

The Seven Environmental Principles*

1. Everything is connected to everything else. (*Ang lahat ng bagay ay magkakaugnay.*)

The intricate relationships of various elements of the ecosystem bind the components together into one functional unit. The trees in the forest are home to ferns, orchids, birds, insects and mammals. When these plants and animals die, their products of decomposition contribute to soil fertility. Plants provide oxygen to animals for aerobic respiration while animals furnish carbon dioxide to plants for photosynthesis. The quality of the soil determines the type of vegetation that exists while vegetation contributes to the minerals of the soil when they die. The living component of the ecosystem affects and is affected by the abiotic components, such as air, temperature, land. Inter-specific relationships create a dependency with each other so that they both have to co-exist to live. All these relationships provide dependencies, check and balances that compose the details of our life-support systems.

Human interaction with nature oftentimes alters the ecosystems. The waste we improperly dispose of brings about the deterioration of land and water quality. This may in turn reduce their capacity to provide life for other organisms. Deforestation causes soil erosion and the earth deposited on the water bodies covers the coral reefs resulting to fishery loss. Suspended particulates from vehicular and stationary sources may cause lung problems among city residents. War causes destruction of wildlife and habitats. There is a cause and effect chain, even when it is neither always visible nor observable.

Global economic systems affect the distribution of biological goods worldwide. Through the Galleon trade, spices reached different parts of the world. Today, oranges and apples from China have become easily accessible to the Filipino market. Developing countries argue that globalization promotes the introduction of species detrimental to the recipient habitat and market.

2. All forms of life are important. (*Ang lahat na may buhay ay mahalaga.*)

All living organisms were created for a purpose in relation to humans, other species on earth and global ecosystem in general. Thus, when a species becomes extinct, it is like removing a piece of a jigsaw puzzle from the web of life. The variety of life forms, manifested by the different levels of biological diversity – community, species and genes – contributes to the stability of the environment. Food webs, food chains and ecological relationships link plants and animals together in the web of life. Even bacteria, insects, snakes and rats have ecological functions even though humans perceive them as parasites or pests.

The Philippines ranks high among the biodiversity hotspots – the richest but the most threatened of terrestrial ecosystems in the world. The Philippines has rich flora and fauna: an estimated 13,500 plant species, 80 amphibians, 240 reptiles, 556 birds, 174 mammals, 300 corals, 27 mangrove species. Of these, approximately 75% are endemic. Some of the threatened species are the Philippine eagle (*Pythecophaga jefferyi*), Philippine crocodile (*Crocodylus mindorensis*), and Tamaraw (*Bubalus mindorensis*).

The composition of biological diversity naturally changes slowly but the rate of transition has become faster due to factors such as habitat destruction. Deforestation may diminish forest species such as birds that are vulnerable to modification of their home. Pollution of waters reduces the quantity of fishes, shells, algae and other aquatic life. Over harvesting of natural products likewise contributes to the unsustainable use of food and material resources.

To maintain ecological balance, therefore, the conservation of genes, species and ecosystems becomes essential to keep life together. Biodiversity conservation strategies commence with the protection of both terrestrial and aquatic ecosystems. Land uses, such as protected areas, ensure that the natural state of these habitats continue to exist in designated areas. Community-based approaches in conservation maximize citizens' participation in protected areas. Integrity of natural ecosystems can likewise be guarded through the preservation of indigenous species.

Strategies outside of the protected areas can be adopted. Cities and human settlements can still keep trees, patches of forests and garden as home for wildlife like birds, butterflies, and insects. Agricultural ecosystems sustain the variety of plants and animals through inter-cropping, multi-cropping and crop rotation. Plant and animal breeding can increase the population of commercially important species without directly harvesting from the wild. The captive breeding of Pag-asa, the Philippine eagle, provided a solution to the diminishing eagle population. Although it is still recommended that habitat protection must be the first step to species protection.

3. Everything must go somewhere. (*Ang lahat ng bagay ay may patutunguhan.*)

By-products of consumption go back to the environment. Everything that we throw away – pieces of paper, left-over food, peelings of fruits, plastic wrappers, used containers – have to go somewhere. Even plants and animals have their own wastes – feces, urine, dead leaves and branches. It is the law of nature that the by-products of metabolism return to the soil, acted upon first by worms, bacteria and fungi, and then converted into minerals, to be again absorbed by plants and eaten by animals. In short, they enter into a material cycle that is an integral part of the ecosystem. But what happens if what we throw is an artificial product such as plastic? Then natural bacteria can not recognize them and may not be capable of breaking them apart. These non-biodegradable products must enter another material cycle – the one that goes to the factory to be manufactured into a new product. Thus the retrieval, collection and recycling of these materials become necessary so that they do not pollute land and water habitats.

In our present consumer-oriented, setting up an ecological solid waste management system becomes necessary for maximizing the use of resources. Ecological solid waste management recommends that solid wastes be reduced, segregated, re-used and recycled. Biodegradable materials are either to be eaten again or composted. Non-biodegradable materials have to be segregated and collected for recycling.

Industries have their own responsibility in reducing their effluents. End-of-the-pipeline technologies are augmented by clean technologies in raw product extraction and manufacturing. The “polluters pay” principle adopted by governments intensifies the campaign for clean land, water and air. Waste exchange programs by industry turn wastes of one industry into raw products of another. In that way, habitats for organisms are not destroyed or deteriorate.

4. Ours is a finite earth. (*Ang kalikasan ay may hangganan.*)

Everything that we need is provided by nature in abundance – food, water, energy, minerals and air. However, some resources that we depend upon nowadays are extracted excessively but are slow to replace. These non-renewable resources experience limits of supply. For instance, fossil fuels produced over thousands of years may be exhausted in a hundred years. Some energy sources like water, and

wood may be replaced easier but have become inaccessible due to pollution and excessive extraction. Diminishing forest cover have resulted from logging, ineffective reforestation and continued land conversion. However, food scarcity and poverty may have resulted from failed distribution systems rather than inability of the land and water bodies to yield food.

It can be argued that increasing population decreases the amount of resources available to each person. Carrying capacity, or the ability of the ecosystem to support a number of people, may be influenced by limit of resources due to an increasing population. Competition increases as the carrying capacity is reached. Per capita consumption must also be taken into account because people in Northern countries generally consume more food, energy and resources than people in the developing Southern countries. Carrying capacity may be addressed two ways: increase resources and reduce population growth. Agricultural productivity for instance may be increased with better availability of water and farm inputs.

Pollution reduces the absorbing capacity of air and water. Pollution likewise reduces the availability of land and water to produce food for human consumption. A river classified a Class IV means that it becomes fit only for navigation and can no longer sustain life forms. Likewise, oil spills from accidents or war destroy bays and rivers. Waterways that have become cesspool of domestic wastes cannot contain fishes and shells or if they do might transmit toxins and harmful bacteria to consumers.

Several solutions have been suggested to solve this problem: reduction of consumption, increased use of renewable energy, emissions trading, and pollution control. The conservation ethic and technological solutions have become viable strategies to address finiteness of resources. Biodiversity conservation is anchored on the principle that lost species are irreplaceable. Thus, extinct species have acquired a greater value – more effort has to be exerted to protect and save endangered species. The conservation ethic supports the belief that we should tread lightly on the earth by using only what we need. The philosophy of “*sapat*”, meaning “enough” suggests that we should buy and consume only what we need and leave some for the less privileged and the next generation.

5. Nature knows best. (*Ang kalikasan ang mas nakakaalam.*)

Nature manifests certain processes that enable it to maintain balance and remain in a state of equilibrium. The nutrient cycling of nitrogen, carbon, sulfur and phosphorous in the air, water and land indicates that minerals are utilized within the confines of the earth. The flow of energy from the sun enables light to be converted into sugar in plants through photosynthesis, and later for consumer organisms to obtain energy from plant starch. Food chains and food webs allow transfer of energy from producers and consumers and provide the means for all living organisms to acquire nutrition. Population control also occurs naturally through predator – prey relationships.

The equilibrium in the ecosystem is maintained, thus if humans intervene, unforeseen negative impacts known as ecological backlash, may arise. Floods are often times backlashes of excessive felling of trees. The importation of golden kuhol, that became a pest, reminds us that biological organisms may not acclimatize in a new environment or may cause harm to indigenous species.

The environmental ethics promote that we conform to ecological principles and stay close to natural products and processes. We should patronize natural food and consumable materials. Organically

grown vegetables provide healthy food without the side effects that may arise from pesticides. Ecological technology offers an option for us to choose, that which is closest to nature. The extent to which Genetically Modified Organisms (GMOs) affect health remains debatable and the formidable task of providing adequate safe food for a growing population continues to challenge agricultural scientists and environmental managers worldwide.

6. Nature is beautiful and we are stewards of God's creation. (*Ang kalikasan ay maganda at tayo ang tagapangasiwa ng lahat na nilikha ng Diyos.*)

Creation presupposes the existence of a Creator. The beautiful nature around us, perfect by itself, has deteriorated due to the negative impacts of human use. This principle suggests how a Human-Creator relationship is translated in our attitude towards creation. Theologians explain that there are different levels of this relationship. First is a relationship determined by dominion of humans over creation, that humans can do as they wish because this was given by God. The book of Genesis says "have dominion over the fish of the sea and the birds of the air..." The second level is one of stewardship, that of a caretaker where humans are not owners but guardians of the integrity of nature. The third level promotes a kinship relationship postulated by St. Francis de Assisi in the famous verse "Blessed are you, Brother sun, Sister moon", where humans are no higher than the birds and fishes of the sea. Fourth is one of sacrament, where nature becomes a testimony of God's love. Fifth is a covenant relationship, where protection of the earth is a life mission manifested in the things that we do and say.

Different religions from Islam to Buddhism to Judeo-Christian to indigenous people's animism express the belief of caring for the earth, including all creatures. Thus it is the goal of environmental education and biodiversity conservation education to motivate target audiences towards developing an eco-spirituality that moves them into a more meaningful relationship with nature and a greater participation in the biophysical economic processes that make this world a better place to live in.

7. Everything changes. (*Ang lahat ay nagbabago.*)

Changes in the biophysical world occur naturally. As they say, there is nothing more permanent in this world than change. Consider the following examples. Metamorphosis of caterpillars to butterflies illustrates morphological changes that occur in living forms. The increase of vegetation on earth augmented the amount of oxygen in the atmosphere through time. Seasons are cyclic changes that contribute to the diversity of flowers, fruits, vegetables and other crops during the year. Random changes manifested by natural catastrophe such as typhoons destroy forests, coral reefs and mangroves. Volcanic eruptions annihilate surface flora and submerge rivers.

Human-induced alteration such as climate change may cause more massive repercussions. Land use change – from forests to agricultural land to human settlements – change the composition of vegetation and animals. Human-induced changes can be managed so that the negative impacts are minimized and positive changes accentuated. Environmental impact assessment (EIA) provides a tool for the projection, planning and management of change brought about by industrialization and human settlement expansion. Effluents can be managed through policy and pollution control techniques by both industry and government to achieve clean air and water.

Sustainable development presents a paradigm of change for the 21st Century. Sustainable development promotes ecological integrity, equitable sharing of resources and people empowerment as

pillars of growth. Biodiversity conservation contributes to ecological integrity, through both in-situ and ex-situ techniques. Biodiversity conservation becomes successful only if coupled with poverty alleviation, improving equity of access to resources and instituting social change. Environmental education facilitates social transformation by modifying attitudes and behavior of people towards an ecological ethic.

**Adapted from Barry Commoner, as compiled by Miriam College.*