will consequently apply ethical thinking when faced with environmental dilemmas. When teachers encourage students to develop thinking skills, their students may continue to discover, understand and negotiate environmental facts in order to guide their future decisions. They can continue to think of the environment in ethical ways long after they learn ethics in the classroom.

3.2 Philosophy as a Tool

The “philosophical method” can be a valuable pedagogical tool for improving classroom discussions (Cam. 1995). By using tools of philosophy and ethics, teachers can

encourage students to improve their reasoning abilities, to develop thinking tools and to adopt new understandings. Classroom dialogues can encourage schoolchildren to understand and adopt their classmates' perspectives. It encourages students to acquire new knowledge and question their own understandings. Similarly, teachers can facilitate "guided discussions" by acting as a leader in group discussions. Instead of supplying a single "correct" answer, the teacher asks students to discuss and debate various environmental issues. Then, the teacher challenges students to justify their conclusions, stimulating the discussion.

Teachers can also use a "scaffolding" approach to prompt students to provide new justifications for the ideas they have adopted (Wood, Bruner and Ross, 1976). Through this, the teacher drives the discussion to increasingly challenging levels to allow the students to solve ethical problems with growing complexity (Cam, 2001). Similar to this, using the Kohlberg-Blatt Method (1975), the teacher can create a "cognitive conflict" in the mind of the student. As soon as a he or she adopts a view, the teacher questions such reasoning and thereby exposes any flaws in the student's judgment. Students then move to adopt stronger positions because of this challenge. The interaction is similar to the Socratic Method, a pedagogical strategy which is useful for encouraging independent moral thought among students. Such methods can encourage students to develop philosophical tools in order to address environmental issues.

3.3 Encouraging Student Learning

What is "learning" can be defined several ways; some propose that it can be achieved through specific processes. Bloom's Taxonomy (1956) proposed six basic components for learning: knowledge, comprehension, application, analysis, synthesis and evaluation. These cognitive processes have been considered to be necessary for effective teaching, and this framework has been widely used in North American classrooms. Alternatively, cognitive processes have also been categorized as (1.) Factual Knowledge, (2.) Conceptual Knowledge, (3.) Procedural Knowledge and (4.) Metacognitive Knowledge (Anderson and Krathwohl, 2001). For learning to occur, these cognitive activities must take place. It will be useful for environmental ethics teachers to consider the different notions of "learning" and such learning frameworks can be applied to environmental ethics.

In any case, teachers should gauge the level of knowledge students already know about the issue (Fleming, 1986). Ethical ideas on the subject of the environment are likely to be framed by the student's religion, family beliefs, culture and social traditions. Thus, students may already have a system of ethics in mind when they learn about environmental ethics.

3.4 Moral Development

The term morality refers to a body of learnable standards of right and wrong conduct shared within a society that they form a communal consensus although not necessarily all encompassing. It may include many standards of conduct sometimes called 'moral rules' which may pertain to rules of law or those that are particular to a specific group. Some universal moral precepts according to Orlans et al. (1998) include: telling the truth; respecting privacy of others obtaining consent before invading another person's

body; not killing; not causing pain; not incapacitating; not depriving goods; protecting and defending the rights of others and preventing harm from occurring to others. These moral precepts stated sometimes in a form of obligations refer to relating with humans.

Kohlberg (1969) proposed that moral maturity is needed for ethical behavior. He supposed that all individuals can progress to reach a point of moral maturity. Yet many scholars have critiqued his notions of moral development (Gilligan, 1982; Thoma, 2002; Walker, 2002). Gilligan, for example, argued that females are inclined towards ethical thinking. Jones (2007) supposes that there are indicators for the progression of ethical thinking. They argue that “novice” students will only consider humans to be important in the ecosystem; however, “advanced” students will consider entire ecosystems to be important, not only sentient animals and humans. Students at first will accept ethical frameworks, then move to critique them. As students progress in their ethical thinking, they move from considering scientific knowledge and ethical principles as separate ideas to negotiating those ideas together (time and financial resources spent conserving biodiversity). Rather than thinking about ethics and the environment, students thus begin to think about the *ethics of environmental issues*. There are many indicators for the progression of students in ethical thinking. Students can progress from “accepting ethical frameworks” to “critiquing ethical frameworks”; they advance from “using existing knowledge” to “researching new knowledge”; from “considering humans only” to “considering whole ecosystems,” for example.

3.5 Experiential Learning

In recent years, educators have identified “experiential learning” as an equally important tool for learning (also: hands-on, active, participatory learning. Lewin and Kolb, 1981). Using this approach, teachers encourage students to gain new understandings through personal discovery. In this way, each student negotiates new concepts and develops understandings according to his or her own comprehension when he or she interacts with an ethical problem, practicing how they would react when faced with a real-life situation. Students may debate how an environmental concern has ethical dimensions by using his or her own reasoning, instead of repeating as the teacher demonstrates. This method is important to teaching environmental ethics because ethical decisions are inherently personal decisions, so students must find a way to relate to ethical concepts in a personal way.

Teachers may also encourage “project-based” (cooperative) learning as a tool to allow students to reinforce their skills through real-life application. They may use “role-playing” to simulate an ethical dilemma, with some children acting as environmental activists, while others in the role of resource exploiters. Experiential learning may also take the form of a field visit to an environmental site. Experiential (active) learning comes in contrast to didactic (instructive) instruction, where teaching can often be “moralizing” when students are inculcated a prescribed, “correct” way of thinking.²⁴ This is thought to be undesirable as it does not encourage the students’ own ethical reflections, which are more effective in promoting long-term learning (Brummer, 1984).

²⁴ Using active learning in the classroom in this region may be retained more effectively, simply because of its novelty.

Students retain lessons in the long-term if they can engage with concepts through direct experience (Zlotowski, 1996). Sims and Felton (2006) argue that without application to real-life examples, lessons cannot be reinforced, and “highly interactive learning” is the best environment for ethics teaching. Often, teachers use role-playing to simulate real-life situations (refer to case 4, where role-playing is used). Arlow and Ulrich (1985) argue that students’ moral reasoning do not change significantly after taking theory-based ethics courses.²⁵ This would suggest that programs which place emphasis on theories are less effective in encouraging ethical thinking and reflection.

3.6 Social Learning

According to the “Social Learning Theory,” any learning that takes place in groups and between students and their peers can be highly important to developing individual ethical choices. When students engage in a group dialogue on environmental ethics, they may engage with each others’ ideas, participate in debate and reach new ethical conclusions together. Members of a group often change their views when they are involved in group debate (McGrath, 1984). When students interact with each other, they are pushed to find new justifications beyond their personal moral beliefs (Kohlberg, Scharf and Hickey, 1975; McGraw and Bloomfield, 1987).²⁶

There are several ways to encourage students to develop moral thinking. Another method proposed by Kohlberg is the “Just Community” approach (Kohlberg, 1969). When students were urged to think as a community, they considered ethical problems less selfishly. According to this method, the teacher suggests that students should think of themselves as members of a classroom community. When encouraged to think as a group—and when students felt they were part of a community—this influenced their personal moral thinking and encouraged them consider a communitarian perspective. If students feel unaccustomed to discussing ideas out loud, alternative strategies may be used, such as simulating an “election” with ballots indicating environmental ethical preferences. Moreover, when students share multicultural perspectives with each other in the classroom, they can adopt new cultural perspectives (Conner, 2007). In increasingly multicultural societies, individuals must learn to understand others, and those diverse perspectives can be used to address environmental problems.

3.7 Role of Teachers

Teachers’ personal ethical views can have an influence on students. “The teacher is the students’ primary model for moral reasoning and reflection”, so environmental ethics teachers can have great influence on the perspectives on their students (Ozar, 1997). In the eyes of students, teachers often are viewed as role models, and their environmental ethics beliefs can be highly important. Jurkiewicz (2000) suggests that followers in a group have a tendency to adopt the ethical beliefs of a leader, and the same is true for teachers. Teachers have much ethical authority, as an authoritative figure (Turiel, 1966;

²⁵ There is a great body of research on the ethical reasoning of groups, and the effect of group interactions on individual ethics.

²⁶ According to the Kohlberg model (1981), moral judgment has many levels. Kohlberg’s Moral Development Theory explains different degrees of moral maturity.

Kramer and Messick, 1996).²⁷ In environmental ethics education, besides the lesson plan used, teachers' own beliefs can have great influence on the views students adopt.

Classroom practices can be aligned with the overall objective of environmental ethics. Conner (2010) suggests that pedagogy can be matched to purpose, always considering "what do we want students to gain from a particular discussion?" Another issue to take into consideration is that the way in which students are taught is highly symbolic. Some argue that in the case of democratic education, teachers cannot truly teach values of democracy when they teach in an authoritarian way (Guttman, 1999). Applied to the case of environmental ethics, philosophical methods can be used in the classroom to discuss environmental issues. The teacher can encourage the use of ethical reflection so students may understand environmental ethics using the vocabulary and practice of ethics.

Teaching background also matters. Environmental ethics can be taught by an ethicist, or it can be taught by a scientist—and the outcomes of this teaching will differ. An ethicist will be more familiar with ethics vocabularies, concepts and approaches. On the other hand, an environmental science teacher facilitating a dialogue on environmental ethics may adopt contrasting perspectives. It can be difficult for science teachers to teach environmental ethics without a clear lesson plan (Murray and Reiss, 2005). When teachers are trained in the sciences, they cannot be expected to have equally profound knowledge of moral philosophy, and without lesson planning, environmental ethics teaching may not be delivered effectively.

3.8 Environmental Teaching

Not only can students be taught about the environment, the environment itself can also serve as a medium for teaching students about ethics. Palmer and Neal (1994) note that education can be linked to the environment in various ways: 1.) education can be on the subject of the environment; 2.) it can be for the environment, or 3.) environmental ethics can also be taught *through* the environment. Seasonal changes, for example, reflect changing atmospheres, differences in temperature, sunlight, and rainfall in different regions of the earth. When students interact with nature, they may observe some natural properties of the environment.

3.9 Conventional Teaching Methods

Many teachers and students see rote memorization and learning as the same processes (Iran-Nejad, 1990). Teacher-centered, didactic teaching is common in many parts of the world, as a characteristic of mass education systems developed over the past half-century. Teachers conventionally placed emphasis on the transmission of factual knowledge, rather than the interpretation and critical analysis of those concepts. While rote memorization may be valuable for learning new information without inherent meaning—vocabularies of foreign languages, for instance—it is not as effective for understanding complex concepts, and especially not for a subject such as environmental ethics (Woolfolk, 2004).

²⁷ "Moral comprehension" can also be measured by instruments such as DIT, which is used by some researchers to evaluate the level of moral reasoning among students.

In many cases, students may not feel comfortable sharing ideas aloud in the classroom. Class discussions that facilitate learning in ethics should therefore take place in a different classroom format. Lessons must be designed with the local cultural context in mind, and students must firstly become comfortable to share ideas openly in the classroom. Perhaps teachers can arrange discussions into smaller groups, or they can promote an active discussion by setting an example. As students become familiar, they can ease into philosophical and ethical discussions. But without transition, it will be difficult to suddenly alter the conventional format to suit the approach for teaching ethics.

The novelty and surprise of any kind of new teaching method can often be enough to generate student interest. The media and news can be useful tools in the education of environmental ethics (Kirac, et al. 2012).

3.10 Curriculum Planning and Course Design

Educators can make decisions as to whether environmental ethics lessons should be integrated into all aspects of the curriculum, or taught as a separate subject. Should it be taught within environmental science courses, or across all subjects of a student's school level? Should environmental ethics be chosen as the "theme" for the school year, with both academic and extracurricular activities supporting this learning goal? Primary school students can engage with environmental ethics education across all of their subject areas—in the sciences, arts, language, music, or physical education—and schools can propose environmental consciousness to be an ongoing learning theme. At the university level, entire courses and degree programs can be devoted to environmental ethics. Ethics graduates can specialize in environmental ethics. From the preschool level to higher education, environmental ethics curricula can be designed a number of ways.

The age of students matters to ethics teaching. As students become older, Lind (2000) supposes that it becomes increasingly difficult to change their ethical beliefs. Colby (1983) similarly suggests that moral development takes place mostly in childhood.²⁸ When students are exposed to ethics at an early age, they have a greater likelihood of challenging their personal ethics and adopting new perspectives when presented with diverse viewpoints. Piaget (1932) also argued that as children mature, they move from having a rule-based moral view, to having autonomous views. As questions of environmental ethics are incorporated into the general education of school students, it has greater impact on the "ethical" decision-making in their lifetime. Added to this, in some other countries, compulsory and free education is often offered only until early secondary school, so most individuals will only have access to basic education.

Education itself takes place in varied settings—it is not limited to the learning that takes place within science classrooms. Educators can consider that ethics teaching takes place

²⁸ Yet as a generalization, those with "principled moral reasoning" be less likely to adopt new moral reasoning (Dukerich et al., 1990). They may not change their reasoning as a result of classroom experiences.

not only in the classroom, but across subjects and outside of the school. Family factors are influential, but so are communities. Schools may practice environmental ethics teaching by encouraging students to engage in environmental activities, such as tree planting or beach cleaning. Outside of the formal school setting, individuals may learn of environmental ethics through public campaigns to conserve electricity. They may engage in a community activity to recycle materials. What the child or individual learns in the home, from society, or from the media can be equally important to learning of environmental ethics.

Teachers have varying degrees of independence to choose what and how they teach. Teachers in some education systems may be expected to strictly follow the national curricula, while others may have the autonomy to plan lessons and to set their own learning objectives. Ministries of Education in some countries could provide training and assistance in teaching environmental ethics. In other countries, planning a lesson in environmental ethics may require the teacher's own initiative.

More specifically, teachers need to take an active role in helping students develop analytical, evaluative and participatory skills, knowledge and awareness. Teachers must also encourage students to develop cognitive and affective understandings and values, as this shapes humans relationships and participation in their environments. By empowering students to be active citizens and carrying out activities as individuals and a part of a larger collective this can move beyond the local context and becomes more global in scope.

4. Environmental Ethics Education in the Context of Environmental Education

“Ethics are the set of regulations and rules which are used to correct and evaluate human behavior to each other, to society, to nature at present, in the past and in the future as well, implemented by individual belief, tradition and power of public opinions” (National Political Institute, Vietnam).

4.1 Definitions of Environmental Ethics Education (EEE)

Environmental value education is an evolving, increasingly important component of environmental ethics education (EEE). Values education has a vital role in ethics education. Values are the most frequent precursors to behavior. Environmental values education refers to the teaching of general environmental values and to the ethical system for applying these values. The challenge for EEE is to promote an understanding of environmental issues and how our value systems influence or compound these problems. Environmental pragmatism encourages practical responses to such issues and this approach built on the philosophical and educational work of John Dewey (1859-1952) has popular support in “hands-on” educational programmes. The growing level of green issues in the media and popular conscience do lend support to environmental education (EE), yet this is often focused on conservation and recycling issues and the values of consumerist society and environmental ethics are less specifically addressed.

As reviewed by Rai et al. (2010) there are fundamental different world views in different countries such as apathetic, apocalyptic, symbiotic and integrationalist value systems. Although no educational system teaches apathy as a virtue, the observed behaviour of many adults to environmental problems will teach by example apathy to children. Among the other three mentioned, and others that exist, most will promote values in learners to protect the environment.

Strategies for environment values education are widely divergent in their aims and methods. Major strategies currently practised are: *laissez-faire*; inculcation; values analysis; values clarification; and action-learning.

Environmental ethics are foundational to existing EE and Education for Sustainable Development (ESD) programs, but not always well recognized or analyzed. We can ask how are EE and ESD different from environmental ethics teaching or Environmental Ethics Education. EE/ESD deals with environmental problems while EEE deals with the education of ethical issues concerning the environment. EE/ESD often focuses on the questions *what can schools do?* While EEE aims to answer the question *what values should parents and schools teach?*

The ethics of deep ecology holds that a whole system is superior to any of its part. Deep ecology was that of Arne Naess (see section 1.2) who often asked audiences to “listen with the third ear” and “think like a mountain”. The environment is bigger than us. Rightness or wrongness of action is based on our recognition of our place in this bigger picture and challenges humans to cease being the center of the universe. We can

attribute deep ecology to many schools of indigenous philosophy because deep ecology seems to be a very fundamental principle of life.

We have to extend the traditional anthropocentric approach of ethical theories, to teach persons to act responsibly to the environment. Virtue Ethics is based on Aristotle's *Nicomachean Ethics* and looks at happiness or well-being as the highest goal by way of cultivation virtues or excellences and guided by reason. Virtues are a kind of balancing act and making right decisions after consistent habituation. Duty Ethics is represented by Kant's moral philosophy known as deontology based on his book *Groundwork for the Metaphysics of Morals* (Kant, 1785). Duty is the necessity of an action done out of respect for the law and the law contains within it universality. There must be a law and commands respect for the law. There is a moral philosophy to look at the necessity to do as opposed to ulterior motives because in ulterior motives, it looks at the consequences of the action such as getting votes in the election as an example. Kantian ethics is non-consequentialist.

Kant's supreme moral law is the "Categorical Imperative" which is universal and admits no exception. It means to "act only on those maxims whereby you can at the same time will that it should become a universal law." Another meaning of the Categorical Imperative is to "act in such a way that you treat humanity, whether in your person or in the person of another, always at the same as an end and never simply as a means." A "man / woman of principle" consistently acts on the basis of principles and does not make exceptions.

Utilitarian Ethics is consequence-focused and is mainly represented by J.S. Mill's utilitarian ethics (Mill, 1863). It looks on the greatest good for the greatest number of sentient beings. An act is right if it is the one that brings about the greatest amount of happiness to the greatest number, or, conversely, the least amount of pain for the moral agents involved.

Ecofeminism looks at the oppression of women as linked with oppression of the environment. Ecofeminists unlike social ecologists don't argue that the society must be changed before changes in the attitudes toward the natural world can occur. For them the oppression of women and the natural world are twin oppressions that must be addressed.

Environmental ethics education includes several approaches. Libertarian extension is the civil liberty approach and exposes that all member of a community animate or inanimate have innate rights on the basis that they exist. Ecologic extension puts emphasis not on human rights but in the recognition of the fundamental interdependence of all biological entities and their essential diversity. The Gaia hypothesis, says that the planet is characterized as a unified, holistic entity with ethical worth of which human race is of no particular significance in the long run.

Conservation ethics focuses on the worth of the environment in terms of its utility or usefulness to humans preservation of the environment on the basis that it has extrinsic value- instrumental to the welfare of human beings. Anthropocentrism looks at humans at the centre of the universe; the human race must always be its own primary concern.

Everything else in existence should be evaluated in terms of its utility for us, thus committing species.

In a Workshop on Environmental Ethics Education for All held in the Environmental Studies Institute Miriam College, Quezon City, the Philippines, 2-3 December, 2009, participants worked in different groups and came up with the following responses. They said EEE allowed learners to use basic information to explore environmental concepts, problems and issues. EEE is a way of equipping/training students and learners to be able to handle conflicts involving environmental issues and problems. EEE is the part of environmental philosophy which considers extending the traditional boundaries of ethics from solely including humans to including the non-human world. EEE exerts influence on a large range of disciplines including law, sociology, theology, economics, ecology and geography. It includes theoretical foundations; causes of environmental problems, the intervention of education, with an ethical basis; applications of principles of bioethics, benefits or risks involved in accompanying the benefits; autonomy or freedom, justice and the impacts of human action on the environment all based on some fundamental environmental principles.

Students may extend their knowledge about and gain insight into their own environment and acquire of skills to solve environmental problems through ecological principles and sociological tools. As they apply these principles to their understanding of their environment and society it may foster an attitude of stewardship.

4.2 Values

A capacity-building approach to development involves identifying the constraints that people experience in realising their basic rights, and finding appropriate vehicles through which to strengthen their ability to overcome the causes of their exclusion and suffering. (Eade, 1997, p. 24). Transformative participation addresses the discrepancy between social groups and the need to shift more power to these disadvantaged groups (Nelson and Wright, 1995). A social change paradigm of protected area management is important (Reyes, 2005).

The Universal Declaration on Bioethics and Human Rights (UDBHR, UNESCO, 2005), contains substantive principles which apply to environmental issues. This Declaration is a framework agreement on which our reflections on ethics can be based, and inside the Declaration is a commitment to raise the ethics education of these topics at all levels of education. The declaration on the protection of the environment and biodiversity, and protection of future generations, solidarity describe international consensus on environmental ethics. Article 17 reads,

“Protection of the environment, the biosphere and biodiversity

Due regard is to be given to the interconnection between human beings and other forms of life, to the importance of appropriate access and utilization of biological and genetic resources, to respect for traditional knowledge and to the role of human beings in the protection of the environment, the biosphere and biodiversity.”

Some nations also have constitutional mandates. The Philippine national constitution enshrines in Section 16 the right to a balanced and healthful ecology. Section 16 of the Philippine Constitution particularly mentions that: “The state shall protect and advance

the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.” Presidential Decree No. 1151 which was issued in 1977 reflected our environmental policy. In Section 1 particularly stipulates that “the state must create, develop, maintain and improve conditions under which people and nature can thrive in productive and enjoyable harmony with each other.” In the same presidential decree, it also continues “that the state must fulfill the social and economic requirements of the present and future generations of the Filipinos.” The state must ensure the attainment of environmental quality that is conducive to a life of dignity and well-being. And that the nation will recognize, discharge and fulfill the responsibilities of each generation as trustee and guardian of the environment for succeeding generations.

Cathie Holden (2007) observed that in surveys of UK two cohorts of eleven year old students in 1994 and 2004 there was increased optimism over social justice there was a decline in their optimism over environmental problems. In a similar survey of 852 teacher training students in the UK at undergraduate and postgraduate level Holden found that only 20% claimed to *know a lot about environmental problems*, moreover 95% and 90% said that television and newspapers respectively were their main primary source of global issues, whereas only 34% stated that the information they had was from secondary school. Save the Children, a UK based NGO, surveyed over 4000 11-18 year olds in 2004 and found concerned over the global environment was held by 41% of respondents in comparison to 90% who expressed worries over global war and conflicts (Wicks, 2004).

In a similar vein, Waller (2011) in a small survey of 45 international school students in Thailand, found that local environmental issues were of less concern to them than owning their own transport and house, or marriage and personal health. Yet within the same three month case study it was noted that following a short environmental ethics course a measurable shift had been found regarding these students concerns over human population growth, economic globalisation, acid rain, climate change, overfishing, childhood mortality, educational standards and fossil fuel use. These increased concerns were accompanied by decreased concerns over ozone layer damage, nuclear accidents, freedom of speech, international conflict, land rights, maternal health, water security, and nuclear warfare. This case study was carried out prior to the Fukushima disaster; which highlights the need for ongoing research into the changing aspirations and fears of youth and more importantly there is a need for longitudinal studies over greater time frames. Nonetheless, there are similarities with the aforementioned UK surveys that shows aspirations for wealth accumulation and personal comfort.

4.3 Goals

Our world is socially, economically, politically and environmentally heterogeneous. As such, the understandings of human relationships with the environment often differs between and within societies across the region. Socio-cultural beliefs and traditions, approaches and views, geographical, and financial and economic circumstances shape how humans understand and interact with the environment. Therefore, EEE courses must be appropriate not only to the environment and resources, but also to the culture, history and social system of each respective community. By recognizing the unique

situations of each community and country, EEE courses can influence global thinking and local action, influencing human activities and facilitating sustainable development that could ultimately lead to a healthier environment.

EEE will enhance and enliven the pure scientific understanding of nature. EEE can develop positive attitudes and behaviour towards the environment. It can develop a love of nature, promoting friendly life styles to the natural environment, and to surrounding people. The love of life will enhance the way we treat all beings (Macer, 1998). The goals will ensure harmony in benefits between human beings within their society and with nature.

The goals of EEE go beyond understanding nature, and that everything is interconnected. It will also teach that the world is enriched by the biodiversity of species. The Content of environmental education can include the Four Laws of Ecology: "Everything is connected to everything else; Everything must go somewhere. Nature knows best. There is no such thing as a free lunch." (Commoner, 1971).

In the *Joint UNESCO Miriam College Workshop on Environmental Ethics Education for All* held in Miriam College in 2009 we identified goals including: To produce environmentally responsible individuals who are able to analyze environmental problems, and make sound judgments that will constitute an ethically correct behavior toward the environment; In order to develop the ability to analyze situations so that students can develop ecologically oriented judgment; Provide opportunities and venue to develop and enhance the skill of analyzing and evaluating environmental issues and problems; Provide theories and ethical principles that will guide learners in the analysis of the problems and or issues; Facilitate the formation of a personal worldview which may serve as a handle of analysis; Encourage learners to come up with a position or stand, or simply make an environmentally sound judgment and act in accordance with this; To raise eco-friendly citizens for a sustainable community; Content-action-evaluation; "Not just awareness... Should lead to things that should be done..."; Develop teachers to be models for doing the right things... models for ethical decisions (informed choices) and action for the environment; Integrated action of the schools with the immediate community, municipality; Bring EEE to beyond the classroom; To encourage educational institutions to enhance their role in shaping society's future and seeking solutions to environmental and developmental challenges; To mainstream environmental sustainability.

4.4 Interdisciplinarity

EEE is interdisciplinary and integrated into different subjects. Environmental education in Viet Nam is not taught as a specific subject, but it is included into other subjects such as Nature and Society, Science, History, Geography, Vietnamese, Moral, Arts in primary education; and Biology, Literature, Physics, Chemistry, Geography, History, Citizenship in secondary education. There are some guidelines to include environmental education into curriculum subjects.

Environmental ethics is the foundation of EEE. Many academic institutions have incorporated EEE in a range of disciplines in formal primary, secondary and university curriculum, including Sociology, Economics, Sciences (Biology, Chemistry, and Physics),

History and Geography. The interdisciplinary nature of EEE enables humans to understand the complexities of their relationships with the environment (this is Environmental Education), and instills an understanding of the need for people, communities, countries and regions to undertake political, economic, socio-cultural activities which are harmonious with the environment teaching values is ethics education.

EEE programs may be shaped by several components and factors, including by:

- Integrating EEE in all levels of learning development
- Teacher training in EEE
- Teacher immersion in EEE
- Modeling
- Check other existing programs, compare & contrast
- Conduct Student fora/symposia where students can learn and experience doing environmental ethics; Field trips/out of the classroom activities where students could appreciate the environment, and/or reflect on its current state and ask questions
- Come up with environmental projects that will involve students
- Partnership with LGUs and NGOs; Songs such as “Earth Song” by Michael Jackson, “Kapaligiran”(Environment) by Asin; song writing
- Web blogs, essay writing, pamphlets, artwork, paintings, debates, group discussions
- Research
- Exposure trips
- Immersions
- Film viewing (from You Tube, or feature films) and critical analysis
- Performance tasks, video presentations
- Position-paper writing
- Reflection paper (Discernment)
- Discovery learning; Lifestyle of Stewardship: Performance Audit (checklists), Feedback from parents, actual home visits, Cleanliness drives (inter-classrooms)
- Informal and formal evaluation
- Brainstorming; Integration and addition of EEE as subject into the curriculum
- Environmental training for all stakeholders
- Environmental support instructional materials
- Environmental degree/certificate
- programs being offered by the school
- Objective-specific activities; case studies, exposure trips/immersion

In late 2011, the authors conducted a mapping exercise to document ethics courses in existing Environmental Education (EE) and EEE courses in Universities in Asia Pacific. The results are presented in Appendix A of this book. This allowed understanding of course scope, subject matter and target audience. The results are a representation of the formal EEE courses in Asia Pacific from a number of countries^{26a} curricula have been examined in the mapping exercise using Internet-based searches.

4.5. Primary Education

Some countries have schools that incorporate EEE in their primary education courses. Delivering EEE in schools, particularly at the primary-level, is seen as one of the most effective means of educating children about the human relationship with the environment. This belief stems from the fact that in some countries the highest level of education for a large percentage of students is at the primary level. Gradually the educational attainment levels have advanced so that in OECD countries over 80% of students complete secondary education (OECD, 2018). Environmental and ethical themes are fused to early primary courses including *Environmental Studies*, *Environment and Me*, *Life Environment Studies*, *Basic Science*, and *Geography*, to name but a few, and through informal training such as learning to take care of houseplants and pets. Some schools have taken initiatives to incorporate other environmental issues in student coursework. For example, Tau Rak School in Thailand developed programmes for kindergarten pupils and primary students that focus on the issue of climate change.²⁹

Mid-primary education students (including grades 3-6) often learn about EEE themes in courses such as *Environmental Studies*, *The World around Us*, *Men and the Environment*, Social science courses such as *Geography*, *History* and *Civics*, and Science courses such as *Earth Sciences*, and *Resource Conservation*.

In higher-primary grades (6-8) students attend courses on *Population and Environmental Education*, *Health and Education*, *Health and Moral Education*, *Natural Sciences*, *Biology*, *Geology*, *Geography*, *Physics*, and *Chemistry*. In Cambodia, several primary schools' curriculum includes agriculture courses which contain elements of EEE. The International School of Bangkok (ISB) also has a 'Green initiative' which aims at teaching students the importance of reducing their carbon footprint. The ISB has been a success story in fighting global warming, as students have gained the understanding of how their actions impact the environment. The student body and school has undertaken several 'Green initiatives', including turning off air conditioning units when the temperatures are not too hot, recycling batteries, tabs from cans and juice boxes, banning Styrofoam from the school, and planting trees around the campus.³⁰

4.6. Secondary Education

Upon entering secondary school, students have greater selection in terms of courses which incorporate EEE. For instance, some school curriculums include courses that are local in scope, for instance, in the Maldives there are *Fisheries Science* courses offered as part of the secondary school curriculum. Other countries within the Asia Pacific region also have courses on *Health*, *Population and Environmental Science*, *Environmental Education*, *Botany*, *Zoology*, *Biology*, *Physics*, *Chemistry*, and other *Environmental Science*, *Planning and Protection* courses. Wolf and Macer (2019) describe the philosophy curriculums at primary and secondary level, which were also found to include EEE.

²⁹ "Teaching them young," *Bangkok Post*, April 3, 2008, p. 9.

³⁰ "Green School," AnjiraAssavanonda, *Bangkok Post*, April 3, 2008, p. 8.

4.7. Undergraduate, Graduate, Doctoral Education

At the undergraduate, graduate and doctoral studies level there are several avenues that may be taken to specialize in, or research and study EEE. Students may enroll in an undergraduate, graduate or doctoral program in EEE at several universities and colleges in many countries. Some examples of degree courses are in Appendix A.

The mapping exercise results indicate that EEE is interdisciplinary in nature and values and ethics are often incorporated in several science and social science courses. Throughout the world, formal environmental and ethical components are included in coursework starting in primary school, and become increasingly prevalent in secondary education, in particular, in the social science and science courses. In some countries undergraduate, graduate and doctoral students may pursue coursework in Environmental Studies, Environmental Ethics, and Environmental Sciences. Throughout a student's academic lifecycle, they may develop and foster a greater sense of self awareness in regard to their relationship with the environment.

Questions have been raised regarding the success of environmental education. Some critics argue that since gaining recognition by the international community in 1972³¹, environmental education has failed to meet the goal of transforming both communities and individuals to live sustainably and overall has had limited success (Strife, 2008; Barraza, et al, 2003 and Cutter-Mackenzie and Smith, 2003). However, a number of environmental education initiatives have been credited with encouraging behaviour change and developing the capacity of citizens.

In recent years, the UN DESD has been a primary instrument for mobilizing environmental education initiatives and resources in developed country contexts. The results of one Australian based UN DESD initiative have been significant. Starting out as a pilot program in 2005, the Australian Sustainable Schools Initiative (AuSSI), now actively runs in more than 2500 schools across the country and in specific cases results have included; school waste collection reductions of up to 80 per cent and decreases in water consumption of up to 60 per cent (Taylor, 2009).

Riordan and Klein (2010) also discuss the results of two experiential environmental education initiatives in the United States. In one instance, students were able to create action in both their school and the wider community. Specifically, students created an exhibition of their work at the city hall and invited community members and also launched the development of a school garden. While long term behaviour change was not measured in the study, the immediate behaviour change and increase in environmental awareness is clearly evident (Riordan and Klein, 2010).

If environmental education is to achieve its goal, the scope and impact of strategies and policies need to reach their full potential. Access needs to be across the board; formal, non-formal and informal education. Information must be relevant (context specific) and available to a large and diverse target audience including; children, youth and adults, and individual, community and government levels. The application and implementation

³¹ See: UN Conference on Human Environment, Stockholm, Sweden, 1972

also needs to be practical, expectations should be realistic and appropriate support made available at all levels.

Environmental education is added to Extra-Curricular Activities, Outdoor Activities, Pioneer Activities, Youth Union Activities, and Class Meeting Activities. There are also movements and campaigns. It is organized in the movement "Making schools become green, clean and beautiful centers". It also was included in campaigns in Viet Nam: "Green Rain", "Water, use enough for to day, save for tomorrow", "Sharing and donating used things such as toys, clothes, textbooks, story books, hand made recycled things...", with some of these held on world environment day (5th June). A whole-school approach is useful, as seen in examples in chapter 5, which include practices for waste management, segregation, cleanliness, and so on.

An example of a project in Viet Nam is the "Campaign for raising awareness on Environmental Education in schools in 2006-2007". The goals were to guide students towards an economic, sharing and responsible lifestyle. The implementation scale included nation-wide schools of elementary and secondary level. A typical activity was to Organize the Exchange Fair.

The rationale was to give students a practical insight of sharing and saving, so they could mutually share products with friends or give them to the poor students. Other benefits were that the students (especially in primary levels) get to know commercial matters; and this kind of activity 'releases' them from the serious fixed classes.

Students made the products by themselves (recycle, draw pictures, Self-made clothes for dolls, etc.) or brought along their old stuff to the Fair. The products are valued by a group of Teachers and Students. Their values were expressed by price labels. Participants were organized in booths to show what they had. Some most interesting things were auctioned. The money collected was transferred to a Charity Fund (for Unlucky Children).

The Fair attracted not only teachers and students, but also many of their parents and families. In the Hanoi Fair 7000 products were exchanged, and the total money collected (from Tickets and Auction) was 9,619,000 VND (approx. 550 USD) which was sent to support people who suffered from Chanchu storm and poverty. A further 8 cartons of presents (i.e. used books, stories, study materials, clothes and toys) were given to far-flung students.

Results were disseminating into provinces, and 21 provinces later got involved in the campaign with the participation and support from 3 organizations within province: Department of Education and Training, Department of Natural Resources and Environment and the provincial Youth Union. Most of the schools in the 21 provinces organized the fair. They were very interested in the tasks. This campaign had a rather big impact on students' behavior: saving, sharing things and love, and developing environmental ethics. The campaign is practical, being able to construct awareness and form behavior of the students. The campaign is admirable in contents and approach and easy to promote all people to be involved, so that can be sustainable.

The campaign focuses rightly on a developing society problem, namely, gaps between the rich and poor become wider. The campaign has deep ethics education value and gives suggestions for creating similarity. The campaign has opened a new approach to help students in practicing saving and sharing life styles effectively, naturally and voluntarily.

Subsequent chapters in this book describe further case studies. COMEST (2009) provided some examples of EEE including training of teachers in EEE in Belarus, Russia, Kyrgyzstan, Moldova, and Ukraine³²

³² <http://www.ecoethics.mrsu.ru/eng/>

5. Case Study of Environmental Education (EE) and Environmental Ethics Education (EEE) in India

5.1. Society, Culture and Law

In India, social values and attitudes have historically and culturally been in harmony with the environment. If one reads Indian literature, the writing of the sages, religious texts, these reflect the recognition that all life on earth, human life included, is intimately dependent on the quality of the environment. These also talk of the humbleness of human in this larger system, and the need and responsibility to protect it.

The Indian constitution captured much of these deep rooted values and further strengthened them by giving responsibility to its citizens to protect the environment. The Constitution enjoins the “state to take measures to protect and improve the environment and to safeguard the forests and wildlife of the country” (Article 48-A). It also makes it a “fundamental duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have ecological compassion for the living creatures” (Article 51A).

5.2. National Policy on Education

Environmental education has been an area of concern in all curriculum development programmes in India. The movement of Basic Education launched by Mahatma Gandhi in 1937, was perhaps the first serious attempt at relating education in schools to local environmental needs. The essential elements of Basic Education were: productive activity in education; correlation of curriculum with the productive activity and the social environment; and intimate contact between the school and the local community. The best that Basic Education had to offer was incorporated in the Report of the Education Commission (1964-66) so as to relate it to the life, needs and aspirations of the nation. For the primary stage, the Report recommended that “the aim of teaching science in the primary school should be to develop proper understanding of the main facts, concepts, principles and processes in the physical and biological environment”.

The National Policy on Education, 1986 (NPE) states that “Protection of the Environment” is a value which along with certain other values must form an integral part of curriculum at all stages of education. Para 8.15 of the Policy states: “There is a paramount need to create a consciousness of the Environment. It must permeate all ages and all sections of society, beginning with the child. Environmental consciousness should inform teaching in schools and colleges. This aspect will be integrated in the entire educational process”. The national system of education, as defined in the National Policy on Education 1986, visualized a national curricular framework which contains a common core including several elements having direct bearing on the natural and social environment of the pupils, such as: Protection of the environment, content essential to nurture national identity, and inculcation of the scientific temper. These core areas are expected to occupy a place of prominence not only in the instructional materials, but also in the classroom and out-of-school activities.

Following the National Policy on Education, National Council for Education, Research and Training (NCERT) brought out detailed curriculum guidelines and model syllabi for classes I to X reflecting these ideas. The approach strongly recommended adoption of innovative teaching and learning techniques. Subsequent curriculum frameworks brought out by the NCERT in 1988 and 2000 reiterated the importance of EE in school education.

5.3. The Supreme Court and Environmental Education (EE)

In 1991, Shri M.C. Mehta filed an application in the public interest, asking the Supreme Court to: (1) issue direction to cinema halls that they show slides with information on the environment; (2) issue direction for the spread of information relating to the environment on All India Radio; and (3) issue direction that the study of the environment become a compulsory subject in schools and colleges.

Judgment of Supreme Court Of India

India -- M.C. Mehta v. Union of India, WP 860/1991 (1991.11.22) (Environmental Education Case)

M.C. Mehta Vs Union of India and Others

Writ Petition (Civil) No. 860 of 1991

(G.N. Ray, A.S. Anand, JJ) 22 November 1991

Judgment

“This application is in public interest and has been filed by a practicing advocate of this Court who has consistently been taking interest in matters relating to environment and pollution. The reliefs claimed in this application under Article 32 of the Constitution are for issuing appropriate directions to cinema exhibition halls to exhibit slides containing information and messages on environment free of cost; directions for spread of information relating to environment in national and regional languages and for broadcast thereof on the All India Radio and exposure there of on the television in regular and short term programmes with a view to educating with view to educating the people of India about their social obligation in the matter of the upkeep of up the environment in proper shape and making them alive to their obligation not to act as polluting agencies of factors. There is also a prayer that environment should be make a compulsory subject in schools and colleges in a graded system so that there would be a general growth of awareness. We had issued notice to the Union of India on the petition and the Central has immediately responded.

Until 1972, general awareness of mankind to the importance of environment for the well-being of mankind had not been appropriately appreciated thought ever the years for more than a century there was a growing realisation that mankind had to live in tune with nature if life was to be peaceful, happy and satisfied. In the name of scientific development, man started distancing himself from nature and even developed an urge to conquer nature. Our ancestors had known that nature was not subduable and, therefore, had made it an obligation for man to surrender to nature and live in tune with it. Our Constitution underwent an amendment in 1976 by incorporating an article (51A) with the heading “Fundamental Duties”. Clause (g) thereof requires every citizen to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures. Soon after the international conference

on environment the Water Pollution Control Act came in 1981 and finally came the Environment Protection Act of 1986.

Law is a regulator of human conduct as the professors of jurisprudence say, but no law can indeed affectively work unless there is an element of acceptance by the people in society. No law works out smoothly unless the interaction is voluntary in order that human conduct may be in accordance with the prescription of law it is necessary that there should be appropriate awareness about what the law requires and there is an element of acceptance that the requirement of law is grounded upon philosophy which should be followed. This would be possible only when steps are taken in an adequate measure to make people aware of the indispensable necessity of their conduct being oriented in accordance with the requirements of law.

There has been an explosion of human population over the last 50 years. Life has become competitive. Sense of idealism in the living process has systematically eroded. As a consequence of this the age old norms of good living are no longer followed. The anxiety to do good to the needy or for the society in general has died out, today oblivious of the repercussions of one's actions on society, everyone is prepared to do whatever is easy and convenient for his own purpose. In this backdrop if the laws are to be enforced and the malaise of pollution has to be kept under control and the environment has to be protected in an unpolluted state it is necessary that people are aware of the vice of pollution and its evil consequences.

We are in a democratic polity where dissemination of information is the foundation of the system. Keeping the citizens informed is an obligation of the Government. It is equally the responsibility of society to adequately educate every component of it so that the social level is kept up. We, therefore, accept on principle the payers made by the petitioner. We are happy to find that the learned Attorney General who appeared for the Union of India has also appreciated the stand of the petitioner and has even cooperated to work out the procedure by which some of the prayers could be granted.

We dispose of this writ petition with the following directions:

(1) Respondents 1, 2 & 3 shall issue appropriate directions to the state Governments and Union Territories to invariably enforce as a condition of license of all cinema halls, touring cinemas and video parlours to exhibit free of cost at least two slides/messages on environment in each show undertaken by them. The Ministry of Environment should within two months from now come out with appropriate slide material which would be brief out efficiently carry the message home on various aspects of environment and pollution. This material should be circulated directly to the Collectors who are the licensing authorities for the cinema exhibition halls under the respective state laws for compliance without any further direction and helping the cinema halls and video parlours to comply with the requirements of our order. Failure to comply with our order should be treated as ground for cancellation of the licence by the appropriate authorities. The material for the slides should be such that it would at once be impressive, striking and leave an impact on every one who sees the slide.

(2) The Ministry of Information and Broadcasting of the Government of India should without delay start producing information films of short duration as is being done now on various aspects of environment and pollution bringing out the benefits for society on the environment being protected and the hazards involved in the environment being polluted. Mind catching aspects should be made the central theme of such short films.

One such film should be shown, as far as practicable, in one show every day by the cinema halls and the Central Government and the State Governments are directed to ensure compliance of this condition from February 1, 1992.

(3) Realising the importance of the matter of environment and the necessity of protecting it in an unpolluted form as we had suggested to learned Attorney General to have a dialogue with the Ministry of Information and Broadcasting as to the manner the All India Radio and Doordarshan can assist this process of education. We are happy to indicate that learned Attorney General has told us that five to seven minutes can be devoted every day and there could be, once a week, a longer programme. We do not want to project an impression that we are authorities on the subject, but we would suggest to the programme controlling authorities of the Doordarshan and the All India Radio to take the proper steps to make interesting programmes and broadcast the same on the radio and exhibit the same on the television. The national network as also the State Doordarshan Centers should immediately take steps to implement this direction so that from February 1 1992, regular compliance can be made.

(4) We accept on principle that through the medium of education awareness of the environment and its problems related to pollution should be taught as a compulsory subject. Learned Attorney General pointed out to us that the Central Government is associated with education at the higher levels and the University Grants Commission can monitor only the under graduate and post graduate studies. The rest of it, according to him, is a State subject. He has agreed that the University Grants Commission will take appropriate steps immediately to give effect to what we have said, i.e., requiring the Universities to prescribe a course on environment. They would consider the feasibility of making this a compulsory subject at every level in college education. So far as education upto the college level is concerned, we would require every State Government and every Education Board connected with education upto the matriculation or stage even intermediate colleges to immediately take steps to enforce compulsory education on environment in a graded way. This should be done that in the next academic year there would be compliance of this requirement.

We have not considered it necessary to hear the State Governments and the other interested groups as by now there is a general acceptance through out the world as also in our country that protection of environment and keeping it free of pollution is an indispensable necessity for life to survive on earth. If that be the situation, every one must turn his immediate attention to the proper care to sustain environment in a decent way.

We dispose of the matter with the aforesaid direction but give liberty to Mr. Mehta to apply to the Court from time to time for further direction, if necessary."

On 18 December 2003, the Hon'ble Supreme Court further ordered, "We also direct the NCERT . . . to prepare a module (model) syllabus", and on 13 July 2004 it directed that "the syllabus prepared by the NCERT for Class I to XII shall be adopted by every state in their respective schools". It further directed that "the NCERT be appointed as a nodal agency to supervise the implementation of this Court's order".

Compliance to Supreme Court order is mandatory and desirable, and applies to all states and UTs (in fact, it is one of the few things that apply to all education in India)

NCERT has clarified that in order to have compliance; a separate subject is not a necessity. It can be done through infusion, in science, social studies, mathematics, language and other subjects, and/ or through a separate subject.

It does however have to be part of the compulsory curriculum.

NCERT has developed a syllabus for Environment Education for 1 to 12 standards, which is accepted by the SC. Therefore in order to comply, this syllabus would need to be covered. In the light of this directive, in 2004, the NCERT undertook a massive national consultation. It also initiated a review of the national curriculum framework towards which 21 National Focus Groups were set up on various problems and subject areas of education in schools.

5.4. Habitat and Learning

The focus group on Habitat and Learning was constituted to address the area of EE. The draft report of the Habitat and Learning Focus Group states that "The new paradigm of education, embodying the spirit of science, of democracy, and of caring for the environment, would emphasize a number of key elements:

- Learning rather than teaching;
- Building capacity for critical thinking and problem solving;
- Locale specificity in the context of a global vision;
- Multidisciplinary approach;
- Multi-sourced and accessed, rather than top-down, controlled and orchestrated in nature;
- Participatory with broad involvement of peers and other community members;
- Life long and continuous in character;
- Sensitivity to diversity, equity and gender;
- Knowledge generation;
- Empowerment, rather than indoctrination.

5.5. Support for Environmental Education (EE)

In India, at the central level, both the Ministry of Environment and Forests and the Ministry of Human Resources Development (MHRD) have been working towards supporting EE in schools. The Ministry of Environment and Forests supports two Centres of Excellence in Environmental Education—these are Centre for Environment Education, Ahmedabad and C.P.R. Environmental Education Centre, Madras. It has also supported training of teachers in EE and school level activities under the National Environmental Awareness Campaign. The Environmental Orientation to School Education scheme of the MHRD supports initiatives by state governments and NGOs for environmentalizing school education. Some state governments have also initiated efforts within their own state. Academic institutions including Teacher Training Colleges are also looking to see how they can support EE in schools. Some colleges have already introduced special papers in EE in the B. Ed. course. An innovative initiative was the Environment Education in School System (EESS) project undertaken by the Ministry of Environment and Forests (MoEF), to take stock of environmental education efforts in

the country, and to assess how the Ministry of Environment and Forests could contribute to strengthening EE in schools.

Phase I involved a detailed study of the status of infusion of environmental concepts in school curricula in the country and the status of teaching of EE in schools.

Phase II involved pilot implementation of the programme in eight states at the middle school (Std VI, VII, VIII) mainly through impacting the teaching of Science, Social Studies and Languages and through extra and cocurricular activities. For strengthening EE in schools, as a first step, greening of existing State level textbooks has been undertaken by infusing environmental concepts into the textbooks of Science, Social Studies and Language for Standards 6, 7 and 8. The process of greening textbooks involved adding, deleting, modifying and adapting text, visuals, activities, exercises etc., to give an environmental perspective. The participating states are Andhra Pradesh, Assam, Goa, Jammu & Kashmir, Maharashtra, Orissa, Punjab and Uttaranchal.

Phase III involved 8 more states for a similar exercise of greening textbooks, training teachers, and enriching EE by co-curricular hands-on activities. As part of Phase III, greening frameworks have been developed for Chhattisgarh, Kerala, Tamil Nadu, Karnataka, Himachal Pradesh, Sikkim, Tripura and West Bengal in consultation with the states. Training of Master Trainers and teachers, and co-curricular hands-on activities in the selected States has also been undertaken.

6. Case Study of Environmental Education (EE) and Environmental Ethics Education (EEE) in Vietnam

The Educational Technology Experimental School is the first research space for curriculum development in Vietnamese education. The education content, method and organization methods from the first grade have been done in a new way. The education contents are designed in 3 areas: Science, Fine Art and Moral Education. Scientific concepts are the cores to be formed in the three education areas. Scientific concepts are the building blocks of human thought. They reduce the complexity of the environment and enable us to respond to it efficiently. The learning of concepts consists essentially of a process of abstraction, because a concept refers to the essential common features of a class of objects. Because of the common features of objects, a concept is helpful in identifying regularities in the environment. However, scientific concepts (contents) have different values in different education areas, as we can summarise:

In Science: Concepts are *genuine objectives*, which need to be acquired completely, definitely.

In Fine Arts: Concepts are *material cores* of a possible, hopeful object of thought.

In Moral Education: Concepts are *material point d'appui* of a possible, hopeful object of thought.

Among the three areas, moral education is the most difficult to get desirable results. That is why educational technology does not want to teach "morals", but rather, "*Life Style Education*". Moral Education is something more theoretical than Life Style Education. Life Style Education still has theory, but it must affect behaviours. Life style is the student's knowledge manifesting outside with behaviours, gestures, words, ways of life, everyday activities.

Life style is an expression of culture, and has features of a specific place, although it is evolving in every community. It is an outcome of the total education process, the material production relations and the current institution. Therefore, life style education is a study subject, but it has been done through all the other subject areas. A student's life style is formed not only in schools, but also in families and the society as well.

Life style education for primary education focuses on helping children solve responsibly the relationships in the family, in schools and in society. Those are the relations with their grandparents, parents, brothers and sisters, the relations with their teachers, friends, relatives, the relations with the natural environment, pets, with the social and school rules, regulations, norms. Life style education must contribute in forming humanism, love for nature, schools and families, which are tied to patriotism.

Which moral concepts are basic for the secondary school age? The relationship standards between people and people, people and society, people and nature have been selected. Children are taught that their actions affect themselves and others, to care about other people's feelings and try to see things from their points of view, to think about the lives of people living in other places and times, and people with different values and customs, to be aware of different types of relationship, including marriage and those between friends and families and develop the skills to be effective in

relationships, to realize the nature and consequences of racism, teasing, bullying and aggressive behaviors, and how to respond to them and ask for help. Children can talk and write about their opinions, and explain their views on issues that affect themselves and society, to recognize their worth as individuals by identifying positive things about themselves and their achievements, seeing their mistakes, making amends and setting personal goals. They are taught to research, discuss and debate topical issues, problems and events. They are taught why and how rules and laws are made and enforced, why different rules are needed in different situations and how to take part in making and changing rules.

They know that there are different kinds of responsibilities, rights and duties at home, at school and in the community, and that these can sometimes conflict with each other. Children can understand that resources can be allocated in different ways and that these economic choices affect individuals, communities and sustainability of the environment, recognize how people can improve the environment or damage it and how decisions about places and environments affect the future quality of people's lives... The standards are inherited and filtered from time to time, have been developed in the current politic – social relations and enlightened under the modern science. The secondary schoolchildren's vision has been gradually opened and summed up into a *philosophy*.

Next, we can consider the results of a project from June 1996 to December 2004 in Viet Nam. The executing agency was the Ministry of Education and Training (MOET), and the implementing agency was the Center for Educational Technology, Hanoi. The overall objective was to promote greater environmental protection in Vietnam through influencing the values, attitudes and behaviors of school children through environmental education programs in schools.

Objective 1 was "To assist the education system in Vietnam to put into effect the approved National Policy Statement on EE and National Implementation Strategy for EE." The MOET approved the Policy and Action Programme document. 64 provinces completed the Action Programmes in 2001-2005 and 48/64 provinces revised theirs towards 2010.

The project completed 6 National Environmental Education Courses for 126 learners. They set up 3 Environmental Education Resource Development Centres in line with their responsible provinces. Publications included the documents: National Policy on EE; National Strategies on EE and Policy; EE Action Program in the schools 2001-2010; Guides to Designing EE modules for training courses; Policy and Environmental Education Action Program in the Schools of Vietnam; and Designing Environmental Education Modules for Training Courses.

Objective 2 was "To promote the full implementation of the EE Guidelines for Teachers Trainers in the pre-service and in-service training of teachers." As results they set up 9 teacher training nodes. They trained 800 cadres from 73 pedagogical institutions in EE. They published General Guidelines on EE for Teacher Trainers and 3 Introductory EE Module Guidelines for primary, lower and upper secondary levels. They also published the guides on Environmental Education Modules Designed as Examples from the Curriculum; EE Modules for the Extra-Curricular Activities; General Guidelines on

Environmental Education for Teacher Trainers (primary level); Introducing some Environmental Education Modules for Primary Level: General Guidelines on Environmental Education for Teacher Trainers (Lower Secondary Level): Introducing some Environmental Education Modules for Lower Secondary Level: General Guidelines on Environmental Education for Teacher Trainers (Upper Secondary Level): Introducing some Environmental Education Modules for Upper Secondary Level; Environmental Education Modules Designed as Examples from the Curriculum; and Environmental Education Modules for the Extra-Curricular Activities.

Objective 3 was “To expand and enhance environmental education practice in primary and secondary schools through the curriculum, extra-curricular activities and school/community links”. The results were to train 5,000 cadres on the EE issues. They identified 43 pilot provinces and 4,136 pilot schools nationwide. They also produced 11 VCDs, 5 photo books, 18 EE Newsletters and a series of articles on Nhandan newspaper (Weekend issue), Education and Times magazine (Sunday issue), on VOV and HTV. They published the guides School Greening Guide for Teachers and How to Design Green, Clean and Beautiful Schools. They also produced further illustrated books for the photo competition “Environmental Education and Sustainable Development”, and 18 Environmental Education Newsletters. There were a series of books including:

Illustrated book for 2000-2001 school year EE campaign “The Green Rain”

Illustrated book for 2001-2002 school year EE campaign “To Live Economically for a Sustainable Environment”

Illustrated book for 2002-2003 school year EE campaign “Let’s Share with People!”

Illustrated book for 2003-2004 school year EE campaign “For Today, and for Tomorrow!”

Illustrated book for 2004-2005 school year EE campaign “!Water - Use enough for today, save for tomorrow!”

The project also developed a project network with 3 EERDCs, 9 Teacher Training Nodes, 43 pilot provinces, 4,136 pilot schools nationwide. The Project Steering Committee included PAT, TSU, Supervisors from 64 Provinces and 73 Teacher Training Institutions, 126 key learners from 6 NEECs.

On 12 December 2002, the Project was awarded a Golden Cup for the Green in Vietnam by MONRE, VAST and Organization Committee of International Green Week. In May 2005, the Center for Education Technology was one among 11 organizations and 9 individuals to receive the Environment Award 2005 given by MONRE for their outstanding achievements in environmental protection of Vietnam.

7. Case Study of Environmental Education (EE) and Environmental Ethics Education (EEE) in Philippines

7.1. Miriam College

The Whole School Approach intends to develop a culture of environmental care in schools. In this approach, environmental education incorporated in school policy and administration, curriculum and research, campus practices, and outreach and extension. Some projects also become production and Income Generating Projects.

This approach describes the practice of various schools such as Miriam College in Quezon City, Philippines. Miriam College has students from primary through tertiary levels, and is a woman's college. In policy, environmental care is incorporated in the Vision and Mission Statement as the core values of the institution in *Kalikasan* (Integrity of creation). It is also incorporated it in its institutional programs. Environmental policies embed environmental ethics in school programs such as: integration of 7 environmental principles in the curriculum, MakiTIPS Program (Conservation program), Ecological Solid Waste Management, Natural and local food in the cafeteria, No smoking policy, and Anti-smoke belching.

Environmental education and the values orientation in the care of creation are taught through the following 7 Environmental Principles:

1. Nature knows best.
2. All forms of life are important.
3. Everything is connected to everything else.
4. Everything changes.
5. Everything goes somewhere.
6. Ours is a finite earth.
7. Nature is beautiful and we are stewards of God's creation.

(Miriam College. 2006. *7 Lenses: Environmental Principles as if adults mattered*). A summary of these is in Table 1.

Table 1: Seven Lenses Approach

Environmental principle	Related scientific concepts/ethical principles
1. Nature knows best	Balance of nature Harmony with nature Ecocentrism Precautionary principle
2. All forms of life are important	Biodiversity conservation Animal rights Invasive alien species
3. Everything is related to everything else	Ecosystems Interrelatedness Humans and nature
4. Everything changes	Climate change Sustainable development Change management

	Environmental Impact Assessment Disaster risk management Ecological technologies
5. Everything goes somewhere	Pollution Ecological waste management
6. Ours is a finite earth	Finiteness of resources Water and energy conservation Access to resources Sources of energy Water, food and energy security Ecological footprints/ Low carbon lifestyles
7. Nature is beautiful and we are stewards of God's creation	Ecospirituality Community and multi-stakeholder participation Good governance Collaboration and networking

A common subject is offered at tertiary level in Miriam College as well. The course offered in common to all university courses and taken by all tertiary level students (MC 101, MC 201) ensures that every student gets EE/EEE. The course covers principles and values, school programs covering the 4 core values: truth, social justice, peace, environment and women. The course is taught by advocacy centers: Institutional Network for Social Action, Center for Peace Education, Women and Gender Institute, and the Environmental Studies Institute.

At the tertiary level, education is aimed at producing environmental professionals. Miriam College offers the following courses: BS Environmental Planning and Management, MS Environmental Studies, MA Environmental Education, MA Environmental Management, Ph.D. Environmental Education, and Ph.D. Environmental Studies.

Certain teaching methods characterize EE and EEE: outdoor education, multiple intelligences, critical analysis, debate, exposure to global and local environmental issues, solution of environmental problems, interdisciplinary, and holistic approaches. In curriculum integration, core messages in ethics are part of the seven environmental principles that are infused in all levels and subjects. In order to operationalize this method of reinforcement, an environmental education continuum through the various curriculum levels guides the teachers in the extent and breath of discussion. The continuum can be reflected in a matrix that shows the particular value, knowledge and behavior/skills that can be learned in a specific curriculum level and specific subject. Faculty and student research can be a fertile ground for critical analysis of environmental issues and concerns. Environmental ethics can also be incorporated in the school's vision, mission, core values, and strategic plans and in other policies of the school.

Campus practices likewise reflect care for the environment: food served in the cafeteria, purchasing policies, and water and energy conservation. In addition, outreach and extension programs aim to disseminate information about the environment and

sustainable development and help capacitate marginalized groups in society. Such a comprehensive approach of applying environmental ethics in the school and college has proven to be an effective way of elevating environmental consciousness and involvement among the members of the school community and in increasing the institutional commitment of schools in caring for the earth.

There is a different focus of EE for academic level: The grade school seeks to develop environmental persons; the high school produces environmental citizens; tertiary level education produces environmental professionals. This progression leads towards an EE continuum that ensures that for every stage of academic life, there is a progression of knowledge, values and skills.

Capacity-building of teachers includes the development of materials for teachers such as lessons exemplar and modules, training of new teachers, and annual faculty updates. The school also has an environmental library at the Environmental Studies Institute. To harness the energy of enthusiasts and volunteers, environmental groups are organized at various sectors and levels of the school. Such groups include: Earthsavers Club, Junior Environmentalists Club, Kalikasan (Environment) Club, Miriam Environmental Planning Organization, Outdoor Society of Miriam and, Miriam, and *Public Education and Awareness Campaign for the Environment* (P.E.A.C.E.).

To achieve a green campus, the campus must reflect environmental principles through systematic greening of campus, environmental management, ecological solid waste management, and green architecture and design. The outreach and extension programs is aimed towards community involvement and multi-stakeholder participation. EE can be incorporated in outreach and extension programs in the immediate urban community as well as in watersheds and protected areas. The programs focus on poor and marginalized communities and sectors e.g. communities living in and around protected areas, tricycle drivers.

A capacity-building approach to development involves identifying the constraints that people experience in realising their basic rights, and finding appropriate vehicles through which to strengthen their ability to overcome the causes of their exclusion and suffering (Eade, 1997, p. 24). Transformative participation addresses the discrepancy between social groups and the need to shift more power to these disadvantaged groups (Nelson and Wright, 1995.).

Ethical issues are encountered on site, specifically, access to resources. For example, how can communities living in and around protected areas be so poor? Is it ethical for a large mining company to extract marble at the expense of the water resources of the community? Why do communities living in the watershed have limited access to basic services? Is it ethical for a large dam to be built to supply water to Metro Manila and environs at the expense of submerging local and indigenous communities and threatening downstream communities? What is the cost of water?

Being a member of various environmental networks assists the school in becoming part of the mainstream civil society groups. Thus, the school remains relevant in addressing local issues.

7.2. Environmental Policy of Visayas State University³³

Environmental ethics is applied in Visayas State University, the Philippines, through the university environment policy, curriculum, research innovations for sustainable development and other environment programs. The school environmental policy is based on memoranda on waste management; energy and electricity conservation; pollution prevention program; greening program; Integration of rain, forestation farming strategy in denuded areas wherein native species were planted. The policy includes the following notices:

- A. Waste Management - Memorandum Circular NO. 66 Re: First Garbage Recycling and Compost Fair and Memorandum Circular NO. 28 on Policy Governing the Use of Plastic Bags, Styrofoam and other Non- biodegradable Containers
- B. Electricity Conservation - Memorandum Circular NO. 75 on Energy Conservation Measures
- C. Pollution Prevention Program - Memorandum Circular NO. 49 on the Orientation on “Bantay Tabutso sa Eskwela Program”
- D. Greening Programs - Memorandum Circular NO. 277 on Inventory of Tree Species and DENR Memorandum Circular No. 2004-06 on Guidelines in the integration of Rainforestation farming strategy in the development of open and denuded areas within protected areas and other appropriate forest lands wherein native plants and trees are planted instead of *Gmelina* sp.
- E. Other Environmental Programs and Natural Resource Programs such as Research Innovations for Sustainable Development which includes developing cooking stoves which use plant oils (coconut milk); incorporation of natural fibers (abaca) in car parts; Natural Resource Management and Ecosystem Restoration wherein they VSU had done studies comparing *Jatropha (Jatrophacurcas)* and coconut oil in terms of yield and methods of extraction as alternative for oil. They also have research on the use of abaca (Manila hemp) instead of glass fibers in car parts which provide livelihood for people in the community thereby decreasing slash and burn activities and helps in recycling because less fiber glass is used in car parts.

In coordination with an agri-tech project in Australia, there is integration of environmental themes and ecology in the entire curriculum. They have programs in agriculture, animal science, animal husbandry and others which are geared towards increasing production. Environmental degree/certificate programs are also being offered by the school. They conduct regular in-service environmental training for faculty members and have environmental support instructional materials in their library.

The challenge they need to overcome is more of administration and how to live sustainably. There is a need for a paradigm shift in education strategy such that lifestyles are put in check and we become the judge of ourselves in determining if we were effective in our teaching methodologies, resource materials, experimentations and learning facilities toward promoting sustainable development and advocating environmental ethics or environmental conscience.

³³ Contributed by **Professor Pacencia P. Milan, Visayas State University**

7.3. St. Paul University Dumaguete Environmental Stewardship since SY 2005-06³⁴

Technical support was provided by Miriam College to St. Paul University Dumaguete (SPUD) to started this program since 2005. SPUD was awarded the Eco-Friendly School in Region 7 in 2009. SPUD is located in a 3.5 ha land area with 208 trees and has around 2,800 to 3,000 students. Under their solid waste management (SWM) program, they were able to estimate percentage of wastes generated and collected in a month with about 1,244.40 kg of recyclable wastes comprising more than 12 percent, 6,223 kg for compostable wastes and 2,313 kg or around 24 percent are residual waste. He mentioned the major contributor of wastes come from the creek in the university, which is being cleaned everyday.

The EEE foundations for SPUD are mainly theological and students were taught that they are co-creators, tenants and caretakers. They believe that schools are cradles of values formation. In August 2005, SPUD introduced their Eco-SWARM Program (Eco-Solid Waste and Management) and in September of that same year, they had a Reforestation and Adopt a Tree Program. Program Objectives and formation framework center on instilling the value of stewardship and includes sharing God's goodness, developing attitudes, appreciation and fascination for God's creation, raise funds, realization of interconnectedness of humans and nature and providing opportunities to share.

Eco-SWARM has five committees assigned to work on Advocacy and Livelihood, Collection and Disposal, Research and Innovation, Monitoring and Evaluation, and Communications and Documentation. The main components are:

1. ECO-SANCTUARY PARK: Butterfly Sanctuary and Fish Pond; Aviaries for birds, turtles, and rabbits
2. SOLID WASTE MANAGEMENT SKILLS and TECHNOLOGY: MRF; Vermi Composting ; Recycling of papers, Styrofoam, glasses, and plastics bags; and improvised paper pulp machine and press.
3. CURRICULUM INTEGRATION - Environmental Education (7 Environmental Principles)
4. ECO-SCHOLARSHIP - raise funds from the collected trash from the different sources to be able to offer educational scholarship to the deserving young scavengers

Environmental Policies and practices in the university include no burning of garbage like printed/painted paper, plastic, rubber and the like to avoid emission of carbon dioxide and other toxic gases; composting of food and garden waste at your own household; conservation of energy by switching on/off air conditioners according to a schedule, electric fans, and turn off lights when not in use, and using water wisely; utilizing the back page of paper before disposing it; no smoking policy in the school campus as lunchboxes, decoration and for other purposes; banning the use of Styrofoam

³⁴ Contributed by **Prof. Romualdo "Dondee" Señeris II, CFO-CES Assistant Coordinator.**

in the school campus and; integration of Environmental Stewardship in the Community Extension Service Programs.

The students and the nearby communities are engaged in SPUD in program advocacy and capacity building. SPUD also has Styropor Plastic Recycling Facilities. fertilizer. They also have "Support Diploma saBasura" where students conduct recycled paper making, charcoal making and plastic rope making out of plastic bags to generate funds for scholarship of other students.SPUD began its journey to becoming an accredited dark green school in 2009.

EE is integrated in all classes and subject areas in SPUD. Students are engaged in all stages of the Eco-SWARM Program involving collection, segregation, recycling and marketing advocacy. High school volunteers usually assist with Naturally Fermented Solutions (NFS) -making as part of composting while college students help with recycling. A least once a year, a student has to undergo immersion activity in SPUD's project. The students are oriented before they immerse and the parents are informed about the activities to how these are part of the learning process. They also take part in paper, mixed paper and dry leaves charcoal project. They found out that paper without any binder such as cassava starch has high level of combustion. Eight pieces of charcoal can cook 1 kg of rice.

Eco-SWARM is not limited inside the university. SPUD shares their knowledge to the nearby communities and schools through Eco-SWARM Outreach where they do Solid Waste Management Advocacy; Technical Assistance on SWM; Assessment and Monitoring on SWM Implementation and; other related programs. SPUD had partnered with ten barangays (small communities) where they invite all public school teachers with their local officials to introduce the various environmental programs of SPUD. An example is the case of Boloc-Boloc Elementary School with MRF and SWM-Vermi Composting Facility and in Boloc-Boloc community with MRF. SPUD will turn over the MRF to Boloc-Boloc.

Another project they have with the community is the Kasambahay Skills and Personality Development where they teach household help with ccomputer literacy, hygiene and sanitation in the kitchen, table setting/skirting, and napkin folding, basic household health management, hhousekeeping, hhousehold solid waste management, fruit carving, basic cooking, personality development, spiritual recollection, sewing skills, and other livelihood skills.

The Reforestation and Adopt-a-Tree in the Mt.Talinis-Twin Lakes (MTTL) Forest Reserve Project started in September 2005. The growth success of planted trees was only 25 percent in 2005-2007. In 2008, SPUD introduced the local partnership with the community to increase survival of trees. They pay partner-farmers Php4 for each tree with maximum on 1,000 trees per month. The Php4 comes from students who are willing to adopt a tree for one year and they contribute around Php50. Php 200 is charge per tree for alumni and non-student of St. Paul University Dumaguete or any St. Paul University in the world. After three years of consistently adopting, they put a name on the tree. It is their goal to plant 9,000 trees by 2010 and double it every 3 years.

7.4. Climate Change Adaptation Initiatives in Libon, Albay, the Philippines³⁵

Many local governments are already doing climate change adaptation and mitigation and environmental governance. The **A2C2 Libon Initiative** was a localized provincial climate adaptation template of the governor. A2C2 is a provincial initiative and she presented how they implemented in Libon City, Albay. A2C2 is the acronym for Albay in Action on Climate Change. Albay is in the eastern side facing the Pacific Ocean and the other side is facing South China Sea where Libon is. Libon is frequently visited by typhoons because on the Pacific Ocean lies a big portion of the Albay peninsula.

A2C2 is one of the priority governance templates of the governor because when the governor took office in 2007, Albay was hit by two successive very, very strong typhoons, Milenyo and Reming. Governor Salceda said the severity of the weather disturbances in Albay prompted him to draft his own climate change and disaster reduction policy for his constituents. He says local government units should act as lead agents for disaster reduction and not the national government. International Alert identified the Philippines as a climate hotspot and ranked it 4th in the Global Climate Risk Index, with 20 out of 80 provinces vulnerable to a one-meter rise in sea level. These provinces are in the Autonomous Region of Muslim Mindanao, the Zamboanga Peninsula, Eastern Visayas and the Bicol Region. A2C2 has programs which focus on "climate-proof and disaster-proof" development in the province by strengthening and improving evacuation sites, introducing climate change curricula to schools and training 720 village officials in climate change adaptation and disaster preparedness.

The local government unit of Albay was able to come up with Ten Commandments which she hoped would find their way into Albay's environmental laws. These are printed on tarpaulin and posted in every town to remind the people to integrate that in their lives.

1. Iwasan na ang paggamit ng Chlorofluorocarbons (CFC's) per Chlorofluorocarbons (CFC's) at sangkap (Avoid using CFC's, per CFC's and other harmful chemicals);
2. Iwasan na ang paninigarilyo lalo na sa mga saradong lugar at huwag kailanman titikim ng droga (Avoid smoking and never try illegal drugs);
3. Magtanim ng maraming kahoy at itigil n aang illegal na pagtotroso at pagsunog ng kagubatan (Plant more trees, stop illegal logging and slash and burn);
4. Pangalagaan ang mga paubos nang uri (species) at pamaraang indigenous at ipagtanggol and Bio-cultural diversity (Protect endangered and threatened species and indigenous knowledge and Bio-cultural Diversity);
5. Huwag gumamit ng mapaminsalang pamamaraan sa pangngisda at isaayos ang napinsalang coral (Do not use destructive fishing methods and rehabilitate damaged corals);
6. Itigil ang pagsalaula ng lupa at daanan ng tubig ng mga basura at nakakalasang dumi, sahalip, magresiklo at mag-compost na lang, may pera sa basura (Stop making our land and waterways dirty. Let us recycle and compost. There is money from garbage);

³⁵ Contributed by Hon. Agnes Perez Dycoco, Mayor, Libon, Albay, the Philippines.

7. Huwag gumamit ng sistemang open pit mining at sunugin ang mga basura lalo na ang mga plastic upang maiwasan ang pagbabago ng klima (Do not use open pit mining and burn garbage especially plastics to prevent climate change);
8. Iwasan ang pagbubuga ng maitim na usok na magiging sanhi ng sakit sa mga bata sa pamamagitan ng pagsasaayos ng mga sasakyan at mga pagawaan (Avoid air pollution which causes health problems in children by maintaining vehicles and industrial equipment);
9. Pangalagaan ang malinis na tubig at enerhiya dahil ang mundo ay mayroon lamang na limitadong kakayahan; Magkaroon ng populasyong balance sa mga likas na mapagkukunan (Conserve clean water and energy because the earth has limited capacity; Population should be balanced with natural resources and);
10. Pigilin ang mga digmaan. Iwasan ang paggawa ng armas nukleyar at kemikal na makapipinsala ng sangkatauhan (Stop war. Do not make nuclear and chemical weapons which put the world in danger)

Mayor Dycoco created A2C2 Libon initiative ten commandments which are:

1. Observe Earth hour everyday
2. Change fluorescent bulbs with incandescent bulbs
3. Buy CFC free air cons only
4. EO adopting & implementing a smoking citation ticket for smokers within the LGU Buildings/Municipal Ordinance banning Smoking in closed public spaces
5. Quarterly Linis-Kalog project (Pilot are: Centro Poblacion replicated subsequently in other leagues)
6. Establishment of Tree Nurseries, at least 1 per league
7. Sustain LINIS-GANDA projects by establishment of Cluster MRFs
8. Sustain CBRMP Projects, Refo/Agro-forestry, Mangrove, FSMR
9. Establish coco nurseries to replenish typhoon damages at upland areas and lakeside
10. Establish a palay seedbank to ensure continuous farm production despite calamities

Twenty-three schools made their pledge for mother Earth by conducting activities that will encourage pupils awareness on the importance of preserving our environment and educating the parents through PTCA conferences best practices to preserve and nurture our mother earth. Under the Municipal Ordinance No. 2009-03, graduating high school students and students studying within the territorial jurisdiction of the municipality of Libon and graduating Libon tertiary students are mandated to plant trees as part of their community service and additional requirements for graduation. Mayor Dycoco said that they have continuous reforestation of public and private upland areas and they are using the seedlings coming from their nurseries. Under the CBRMP project, they have already reforested around 500 hectares of public lands. They are still negotiating with private landowners to extend their reforestation project. LGU officials and municipal staff are also involved in tree planting. Environmental Governance in communities includes several practical elements, listed below:

Seedling Nurseries

They established 6 tree nurseries. They are trying to sell tree seedlings to the DENR instead of asking supplies from DENR. After Reming and Milenyo, they had no copra so they partnered with the CIN to establish coco nurseries and wan lent to the farmers.

Now, they have planted around 175,000 coconut seedlings. They also established a palay seed bank to ensure continuous farm production. Farmers were given a seed fund and provide them with technology assistance so they grow the seedling received from the Department of Agriculture (D.A.). They coordinated with D.A. so that seedlings supplied will be coming primarily from the seedlings grown by their farmers.

Solid Waste Management

LGU have a Libon-Linis Ganda Project conducting IEC on SWM. Libon has school based campaigns under the Department of Education program which is called "War on Waste". The Project Management Office (PMO) conducts IEC on SWM and on landfills. Trainers' Training of volunteers is also being conducted so that they can help in IEC. Establishing MRFs is also under the SWM. They have an existing MRF in Zone 2 which is for the central poblacion, and are working now to establish the MRF in two other leagues, which are the coastal league and the lakeside league. Mayor Dycoco also mentioned about the Linis Kalog Linis ng kanal at ilog" (Clean waterways and rivers) which they do every three months. They divide the rivers into four and put in a river eco-aide with a small boat for collecting garbage. Mayor Dycoco launched a corollary program "Bantay Bayan" which involved the schools. Eco-aides were given mobile phones with camera for reporting environmental violations. She also told students that if they can take a clear photo of people throwing trash in the rivers, they can send the photos to the Mayor's office and a reward of Php 500 worth of phone credits will be given.

Community Based Resource Management Project (CBRMP)

In 2001, the former Mayor and husband of Mayor Dycoco placed the Community Based Resource Management Project (CBRMP) in eight barangays. This is maintained as a good template for environmental governance with coastal, lake, reforestation, agro-forestry, mangrove replanting and a fish sanctuary. Under the Bida Ka Program, there is IEC as part of the BHEMM Project wherein environmental principles are taught in coastal communities. The volunteers who work on this are called Sea Angels. Under the coastal fisheries resource management project called "Bidahan" or Balik-Isda-Pangkabuhayan, fisher folks are empowered. BalikIsda-Pangkabuhayan is bringing back the fish. Under the program, they have registered around 500 fishermen and they were being trained with partners from USAID and World Fish Program which started with the Fish Summit held last April. They also have Sea Rangers and Lake Rangers for law enforcement.

They worked with the Bureau of Fisheries and Aquatic Resources (BFAR) to determine the growth of fishes in their sanctuaries, by establishing a baseline. They are also aiming to establish more Marine Protected Areas (MPA) both for environmental protection and tourism.

Eco-tourism

Tourism and environment is included in the environmental ethics of Libon, Albay. They want to be stewards of mother earth but they also want to enjoy God's creation. So they have ecotourism which was launched only in 2009. They are promoting the smallest fish in the world, *Pandaca pygmaea*. They use the local festivity Libon-Paroy Festival which they had been celebrating since 1994 to popularize climate change issues and in launching their adaptation program. They already had existing environmental governance but they focused it on the immediate and overwhelming concern for climate change adaptation.

Disaster Management

The LGU of Libon has Disaster Management Protocol called LIBONIC which aims to increase awareness of the constituents. It has a manual / booklet which the barangay captain can refer to in times of disasters. Written on this are standards and timeframes such that when Mayor gives an order for evacuation and they barangay officials do not comply, they will not be given relief goods.

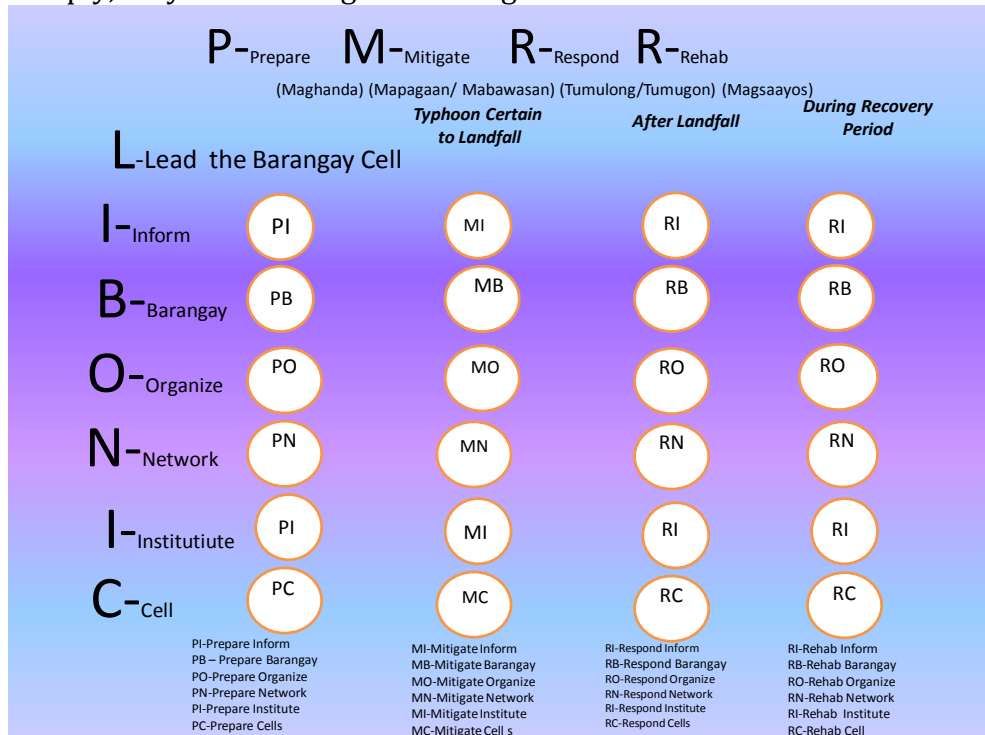


Figure 1: LIBONIC Framework on Disaster Management

The columns in Figure 1 are the different stages of disaster management the LGU officials have to be prepared to mitigate, respond and rehabilitate. LIBONIC stands for the different responses such as:

- L = Lead, gather, and mobilize when needed
- I = Inform
- B = Barangay
- O = Organize
- N = Network
- I = Institutionalize
- C = Cell

The Cell represents the barangay unit of safety. Another unit of safety measure in the barangay is the purok which is headed by the district kagawad, the Barangay Kagawad, the purok officers, the volunteers, Barangay Tanod, barangay health workers, barangay nutrition volunteers and all the constituents. That is how they divide the people so that it is easy to account for if somebody is missing.

The essence of LIBONIC is based on the science of disasters. The LGU officials have to know the stage of each disaster and the appropriate response. Environmental protection is not any more just the duty of NGOs but also of governments, schools, and everybody. All sectors must be included in dialogues.

7.5. Community education

The Southern Sierra Madre Wildlife Center (SSMWC) is a 25-year project of Miriam College to reforest and develop 180 has. of land in Brgy. Laiban, Tanay, Rizal within the Kaliwa Watershed, with the Department of Environment and Natural Resources. The Reforestation includes Community education, Community interaction, Community service: Scholarship Program, Enhanced Literacy and Numeracy, Service learning, and Ecological profiling.

There are ethical questions on site, including why do communities living in the watershed have limited access to basic services? Is it ethical for a large dam to be built to supply water to Metro Manila and environs at the expense of submerging local and indigenous communities and threatening downstream communities? What is the cost of water?

Radyo Kalikasan is a weekly radio program on the environment, broadcast 8-9am every Sunday. ³⁶ It is entering its 18th year of radio broadcasting, and it promotes a low Carbon Lifestyle. There is also a website for Pinoy Low Carbon Lifestyle.

Networking and Advocacy is also important, and is accomplished by representation in various decision-making bodies, including:

- Convergence for Safe Food, Healthy Environment and Sustainable Economy
- Partnership of Philippine Support Service Agencies
- CODE - NGO- Committee on Internal Reform
- Environmental Education Network of the Philippines
- Civil Society Counterpart – Council for Sustainable Development
- Philippine Council for Sustainable Development – IEC Sub Committee
- Concerned Citizens Against Pollution
- Partnership for Clean Air
- Environmental Broadcast Circle
- Philippine Network on Climate Change
- Solid Waste Management Coalition
- Philippine Council for NGO Certification
- Earth Day Network
- Ang Partido Kalikasan
- United Nations Civil Society Advisory Council
- Protected Area Management Board for Kaliwa Watershed and Marikina Watershed
- AlyansaTigil -Mina
- Protected Area Management Board (Kaliwa Watershed, Marikina Watershed, Biak-na-Bato National Park
- Royal Melbourne Institute of Technology
- UNESCO
- ASEAN Center for Biodiversity
- Case studies

³⁶ DWBL 1242 AM Band.

8. Case Study of Environmental Education (EE) and Environmental Ethics Education (EEE) in Thailand: Magic Eyes and Environmental Consciousness³⁷

As Thailand's economy and society modernized, its citizens began to consume more non-renewable resources. Littering became an increasingly prevalent problem in public spaces. In 1984, the Thai Environmental and Community Development Association identified this problem and worked to create a campaign against littering, with a focus on changing the behavior of children. Led by Chodchoi Sophonpanich, "Magic Eyes" was launched to deter children from littering and to build awareness their role in producing waste. Multiple advertising agencies were consulted to find an appropriate concept for the campaign. Initially, a superhero cartoon character was developed. Yet although children could relate to the figure, it was decided that such a personality was too friendly and could be ineffective in advancing a strong message.

Finally, Sophonpanich opted the concept of "Magic Eyes" (literal meaning—wonderful eyes), similar the notion of an all-seeing eye. The fierce-looking eyes would "watch" children, spotting anyone who litters. During the first decade, the organization adopted the slogan, "put trash where it belongs," as well as "ah, ah...don't litter...the Magic Eyes can see you." "Ah, ah" is the cautionary sound Thai adults make to stop small children from misbehaving.

With collaboration from private companies, the Magic Eyes logo was printed on food packages, consumer products and trash cans. Later, slogans and jingles were used to communicate the message that waste should be disposed of properly. Many kinds of media, using print, online and television have been used to communicate environmental consciousness. Musical skits were broadcasted on the radio. Life-sized Magic Eyes mascots would visit schools and community events. The organization built cooperation among NGOs, schools and private sector partners.

The eyes were chosen because of their seriousness, and for their ability to instill a sense of shame. Instead of using a cartoon, the association wanted to portray a more authoritative figure. As a result, the design featured a "mean-looking," fierce set of eyes. Additionally, the eyes were chosen with the idea of ostracizing those who litter, as Thais value the concept of "saving face." The eyes would also serve to protect the environment, defending nature against harm.

Magic Eyes currently has the following objectives:³⁸

1. To foster "environmental consciousness" in the minds of children and the youth (both immediate and long-term)
2. To disseminate knowledge of the environmental process, materials and the process of recycling. To make expert knowledge applicable to children and the greater public.
3. To promote environmental conservation, environmental responsibility

³⁷ Magic Eyes website: <http://www.magiceyes.or.th/th/cms/index.php?section=activity>

³⁸From "เป้าหมายของดาวพิเศษ" (Magic Eyes Objectives) <http://www.magiceyes.or.th/th/>.

4. To encourage responsible waste disposal.
5. Teach children that each person plays a role in creating emissions. To build awareness of the problems caused by waste and consumption, and how to begin to solve the environmental problem.
6. Teach students that they play a role in reducing emissions and waste
7. Education and conservation go hand in hand
8. To translate technical environmental concepts into easily understandable terms

Beyond teaching children and the greater public how to properly dispose of trash, Magic Eyes moved to promote awareness of the effects of waste and the role of the individual in producing waste. By extension, the organization began to promote environmental consciousness and for thinking of ways to act responsibly towards the environment. The overarching objective of Magic Eyes has evolved to promoting “environmental consciousness” among children, adolescents and adults. Achieving “harmony with the environment” is a long-term goal.

Environmental Activities

Magic Eyes has spurred many organizations to create their own programs to promote environmentally conscious practices. Schools, businesses and NGOs have adopted the Magic Eyes slogan and concept, creating their own environmental ethics programs and campaigns.

- The “Magic Eyes Barge” takes students on a boat trip along the Chao Phraya river and exposes them to the river’s ecology and the problems faced due to pollution and environmental damage.
- Beach clean-ups are often organized by schools, associations and companies using the Magic Eyes logo and slogans.
- Organizations have promoted the use of “green” materials, using the Magic Eyes logo.
- Public and private schools have created “green activities” to promote environmentally-friendly behavior. Some have arranged recycling corners to organize waste and generate awareness of the recycling process. Others have tree-planting days.

Once society has solved the problem of pollution, littering, environmental degradation—and when all Thais have developed a sense of responsibility towards the environment, the eyes will change to appear “joyful.” For the time being, the eyes remain angry and vigilant.

Magic Eyes: Future Goals?

What is notable about the eyes is that it appeals to the concept of “saving face” in Thai and Asian culture. The Magic Eyes campaign identified a local environmental problem began a culturally specific campaign to address it. The organization used several forms of media to communicate this information.

Magic eyes became a well-known public environmental campaign throughout the 1980s, receiving spectacular recognition—it was widely successful as a brand. Yet to today it may not have the effect it once had. The character may have related effectively to Thai children at a particular point in time, yet with each new generation it must renew its image.

To follow the trend of other NGO groups, Magic Eyes could enlist support in evaluating the outcomes and impact of its programs. Through this, it can work to identify suggestions for improvement and continue the successful campaign it has led.



“Magic Eyes” poster (1984)

Separating and composting trash



A Magic Eyes poster explaining how materials such as glass, paper, aluminum and plastic can be recycled. The caption reads, “Let’s help each other conserve energy and natural resources through recycling.” It also explains the process required to manufacture paper, plastics and metals for consumer use.

“The production of one ton of paper requires 17 trees, 4,100 kilowatt-hours of electricity and 300 liters of oil. The recycling of paper can reduce water use by 60%, energy use by 70% and emissions by 50%. It can lessen deforestation and the destruction of natural resources. It can lessen the international trade deficit.”



การรีไซเคิลกล้วย

กล้วยสามารถหมุนเวียนใช้ได้ถึง 100% และต้นทุนการผลิตต่ำกว่าการผลิตจากวัตถุดิบใหม่ การรีไซเคิลกล้วยวันละ 3.5 แสนขวด (100 ตัน) จะช่วยลดการใช้ทรายได้ปีละ 26,350 ตัน หินปูน 7,045 ตัน หินพื้นผิว 1,715 ตัน โขดหิน 8,505 ตัน น้ำดื่มเค็ม 9.2 แสนลิตร ประหยัดพลังงานได้ 36 ล้านเมกะจูลต่อปี การรีไซเคิลกล้วย 100 % จะประหยัดพลังงานได้ 30%





การรีไซเคิลกระดาษ

การผลิตกระดาษ 1 ตัน ใช้ต้นไม้ 17 ตัน พลังงานไฟฟ้า 4,100 กิโลวัตต์-ชั่วโมง ใช้น้ำดื่มเค็ม 300 ลิตร การรีไซเคิลกระดาษสามารถลดการใช้ไม้ได้ 60 % ลดการใช้พลังงาน 70% ลดมลพิษลง 50 % ลดการสูญเสียป่าไม้และทรัพยากรธรรมชาติ และลดการเสียดุลการค้ากับต่างประเทศ





การรีไซเคิลอูมิเนียม

กระป๋องอูมิเนียม สามารถนำมารีไซเคิลได้ไม่จำกัดจำนวนครั้ง ช่วยประหยัดพลังงานที่ใช้ในการผลิตกระป๋องใหม่ได้ถึง 95% และยังช่วยลดผลกระทบต่อสิ่งแวดล้อมที่เกิดจากการทำเหมืองแร่ บ็อกไซต์ ซึ่งเป็นแร่ที่นำมาผลิตเป็นอูมิเนียม





การรีไซเคิลพลาสติก

เมื่อนำพลาสติกมาหมุนเวียนแต่ละครั้งจะได้เนื้อพลาสติกที่เหมาะสมกับงานแตกต่างกันไป เช่น ถัง, กระดาษแข็ง, ถุงพลาสติกเกรดต่างๆ โดยจะมีสัญลักษณ์ ♻️ - ♻️ บอกไว้บนเนื้อพลาสติกซึ่งหมายถึงสามารถนำไปรีไซเคิลได้



“มาช่วยกันประหยัดพลังงาน และทรัพยากรธรรมชาติ ด้วยการใช้รีไซเคิลกันเถิดครับ”



9. Animal ethics and Promoting Sea Turtle Conservation through Environmental Ethics Education³⁹

9.1. Morality in the Animal World

The term morality refers to a body of learnable standards of right and wrong conduct shared within a society that they form a communal consensus, as discussed in chapter 3. What about morals relating to animals? Animals are familiar to most people whether as pets or animals in nature. Orlans et al. (1998) mentioned some of the common codes of conduct with application in the fields that use animals as research and these codes include:

- a) Avoidance of unnecessary pain, deprivation, and suffering
- b) Welfare protection by improving the environment
- c) Searching for alternatives to the use of Animals
- d) Setting policies and performing professional review

In relation to animal-rearing systems, the Brambell Committee in 1965 put forth the “Five Freedoms” which was modified by the UK Farm Animal Welfare Council as follows:

1. Freedom from thirst, hunger and malnutrition
2. Freedom from discomfort
3. Freedom from pain, injury and disease
4. Freedom to express normal behavior
5. Freedom from fear and distress

Humans are accepted as moral agents (Macer, 2006; 2012) but are animals also capable of acting morally or making moral judgments? Can the behavior of some animals such as ‘reciprocal altruism’ which includes grooming, aiding in distress and protecting mates (Seyfarth and Cheney, 1984; Connor and Norris, 1982) just ways to gain evolutionary advantage and guarantee perpetuation of their own species? Can an animal make the moral choice of protecting itself and protecting others because it considers it good to do so? On the other hand, is it capable of feeling remorse for killing another animal? Or as moral agent, how does it view suicide?

Charles Darwin seemed to deny moral judgments of animals but affirmed that they have moral dispositions such as animals showing love, affection and generosity. Whether animals show compassion toward other animals, exhibit mercy, express gratitude or engage in selfless acts of rescue is another aspect that needs to be looked into.

There are opposing thoughts if animals possess minds. Immanuel Kant and Aristotle do not think that animals lack minds but they lack reason and that is enough to exclude them from the moral community. Other philosophers view animals as lacking all mental capacity. Descartes viewed that the lack of language and abstract reasoning, together with reacting only based on instincts and reason demonstrate that animals lack minds.

³⁹This chapter was contributed by Lea Ivy O. Manzanero, the Philippines.

Hume on the other hand believes that animals can both understand on the basis of experience and reason by making causal inferences citing as example of animals learning to pursue that which give ease or pleasure and avoid what hurt them. In his *Treatise of Human Nature*, Hume mentioned not only about *reason* in animals but also *love* in animals and *pride* in animals.

Observers of animal behavior today acknowledge that animals exhibit understanding, intention, thought, imaginativeness and various forms of communication. Donald Griffin (1984, 1992) mentioned about innovative forms of defense, use of tools, adaption to sudden and threatening changes in an environment, intentional movements and sounds to communicate. Linden (1999) wrote a book on animal intrigue, intelligence and ingenuity and mentioned how some animals know how to play games and humor, how to deceive humans to get more food or pretend that they were not given food yet when they already were and some scientists call this 'theory of mind' and some animals were noted to apply this to manipulate others. As to how animals' mental activity relates or has ethical significance still needs to be seen.

9.2. Human-animal relationships

9.2.1. How Humans view Animals

Some relationships are asymmetric in nature and this can be seen in the way that some animals are treated. Animals tend to be ranked according to their social value and the role that they are expected to play within a society (Swabe et al., 2005). Humans are at the top of sociozoologic scale followed closely by pets due to the affective value to humans, then livestock which have clear instrumental value and were considered as a kind of natural resource. This sociozoologic scale by Arluke and Sanders (1996) shows the social construction of animals and the diversity of cultural attitudes to killing animals. Humans are ranked at the top of their sociozoologic scale followed closely by pets due to the affective value to humans, then livestock which have clear instrumental value and were considered as a kind of natural resource.

Some religious beliefs include the abiding sacredness of animals which is rooted in a deep sense of identification. This was derived from the Hindu-Buddhist theory of transmigration, according to which the soul moves back and forth between different modes of existence, animals, human and superhuman. This was extended by the corresponding belief that all forms of life partake equally in the universal life force, a belief that was reinforced by Buddhist and Jain teachings. These religions also introduced the concept of ahimsa (nonviolence), prohibiting harm to any living being.⁴⁰

How then should humans relate to animals? If rights are accorded to animals, hurting or killing animals for whatever reason becomes an ethical issue and we as humans have corresponding duties to them although at varying degrees. How individual human person engages with animals is a matter of choice (e.g. not to eat meat) and corresponding rules or codes of conduct such as when conducting experiments involving animals. But Peter Singer (1989) in his paper "All Animals are Equal" criticized speciesism and anthropocentric ethics and argues about the moral rights of

⁴⁰<https://www.britannica.com/topic/ahimsa>, Accessed April 28, 2018.

other living beings on earth by making three claims against it: (a) quality is based on equal consideration; (b) equality is a moral idea not a factual one; and (c) the capacity for suffering is a prerequisite for rights.

9.2.2. Animals as food

Humans have depended on animals as food for a very long time. However, the intensification of meat production and aquaculture has led to negative externalities. Manzanero (2012) explored the implications of aquaculture and the ethics of eating fish. The call toward more humane farm practices in some countries tend to manage the outcry against animal cruelty, to make life for farmed animals more dignified, and to give consumers the choice of supporting a better, more ethical treatment of animals.

In the case of sea turtles that have managed to exist about 200 million years ago, the first reported capture and killing of sea turtles in the Philippines for eggs, meat, and tortoiseshell was reported by Seale in 1911. Up to this date, sea turtles are still being hunted by humans for their meat and eggs as food and their fat for oil. Bagarinao (2011) reported that two green turtles were found butchered and sold for USD \$1.25/kg in a market in eastern Panay.

9.2.3. Animals as pets

It has been a common practice to domesticate animals as pets because it brings joy, love, and companionship to humans. However, there are some ethical issues associated with the intensified breeding for domesticating animals and depriving them of the opportunity to engage in their natural behavior.

In addition to hunting sea turtles for food, in the Philippines, sea turtles, especially the juveniles, are captured to be reared as pets, despite this being illegal under Republic Act 9147. Some sea turtles or 'pawikan' (in local language) are being tied on the neck as pets and even had part of their flippers punctured by ice pick, knife, pliers or other sharp object to attach personal tags or names by the owners. Kids even ride on the sea turtles back which can make it very difficult for the 'pawikan' to breathe. There is also an illegal trade for sea turtles as exotic pet that is still happening. This is further discussed in the following case study.

Captive rearing of sea turtles is allowed usually for an institution such as the wildlife rescue center or school in special cases to take care of a sick sea turtle and then releasing them in the wild as soon as they are deemed capable but only after complying with requirements and being granted permit by the Protected Area Wildlife Bureau, now called the Biodiversity Management Bureau.

9.2.4. Animals as symbols of status

Some humans believe that they belong to a more advanced species than non-human animals. They take pride and spend a lot to put on display some animals as status symbols. This can be considered an act of speciesism which was defined by Peter Singer

as "a prejudice or attitude of bias in favor of the interests of members of one's own species and against those of members of other species".

In some Chinese homes, having a stuffed sea turtle is a status symbol. Chinese records of pre-Hispanic trade in the Philippines showed turtle shells as among the status-symbolizing Chinese commodities being traded (Junker, 1990). At present, some Japanese dealers have continued to import shell illegally as evidenced by numerous bekko shipments intercepted en route to or in Japan since the ban took effect (TRAFFIC East Asia-Japan 2000) and there is still an ongoing underground trade in southeast Asia to Japan and other destinations for sea turtles (van Dijk and Shepherd 2004, TRAFFIC Southeast Asia 2004).⁴¹

There are some animals that are considered not fit for domesticated way of life. In terms of intrinsic value, there may be greater value attributed to wild animals than with domestic animals as they are often used as flagship species in conservation efforts. How do endangered species survive with human interaction?

9.2.5. Animals in their natural habitat

Animals in the wild are considered not fit for domesticated way of life because of their specific niche in the ecosystem. Loss of keystone species through excessive hunting or accidental capture could greatly impact other species in the food web. There may be greater value attributed to wild animals than with domestic animals since they are often seen in logos of conservation groups.

Letting animals stay in their natural habitat undisturbed is letting them live their lives as nature intended it for them to. This is one of the general aims of conservation efforts. Reintroduction of animals in the wild is not without ethical issues, especially when humans have contributed in altering the natural behavior of some animals. As for the case of sea turtles, especially the nesters (who had imprinted) coming back to the areas where they were born to eventually lay their eggs and the hatchlings emerging from their nests, they are in danger of being captured by humans and may not be given a chance to be in their natural habitat.

9.3. Mechanisms supporting biodiversity conservation

As shown in how humans relate to sea turtles, some mechanisms have been put into place to provide level of protection and conserve this species. These can be useful examples for fieldwork of students.

Sustainable development takes into account biodiversity. Ecological degradation and climate change coupled with human's disrespectful and inconsiderate behavior toward non-human animals and plants have contributed to biodiversity loss. The United Nations Millennium Declaration (2000) called for "Respect for Nature" as one of the fundamental values for humanity. The Declaration urges: "Prudence must be shown in

⁴¹Mortimer, J.A & Donnelly, M. 2008. *Eretmochely simbricata*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2017-3. <www.iucnredlist.org>. Accessed 17 February, 2012.

the management of all living species and natural resources, in accordance with the precepts of sustainable development.”⁴²

Conserving biodiversity, as the backbone of all life on Earth and the core of what IUCN does, is the basis for four other priority areas of work: tackling climate change, sustainable energy, managing nature for human well being and greening economy.⁴³

Education for Sustainable Development (ESD) is a transformative learning process and aims to change the way people interact with the world. In December 2002, the United Nations General Assembly, through its Resolution 57/254, declared a Decade of Education for Sustainable Development (2005-2014) and also designated UNESCO as the lead agency for the promotion of this ESD. ESD aims to promote or encourage the establishment of locally relevant and culturally appropriate approaches and processes informed by the principles and values inherent in sustainable development. How countries aim to attain sustainable development is closely linked to the values held by the people, because these values define how personal decisions are made as well as how national legislation is crafted. It means seeking *choices* in ecology, economics and ethics that will provide a sustainable future, eliminate pollution, poverty and violence, awaken the wonder of life and foster peaceful progress in the human adventure.

The issue of biodiversity should not be overlooked both in teaching and learning perspectives and curricula and materials be developed to create desired learning outcomes. Learning outcomes should include academic understanding, acquisition of values, increased capacity, skills development and the adoption of attitudes, and behaviour conducive to biodiversity preservation. Values such as compassion, nonviolence, respect, and pursuit of environmental sustainability are some of the concepts intertwined with the concept of peace in regard to how humans relate with animals.

As discussed before, the Tbilisi Conference (1977) recognized the role of education in facing the challenges of environmental problems.⁴⁴ It mentions about the inculcation of a considerate and careful attitude to the environment, together with dissemination of knowledge and skills necessary for its protection and improvement as part of the general system of education and training. Before education can teach to encourage responsible citizens, it must first be reoriented and based on an ethos of the environment. Environmental education must adopt a holistic perspective which examines the ecological, social, cultural, and other aspects of particular problems. It is therefore inherently interdisciplinary.

There is a need for schools to shift from a rationalistic, functionalist perspective that primarily emphasizes tests and efficiency among students to a constructive, transformative paradigm in which the integrated development of students' intellectual, moral, emotional, spiritual, and ecological abilities to promote understanding of the world helps nurture respect for all human beings and nature. Fostering the values of

⁴² Cultural Diversity and Biodiversity

⁴³ CBD <http://www.cbd.int/cepa/>

⁴⁴ CBD CEPA, <http://www.cbd.int/cepa/toolkit/2008/doc/CBD-Toolkit-Complete.pdf>

Intergovernmental Conference on Environmental Education organized by UNESCO in co-operation with UNEP Tbilisi (USSR) 14-26 October 1977

caring in education plays a crucial role in the development of responsible citizen and having citizens possessing high level of predictors of Responsible Environmental Behavior or REB (Hines et al., 1986/87) which is one of the goals of environmental education.

Acts of caring can be part of communal learning and problem-solving. Caring for simple things in nature helps children develop a sense of themselves as nurturers and as people who care. This sense of self contributes to a peaceful way of living with self, with others, and with the natural world (Wilson, 2009). Johnson and Thomas (2009) mentioned that encouraging acts of caring helps children feel empowered and develop a moral sensibility. The new Earth Care Ethic is best communicated person-to-person. Each individual who makes Earth care a major goal can contagiously spread the excitement and adventure to be enjoyed as caretakers of our planet. ⁴⁵ To practice an Earth Care Ethic, its inclusion is the first requisite for a good education (McConnell, 1979).

Communication, Education & Public Awareness (CEPA)

Article 13 of the Convention on Biodiversity (CBD), the programme of Work on Communication, Education and Public Awareness, or CEPA seeks to:

- **Communicate** the scientific and technical work of the Convention in a language that is accessible to many different groups;
- Integrate biodiversity into **Education** systems in all Parties to the Convention;
- Raise **Public Awareness** of the importance of biodiversity to our lives, as well as its intrinsic value

Conserving biodiversity involves addressing three categories: species and their sub-populations; genetic diversity; and ecosystems. Hundreds of projects are underway around the world aimed at saving species and ecosystems and providing the knowledge needed for successful conservation action. IUCN's biodiversity conservation work is carried out by its various programmes including Water, Forests, Marine, Species, Ecosystem Management and Protected Areas

⁴⁵<http://www.earthsite.org/EarthCharter.htm>, Accessed April 28, 2018.

9.4. Case Studies Promoting Sea Turtle Conservation through Environmental Ethics Education

Sea Turtles in the Philippines

Sea turtles belong to the most ancient lines of living reptiles. They have traveled our planet for more than 200 million years, tracing a highly successful evolutionary path, living in a variety of environments from dry land to the open sea.⁴⁶ Green turtles nesting in Tawi-Tawi are protected both by Philippines and Malaysia under the Turtle Islands Heritage Protected Area (TIHPA). The IUCN Red List of Threatened Species classifies green turtles (*Chelonia mydas*) as 'Endangered'. Collectively, the main threat to green turtles is overharvesting. Many green turtle populations used to have a nesting density of 4,000 turtles on the beach per night that used to occur a hundred years ago in the Sulu Turtle Islands and Sarawak Turtle Islands (Limpus, 1994 in WWF)

Other sea turtles nesting in the Philippines include hawksbill turtles (*Eretmochelys imbricata*) which are categorized as 'Critically Endangered' under the IUCN (2008)⁴⁷, a status which reflect centuries of intense exploitation across its circumtropical range to supply international demand (Meylan, 1999; Meylan and Donnelly, 1999). Hawksbill turtles are harvested to make tortoiseshell items such as jewelry and comb, collected as souvenirs, polished shells or carapaces and stuffed turtles. Each complete set of thirteen carapace scutes weighs about 0.92 kg and sells for 180 USD per kg. Countries buying tortoiseshells include Japan, China, and Hong Kong (TRAFFIC East Asia, 2012). In the Philippines, hawksbill nest distribution has been reduced (De Celis, 1995) from its historical abundance due to the harvest of eggs and turtles by locals (Palma, 1994, Alcala 1980) and foreign fishers (Cruz, 2002; Lacuarta, 2002; Gomez, 1996).

Leatherbacks (*Dermochelys coriacea*) was classified by IUCN Red List of Threatened Species.

Olive ridley turtles (*Lepidochelys olivacea*) are considered vulnerable under IUCN. After the collapse of the crocodile skin trade in 1960s in Mexico, the luxury leather trade found that turtle skin could be used as high quality reptile leather and a new industry began to use olive ridley skins to make handbags, belts and shoes. Three of the four arribada areas in Mexico were wiped out. In the Philippines, olive ridleys are taken for their meat and served as an acceptable source of protein in most coastal communities (Palma, 1994 in WWF). In some cases, blood and liver are used to cure asthma (Alcala, 1980).

The initial study on beach assessment of a nesting site of hawksbill in Davao City, located at the southern part of the Philippines was conducted in 2003 by Torres et al (2004).⁴⁸ Environmental Education was done in seven secondary schools and the

⁴⁶http://www.oneocean.org/ambassadors/track_a_turtle/biology/index.html, Accessed April 28, 2018.

⁴⁷ IUCN, <http://www.iucnredlist.org/details/8005/0>, Accessed April 28, 2018.

⁴⁸ <http://hopkins.addu.edu.ph/moda/wp-content/uploads/2016/04/Conservation-of-a-Remnant-Hawksbill-Eretmochelys-Imbricata-Population-nesting-in-Punta-DumanlagBarangay-Matina-Aplaya-Davao-City-Philippines-Agham-Mindanao-Vol.-1-2005.pdf>, accessed October 7, 2018.

findings showed that 71% of the biology teachers were already teaching biodiversity as part of topics such as Ecosystem, Biodiversity of Living Things, Environmental Problems and Issues, Ecology, Wildlife Extinction and Changes in the Biosphere. This showed how environmental education is integrated in the curricula. The study which was funded by Davao Light and Power Company as part of its Corporate Social Responsibility resulted in the establishment of a sea turtle research center on sea turtle biology and ecology. Up to this day the research center is operating and is known as Aboitiz Eyes and has been promoting sea turtle conservation.⁴⁹

Although environmental education was initially not the main aspect of the study, media reports about the nesting had encouraged concerned citizens to report previously unknown nesting sites, institutions got involved in managing nesting beaches and biology teachers helped raised awareness among their students. The nesting of a single hawksbill in a highly urbanized area encouraged positive behavior of the people.

Case Study 1 Environmental Ethics Education for Grade School Teachers in Laiya Aplaya in San Juan, Batangas

Environmental education (EE) and sea turtle conservation workshop was conducted with the Pawikan Conservation Project of the Protected Areas and Wildlife Bureau in a sea turtle nesting area in San Juan, Batangas. The teachers were asked to identify endangered species where the key word 'biodiversity' could be formed if they had completely answered the infographic material. (Please see Appendix 1 for the sample material).

Activity Name: Together We Move

Task: A disposable cup which was filled with sand had to be moved from the beach shore to the shed/cottage without spilling the sand. There were three groups with eight or more teachers per group. The teachers represented the various stakeholder involved in conservation, i.e. representative from government agencies, schools, media, conservationists, community leader, fisherman

Challenges: The participants were not allowed to touch the cup. They were asked to hold the strings to lift the cup weighed down by the sand. The strings tied to the rubber band holding the cup are of different length.

Summary of Discussion after the Activity "Together We Move"

Action	Result	Values learned
Pulling the string too much	The rubber band got stretched causing imbalance of the cup	Being too pushy on ideas deprived others
Holding the string too close to the cup	The rubber band got stretched causing imbalance of the cup	Not letting go of old ideas or not being open to others' ideas hamper cooperation
Holding the string too far from the cup	The cup was not lifted on that side	Not doing one's part delays movement

⁴⁹ Aboitiz Eyes, <http://aboitizeyes.aboitiz.com/davao-light-releases-olive-ridley-back-sea/>, Accessed April 28, 2018.

Not all members of the group walking at the same pace	Content of cup was spilled	Proper timing and being in-tune with others
Running	Content of cup was spilled	Doing things in haste without planning and working with others does not produce good result
Talking with one another, listening and following suggestions by others while they were moving the cup	Content of cup was not spilled and they reached destination point	Working together by talking and listening and acting together deliver result

Appendix 1 Materials Used in Environmental Education promoting Protected Species in the Philippines

ACTIVITY 1: NAME GAME!
INSTRUCTIONS: Identify the given animals and collect the letters inside the box to decode the hidden word.

1. LUZON LEED NG
H RI

2. AB E

3. UG

4. SPQ TE EE

5. P IL P INE A E

6. HA S AB

7. MA A

8. EA O S

9. SE U LE

10. L I G F

HIDDEN WORD:
_ _ _ _ V _ _ _ I _ _ _

Case Study 2 Sea Turtle Conservation Awareness-raising activity in Jaime Hilario Integrated School-La Salle in Bagac, Bataan

Conservation awareness-raising activity was conducted with Happy Earth, Inc. as part of Earth Day celebration in Jaime Hilario Integrated School in Bagac, Bataan. The school was located in an eco-village community being supported by De La Salle University.

For the activity, green cartolina cut outs to create the carapace of sea turtles which was based on a cut out sea turtle 3-D puzzle from Japan (Please see Figure 6-1 for the images) which the kids wore and some students from De La Salle University prepared costumes of predators to be worn by adults such as a crab, bird/eagle, and others. After a lecture on the life cycle of sea turtles, the kids were gathered along the beach shore wearing the carapace and were instructed for the role playing activity. They were to pretend they were hatchlings emerging from the nest and had to take very little steps from the shore as starting point until they reach the water (end point) which was about 10-15 meters. Small steps mean that their feet must touch each other when they start walking from the nest to the beach (e.g. heel of the left foot must touch toes of the right foot when taking the steps). The instruction was made clear and how to walk as pretend-to-be hatchlings had been demonstrated to the kids and they had practiced doing the small steps. It was also explained that they had to be careful of the predators because once caught, they would be considered out. Then the role playing started. Together, the kids started walking while imagining themselves as hatchlings emerging from the nest but then, adults dressed as predators started coming from various directions and started catching them. The kids then started running in panic and in different direction, not even going to the shore and totally forgetting about the rule of the activity about taking small steps! Others who were caught by predators felt really sad to the point of crying. The activity was repeated after explaining the rules and again, the kids started running once the predators emerged!

Discussion with the kids after the activity:

How did you feel being a hatchling?	Why did you run when you see the predators approaching?	How should we relate to sea turtles if we see them?
I was with other hatchlings so it was alright at the beginning.	I felt so scared of the predators!	Do not play with them
It was difficult to take big steps because my feet are small so I could only walk very short distance.	I don't want to die!	Do not hurt them
The shore looked so far!	It was very hard to be a hatchling and to stay alive so I had to run to make sure I escape the predators.	Do not kill them
It was hard to be a hatchling because others	I did not care about the rules, I just wanted to	Put them back in the sea

wanted to kill me.	get away from predators.	
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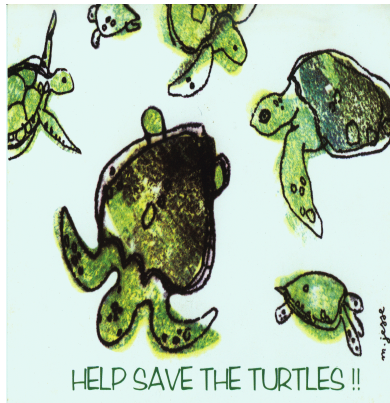
Figure 2: Students of Jaime Hilario Integrated School wearing carapace (Photo credit: Happy Earth Inc.)

Appendix 2

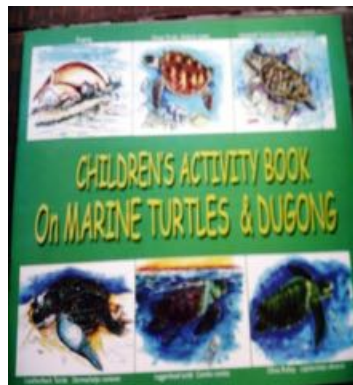
3-D cut-out material used as basis for kids' carapace costume for the activity



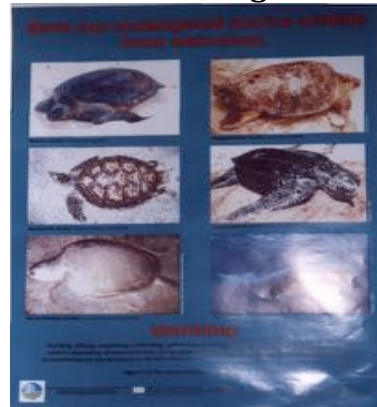
Appendix 3 Other Materials related to Sea Turtles can be used as Teaching Aids



Post Card Sold at Pawikan Conservation Center in Morong, Bataan; Copyrighted by creator (sold to visitors)



Activity Book on Sea Turtles given away by Pawikan Conservation Project PAWB DENR



Poster on Sea Turtles given away by Pawikan Conservation Project PAWB DENR



Photo of Bulletin Board about the Turtle Cove and warning sign at Diego Garcia, B.I.O.T.



PAWB DENR Warning Sign in Pawikan Conservation Center in Morong, Bataan



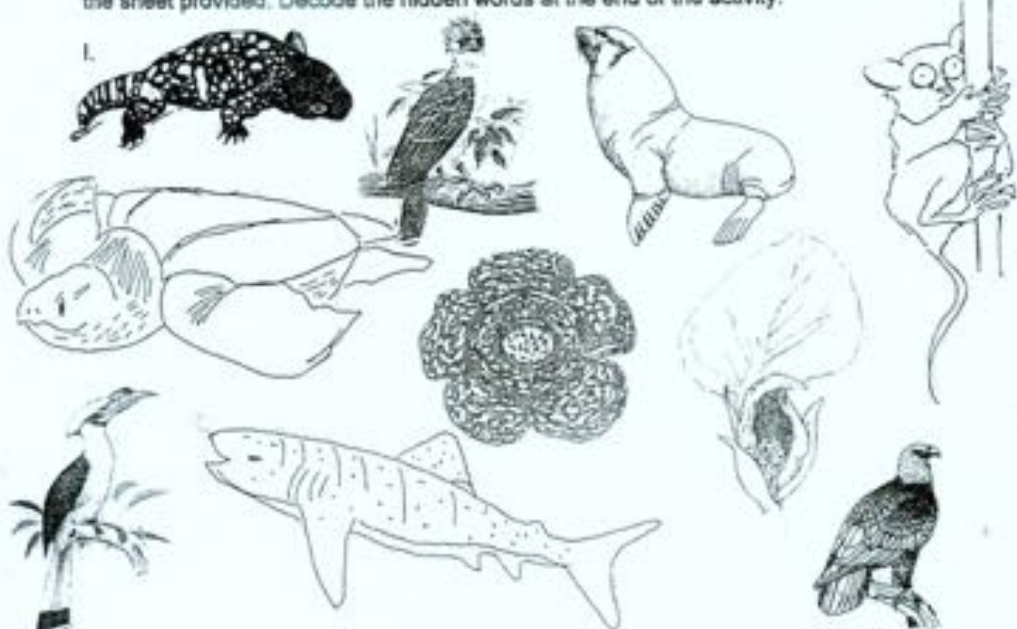
Bookmarks and T-shirts given away by Pawikan Conservation Project PAWB DENR to volunteers helping in conservation; others are for sale to raise funds like in Morong, Bataan

Appendix 4 Activity Sheet related to Philippine Biodiversity Conservation that can be used as a Teaching Aid


Activity Sheet Math-link sa Science In-service Training for Teachers

Name only the species that can be found in the Philippines and write your answers on the sheet provided. Decode the hidden words at the end of the activity.

I.



II.



Appendix 5 Activity Sheet related to Philippine Biodiversity Conservation that can be used as a Teaching Aid



Appendix 6 Activity Sheet related to Philippine Biodiversity Conservation that can be used as a Teaching Aid

Activity Sheet

Math-tinik sa Scientia

In-service Training for Teachers

Answer Sheet

I.

1. P _ _ _ _ P _ _ N _ _ _ Q _ _

2. _ A _ _ _ _ B

3. _ _ A _ _ _ _ _ Q _ _

4. R _ _ E _ _ _ _ _

5. _ _ I _ _ _ R _ _ _ _ N _ _

6. M _ _ D _ _ Q _ _ R _ _ _ _ G

7. _ H _ _ _ _ _ _ K

II.

1. L _ Z _ _ _ _ E _ _ _ N _ _ _ _ R _ _

2. _ _ _ _ G _ _ Y

3. _ Q _ _ _ _ _ Q

4. _ U _ _ N _ _

5. _ L _ _ _ G _ _ _ X

6. P _ _ W _ _ _ _ A _ _ _ K _ _ _ E _ _ _ N _ _

7. _ N _ _ _ _ Y

8. _ _ A _ _ _ _ E

9. P _ _ _ E _ Q _ _ _ L _ _ N

10. _ N _ _ _ _ _ I

11. P _ _ _ Y _ R _ G

Hidden Words:

I.

<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
1-1	1-2	2-5	3-1	4-8	5-1	1-1	6-11	6-3	7-5

II.

<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
1-6	2-3	3-8	4-1	5-4	V	6-9	7-6	8-1	9-6	10-8	11-5

Case Study 3 Utilizing Available Materials as Teaching Aids for Secondary School Teachers in Metro Manila

The Biology Teachers Association of the Philippines (BIOTA-Diliman Chapter) conducts Annual Seminar/Workshop. In 2008, forty-five (45) participants took part in the case study on identifying publicly available materials for sea turtle conservation such as brochures, calendars, CDs, posters, postcard, bulletin boards, bookmarks, t-shirts and others which could be used as teaching aids. (Please see Appendix 7 for sample materials)

The workshop identified specific topic and activity in Biology in which the 12 images of sea turtles from **2006 calendar on UNEP CMS IOSEA Marine Turtle MoU** program could be of use and what specific Science Process Skills would the students learn. (See Appendix 8 for the images)

These materials could promote *scientific attitudes* among students such as:

- a) being curious and imaginative
- b) being enthusiastic about asking questions and solving problems
- c) respect for the methods and values of science
- d) seeking to answer questions using evidence
- e) recognizing the importance of rechecking data
- f) understanding that scientific knowledge and theories change over time as more information is gathered

These materials could lead to science process skills such as:

- a) observation
- b) communication
- c) classification
- d) measurement
- e) inference
- f) prediction
- g) making models
- h) defining operationally
- i) collecting data
- j) interpreting data
- k) identifying and controlling variables
- l) formulating hypotheses
- m) experimenting

By using teaching materials that successfully integrate science process skills with classroom lessons and field investigations, the learning experiences of students become richer and more meaningful.

Summary Table of Activity using 2006 calendar on UNEP CMS IOSEA

Image Number	Topic in Biology	Activity	Science Process Skills
1	Animal habitat Population Ecosystem Biodiversity Movement/survival	Describing the structure that makes them cope in their environment Presentation on the importance of group in energy flow Film viewing	Critical thinking Observation Interpreting data Prediction Communication Inferring
2	Reproduction Types of reptiles Ecosystem Characteristics of living things	Observation Film Viewing Identifying differences Field trips Turtle classification and its habitat	Observation Critical Thinking Skills Discovering highlights Classifying Comparing
3	Not chosen		
4	Population Interaction between biotic and abiotic components Reproduction Biodiversity Characteristics of living things	Filed Trip Making cut out puzzle Functional and structural characteristics	Observation Classifying Identifying anatomical parts Comparing
5	Extinction of the species	Group Discussion giving situations Lecture/Discussion	Inferring Hypothesizing Analysis
6	Symbiotic relationship	Dramatization showing symbiotic relationship	Observation inference
7	Not chosen		
8	Classification of living things Diversity in the animal kingdom External part of turtle Biodiversity	Visit to zoo Identifying the parts of turtle Differentiating sea turtle from freshwater turtle	Classifying Observation Identifying Making models
9	Survival of the fittest Biodiversity Ecosystem	Film Viewing Lecture Making inference regarding the picture Identifying biotic and abiotic components	Observation Identifying Making Hypothesis Analysis Inferring Defining operationally Interpreting data
10	Not chosen		
11	Properties of life Biodiversity Life cycle; Growth and development Reproduction	Tracing the life cycle of turtle Making of comics Forming puzzle showing life cycle	Predicting Comparing Making model Communication Inferring Observation Discovery
12	Biodiversity Reproduction		Observation Classifying

Film showing

A film showing for the biology teachers assigned in Metro Manila was conducted because they were not near a nesting site for sea turtles. A copy of the four-minute video entitled “Sea Turtles – Our Ocean Ambassadors” from UNEP CMS IOSEA was shown.⁵⁰ (Please see Appendix 10 for the DVD cover) When the scene on the video showed a by-catch sea turtle being butchered while on the fishing vessel, the teachers felt pity and expressed willingness to show the video to their students in the city.

Discussion

The human relationship with the natural world is endangered. Constructing a “loving world” that fosters this relationship should be the central purpose of education in the 21st century (Lin, 2006). Looking at bioethics as love of life (Macer, 1998) can be one approach that we humans can take inspiration of in our journey toward personal as well as societal maturity especially in how we relate to nature and other forms of life. Looking at justice as having the right relation at all levels of creation based on love and loving life recognizes what is common for all living beings no matter what species we belong to.

Refocusing our education programmes so that they enable educators and learners to protect biodiversity can be an initial step toward this maturity. The three case studies presented were reflections of personal journey toward maturity by promoting sea turtle conservation which initially falls under environmental education and matures into environmental ethics focusing on the concept of care, concern and cooperation.

In Case Study 1, the teachers in Batangas were made to experience the intricacies on conservation efforts wherein dealing with other institutions or with each other might not always go smoothly but focusing on a common goal and not on the differences could be a starting point to conserve sea turtles. It might mean for others not to be pushy with their ideas and be open with others. The teachers also learned doing things together and cooperating (doing task assigned) could get the work done. According to Pollard (2003), the fundamental design principles of Nature which are based on cooperation, biological feedback, adaptation to changing conditions, and promoting ecological diversity makes way for extensive cooperation as an evolutionary stable strategy because it produces a benign environment in which everybody thrives. Fostering a global spirit of cooperation needs to recognize our common desires for love, truth, beauty, justice and freedom, and our inter-dependence as members of one family (McConnell, 1979). They also noted of the importance of talking to each other and listening as they tried to move the cup together. According to Stokes (2009) collective action requires communication among all stakeholders, including traditionally marginalized populations such as Indigenous people, women, youths, and children.

In Case Study 2 involving the kids who identified or empathized with the hatchlings, the barrier that separated their feeling of being different from sea turtles was broken when they experienced how scary it was to be threatened by predators. They no longer looked at sea turtles as a different species from them but embodied the *idea* that they

⁵⁰ Sea Turtles - Our Ocean Ambassadors, IOSEA Marine Turtle Memorandum of Understanding, www.ioseaturtles.org

were real sea turtles during the activity running scared for their lives. In this case study, a type of friendship develops between the kids and (imagined hatchlings) which inform us about the subtleties of love and caring which could be a universal prerequisite for a just, participatory and mature society and supports Macer's (1998) idea on a specific love which can progress to general love of life; that is, the love of nature as the love of neighbor universalized. The dissolution of the barrier between being human and being a sea turtle (an animal) arise from the children's creative intelligence, emotional wisdom, and experience during the role play and in effect, altered or regulated their behavior as humans. Choosing activities in promoting environmental ethics should include *ecocentrism* as a mediating variable and Arnocky and Stroink (2011) indicated that environmental concern partially accounted for the relation between choosing outdoor recreation and self-reported environmental behavior of students and fully mediated the relationship between outdoor recreation and ecological cooperation.

In Case Study 3 for teachers in the city, far from actually witnessing sea turtle nesting or hatchling emergence, they could be very objective in choosing specific topics in biology and the expected science attitude they wanted their students to develop by looking at the different images of sea turtles. However, when they saw the short video made by UNEP CMS IOSEA MoU and saw a sea turtle being slaughtered, their reaction changed. There was an innate recognition that they must do something about sea turtles even though they were far from nesting areas of sea turtles. They felt it was a moral imperative to act as stewards and to share what they saw in their respective classes. According to Bramston, Pretty and Zammit (2011) motivations for environmental stewardship include developing a sense of belonging, caretaking the environment, and *expanding* personal learning. Sense of environmental stewardship has also been related to science self-efficacy, science interest, environmental stewardship and career knowledge and awareness (Barnett, Vaughn, Straus and Cotter, 2011).

9.5. Conclusions

This collection of case studies gives a very specific way of promoting sea turtle conservation through application of some principles of environmental ethics concepts in environmental education. It covers reaching unto both the students and teachers and looking at possible areas of learning by creative intelligence and emotional wisdom. With the current status of sea turtles in IUCN CITES as either endangered or critically endangered (as in the case of hawksbills), it is not enough that conservation efforts be left into the hands of wildlife biologists or conservationists. Sea turtle-human interactions are varied and as such may require a conservation approach that is not just science-centered. And most common approach to conservation is by use of regulations or punishing those who have violated the rules against sea turtles either by fine or imprisonment. However, investing in activities such as those promoting environmental ethics through environmental education had not been much documented and this book had tried to show how we can learn from the case studies to look deeper into the issues and see how ethics can play a role in influencing human-sea turtle relationships and perhaps, human-animal relationships in general.

There will always be some humans looking at sea turtles (and maybe even other animals as well) like they are sources of food, pets to play with or exotic animals to promote their status and these issues bring us back again to the context of speciesism as

defined by Peter Singer and how we humans can choose to act toward animals in general (or sea turtles in particular) whether they are considered as moral agents with rights and to which we as humans have duties to perform. It may sound as prescriptive ethics to stress these duties toward non-human animals because of their ability to suffer yet as shown in the case studies, both the children who feared for their lives during role play and the teachers witnessing the video of slaughter of sea turtle made them realize that we are not so much different from the sea turtles in the way we view our basic right to live and not to feel fear or pain.

Fighting speciesism may take a while and even ethicists may argue with this concept very differently but looking at the common environmental ethics concepts presented in the case studies can be a starting point in animal conservation efforts. Promoting the concept of a “loving world” and bioethics as the “love of life” can be a foundation for reaching both personal and societal maturity. The concept of caring exhibited both by the students and teachers and developing friendship among animals is another one which helps dissolve the barrier of being and looking at ourselves as disconnected from the rest (animals and nature). The concept of cooperation opens avenues for exploration by making the teachers see that we are all interconnected and no single organization or entity bears the full responsibility of conservation efforts.

Examination of other environmental ethics principles as they relate to other issues pertaining to human-animal relations should be explored on a case by case basis (such as the use of animals as food or the use of animals in research) to gain more understanding, creative intelligence, emotional wisdom, and ethical actions with the aim of decreasing the asymmetric relationship between humans and animals.

Appendix 7**Case Study 3 Utilizing Available Materials as Teaching Aids for Secondary School Teachers in Metro Manila**

Display of UNEP CMS IOSEA MoU Sea Turtle Calendar during BIOTA Workshop in Metro Manila



Biology Teachers identifying science concepts and developing scientific attitudes of students using UNEP CMS IOSEA MoU Sea Turtle Calendar during BIOTA Workshop in Metro Manila

Appendix 8

Images of UNEP CMS IOSEA MoU Sea Turtle Calendar used during BIOTA Workshop in Metro Manila for Case Study 3

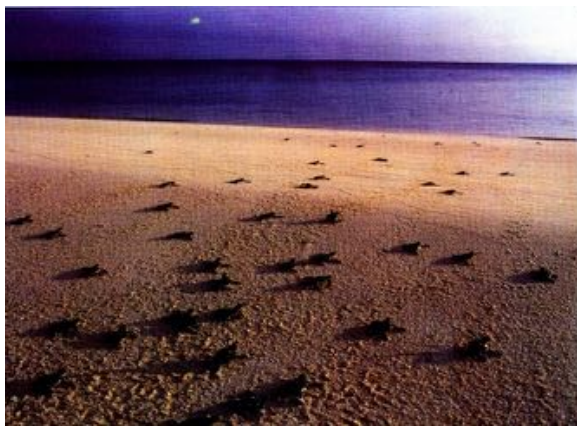


Image 1

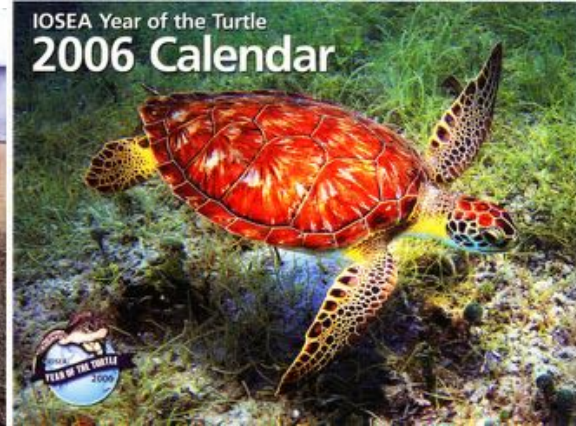


Image 2

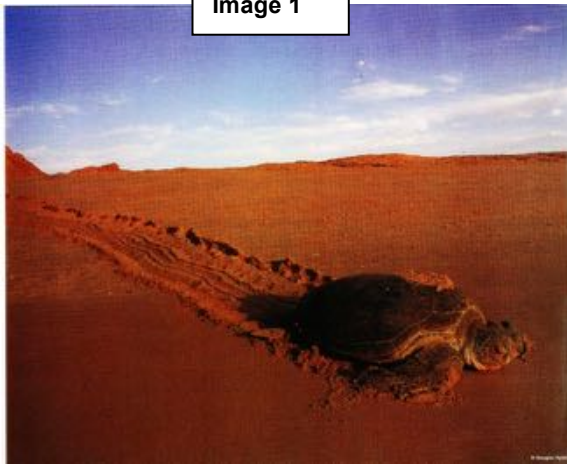


Image 3

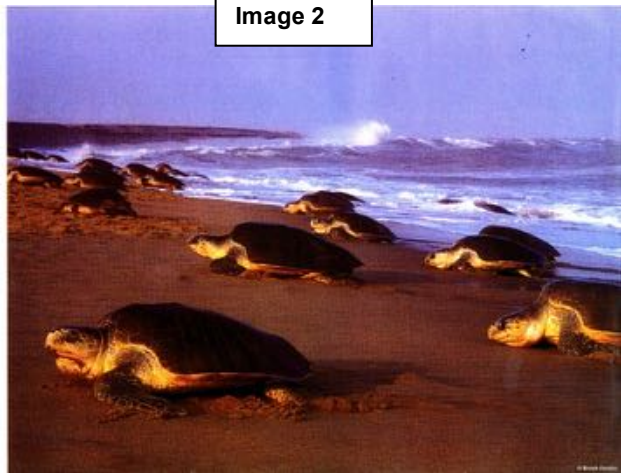


Image 4



Image 5

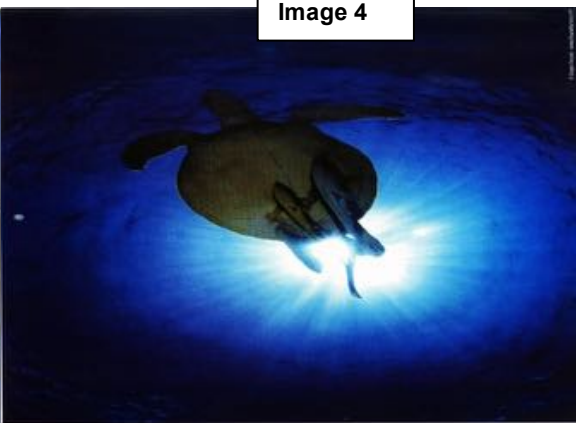


Image 6

Appendix 9

Images of UNEP CMS IOSEA MoU Sea Turtle Calendar used during BIOTA Workshop in Metro Manila for Case Study 3



Image 7



Image 8

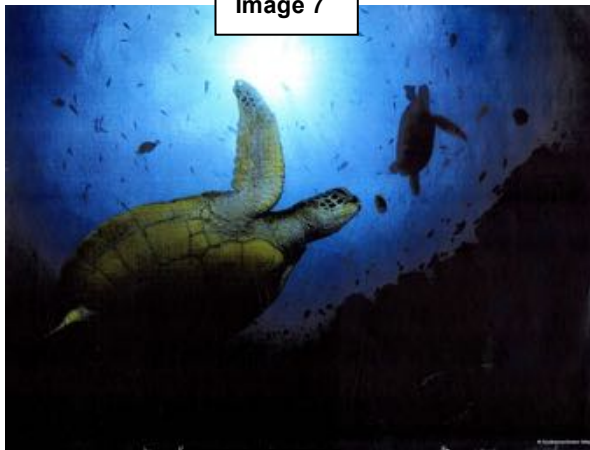


Image 9

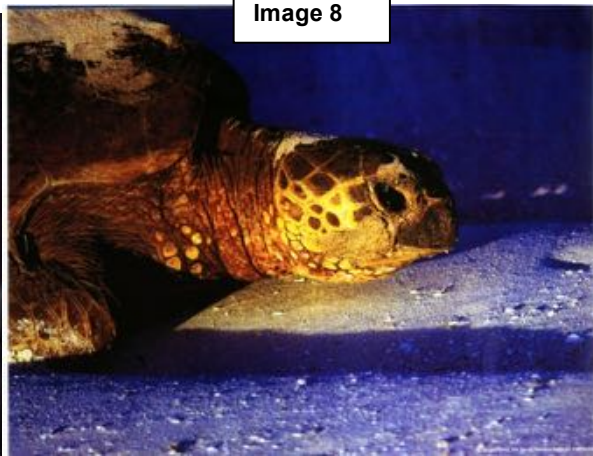


Image 10



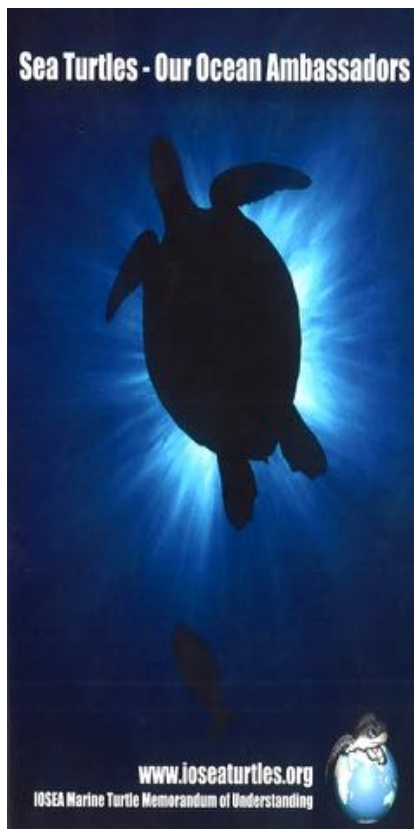
Image 11



Image 12

Appendix 10

CD cover of UNEP CMS IOSEA MoU Sea Turtle video used during BIOTA Workshop in Metro Manila for Case Study 3



Signatory States include:

Australia, Bangladesh, Cambodia, Comoros, Eritrea, Indonesia, Islamic Republic of Iran, Jordan, Kenya, Madagascar, Mauritius, Myanmar, Oman, Pakistan, Philippines, Saudi Arabia, Seychelles, South Africa, Sri Lanka, Thailand, United Kingdom, United Republic of Tanzania, United States of America, and Viet Nam

10. A case study of bioethics education in Thai secondary schools⁵¹

10.1. Sufficiency Economy and Bioethics

There are ever mounting concerns of the impacts global warming or climate change likely due to rising atmospheric carbon dioxide levels that may be attributed in no small part to our dependence upon the combustion of fossil fuels. There is a strong scientifically argued case for the adoption of Renewable Energy (RE) technologies. However, the various technologies currently available all have limitations, drawbacks and the implementation of some could impinge on human rights and have deleterious environmental consequences. The uptake of RE technologies is rising but RE remains a very low percentage of the global energy production⁵², there are also huge disparities in the consumption of energy per capita between developed and less developed countries⁵³. This is clearly unsustainable on a global basis. The shift to a sustainable energy economy requires more than reasoning based on scientific persuasion as human cultures, politics and emotions are so influential in decision making.

Many national curricula and international examinations have incorporated a requirement for students to develop ethical considerations in their learning skill sets in line with the requirements of Article 23 of the UDBHR. In Thailand there is a statutory requirement for students to learn about the Sufficiency Economy Philosophy (SEP) of the late king Bhumibol Adulyadej⁵⁴. This philosophy has two conditions, being the requirements of knowledge and morality. Sirina Pavarolarvidya (2010) said that the three SEP characteristics of moderation, reasonableness and self-immunity may be regarded as vigilance towards sustainability.

The development of the *Bioethics Core Curriculum* by UNESCO (2008) along with supporting materials such as *Moral Games for Teaching Bioethics* (Macer, 2008), *A Cross-Cultural Introduction to Bioethics* (Macer, 2016) and *Ethics in the Science and Technology*

⁵¹ This chapter was contributed by Alex Waller, Thailand/England.

⁵² U.S. Energy Information Administration *International Energy Outlook 2017* Figure 2 in the Executive Summary available online at: https://www.eia.gov/outlooks/ieo/exec_summ.php

⁵³ Illustrated on a map *The Energy use* (kg of oil equivalent per capita) for 2014 on the World Bank's website. Available online at: <https://data.worldbank.org/indicator/EG.USE.PCAP.KG.OE?view=map&year=2014>

⁵⁴ "ตั้งหยาดทิพย์ชโลมใจ" Unit in Phasa Patee textbook for Prathom 5 Suksapan publishing and "อ่านป้ายได้สาระ" Unit in Phasa Patee textbook for Prathom 6 Suksapan publishing and also the Thai National Curriculum [available online at <http://www.act.ac.th/document/1741.pdf>]

Classroom (Jones, et al., 2010) paved a way to develop a bioethics course for secondary school students.

In this case study a secondary school Environmental Ethics and Renewable Energy Education (EEREE) course explored and applied many of the principles relevant to the UDBHR to enable students to express their own choices regarding energy technologies and challenged them to shift their attitudes towards sustainable living. The EEREE course specifically addressed issues referenced in Articles 10, 16, 17 and 23 of the UDBHR. Those being the principles of equality, justice and equity, the protection of future generations, the environment, biosphere and biodiversity through bioethics education of young people to achieve a better understanding of the implications of scientific and technological developments. Therefore, the emphasis of the EEREE course was applied to aspects of bioethics that are included in the UDBHR but are less well addressed in textbooks and other literature compared to more traditional medical related bioethics. The EEREE course additionally is in line with at least five of the SDGs: health and wellbeing, quality education, affordable and clean energy, climate action and concern for life on Earth as well as involving discussion of issues relating to peace, justice and sustainable communities.

10.2. The aims and objectives of the case study

The case study was undertaken to determine the effects learning EEREE on multiple intelligence (MI), the personal values and environmentally friendly behaviour and attitudes of the secondary school students. Other studies have shown the advantage of learning philosophy on the literacy and numeracy skills of primary students such as Gorard *et al* (2015) but there has been little work to quantify advantages at secondary school level. Wilmott (2015) has studied the level of bioethical knowledge, interest and understanding of students at this level, but did not go further to see the impact of this learning on the academic achievement of lives of these students. The specific objectives of the EEREE course were:

1. To promote a greater acceptance of RE technology;
2. To determine measurable increases in interpersonal, intrapersonal and naturalistic MI;
3. To observe and evaluate changes in attitudes and behaviour that reflected choices based on the principles of sustainable lifestyles.

10.3. The course protocol and case study scenario

The study was carried out over four academic years from 2013-14 to 2016-17. The first year the EEREE course was delivered at two schools and the data obtained was compared. One school was a non-selective provincial Thai secondary school in Nakorn Ratchasima province in the North East of Thailand, the other was a small partially

selective international school in the same sub-district. In subsequent years the course could only be delivered in the international school due to the time commitments of the researcher. The data from these years of repeat trials of the course were used to determine longer term trends and follow-up on the later academic achievement of participants. In both schools the students learned their Science, Mathematics and Social Studies lessons through the medium of English. The EEREE course was also delivered in English with a variety of tools and methods that were used to assist the translation of words and concepts such as prudence, tolerance, altruism or equity and so on.

The EEREE course was delivered for an hour a week over a forty-week period in each academic year. It sequentially developed an understanding of the fundamentals of and then applied the principles of traditional ethical frameworks, environmental ethics, the science behind RE technologies and related environmental science issues. In the latter part of the course students were introduced to wider socioeconomic factors international agreements and economic or political initiatives that have further influenced choice and development within the RE sector. Collectively this allowed students to apply systems thinking to making energy choices, as recommended by researchers such as Capra (1997), Haluza-Delay (2008) or Eilam (2012). An outline of the course curriculum is shown in Box 1.

<p>Introduction and Precourse Testing and Formative assessment</p> <ol style="list-style-type: none"> 1. What is philosophy? Historical and cultural background. 2. What is ethics? Why study it? Historical and cultural background. 3. What is happiness? Peace? Sustainability? Development? <p>Frameworks of ethics, normative ethics and moral theories.</p> <ol style="list-style-type: none"> 4. Virtue ethics, origins, what are virtues? limitations and relevance 5. Deontological ethics. Kantian Rules. Implications and drawbacks. 6. Utilitarianism and pleasure. Consequentialism. Greater Good. <p>Science of Energy and Electricity</p> <ol style="list-style-type: none"> 7. What is energy? Energy dependence in modern society 8. How electricity is generated / electromagnetic induction 9. Conventional fossil fuel power stations and combustion process. 10. Nuclear power... introduction to fission, decay and half-life <p>Environmental Impact of Conventional Electricity Generation</p> <ol style="list-style-type: none"> 11. Greenhouse gas emissions and global environmental impact 12. Socioeconomic consequences ... the pillars of sustainability 13. Acid rain and particulate emissions. 14. Fossil fuel reserves. Socio-environmental Impact Assessments. <p>Value of other living organisms, life and the environment</p> <ol style="list-style-type: none"> 15. Prudential and Moral Values. 16. Specialism, Biocentrism and Ecocentrism. 17. Inspiration from nature. 18. Aesthetic, social and psychological values. 	<ol style="list-style-type: none"> 21. Solar PV cells 22. Solar thermal 23. Wind turbines 24. Hydroelectricity 25. Biofuels 26. Second generation biofuels 27. Geothermal, Wave, Tidal. 28. Fuel cells, electric or hydrogen cars. <p>Application of Environmental Ethics Principles</p> <ol style="list-style-type: none"> 29. Equitable use of trans-boundary resources 30. Future generations and biodiversity 31. Rights of communities, other organisms and ecosystems. 32. Should there be "a right to energy" 33. Eat it or burn it? Population and food / versus energy demand. 34. Ethical arguments surrounding solar and wind RE technologies 35. The polluter pays and economics in relation to climate change <p>Changing towards RE and sustainability</p> <ol style="list-style-type: none"> 36. International Agreements. 37. Why isn't change embraced quickly? Who holds the power? 38. Hegemony of consumerism. 39. Positive stories. <p>Summative Assessment</p> <ol style="list-style-type: none"> 40. Include assessment of
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Box 1: Curriculum for Environmental Ethics and Renewable Energy Education

At the Thai school there were 14 students who completed the EEREE course in the first trial. At the international school there were 18 students who completed the course in the first year and a total of 41 students over the four years of the trials. Additionally, there was a control group of 14 students at the international school in the first year of the EEREE course.

10.4. The EEREE course approach to learning and associated materials

Kongcnana (2010) reports inconsistent teaching of philosophy across Thailand so the development of a thoroughly planned EEREE scheme of work has potential benefit for use across the country. The full EEREE course scheme of work⁵⁵ was developed to meet a range of abilities and learning styles. The 5E model the learning cycle proposed by Bybee & Landes (1990) of engagement, exploration, explanation, elaboration and evaluation was employed to ensure full participation of all learners. This was to address often reported issues of secondary school students becoming increasingly disaffected and underachieving in science and technology lessons. Duran & Duran (2004) report the motivational advantage of this model that promotes the use of higher order thinking skills. All of the lessons in the scheme of work included a range of starter and plenary activities as recommended by the UK DfES (2004), many of which were taken or adapted from Macer (2008).

10.5. Research Methodology

A mixed methods approach was used to glean, describe and determine the extent to which the research objectives had been met. The quantitative methods were largely used to assess changes in MI and academic achievement for the second objective. The MI data was collected using pre-test post-test comparisons of questionnaires based on statically reliable MI sensitivity tools developed by Tirri and Nokelainen (2011). These tools⁵⁶ were based on five point Likert scales, which are statistically justified by many researchers such as Preston & Colman (2000), Allen & Seaman (2007) and Norman (2010). The MI sensitivity questionnaires and Multiple Intelligence Development Assessment Scale (MIDAS) tools were available in both Thai and English. These tools were also trialled with a control group at the international school to determine their repeatability and for the comparison with the test groups at both schools. All pre-test

⁵⁵ An electronic version of the scheme of work is available free from the researcher upon request. Many of the materials used in the course are also freely accessible on line. Others developed by the researcher may be available for school use if requested.

⁵⁶ Electronic versions of these questionnaires are freely available in Thai and English from the researcher if required.

post-post data was analysed for statistical significant differences using Wilcoxon Signed Rank (WSR) matched pairs test of non-parametric data.

The subsequent academic achievement of former EEREE participants was obtained through the analysis of their International General Certificate of Secondary Education (IGCSE) examination results. The data obtained was also used to inform the sampling of post course interviewees. Further quantitative and semi-quantitative data was collected by the document analysis of medical records that recorded Body Mass Index (BMI) and requests for medical attention to make an estimate of the physical and emotional health of students who followed the EEREE course. This data contributed towards an assessment of the third objective.

The qualitative methods were used to provide a rich description of the shifts in attitudes of the students as expected in the first and third objectives. These included coded analysis of written classwork, interview transcripts, student productions of websites and poster displays and a final examination essay. There were also interviews with other academic and non-academic school staff, lesson and fieldwork observations and analysis of teacher reports in an effort to gain as much unbiased data as possible and to triangulate data to provide rigour to the case study.

10.6. Results

The first objective of the EEREE course was for students to show a greater support for RE technology. The students in both schools in 2013-14 and during the four year trials at the international school showed an increased preference for RE technology over the duration of the EEREE course. This was indicated in responses to questionnaires and interview questions, through the analysis of essays and poetry written by students, from student produced websites (many of which were further developed in their own free time) and some limited evidence from student diaries. For example, a mapping exercise was used whereby students placed thirty cards (in Thai and English) with different factors that they valued as being important or of concern to them for their future happiness and wellbeing. At the end of the first trial of the course in 2014 the collated results from both schools showed that they rated electricity, energy, human rights and the environment within their top ten priorities; none of which had appeared in their top ten prior to the EEREE course. Prudently, health and education remained their top two priorities. The international school students' reasons' for the adoption of RE technology was most frequently linked to environmental concerns and finite fossil fuel reserves. Whereas the Thai school students' uppermost concern was the rising price of fossil fuels. This mirrored results found in a survey of the general public conducted at the same time reported in Waller (2017). However, the general public also considered the spiritual value of nature as significant factor in favour of RE.

Figure 1: EEREE students collecting and weighing trash found along the edge of a dam in Thailand.



They subsequently used the data collected to make estimates of the potential of this as fuel for a municipal waste electricity generation combined heat and power station such as those found in countries like Germany and the UK to assess potential for similar plants in Thailand.

In general, students favoured wind, solar and a marked increased preference for second generation biofuel technologies over other RE technologies. Many students had reservations over the impacts on local communities, biodiversity and the natural environment; this was particularly so regarding geothermal, hydropower and biofuel monocultures.

The second objective was to show an increase in MI. The control group analysis of the environmental, intercultural and ethical sensitivity questionnaires and the MIDAS test showed no statistical significant differences between their pre-test post-test responses over the same forty-week period as the first year trials at both the Thai and international schools. The results from both of these schools showed statistically significant increases in both the environmental and ethical sensitivity assessments. There was also a significant increase in the MIDAS score at the Thai school. The MIDAS scores of both the control and test groups at the international school were significantly higher than the Thai school students in the pre-test scores, but there was no significant difference between the test groups on MIDAS post-test scores.

The WSR analysis of the pooled data from all 41 students who completed the EEREE course at the international school showed a statistically significant rise in all three MI sensitivities tested. The MIDAS test showed no overall rise, yet this tool assessed all eight MI dimensions. Closer analysis of the data from this test battery showed that there was a statistically significant increase at the 95% level in the naturalistic dimension, and although there were small rises in the mean average interpersonal and intrapersonal intelligence scores these were not statistically significant. There was also a rise in the verbal-linguistic MI dimension which was also reflected in comparisons of lexical

density analysis of essays written by international school students and compared the control group both prior to and in summative assessments of the EEREE course.

The analysis IGCSE results at the international school show that in the four years prior to the 2013-14 cohort of EEREE students there had been a small value added level on actual over predicted grades that were based on students former Cognitive Ability Test (CAT) scores. The 2013-14 EEREE cohort, who took their IGCSE examinations in 2015, achieved on average a significantly higher value added score with their mean results being more than one grade higher than forecast by CAT scores. This was also the first year that the mean results in the science examinations were higher than the average residual scores from all of the subjects examined at that school.

A hypothesis of the mechanism for this rise in both the overall improvement in grades and the even greater improvement in the science subjects was that students who had studied the EEREE course had regularly practiced and focused on developing higher order thinking skills. This was corroborated by lesson observation comments of other teachers, the analysis of EEREE students completed experimental and written tasks such as those described by Waller *et al* (2018) and to some degree further triangulated through the document analysis of subject teacher reports. These reports indicated that only the science and EEREE teachers made reference to the significance of the development of these skills, whereas all other staff urged improvements in lower level tasks such as presentation, punctuality and vague comments such as being prepared. Post EEREE course interviews with students often revealed they had made connections with the EEREE learning with concepts and topics in other subjects including Biology, Chemistry, Physics as well as Geography and Business Studies. Follow-up interview transcripts and the summative EEREE course essays were coded, that was independently checked, for use of different MI dimensions and thinking skills. Further analysis of these statements following a grounded theory approach showed that *proportionally* far more of the higher order thinking skills of analysis, synthesis and evaluation were applied to arguments that demonstrated naturalistic intelligence rather than solely verbal-linguistic or mathematical-logical MI dimensions. This links to the exceptionally high performance in these students IGCSE Biology examinations and further supporting the hypothesis that EEREE developed higher order thinking skills in certain MI dimensions.

The third objective was to show a positive change in attitudes and behaviour that reflected a shift in values conducive to promoting sustainable lifestyles. The websites advocating the use of various RE technologies that were mentioned above and were developed in the students' own free time contained a wealth of data that indicated they were both in support of various sustainable technologies and were embracing many ethical principles of sustainability. Figure 1 illustrates the active engagement if EEREE students collecting litter in the natural environment. A comparison of surveys taken mid-course and towards the end of the course along with the analysis of post-course essays that a higher number of the international course students had endorsed or employed a broader range of ethical frameworks in decision making, validating

biocentric, situational and ecofeminist perspectives. Furthermore, they generally argued less in vague terms of virtues and the SEP, but rather applied principles founded on deontological precepts and utilitarian consequentialism.

A number of the international school EEREE students became active on the student council and initiated recycling projects, became involved in local and international humanitarian and environmental activities that showed an endorsement of sustainable living. For example, it was former EEREE students who organised a T-shirt fund raising campaign to rebuild schools following the earthquakes in Nepal of April 2015. Pastoral and site management staff reported improvements of interpersonal behaviour amongst EEREE students than in the wider school community, and even them showing leadership initiative to keep the school environment better maintained and cleaner through recycling and raising awareness regarding litter. The international school senior management claimed that running EEREE course had been an influencing factor in their own decision to install more energy saving devices such as LED lighting and fuel efficient air conditioning units that had resulted in a 5% reduction in electricity bills within just one year, which had offset much that investment.

Sustainable living is fairly meaningless with good health. The high significance placed on health and wellbeing indicated by EEREE students in the value card sorting activity referred to above was confirmed in an analysis of student medical documents. The chi squared analysis of BMI data showed that a statistically significant number of former EEREE students had healthier BMI values compared to both younger and former students at the international school who not studied EEREE. Additionally, there were significantly fewer former EEREE students seeking medical (both physical and emotional) support or attention compared to the wider school student population. This *could* indicate lower stress levels. Higher stress and higher BMI levels have both been linked to poorer academic performance as reviewed in Waller (2018). Conversely, it could be argued that the improvements in BMI and lower stress levels of students who studied EEREE, developing their intrapersonal and interpersonal intelligences, made a positive contribution to their subsequent academic achievements in the final IGCSEs.

10.7. Conclusions and further recommendations

The first requirement for this case was the development of the EEREE curriculum, scheme of work, associated teaching and learning materials and assessment tools. The high level of engagement in lesson and field work observed by independent observers along with student extension activities and subsequent independent examinations all strongly confirm the relevance, accessibility and academic benefit to students working at this level. These materials are freely available for other teachers and educational institutions to assist the development of their students. Students also rated ethics education as being of greater value for their personal development compared the opinion to the general public survey reported by Waller (2017). Unlike the general public, very few students referred to specific religious reasons relating to

environmental ethics. However, several students regularly expressed that the natural environment had a positive impact on, and in some cases was essential for, their wellbeing.

The long term study at the international school and in the Thai school trial indicate that students showed greater acceptance of RE technologies and were able to employ more than merely scientific reasoning in their arguments in favour of different technologies. These arguments included cultural, socioeconomic, political and environmental factors from a range of perspectives as well as making reference to a variety of ethical considerations. The long term study also revealed a number of changes in lifestyle, behaviour, attitudes and health that are compatible with sustainable living.

Teaching has been likened to sowing seeds. The ground maybe well prepared, the seedlings may germinate quickly if the conditions are right and later may need nurturing to remove weeds (or misconceptions), fertilising and watering to maintain growth (providing opportunities for further action). Alternatively, some seeds may remain dormant, but viable, for many years. For many temperate species it is only later as the temperature warms and through the imbibition of water causing the pressure to build sufficiently so that the testa splits, that finally allows the plumule to reach out freely for self-sustaining sunlight energy. In either case a long term study of the career development, health, social action or environmental concerns of the former students from both schools would be of great benefit to demonstrate the need for EEREE in all schools.

11. Action Forward

11.1 Environmental Ethics

Through many kinds of education and many educational frameworks, countries have encouraged a variety of approaches to environmental ethics. The scope of Environmental Ethics courses differs across programs. Some choose to focus on local environmental concerns, while others focus on macroeconomic and global trends—the particular set of issues included within the curriculum vary. Some formalized degree programs place greater focus on scientific components, while others place emphasis on applied ethics training. While education from indigenous and local knowledge may have indeed included consideration for ethics towards the environment, formalized programs have only recently emerged. Undoubtedly there are existing ethical frameworks used by local schools and communities for encouraging students to respect the environment.

Although environmental ethics programs may not necessarily result in the immediate mitigation of environmental problems, environmental ethics education indeed has a critical role to play in that process. It promotes reflection on the subject of the environment, which in itself is a starting point for ethical discussion and change. The existence of formalized programs and institutions points to greater environmental concern and activism in the region. As Callicott (1995) explains, “environmental philosophy is environmental activism.” When students recognize that actions towards the environment have ethical dimensions, perhaps this can give rise to a careful evaluation of the consequences of their actions.

Without environmental ethics education, we cannot even initiate the debate, or identify subjects for debate. Environmental ethics education can be a forum for dialogue on such issues facing societies.

7.2 Environmental Ethics Education as a Trend

One view of education is that it legitimizes. As an institution, education creates academic disciplines, which would not exist without formalized education. Meyer et al (1977; 1980) suggest that education creates and validates categories of knowledge. Education creates disciplines and creates professions; engineering was first formalized as an academic discipline, and this created a profession. When environmental ethics curricula exist, so too does legitimacy and attention for environmental ethics.

Yet education institutions can adopt widespread practices from international trends. In some instances, environmental education may be nothing more than a fashionable subject, to be included within environmental sciences courses. Ideally it will become more deep rooted rather than merely highlighting the misfortunes of enigmatic flagship species such as elephants reduced to begging for food from tourists. It will hopefully become part and parcel of all thinking and action take upon graduation from compulsory education to make our nations and whole world sustainable both socially and environmentally.

7.3 Ethical Debate in Science Classrooms

In *Teaching Ethics in Science*, Reiss (1999) supposes that when ethics instruction is incorporated into science curriculum, there are some risks. Through ethical debate is important in science classes, clear difference must also be made between ethical reasoning and scientific reasoning. Students should develop the ability to separate scientific fact from preference. They must understand that scientific knowledge deserves questioning, though they must not take this to mean that the scientific method is somehow arbitrary. Teachers must be careful to stress that sciences should not be undermined simply because we can think of scientific ethics.

Reiss also asks, “Should science educators be deal with the science/religion issue?” Already, science teachers are tasked with teaching a substantial amount of core content and methods. It would require more time and effort to integrate an “environmental ethics” module into the curriculum.

7.4 Policy Options/ Recommendations

Although there are several EEE courses offered throughout the world, there are a number of variables that inhibit people from properly participating in formal education, including finances, accessibility, socio-cultural issues, and other family and personal obligations, to name but a few examples. There are also a number of factors that may hinder EEE from being effectively implemented in each country.

The interdisciplinary nature of EEE is one issue. This book on argues that there is a strong case for mainstreaming EEE into ‘everyday’ curriculum rather than teaching it as separate subject areas. The mapping exercise supports this general trend across Asia Pacific; however, there are instances that argue against this teaching methodology. For example, some schools struggle with defining course learning plans and course objectives, as curriculum is too broad and there are no standard course requirements for EEE components in science and social science curricula.

For instance, in 2008, the New Zealand Education system considered the issue of oversaturated school coursework. Secondary school administration noted a trend that students’ course assignments and essays lacked the quality deemed compulsory at their respective level. Student’s lack of understanding and a review of course content indicated that some courses may be too broad in scope. For instance, *Geography* courses were seen as lacking in physical geography components, and similar concern was expressed over the amount of *Physics* courses being taught at Level 1.⁵⁷

The issues of time allocation, quality of evaluation, and breadth of topics are important to address for proper management of the curriculum, and any particular programs. We can see vague curricula requirements, ambiguous concepts, and a lack of information for teachers and students across the region.

⁵⁷ “Principals want curriculum delayed,” Martha McKenzie-Minigie, *New Zealand Herald*, December 4, 2008.

Socio-cultural values are also important. Environmental ethics includes the development of cognitive, affective and skill-behaviour processes, especially for the development of attitudes and values that motivate people to become involved in environmental problem solving. EEE promotes learning that leads to action, and influences values and attitudes which encourage more responsible behaviour, promoting stewardship in which nature has its own value regardless of its value to humans, and that humans are morally responsible for decisions related to the environment.⁵⁸ Socio-cultural circumstances often influence how people react, assimilate to and participate in EEE.

Although some values may be universal in nature, they may not be understood or acted upon in the same way by members of each society.⁵⁹ In Australia, for instance, in 2009, a pilot program of ethics education was being offered as an alternative to a scripture course [at the primary level]. The Australian government's religious education advisory panel opposed such a course, as it was believed to conflict with the time set aside for religious studies. In an article in *The Sunday Morning Herald*, Philip Cam, a University of NSW philosophy professor who was involved in developing the ethics pilot program, commented "The question is about giving kids a chance to reflect on values..."⁶⁰ This example illustrates how teaching of EEE courses may be viewed as conflicting traditional thought and engagement in critical thinking regarding religion and human values.

In Japan there was also debate regarding whether moral education should be taught in schools as an "official subject."⁶¹ In 2008, the Japanese Education Rebuilding Council refused to give moral classes an "official" status. On the other hand, in a more positive light, in Thailand, teachers are developing moral education programs and arguing that moral education should be a core part of the curriculum that is integrated systematically to reflect real-life applications.⁶² Environmental value, moral and ethical education continues to be an evolving component of EEE.

The mapping exercise demonstrates that there are a number of formal courses in Asia Pacific, which incorporate an EEE and ethical framework and/or themes.

In order for citizens of all ages to truly understand their unique relationships with the environment, steps must be taken to establish more equitable access and engagement in EEE, including formal, informal and non-formal education opportunities. Until there are mechanisms in place to enable equitable access to formal education, humans will not be able to "think globally and act locally" in regard to the environment.

Some recommendations and lessons from the experience show that schools which promote environmental ethics can do the following:

⁵⁸Refer to chapter 1.

⁵⁹ "Adding Values to Values" by Edward Roy Krishnan, *Bangkok Post*, February 9, 2010, p. E3.

⁶⁰"Almighty row over ethics class in schools," by Erik Jensen, *The Sunday Morning Herald*, September 26-27, 2009, p.1.

⁶¹"Concerns remain on education", *The Daily Yomiuri National*, February 17, 2008, p. 3.

⁶²"Teaching moral values", *Bangkok Post*, February 10, 2009, p E3.

- Identify and utilize universal, easily understandable environmental ethics principles to be integrated in the existing curriculum
- Demonstrate the application of environmental ethics by students and faculty groups
- Engage students in community service to learn about the local situation roots of environmental problems and of solutions that work
- Engage the community in mutual learning
- Participate in addressing local environmental problems
- Engage in projects that improve the quality of life of local residents
- Engage schools in environmental monitoring
- Organize students and faculty groups in support of environmental ethics
- Endorse or inform environmental legislative mandate for governments

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Appendix A

Sample University Courses that contain ethical components (core curriculum & elective courses)

University/Organization	Degree/Course	Course description
Australia		
<i>Edith Cowan University</i>	Bachelor and Master's and Doctoral Degree Programs Major specializing in:	Environmental Science; Biology; Environmental Management; Environmental Science; Environmental and Biological Chemistry, etc... Environmental Management; Coastal Environmental Science; Environmental and Spatial Design; Environmental and Biological Chemistry; etc...
<i>La Trobe University</i>	Bachelor, Master's and Doctoral Degree Programs; Graduate Certificate	Environmental Education; Environmental Health; Environmental Management and Ecology; Urban, Rural and Environmental Planning; etc...
<i>The University of Sydney</i>	Graduate Diploma, Graduate Certificate; Master's Degree Program; Diploma	Environmental Science and Law; Applied Science (Environmental); etc...
<i>The University of Tasmania</i>	Bachelor, Master's and Doctoral Degree Programs; Graduate Diploma	Environmental Science; Environmental Planning; Philosophy (Environmental Studies); Environmental Management; etc...
<i>University of Western Sydney</i>	Bachelor of Science	Environmental Science; Bachelor of Science (Agricultural Science, Animal Science, Biological Science, Chemistry, Environmental Science, Food Science, Science - No Key Program)
<i>Griffith University</i>	Bachelor and Master's Degree Programs	Environmental Science; Environmental Planning, Urban Planning; Environmental Management and Policy; Environmental Modeling; Environmental Engineering; Environmental Health; Environmental Education; etc...

<i>Curtin University</i>	Bachelor of Science (Honours) Major	Environmental Science; Environmental Health; Agriculture and Environmental Biology; Chemistry Stream; Biology Stream; Coastal Zone Management; etc...
<i>Australian National University</i>	Graduate Diploma in Science; Master of Science	Environmental Science; Environmental Science (Research); Environmental Law; Environmental Management and Development; etc...
<i>Charles Darwin University</i>	Bachelor, Master's and Doctoral Degree Programs	Environmental Management; Tropical Environmental Management
<i>The University of Queensland</i>	Bachelor; Bachelor's Honours	Environmental Science; Environmental Engineering;
<i>The University of New England</i>	Bachelor; Bachelor Honours	Environmental Science
<i>The University of Technology Sydney (UTS)</i>	Bachelor of Science (Honours)	Environmental Science
<i>Climate Change Research Centre (CCRC) University of New South Wales</i>	Bachelor	Environmental Science
<i>The University of Melbourne</i>		Environmental Science
<i>The University of Wollongong</i>	Bachelor, Master's, and Doctoral Degree Programs	Environmental Science
<i>Monash University</i>	Bachelor and Master's Degree Program Diploma in Arts	Environmental Science (Coursework of Research) Geography and Environmental Science
<i>Charles Sturt University</i>	Distant Learning; Bachelor	Environmental Science; Environmental Science and Management
<i>The University of Adelaide</i>	Research	Earth and Environmental Science
<i>The University of New South Wales</i>	Bachelor	Environmental Science
Bangladesh		
<i>Bangladesh University of Engineering and Technology</i>	Master of Science; Master of Engineering	Environmental Engineering
<i>Bangladesh Agricultural University</i>	Doctoral Degree Program	Biotechnology and Environmental Science
<i>Khulna University</i>	Bachelor & Postgraduate	Environmental Science

	Degree programs	(Discipline)
<i>Asian University for Women</i>	Bachelor	Environmental Sciences; Environmental Engineering and Sustainable Development
<i>Jahangirnagar University (JU)</i>	Bachelor	Environmental Sciences; Geography and the Environment
Brunei		
<i>University of Brunei Darussalam</i>	Bachelor	Environmental Studies; Geography and Development;
Burma		
<i>Yangon Technological University (Yangon Institute of Technology, YIT)</i>	Diploma, Master's Degree Program	Environmental Planning and Management
Cambodia		
<i>Chamroeun University of Poly-Technology, Phnom Penh</i>	3 credits, 48 hrs.	Environmental Economics
	Bachelor	Environmental Science
<i>International University, Phnom Penh (IUSPH), Khan RusseyKeo, Phnom Penh</i>	Master's Degree Program	Environmental Science
<i>Royal University of Phnom Penh</i>	Bachelor	Environmental Science
China		
<i>Donghua University, Shanghai, China</i>	Undergraduate, Bachelor, Master's and Doctoral Degree Programs	Environmental Science; Energy and Environmental System Engineering; Environmental Engineering
<i>Beijing Institute of Technology</i>	Undergraduate, Bachelor, Master's and Doctoral Degree Programs	Chemical Engineering and the Environment; Environmental Engineering; Techniques for Environmental Pollution Control; Environmental and Natural Resources Protection Law, etc...
<i>Beijing University of Chemical Technology</i>	Undergraduate	Environmental Engineering
<i>Beijing Normal University (BNUZ), Zhuhai City</i>	Bachelor	Resource Environment and Urban Planning Management
<i>China Agriculture University, Beijing</i>	Undergraduate, Bachelor, Master's and Doctoral Degree programs	Law of Environment & Resource Protection; Resource & Environmental Science ;

		Environmental Science and Engineering; Agricultural Bio-environment and Energy Engineering; Environmental Biotechnology; Atmospheric Physics and Environment; Agricultural Environment and Energy Engineering; Agricultural Resources and Environment; Resources and Environmental Science
<i>Fudan University</i>		Environmental Science and Engineering
<i>Guangdong University of Business Studies, Haizhu District</i>	Bachelor	Resource Environment and Urban Planning; Resources and Environment
<i>Hengyang Normal University</i>	Major	Resource Environment and Urban-rural planning
<i>Hunan Institute of Technology</i>	Undergraduate	Environmental Engineering
<i>Jiangnan University</i>	Bachelor, Master's and Doctoral Degree Programs	Environmental Engineering, Environmental Design
<i>Lanzhou University of Technology</i>	Bachelor and Master's Degree Programs	Environmental Engineering
<i>Nanjing Forestry University</i>	Bachelor, Master's and Doctoral Degree Programs	Population, Resources and Environmental Economics; Environmental Science and Engineering
<i>Northeast Agricultural University, Harbin</i>	Bachelor; Master's and Doctoral Degree Programs	Resources, Environment & Urban-rural Planning Management ; Environmental Science; Agricultural Resources and Environment ; Agricultural Environment and Resource Engineering; Agricultural Structure, Environment and Energy Engineering; Agricultural Environment and Resource Engineering ; Environmental Water Conservancy ; Environmental Water Conservancy ; Agricultural environment and resource engineering , etc...
<i>Sichuan University, Chengdu, Sichuan Province</i>	Major, Bachelor, Master's and Doctoral Degree	Environmental Science; Resources and Environment;

	Programs	Environmental Management and Public Policy; Environmental Science Environmental Analysis and Testing; Environmental Engineering; Zoology Investigation and Environmental Management; Resources and Environment; Radiation Protection and Environmental Application; Population, Resources and Environmental Economics, etc...
<i>Shanghai Ocean University, Shanghai</i>	Bachelor, Master's and Doctoral Degree Programs	Environmental Science; Fishery Marine Environmental Science; Fishery Environmental Protection and Administration
<i>University of Science and Technology Beijing, Beijing</i>	Postgraduate Program	Environmental Science; Environmental Engineering
<i>University of Nottingham Ningbo, China</i>	Bachelor of Science (Honours) & Undergraduate course	Environmental Science; Environmental Engineering
<i>South China University of Technology, Guangzhou</i>	Bachelor, Master's and Doctoral Degree Programs	Environmental Science; Environmental Engineering
<i>Chang'an University</i>	Undergraduate course & Bachelor, Master's and Doctoral Degree Program	Environmental Science; Environmental Engineering; Resources Environment & Urban and Rural Area Planning and Management; Environmental Geology, etc...
<i>Minzu University of China (MUC)</i>	Undergraduate, Master's Degree Program	Environmental Science
<i>Suzhou University of Science and Technology</i>	Course & Master's Degree Program	Environmental Science
<i>Soochow University</i>	Undergraduate	Environmental Engineering
<i>Lanzhou Jiaotong University</i>	Bachelor, Master's and Doctoral Degree Programs	Environmental Science
<i>Xi'an University of Technology</i>	Bachelor, Master's and Doctoral Programs	Environmental Engineering
<i>Dalian University</i>		Environmental Science
Fiji		
<i>University of the South</i>	Diploma; Bachelor;	Environmental Science;

<i>Pacific</i>	Master; Postgraduate Diploma Programs	Environmental Biology; Environmental Chemistry; Environmental Geoscience; Environmental Physics; Environmental Law
Guam		
<i>University of Guam</i>	Minor; Major; Bachelor; Master of Science	Environmental Science
Hong Kong		
<i>Open University of Hong Kong</i>	Bachelor and Master's Degree Programs; Postgraduate Diploma Certificate	Environmental Science and Management; Environment and Sustainable Development; Environmental Engineering; Global and Environmental Studies; Environmental Policy; Energy and Environmental Technology Management; Environmental Leadership Energy and Environmental Sustainability (Energy Management and Audits)
<i>University of Hong Kong (HKU)</i>	Bachelor of Science; Bachelor of Science with Honours	Environmental Science and Management; Environmental Protection; Environmental Policy;
<i>The Hong Kong Polytechnic University</i>	Bachelor of Science; Bachelor of Science with Honours; Doctoral Degree Program	Environmental Science and Management; Environmental Engineering
<i>The Chinese University of Hong Kong (CUHK)</i>	Bachelor of Science; Master of Science	Environmental Management and Technology; Environmental Engineering; Environmental Policy; Environmental Science and Management; Sustainable and Environmental Design
<i>Hong Kong Baptist University (HKBU)</i>	Associate; Bachelor	Environmental Conservation studies; Environmental Engineering; Global and Environmental Studies; Environmental Management and Technology; Applied Biology – Environmental Science; Applied Chemistry – Environmental Science; Environmental Policy

<i>Lingnan University</i>	Bachelor of Science	Environmental Policy; Environment and Sustainable Development; Environmental Engineering; Environmental Science and Management
<i>City University of Hong Kong</i>	Bachelor of Science; Master of Science; Doctoral Degree Programs	Global and Environmental Studies; Environmental Science; Environmental Engineering; Environmental Science and Technology (Pollution Monitoring and Control/Environmental Health and Resources Management/Environmental Impact and Risk Assessment/Environmental Health and Food Safety); Energy and the Environment, etc...
<i>Hong Kong University of Science and Technology (HKUST)</i>	Bachelor, Master's and Doctoral and Postgraduate Degree Programs	Environmental Engineering; Marine Environment Science; etc...
India		
<i>Indira Gandhi National Open University (IGNOU)</i>	Appreciation Programme	Appreciation Course on Environment
	Certificate	Certificate in Health and Environment; Certificate in Environmental Studies
	Postgraduate Diploma	Environment and Sustainable Development
<i>Amity University</i>	Master of Technology; Master of Science; Doctoral Degree Programs	Environmental Sciences
<i>University of Delhi</i>	Certificate course	Environmental Awareness
	Bachelor of Science	Applied Physical Sciences (Environmental Science)
<i>University of Mysore</i>		Environmental Science
<i>RayatShikshanSanstha</i>	Certificate courses	Environmental Studies
<i>Rajiv Gandhi Technical University (RGTU)</i>		Energy and Environment
<i>University Of Jammu</i>	Bachelor, Master's and Doctoral Degree Program	Environmental Sciences; Environmental Geology; Environmental Chemistry

<i>Bangalore University</i>		Environmental Sciences
<i>Bharathiar University</i>		Environmental Sciences
<i>Panjab University</i>	Master of Philosophy; Bachelor of Science (Honours); Master's Degree	Environmental Sciences
<i>BharatiVidyapeeth University</i>	Diploma	Environmental Education
<i>Fakir Mohan University</i>	Master of Philosophy; Master of Science	Environmental Science
Indonesia		
<i>Bogor Agricultural University</i>	Undergraduate	Environmental Engineering; Resources and Environmental Economics
<i>Diponegoro University</i>	Master's and Doctoral Degree Programs	Environmental Health; Environmental Science; Environmental Engineering
Japan		
<i>Kyoto Women's University</i>	Doctoral Degree Program	Living Environment
<i>Konan Women's University</i>	Bachelor, Master's and Doctoral Degree Programs	Living Environment; Social and Cultural Environment
<i>United Nations University</i>	Master of Science (MSc)	Environmental Governance – specialization in Biodiversity
<i>Toyohashi University of Technology</i>	Bachelor and Master's Degree Programs	Environmental and Life Sciences
<i>Senshu University</i>	Doctoral Degree Program	Environmental and Life Sciences
<i>Okayama University</i>	Master's and Doctoral courses	Environmental Science
<i>Akita University</i>	Bachelor, Master's and Doctoral Degree Programs	Natural and Environmental Science; Environmental Science; Environmental and Resource Recycle Technology; Regional Environmental Engineering; Technology for Resources and the Environment, etc...
<i>Fukushima Medical University</i>		Environmental Health
<i>Fukushima University</i>	Doctoral Degree Program	Symbiotic Environmental Systems
<i>Gifu ShotokuGakuen University Junior College</i>	Doctoral Degree Program	Environmental Management
<i>Nagoya University</i>	Teacher program	Earth and Environmental Sciences; Study of Environmental Awareness;

	Undergraduate and Master's Degree programs	Plant Resources and Environment; Environmental Engineering and Architecture Nagoya University Global Environmental Leaders program
<i>Kyoto University</i>	Master's and Doctoral Degree Programs Special Courses (Master's and Doctoral)	International Environmental Management Program; International Course in Environmental Management; Environmental Management Leader Program Agricultural Science – For the Global Future of Life, Food and the Environment
<i>Tohoku University</i>	Graduate	Environmental Studies
<i>Osaka University</i>	Bachelor, Master's and Doctoral Degree Programs	Environmental Economics; Sustainable Energy and Environmental Engineering;
<i>Soka University</i>		Environmental Science; Natural Environmental Science; Environmental Resource Economics; Environmental Policy; Introduction to Environmental Issues; Field Research of Environmental Studies; Environmental Management; Environmental Law; Environmental Engineering, etc...
<i>Aichi Gakuin University</i>	Course Master's and Doctoral Degree Programs	Urban Environment Design Environmental Policy; Field Social Environment and Health
<i>Kyushu University</i>	International Doctoral Degree Program	International Environmental Systems Engineering
<i>Asia University</i>		Environment and Energy Policy Debates
<i>Tohoku University</i>		Environmental Studies: Environmental Life Sciences; Geoenvironmental Science;

		Environment and Energy Engineering; Resource and Environment Economics; Water and Environmental Studies
Kiribati		
<i>University of the South Pacific (USP)</i>	Diploma; Bachelor of Science; Master of Science; Postgraduate Diplomas	Environmental Science; Environmental Law; Environmental Geoscience; Environmental Chemistry; Environmental Physics
Malaysia		
<i>National University of Malaysia</i>	Bachelor	Environmental Health (with Honours)
<i>Universiti Putra Malaysia (UPM)</i>	Bachelor	Bachelor of Science (Environment)
<i>University of Malaya</i>	Bachelor of Science Bachelor of Arts	Environmental Science and Management Environmental Studies
<i>City University College, Selangor, PJ</i>	Bachelor	Diploma in Environment Health
<i>Masterskill University College of Health Sciences</i>	Bachelor of Science (Honours)	Diploma in Environmental Health
Nepal		
<i>Purbanchal University</i>	Master of Science	Environment and Resource Management
<i>Kathmandu University</i>	Master of Education Bachelor of Science; Master of Philosophy; Master of Science, and Doctoral Degree Programs	Environmental Education and Sustainable Development Environmental Science
<i>Pokhara University</i>	Bachelor of Science and Master of Science	Environmental Management
New Zealand		
<i>University of Canterbury</i>	Bachelor, Master's and Doctoral Degree Programs	Environmental Science
<i>University of Waikato</i>	Bachelor of Science; Bachelor of Technology	Environmental Planning; Environmental Sciences
<i>Massey University</i>	Certificate	Environmental Science
<i>Auckland University of Technology</i>	Bachelor of Science	Environmental Studies
<i>University of Otago</i>		Environmental Science
Pakistan		
<i>University of Engineering</i>	Bachelor of Science;	Environmental Engineering

<i>and Technology Lahore</i>	Master of Science	
<i>Sarhad University of Science and Information Technology</i>		Environmental Management
<i>Mehran University of Engineering and Technology</i>	Diploma, Bachelor, Master's and Doctoral Degree Programs	Environmental Engineering and Management
<i>Abasyn University</i>	Course	Environmental Current Issues; Environmental Biotechnology
<i>COMSATS Institute of Information Technology (CIIT</i>	Bachelor of Science; Master of Science	Environmental Sciences
Philippines		
<i>Palawan State University (PSU)</i>	Bachelor of Science	Environmental Science
<i>University of the Philippines Los Banos</i>	Master's and Doctoral Degree programs	Environmental Science
<i>Mariano Marcos State University</i>	Bachelor of Science	Environmental Studies
<i>Xavier University</i>		Environmental Studies
<i>Cagayan State University</i>	Bachelor of Science	Environmental Science
<i>University of the Visayas</i>	Master's of Science	Environmental Studies
<i>Benguet State University</i>		Environment and Natural Resources
<i>Partido State University</i>	Bachelor of Science	Environmental Science
<i>Iligan Institute of Technology</i>	Master of Science	Environmental Science
<i>Caraga State University</i>	Bachelor of Science; Master's Degree program	Environmental Science; Environmental Management
<i>Visayas State University (VSU),</i>	Bachelor of Science	Environmental Science
<i>Southern Luzon State University</i>	Bachelor of Science	Environmental Science
<i>University of the Philippines Diliman</i>		Environmental Science
<i>University of the Philippines Open University</i>	Diploma, Master's Degree Program	Environment and Natural Resource Management
<i>Cebu Normal University (CNU)</i>	Master of Science	Environmental Biology
<i>Zamboanga State College of Marine Sciences and Technology (ZSCMST</i>	Master of Science	Coastal Environment Management
<i>Emilio Aguinaldo College</i>	Bachelor	Environmental Science
Singapore		
<i>National University of Singapore (NUS)</i>	Undergraduate; Master of Science	Environmental Management; Environmental Engineering
<i>Singapore Management University</i>	Undergraduate	Environmental Science

<i>Nanyang Technological University</i>	Minor; Bachelor; Master's and Doctoral Degree Programs	Environmental Management; Environmental Engineering; Environmental and Water Resources; Environmental Biotechnology
<i>James Cook University</i>	Bachelor	Business and Environmental Science
Sri Lanka		
<i>University of Sri Jayewardenepura</i>	Bachelor of Science; Master of Science	Forestry and Environmental Management
<i>Open University of Sri Lanka</i>	Certificate; Diploma; Master of Science	Environmental Sciences
<i>University of Colombo</i>	Postgraduate Diploma; Master of Science	Environmental Science
Thailand		
<i>Chulabhorn Graduate Institute</i>	Graduate Diploma	Environmental Health; Environmental Toxicology
	Master's Degree Programs	MSc Master of Science in Environmental Health, Chemical Biology, Environmental Toxicology
<i>KhonKaen University</i>	Graduate Diploma	Agro-Biosystems
	Master's Degree Programs	MRDM Master of Rural Development Management MSc Master of Science in Agronomy, Animal Science, Systems Agriculture, Land Resources and Environment, Horticulture, Soil Science, Agriculture,
<i>AIT Asian Institute of Technology</i>	Master's Degree Programs	MSc Master of Science in Agricultural Systems and Engineering, Aquaculture and Aquatic Resources Management, Food Engineering and Bioprocess Technology, Energy, Environmental Engineering and Management, Pulp and Paper Technology, Gender and Development Studies, Natural Resources Management, Regional and Rural Development Planning and Urban Environmental Management

<i>Chiang Mai University (CMU)</i>	Master's Degree Program	MA Master of Arts in Sustainable Development MSc Master of Science in Agricultural Systems, Applied Geophysics, Environmental Science, Health Science, Petroleum Geoscience, Postharvest Technology, MSc Master of Science in Sustainable Agriculture and Integrated Watershed Management
<i>King Mongkut's University of Technology Thonburi(KMUTT)</i>	Master's Degree Programs	MBA & MSc International Management of Resources and Environment; Biotechnology, Postharvest Technology, Energy Technology, Energy Management, Environment Technology, Environment Technology and Management
<i>Mae FahLuang University (MFU)</i>	Master's Degree Programs	MSc Master of Science in Natural Resources and Environmental Management, Applied Chemistry, Biotechnology, Bioscience, Computational Science, Materials Science, Ceramic Industrial Technology, Food Technology, Cosmetic Science, Management Information Systems, Dermatology
<i>Maharakham University (MSU)</i>	Master's Degree Programs	MSc Master of Science in Paleontology, Plant Product Technology, Food Technology, Biotechnology, Environmental Administration and Management
<i>Mahidol University</i>	Master's Degree Programs	MSc Master of Science in Environmental Biology, Forensic Science, Pathobiology, Chemical Physics, Pharmacology, Physiology, Exercise Physiology, Anatomy and

		Structural Biology, Applied Mathematics, Materials Science and Engineering, Physical Chemistry, Organic Chemistry, Microbiology, Biotechnology, Plant Science, Tropical Medicine, Tropical Pediatrics, Neurosciences, Molecular Genetics and Genetic Engineering, Food and Nutrition for Development
<i>NakhonPathornRajabhat University (NPRU)</i>	Master's Degree Programs	MEng Master of Engineering in Water Resources Engineering
Tonga		
<i>University of the South Pacific Centre (USP)</i>	Diploma; Bachelor of Science; Master's Degree Program	Environmental Science; Environmental Geoscience; Environmental Law; Environmental Physics; Environmental Biology; Environmental Studies
Vanuatu		
<i>University of the South Pacific</i>	Diploma; Bachelor of Science; Master's Degree Program	Environmental Science; Environmental Geoscience
Vietnam		
<i>Hue University</i>	Bachelor	Environmental Science; Environmental Engineering; Economics (Agricultural Economics and Rural Development, Environment and Resource Economics); Management of Fishery Resources and Environment
<i>Can Tho University</i>		Environmental Sciences; Environmental Engineering; Environmental and Resource Economics
<i>Asian Institute of Technology</i>		Urban Environmental Management; Environmental and Natural Resource Management; Environment Technology Management
<i>Angiang University</i>		Environmental Engineering
<i>Tan Tao University</i>	Major	Environmental Engineering
<i>Hanoi University of Technology (HUT)</i>	Bachelor, Master's and Doctoral Degree	Environmental Engineering; Waste Water and Water

	Programs	Environmental Technology; Solid Waste Environmental Technology; Air Waste Environmental Technology
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Countries included in research: Brunei, Cambodia, China, Indonesia, Japan, Laos, Malaysia, Burma (Myanmar); Philippines, Singapore, Bangladesh, India, Maldives, Pakistan, Sri Lanka, Nepal, Australia, Cook Islands, Federated States of Micronesia, Niue, Kiribati, Nauru, New Zealand, Samoa, Palau, Samoa, East Timor, Fiji, French Polynesia, Guam, Hong Kong, Macau, Mongolia, Thailand, Vietnam, Papua New Guinea, Marshall Islands, Vanuatu, Solomon Islands, Tonga, Tuvalu, New Caledonia, Northern Mariana Islands, Tokelau, Wallis and Futuna

Considered: Formal Tertiary Subjects, Courses, Programs, Degrees

Some useful websites

Eubios Ethics Institute Bioethics Education links (multilingual)
http://www.eubios.info/bioethics_education
Catholic Social Teaching and Environmental Ethics,
<http://www.webofcreation.org/DenominationalStatements/catholic.htm>.
Environmental Ethics Resource Center,
<http://www.ecoethics.mrsu.ru/eng/arts/>.
Environmental Ethics,
<http://online.sfsu.edu/~rone/Environ/Enviroethics.htm>.
Ethics and the Environment, <http://www.phil.uga.edu/eande/>.
Teaching Desirable Environmental Ethics and Action through School Activities,
http://findarticles.com/p/articles/mi_pric/is_198900/ai_3119305224/.
Teaching Environmental Values,
<http://www.cceia.org/resources/transcripts/1012.html>.
The Earth Charter Initiative, <http://www.earthcharterinaction.org/content/>.
Environmental Ethics Teaching Materials,
<http://www.unescobkk.org/rushsap/ethics-resources/multilingual-material/>.
Center For Environmental Philosophy, <http://www.cep.unt.edu/>.
Eco-Ethics International Union, (EEIU),
<http://www.eeiu.org/chapters/nigeriamushin/index.html>.
Environmental Ethics Syllabus Project,
<http://www.appliedphilosophy.org/syllabusproject/>.
Ethics in Science and Environmental Politics (ESEP), <http://www.int-res.com/journals/esep/>.
International Society for Environmental Philosophy (IAEP),
<http://www.environmentalphilosophy.org/>.
International Society of Environmental Ethics (ISEE),
<http://www.cep.unt.edu/ISEE.html>.

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Definition of Terms

Environmental Education (EE): Refers to activities and issues concerning education *in, about* and *for* the environment, which may or may not be categorized as environmental education, ESD, climate change education or education for sustainable societies.

Environmental Ethics: A system of rules and principles that guide conduct towards the environment. A system of rules for judging what is right and wrong when thinking of environmental issues.

Environmental Ethics Education (EEE): Addresses questions of how to live, how to make environmental choices and how to reflect upon the consequences of our activities.

Environmental Science (ES): The study of the environment. Environmental science addresses large-scale ecological and social problems, combining the physical and biological sciences.

Ethics: A system of rules and moral principles guiding conduct. Ethics can be a framework for judging what is good and bad, right and wrong. It guides the reasoning that one makes before acting; understanding the consequences of one's actions (also known as moral philosophy). Ethics is a branch of philosophy which addresses questions of morality.

Morals: Standards for good behavior. The judgment of what is good and bad. Morals are often informed by personal religious, philosophical and cultural beliefs.

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

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Eubios Ethics Institute Publications (Books sent by SAL post, Journal by Airmail - Price included)	
Eubios Journal of Asian and International Bioethics (Annual subscription)	NZ\$100
Shaping Genes: Ethics, Law and Science of Using Genetic Technology in Medicine and Agriculture by Darryl Macer, Oct. 1990, 421pp.	NZ\$50
Equitable Patent Protection in the Developing World by William Lesser, May 1991, 150pp.	NZ\$40
Attitudes to Genetic Engineering: Japanese and International Comparisons (Bilingual) by Darryl Macer, May 1992 330pp.	NZ\$40
Human Genome Research & Society Eds: Norio Fujiki & Darryl R.J. Macer July 1992 ISBN 0-908897-03-0 (English), 230pp. ISBN 0-908897-04-9 (Japanese), 240pp.	NZ\$40
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