7 Environmental Principles

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7 Environmental Principles


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.
Principle # 1

Nature knows best.

Ang kalikasan ang mas nakakaalam.
There are limits to technology and human foresight when dealing with the lethal impact of natural hazards.
There exists in nature mechanisms that tend to maintain a steady state despite shifting in the components of the system.

*Principle of HOMEOSTASIS*

“check and balance”
HOMEOSTASIS

• nutrient cycling
• energy flow
• carbon cycling
• population control
• climax community
• restoration of a damaged ecosystem/ecological succession
WATER CYCLE

Nutrients distributed throughout the tree

Roots absorb nutrients dissolved in water

Roots carry water to lower soil layers and aquifer

Aquifer

spring

River

Ocean
The nitrogen cycle involves various processes including:

- **Atmosphere**: Nitrogen fixation by lightning is about 1/7 of biological fixation.
- **Soil**: The amount of N cycling in terrestrial ecosystems is about 10 times annual fixation.
- **Organisms**: Human activity is a substantial source of atmospheric N.
- **Freshwater**: Rivers add slightly more N to marine ecosystems than does fixation.
- **Land-ocean exchange**: Considerable nitrogen moves through the biosphere as atmospheric dust, sea spray, and pollutants.
- **Ocean**: The largest actively cycled pool of N in the biosphere is in the oceans.
- **Atmosphere over oceans**: Nitrogen fixation slightly exceeds denitrification.
Any disruption of the natural processes/cycles would have detrimental effects on the environment.

ECOLOGICAL BACKLASH
excess fertilizers
  ↓
eutrophication
  ↓
increased BOD
  ↓
high rates of bacterial decomposition
  ↓
increased turbidity
  ↓
change in species composition
  ↓
change in land use
Genetically modified organism (GMO)

- or genetically engineered organism (GEO) is an organism whose genetic material has been altered using genetic engineering techniques. These techniques are generally known as recombinant DNA technology. With recombinant DNA technology, DNA molecules from different sources are combined in vitro into one molecule to create a new gene. This DNA is then transferred into an organism and causes the expression of modified or novel traits.

GloFish
Genetic modification and engineering:

- Constrict farmer seed and variety privileges.
- Confer private ownership of otherwise commonly held life forms.
- Create unanticipated environmental effects.
- Threaten human health.
- Suppress the development and integrity of less intensive, more sustainable farming systems.
- Damage local farming economies

(Environmental Commons, 2008)
Foods containing genetically engineered components

- Nestle Cerelac
- Ensure
- Kwello’s Chocos Chez
- Bonus Protina Hotdogs
- Purefoods Beefies Hotdogs
- CDO Corned Beef
- Argentina Beef Loaf
Researchers found that rats fed on a diet containing NK603 Roundup tolerant GM corn, or given water containing Roundup at levels permitted in drinking water and GM crops in the US, died earlier than rats fed on a standard diet. They suffered mammary tumors and severe liver and kidney damage.

by molecular biologist and endocrinologist Professor Gilles-Eric Seralini, co-director of the Risk Quality and Sustainable Environment Unit at the University of Caen, France.
Nature has its own products and processes.

We must stay close to the natural products and processes to avoid ecological backlash.
FORCED CHOICE

- banana chips
- gulaman & sago
- coke in can
- disposable diaper
- baby formula
- Perla
- premium gasoline
- plastic bag

- boiled bananas
- softdrinks
- coke in bottle
- cloth diaper
- breast milk
- Tide
- unleaded gasoline
- bayong
White House Food Initiatives

White House Cris Pasia-Comeford gardens and shares recipes
Greener buildings

- energy and water efficient
- cheaper to operate and maintain
- reduced negative impacts to the environment
- creates healthy environment for the users
- has improved productivity of users
- improves the quality of life.
Green Architecture

“Contemporary Filipino Green Architecture”

by Francisco “Bobby” Mañosa

• Environmental Studies Institute
• Farm house of Leticia Shahani
We cannot command Nature except by obeying her.
~Francis Bacon
Principle # 2

All forms of life are important.

Lahat ng uri ng buhay ay mahalaga.
Bat
Orchids
Mosses
Cobra

Monkey
Flying Lemur
Deer
Pitta

An Apitong Tree
A place under the sun...

Each organism has a role:

- Nature’s decomposer
- Nature’s pest control
BIOLOGICAL DIVERSITY

- genetic diversity
- species diversity
- community diversity
Approaches in the Determination of the Value of Biological Resources

1. Consumptive-use valuation

- resources *that are consumed directly without passing through market* e.g., firewood, game meat
Approaches in the Determination of the Value of Biological Resources

2. Productive-use valuation

- *products that are commercially harvested and marketed e.g.*, timber, fish, gane meat, ivory and medicinal plants
Approaches in the Determination of the Value of Biological Resources

3. Non-consumptive-use valuation

- indirect uses of ecosystem functions e.g., watershed protection, photosynthesis, climate regulation, soil production
Fisheries

1. MUNICIPAL FISHING

2. COMMERCIAL FISHING
About 70% of the world’s species are located in the humid tropics, mostly in the rainforests that cover about 7% of the earth’s surface.
H O T S P O T S

EARTH’S BIOLOGICAL RICHEST AND MOST ENDANGERED TERRESTRIAL ECOREGIONS
Global Reef Distribution

Note: Based upon coral reef totals (equaling 255,000sq.m.) derived from the World Conservation Monitoring Center base maps (Reefs At Risk - World Resources Institute (WRI)).
Human activity is rapidly depleting the number of plant and animal species that live on the planet. Industry and agricultural depend on this biological diversity for many of their needs.
Threatened Species: The following list includes all mammals which occur in the Philippines and are rated as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) in the 2000 IUCN Red List of Threatened Animals. An asterisk (*) indicates a change from the 1996 Red List to the 2000 Red List.
• **Critically Endangered:**
  - **Ilin Island Cloud Rat** (*Crateromys paulus*). (**Endemic** to the Philippines.)
  - **Mt. Isarog Striped Rat** (*Chrotomys gonzalesi*). (**Endemic** to the Philippines.)
  - **Northern Luzon Shrew Rat** (*Crutomys fallax*). (**Endemic** to the Philippines.)
  - **Philippines Tube-nosed Fruit Bat** (*Nyctimene rabori*). (**Endemic** to the Philippines.)
  - **Negros Shrew** (*Crocidura negrina*). (**Endemic** to the Philippines.)
  - **Tamaraw** (*Bubalus mindorensis*). (**Endemic** to the Philippines.) (Rated **Endangered** in the 1996 Red List.)
  - **Visayan Warty Pig** (*Sus cebifrons*). (**Endemic** to the Philippines.)
National Integrated Protected Systems Act

- National parks
- Protected areas
- Sanctuaries
- Marine protected areas
Bahay Kubo

- Green Housing Design

The Bahay Kubo is the ultimate green design that spans all throughout the Philippine history.

From its materials and design, this Filipino symbolic structure would always remain to be an blue-print of Pinoy Low-Carbon Living.

Bahay Kubo Song

Bahay kubo, kahit munti
Ang halaman doon, ay sari-sari
Sinkamas at talong, sigarilyas at mani
Sitaw, bataw, patani.

Kundol, patola, upo't kalabasa
At saka mayroon pang labanos,
mustasa, Sibuyas, kamatis,
bawang at luya

Sa paligid-ligid ay puno ng linga.
Welcome!

The Miriam College Science Garden was initiated by Miriam College President Dr. Rosario B. Lopez as part of efforts to intensify the school’s Science, Technology, Engineering and Mathematics (STEM) program beyond the four walls of the classroom. It is designed to:

- Promote greater appreciation for nature, sciences and the environment;
- Create a fertile venue for experiential learning where students can see, feel, observe, discover and understand various biological processes in an outdoor setting;
- Showcase basic agricultural practices and appropriate technologies in line with the school’s environmental initiatives;
- Expose students to innovative and environmentally-sound gardening technologies such as hydroponics, aquaponics, vermiculture, and urban gardening;
- Encourage curiosity, observation and discovery among students.

Garden areas:

A - Outdoor Classroom (Nipa Hut)
B - Nursery/Shadehouse
C - Potting Shed
D - Pedology Section
E - Planting Beds & Boxes
F - Pond & Aquaponics Area
G - Vegetable Trellis
H - Container & Urban Gardening
I - Herb, Medicinal & Butterfly Garden
J - Vermiculture & Composting Area

Condocienda
Roadside planting

Multi-layered vegetation  Tree with Bird Nest’s fern
## Indigenous trees

<table>
<thead>
<tr>
<th>Tree</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agoho</td>
<td>Dungon</td>
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<tr>
<td>Guijo</td>
<td>Is-is</td>
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<tr>
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<td>Siar</td>
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<tr>
<td>Batino</td>
<td>Tibig</td>
</tr>
<tr>
<td>Bignay</td>
<td>Yakal</td>
</tr>
<tr>
<td>Botong</td>
<td>Palosapis</td>
</tr>
</tbody>
</table>
Feast day of St. Francis Of Assisi
Eating meat of rare and endangered species! e.g., pangolin

accessories made from rare and endangered species eg. pawikan, ivory!

furniture from hardwood!

buying corals & seashells!

shoes & bags made from alligator skin & snake skin!

mink coats!

shooting birds for ecotourism!

Gathering orchids from the wild!

Life Style

NO!!
“If you wouldn’t wear your dog ... please don’t wear any fur.”

— Charlize Theron
The miracle that's Einstein

By Kathy Moran (The Philippine Star) Updated October 11, 2009

Donna Reyes hugs her dog Einstein who went missing during the onslaught of tropical storm ‘Ondoy’ but was later rescued by members of the Philippine Animal Welfare Society (PAWS).

JUN MENDOZA
Principle # 3

Everything is related to everything else.

Ang lahat ng bagay ay magkaugnay.
Excerpts from the letter of Chief Seattle in 1845 sent to the President of the United States

Every part of this earth is sacred
every shining pine needle,
every sandy shore,
every clearing and humming insect is holy

The rocky crest, the juices of the meadow, the beast and all the people, all belong to the same family

Teach the children that the earth befalls the children of the earth.
The wind gave our children the spirit of life. This we know, the earth does not belong to us; we belong to the earth. This we know, all things are connected. Our God is the same God, whose compassion is equal to all.

For we did not weave the web of life;
We are merely a strand in it.
Whatever we do to the web, we do to ourselves.
Ecosystem

- Any unit that includes all of the organisms in a given area interacting with the physical environment within the system
Ecosystems

- Terrestrial
  
  Natural: forests
  grassland
Biomes of the world

- Rainforest
- Temperate Deciduous Forest
- Boreal, or Taiga Forest
- Chaparral
- Grassland
- Savanna
- Desert
- Tundra
Gaia hypothesis – all organisms have evolved from the physical environment to produce an intricate, self-regulatory control system that keeps conditions favorable for life on earth (Lovelock)
Marine ecosystems
Symbiotic relationships

• Mutualism
• Parasitism
• Predation
• Competition
• Commensalism
WE ALL LIVE IN A WATERSHED

STATISTICS

- Laguna Lake Watershed: 298,798 ha
- Mirkina River Watershed: 53,854 ha
- Marikina City: 2,286 ha
- Marikina River Watershed
  - 95% of the watershed area is outside Marikina City

E.C. Godilano, Ph.D.
Sept 26, 2009
during typhoon Ondoy
Interrelatedness in outreach programs:

- River Basin – Kaliwa-Kanan River Basin
- Sierra Madre Biodiversity Corridor
- Sustainable development approach (socio-political, economic, ecological)
health and fishery problem since 1983 have continued for the period of 1990-1995
Impacts of Global Warming

CORAL BLEACHING
Extractive Economic Activities

Logging

Mining
Biodiversity loss due to pollution
4 Fishing

SOBRANG PANGINGISDA

MGA TAKLOBO
Impacts of Tourism

ANGKLA NG BANGKA

PAGTAPAK SA BAHURA
Principle 4:
Everything changes.

Ang lahat ay nagbabago.
From IPCC’s Fourth Assessment Report (2007)

Source: WWF
Global atmospheric concentrations of CO2, methane (CH4) and nitrous oxide (N2O) have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years.
Humanity’s Ecological Footprint

# of planet Earths, 1961-2003

The graph shows the increase in humanity’s ecological footprint from 1961 to 2003, indicating the number of planet Earths needed to sustain current levels of consumption and waste. The footprint has been steadily rising, surpassing one planet around 1975 and nearing two planets by 2003.
Human Sources of GHGs

Carbon Dioxide (CO₂) – Most prevalent GHG
Methane (CH₄) – Second most common, 21x the potency of CO₂
Nitrous Oxide (N₂O) – 310x the potency of CO₂
Other Gases – HFCs, PFCs, and SF₆ = range 600 – 23900x potency of CO₂

Transportation
Energy Generation
Industrial Processes
Land Use:
Agriculture & Forest
Average white corn production for seven years is approximately **1.70M tons** (2000-2007).

Root crops which is considered a “poor man’s diet”. Cassava, Sweet Potato, Yam, and Taro combined could contribute **2.36 tons** of produce.

Banana production in 2008 is **8.69M M/t** of which **2.20M tons** was exported.
Higher incidence of malaria and dengue
Living in water

- Houses on stilts
- Barangay - from Balangay “the boat people”
- Community-based early warning system – e.g. water level monitoring
- Community-based warning system
- Community-based evacuation center/house
- Taga-ilog, Kapampangan, Dumagat
Floating Villages, Tonle Sap, Cambodia
Miriam College goes WILD!

Working Into Living Diversity

Environment Week
In celebration of International Year of Biodiversity
“I am not afraid of storms, for I am learning how to sail my ship.”

Louisa May Alcott
It’s all about love and compassion...
Mahalin natin ang kalikasan.
Maraming salamat po!