

J. ACTION

CENTER FOR JUSTICE GOVERNANCE AND ENVIRONMENTAL ACTION

MANUAL FOR SCHOOL ENVIRONMENTAL CLUBS
STUDENT WORKBOOK



Miti Kwa Vitukuu Project

A GUIDE TO SCHOOLS ECO-AWARENESS PROGRAMME

1. ENVIRONMENTAL ETHICS AND THE ECO-ETHICAL MOUNTAIN

ENVIRONMENT

The word environment means “surroundings”

This includes the living & non-living things.

The environment includes everything that makes life on earth possible.

NB: Human beings are part of the environment therefore refers to us in our surroundings.

ETHICS

This is the study of reasons for right and wrong actions.

Ethics explains why some people end up doing the wrong and right actions.

However ethics cannot be seen felt or measured.

E.g. Aristotle (a scholar) said “we are studying not to know what goodness is, but how to become good men. Thus we must apply our minds to the problem of how our actions should be performed.

ENVIRONMENTAL ETHICS

This is the study of reasons for right and wrong actions that are imposed to the environment. in the recent years the population has greatly increased and technology has advanced hence some human activities are bound to harm the environment.

e.g. forests can be cut, mountains can be carried away by mining and rivers can be diverted by dams.

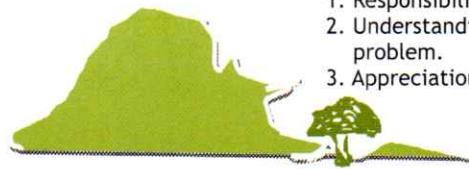
We must learn that **despite the modernization, natural resources must be used thoughtfully and safely, over use can harm both the environment and human health.**

This is what is called **environmental ethics.**

SOME FAQs ON ENVIRONMENTAL ETHICS.

- Does the natural world have value apart from its support in human life?
- Do trees & animals have rights of their own?
- How do we harvest and make use of natural resources without exhausting these resources?
- What should we do to protect the environment so that we can still benefit from the natural world?
- should there be limits on what we choose to do with nature
- when trying to save nature do we have to make a sacrifice?
- Environmental ethics gives answers to those questions.
- Environmental ethics also provides guidance on how to act upon those insights.

THE ECO-ETHICAL MOUNTAIN.



1. Responsibility for a solution
2. Understanding the ecology of the problem.
3. Appreciation of the problem.

The eco ethical mountain comprises of 3 building blocks:

- ≈ Appreciation of the problem
- ≈ Understanding the ecology of the problem
- ≈ Taking responsibility for a solution

These building blocks for environmental ethics make up the different levels of Eco-Ethical Mountain.

The eco-ethical mountain can help people’s perceptions of right & wrong with regards to the environment.

1. Appreciation of the problem

- ≈ Appreciation means to recognize the value of something
- ≈ This means we should have deep respect and reverence for the physical world & its creatures.
- ≈ Some environmental threats like: air & water pollution, deforestation and extinction of animals especially and endangered species.
- ≈ Hence the human choices we make greatly contribute to the above threats.
- ≈ These are the questions we should ask ourselves: what is the right thing to do to prevent actions that harm the environment?
- ≈ For us to answer these questions first we have to appreciate the natural resources and understand its value.
- ≈ Therefore appreciation is at the broad base of the eco-ethical mountain.
- ≈ The Goldman Award winner appreciated the natural world around him or her.

2. Ecology of the problem

Ecology refers to the relationships, connections & interactions that occur among various parts of the environment.

Some of the connections are: trees contribute to the air circulation.

Trees cannot grow without water.
Water is life

Hence the lack or insufficiency of inadequate of one contributes to the failure of another

Ecology is science

Scientists conduct research and come up with conclusions.

Scientists arguments aim to report only what can be proven through careful observation & strict analysis of facts and not through emotions.

Therefore it is wrong to draw scientific knowledge to support beliefs.

Ecology demonstrates the inter relationships among all that is in the environment showing how elements are dependent on each other.

3. Responsibility for a solution

Responsibility is the duty which implies an inflexible obligation to take certain action. This is where we consider the ways we ought to act to preserve a resource in terms of ecological perspective of an environmental issues.

However this can be met by the use of some ethical principals which are:

- a) **Utility** - The responsibility to satisfy human needs.
- b) **Justice** - The responsibility to assure that all people including the next generation will benefit equally from the world's resources.
- c) **Duty** - Responsibility to accept something & act on it therefore for one to come up with a solution.

Building The Mountain

By building on appreciation of the environment, one develops a passion to find out more about the problem.

He/ she finds facts about the problem leading to the ecology of the problem.

He/ she have to use the scientific arguments whenever he tries to take the responsibility of finding solution..

2. WILDLIFE

Wild animals are animals that live outside the domestication and without continuous human interaction.

The 3 building blocks of the eco ethical mountain will be discussed in this topic.

1. Appreciation

We should value wildlife.

Some of the reasons why we should value wildlife are:

- The material commodities it can provide
- The natural beauty of wild animals & wild places.

Use Value

Refers to the benefits one gets because something is useful to them.

Existence Values

Refers to th benefits one gets just because something exists.

2. Ecology

it's important to understand how living things and their habitats are inter-connected.

Bio-diversity

This the variety of life on earth & the inter connection among species and their habitats

Due to the inter dependence, when a specie is endangered its population is threaten with extinction in the near future. Therefore the destruction of one specie may cause harm to many others that are dependent on its existence.

Benefits of bio diversity

- ∞ E.g. Rhinos make savanna more hospitable for other less-powerful creatures by pulling down trees & shrubs for others to feed. They also dig water hoes & create trails through the forest.
- ∞ Bees help in pollination
- ∞ Micro organisms help in decomposition. They break down dead plants & animals in to soil.
- ∞ wild animals acts as a store house of genetic information. They have unique genetic codes which represent adaptations to the bio sphere.
- ∞ wild animals harbor chemical compounds that can be used to treat many diseases.

3. Responsibility

This is the obligation to protect something precious although you derive no direct benefit.

The act of feeling compelled to dedicate yourself & taking risks so that some creature does not perish.

3. FORESTS

They are complex eco-systems that provide numerous services & functions.

E.g. help purify the air we breath, stabilize soils, support decomposition and for natural beauty.

1. Appreciation

Forest Structure

Forests are divided vertically in to 3 layers:

- ✍ Canopy
- ✍ Uppermost Layer,
- ✍ Contains branches and leaves of big trees.
- ✍ They capture sunlight .
- ✍ Provide energy for growth & maintenance of the tree.

Understory

Contains shrubs & younger trees.

Forest Floor

- ✍ Shade & tolerant plants
- ✍ Decomposing leaves
- ✍ Organic matter

Followed by roots which provide nutrients to the plants. Roots prevent soil erosion.

2. Ecology

Forests around the world

* Tropical rain forests

They are located close to the equator at low elevations
Temperature is usually warm
Daylight varies a little from place to place

* Temperate forests

This type of forests is found IN Eastern North America, North Eastern Asia & Central Europe
Temperature varies greatly.

Leafy trees lose their leaves in the fall.

* Alpine & boreal forests

Found in North America & Eurasia
Temperatures are usually low
The growing season is usually short
Precipitation occurs in form of snow.

Forests are renewable resources. Selective cutting & continuous re planting may allow forest to renew itself on the human time scale.

Intensive harvesting & clearing may damage forests & eco systems this compromises their ability to re generate & harm, plants & animals that depend on them.

3. Responsibility

When making resource-use decisions, the principle of utility considers what actions ensure that the greatest possible benefits accrue to the greatest number of people.

Difficult decisions are made to decide on how harvest forest services in a way the honors utility, justice & duty.

Making appropriate & well reasoned arguments in search of a perspective are important elements of activism & conservation.

4. WATER

1. Appreciation

The human body is made up of 70% water
Water covers 2/3 (two third's) f the earth's surface.
Human beings depend on water for various reasons e.g. drinking, agriculture, recreation, spiritual values and Hydro Electric Power.

2. Ecology

✍ Water cycle

Hydrologic cycle is the manner in which water continuously moves through the biosphere.

Heat from the sun causes fresh & salt water to evaporate. Gasous water from plants (through transpiration is also lost.

This water vapor rises the atmosphere until reaches level where it condenses into the cloud & then fall back as rain.

Some percentage of it is taken by plants

Some percolates down to replenish ground water aquifers, some evaporates back in to the atmosphere.

The rest is known as run off. Rn off flows down hill forming streams.

☞ Aquatic webs of life

Marine food is complex. Comprised of inter connected plants & other organisms that eat and are eaten by another E.g. varieties of fish crustaceans & marine mammals.

These animals live within unique ecosystems that exist along the coasts, deep ocean water & on the ocean floor. Fresh Water ecosystems include rivers, streams, marshes & ponds.

They occur in the context of a watershed, which is the total land area drained by major channel & its tributaries. Watersheds form natural boundaries in the landscape.

Ridges, hillsides & mountain peaks control the direction of water flow.

Any changes to the floor or purity of water affects eco system & their inhabitants.

☞ Estuaries

This is the tidal zone between the land & the sea where fresh water meets salt water

☞ Mangroves

Mangroves are shrubs that mostly grow in salty/ fresh water bodies.

They retain river sediments

They control coastal erosion

Mangroves serves as nurseries to marine animals and protect coral reefs.

☞ Coral reefs

Coral reefs support many species of marine life

They provide an accessible are for fishing

They protect coast line from damage by breaking powerful waves during storms

3. Responsibility

Water resources are threatened by pollution & exploitation.

Wildlife in ocean & fresh water ecosystems are threatened over fishing.

Sometimes benefitting the majority in a society causes a minority to suffer. This is a major problem faced by utilitarian thinking. It deprives the few as long as the majority benefit.

5. AIR

Air is a unique mixture of gases.

Air surrounds the earth & supports all life.

The atmosphere serves as shield & blanket.

It protects us from meteorites & cancer-causing radiations, while trapping sun's heat.

Composition of air is maintained by cycles of gases

through the biosphere.

The atmosphere is responsible for:

- Climate change.

- Regular patterns of whether.

- Rainfall/wind/temperature.

Air pollution threatens human health.

Climate change may bring hurricanes, floods & droughts.

1. Appreciation

* Air the medium of life

Air is the medium of our existence.

It makes us hear, feel smell and talk.

Moving air is called wind.

Wind power

Harnessing the power of winds, propelling navigation & exploration of the seas.

On lands winds are harnessed to turn windmills, grind grain power & pump water.

In the modern technology sector, airplanes have revolutionized travel.

Industrial production & quality

Smokestacks from factories have released smoke & pollutants in the air

These pollutants bring about volcanoes but small concentrations of air pollution from human natural resources do not pose a problem.

2. Ecology

Air is a mixture of gases.

There are two primary gases: **Nitrogen 78% and Oxygen 21%**.

The **1% remaining** comprises of a large variety of gases, some remained relatively constant over a time e.g. argon, helium, hydrogen.

Some are variable e.g. water vapor, carbon (IV) oxide, methane, nitrous oxide and ozone.

* Airy Concerns

* The ozone hole

Ozone (O_3) is a gas found in the stratosphere

Ozone absorbs the sun's ultraviolet radiation which can be harmful to life on earth.

The ozone layer is destroyed by chlorine escaping from chlorofluorocarbons CFC,

CFC, are used in: refrigeration, air conditioners and aerosols.

The decreased in levels of ozone causes "the ozone hole". The ozone hole greatly affects life. In humans it causes skin cancer and damages eyes.

* Climate change and green house effect

Atmosphere acts as a blanket trapping energy and heat from the sun

This affects the greenhouse gases what are:

- Carbon (iv) oxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)

The little effects that are caused by changes of the greenhouse effect act as benefit to the improvement of life.

This is because without the green house effects the temperature at the earth surface would be 33 c colder This is below the freezing point of life hence life would not exist.

However concentration of too many green house gases poses problem.

The increase in greenhouse gases is brought about by: burning of fossil fuels like coal, oil and natural gas.

Effects caused by green house

- ∞ Affects global climate and whether patterns.
- ∞ Decrease bio-diversity.
- ∞ Raise sea level.
- ∞ Threaten human health.

* Acid rain and smog

Acid rain is the increase in acidity in the atmosphere.

This occurs when air pollution coal, power industry and automobiles.

This contains precipitation with sulfuric and nitric acid.

Smog is caused by automobile and industrial exhaust.

These includes carbon (2) oxide nitrogen oxides and reactive hydrocarbons.

Smog forms when sunlight hits the gases and form ozone.

NB: Ozone is a deadly pollutant at the ground level despite being a block of ultraviolet rays. Smog is seen as a haze hanging over urban areas.

Effects of smog

- * Nose and throat irritation
- * Breathing difficulties
- * Headaches.
- * Can even cause deaths.

Healthy Environment

The protection of the air emphasizes ethical principal of preserving the community of life

By working together we can create, sustain and preserve our access to clean healthy atmosphere.

3. Responsibility, Duty versus Utility

Duty - requires some sort master rule by which one can judge right and wrong

E.g. do unto others as you would have them unto you.

Duty does not compromise to do anything that satisfies ones another mans needs it has to be the correct thing .

Utility - Coast benefit are measured and decision is made that supports the action that brings the greatest number of people.

6. MINERAL

Mineral resources which are non-renewable are critical are critical to supporting our modern lifestyle.

Because they are non-renewable our use of them must be responsible and sustainable.

This ensures that the 3 benefit is balanced with the importance of saving resources for future generation.

The ethical principal of justice requires weighing the benefit that accrues from the use f mineral resources against the negative impacts that may disproportionately affect local communities and cultures.

This usually affects the poor and disadvantaged.

1. Appreciation

- ∞ User of minerals
- ∞ Building houses e.g. stones.
- ∞ Jewelry e.g. copper, gold, bronze
- ∞ Computers e.g. silica copper zinc, iron, aluminum
- ∞ Food flavoring e.g. salt
- ∞ Produce paper e.g. salt.
- ∞ Soften hard water e.g. salt.
- ∞ Treatment of arthritis e.g. gold.
- ∞ Electronics e.g. silver and gold.
- ∞ Dentistry and pharmaceuticals e.g. gold and silver respectively
- ∞ Batteries e.g. silver lead etc.

2. Ecology

* Mineral make up

Mineral deposit are distributed unevenly around the globe.

This is a result of worldwide geologic processes.

They control the minerals formation and deposition.

Earth is made up of a hot, central iron core, a think mantle of semi sold rock around the core and a crust a solid brittle rock.

The mantle and crust are divided into tectonic plates.

Along the boundaries of tectonic plates some deposits of metallic are found.

Minerals are compound and element found through the earth crust and mantle.

They are hidden in rocks. Example of rocks are:

(I) Igneous rocks

Are formed when magma (molten rocks) flow from he mantle to the crust and cools

(ii) Igneous rocks

They are formed when little bits of weathered rock accumulate and are compacted and solidified.

(iii) Metamorphic rocks

Are formed when sedimentary rocks and igneous rocks are subjected to intense ad pressure

Energy resources actually began as living things.

Petroleum and natural gas were at one time, animals and plants.

They are used to live in the sea many years ago.

Coal on the other hand began as swamps.

Covered by sediments (little rocks) these organic materials didn't decompose in normal way.

* Mineral mining

Mining is very expensive and difficult and sometimes very disruptive to both human and environment.

There are different types of mining which are:

(i) Surface mining

The overburden of rocks, soil and trees cover the mineral, hence must be removed.

The overburden might fill up valleys and clog creeks if not properly managed hence altering the landscape.

As a result of mining dust and toxic substances may be carried in the air.

Toxins can seep into creeks, rivers and ground water.

(ii) Subsurface mining

Have less severe effects on the landscape

It is more expensive

It is more dangerous process for miners

Hazards include

- Collapse that trap and kill miners
- Underground explosion of dust and natural dust
- Underground fires that can be put
- Prolonged inhalation of mining dust
- Causing lung diseases.

Once mined, metal must be processed to remove waste materials known as tailings.

(This can be dangerous pollutants) Smelting of metal to chemically separate the metal from the ore release gases and dust. these gases include sulphur (IV) oxide which contributes to acid rain. Most products made from metals and other mineral resources end up in landfills. This can contaminate ground and surface water.

Oil spills can poison large areas.

Natural gas pipeline can cause destructive explosions.

3. Responsibility

* Justice for all

Mining transportation, processing of mineral carries social and environmental cost.

Usually a large carries the burden while the small groups benefits.

The ethical principal of justice states the obligation to

assure that the benefits and burdens of social life are fairly distributed among all people.

* Minerals for the future

Through minerals have advantages to the economy vast implication are posed on human health

Before setting up a mine, the environment issue should be given first priority.

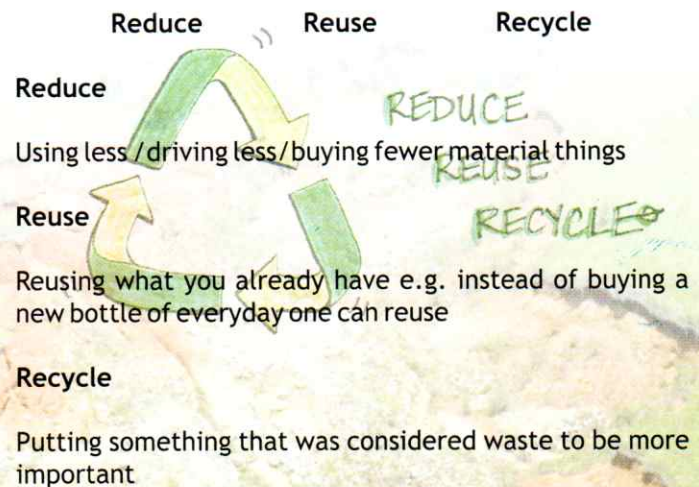
Relocation and compensation is not enough because some cultures are on extinction as they are the last of their language group.

* The future is now

People can take specific actions to conserve mineral resources.

This limits the social and environmental and wealth of mineral resources for future generation.

One of the best known conservation mantras is (the three R'S)



THINKING LIKE A MOUNTAIN

We must appreciate the natural world's myriad values and benefits.

Learn how we relate to another

We should nurture a deep ethical conviction that natural world deserves our respect and protection

The Goldman prize winners demonstrate how ordinary people can take extraordinary action to protect the natural environment.



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