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— MMS3003 —




ENVIRONMENT – ISSUE AND GLOBAL PERSPECTIVE

CHAPTER 1








GLOBAL ISSUE AND SUSTAINABILITY

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GLOBAL ISSUE AND SUSTAINABILITY

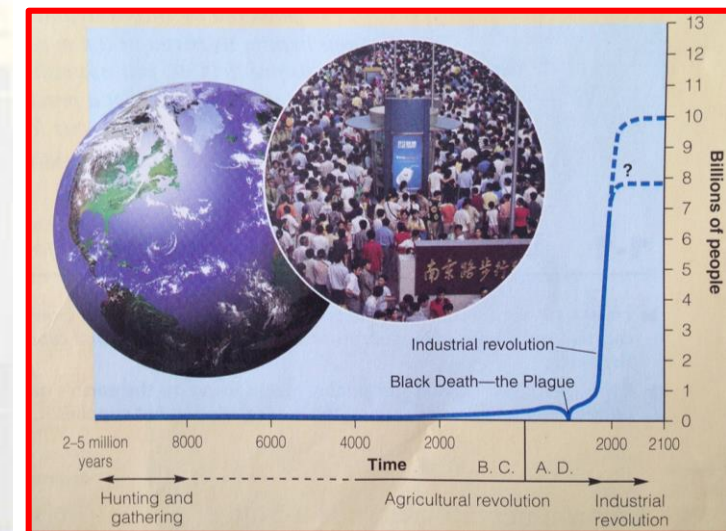
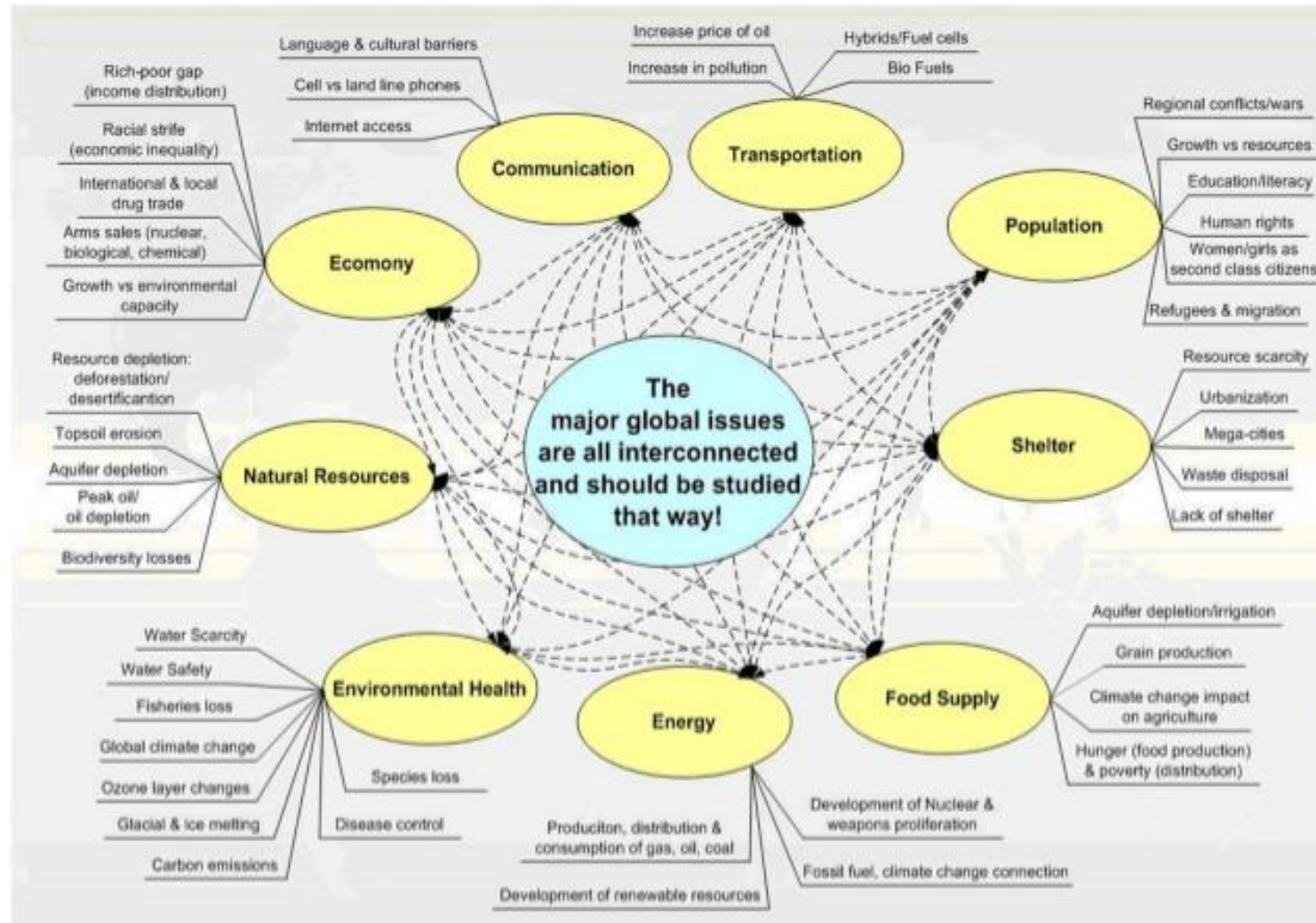
-  These lecture material are for the **Marine Coastal and Delta Sustainability for Southeast Asia (MARE)** (Project No 610327-EPP-1-2019-1-DE-EPPKA2-CBHE-JP)
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LECTURE OUTLINE





-  What is Environmental Science?
-  What is an environmental sustainable society?
-  How can environmentally society grow economically?
-  How are our ecological footprints affecting the earth?
-  What is pollution, and what can we do about it?
-  Why do we have environmental problems?
-  How we can work together to solve environmental problems?







GLOBAL ISSUE




ENVIRONMENTAL SCIENCE


-  Environmental Science is a **study of connections in nature**.
-  The environment is everything around us. It includes all of the **living and the non living things** with which we interact.
-  We depend on the environment for air, water, food, shelter, energy and everything else we need, to stay alive and healthy.
-  An **interdisciplinary study of how humans interact with the environment of living and non-living things**.

ENVIRONMENTAL SCIENCE

-  **Ecology** – The biological science that studies how organisms, or living things, interact with their environment and with each other.
-  **Species** – A group of organisms with distinctive traits and, for sexually reproducing organisms, can mate and produce fertile offspring
-  **Ecosystem** – A set of organisms interacting with another and with their environment of non-living matter and energy within a defined area or volume.
-  **Environmentalism** – A social movement dedicated to protecting the earth's life-support systems for us and all other forms of life.

ENVIRONMENTAL SUSTAINABLE SOCIETY

 Our lives and economies depend on **energy**.

 Living sustainably means living off the earth's natural income without **depleting or degrading the natural capital** that supplies it.



Sustainable Living



Reduce CO₂



Use a clothesline



Run full loads



Use less energy



Recycle & reuse



Reusable drink containers



Reusable shopping bags



Live Simply



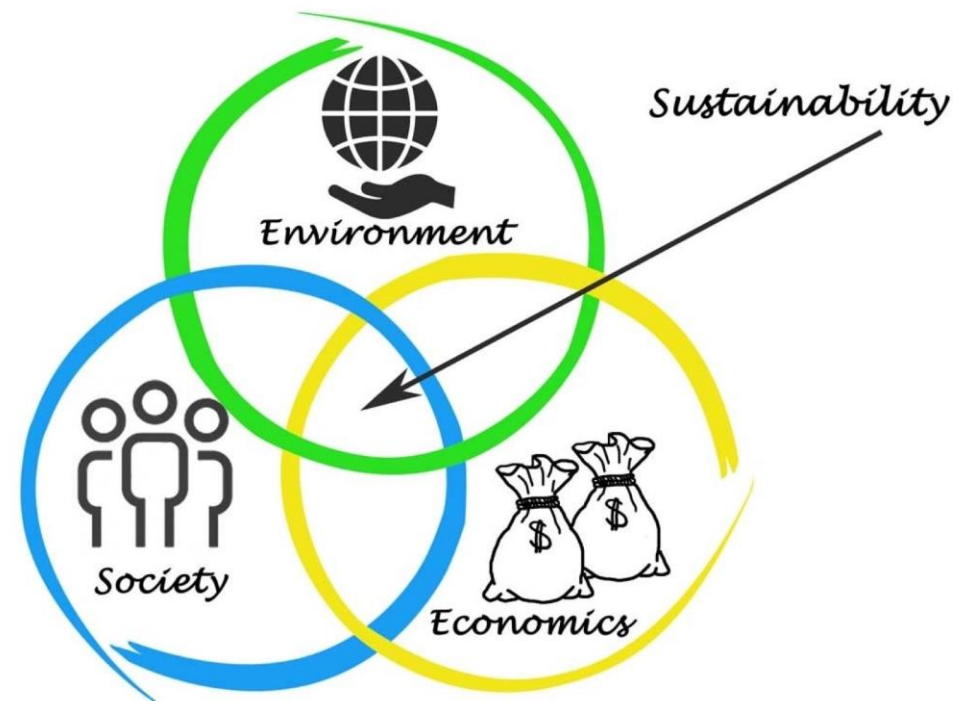
Install LED bulbs




Shorter showers


SUSTAINABILITY

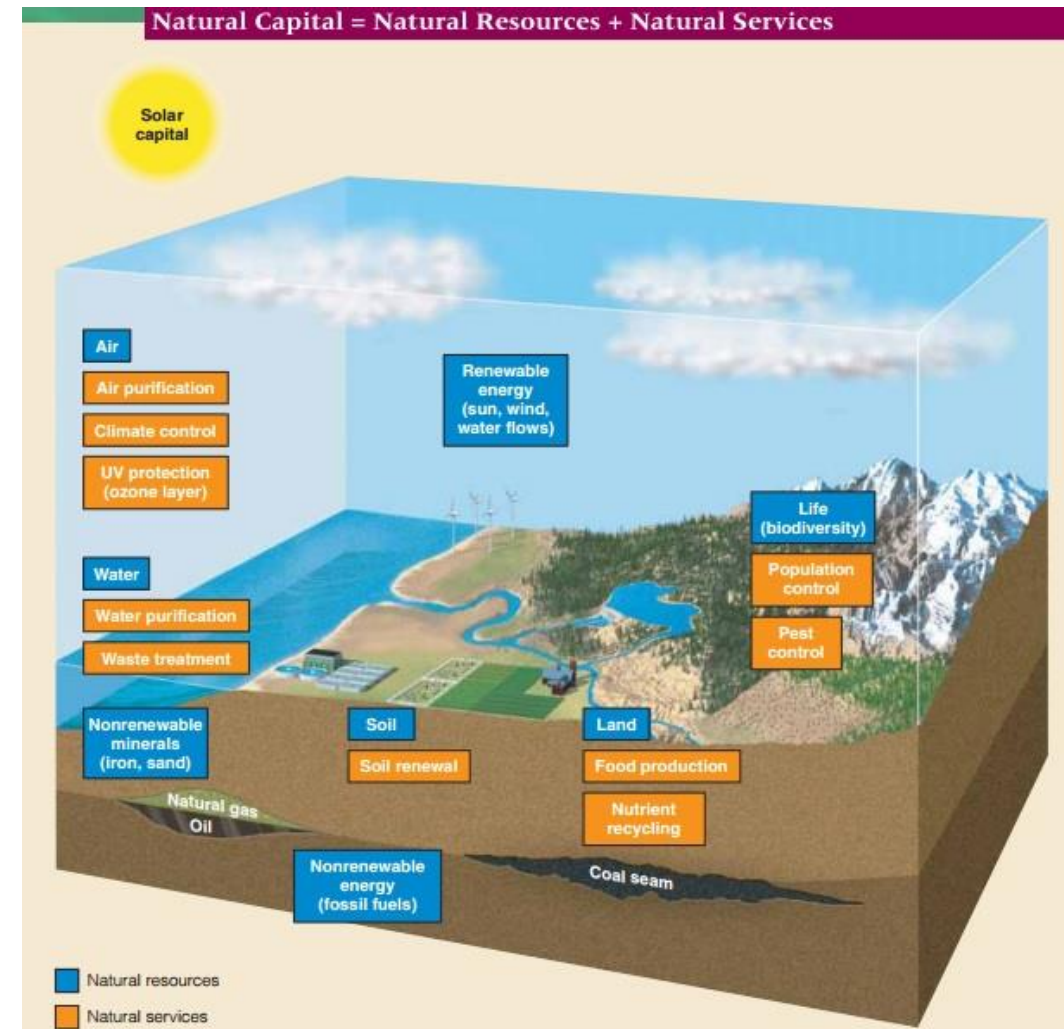
 The **ability** of the earth's various natural systems and human cultural systems and economies to **survive and adapt to changing environmental conditions** indefinitely.




SUSTAINABILITY


 **Natural Capital** – The natural resources and natural services that keep us and other forms of life alive and support our economies.

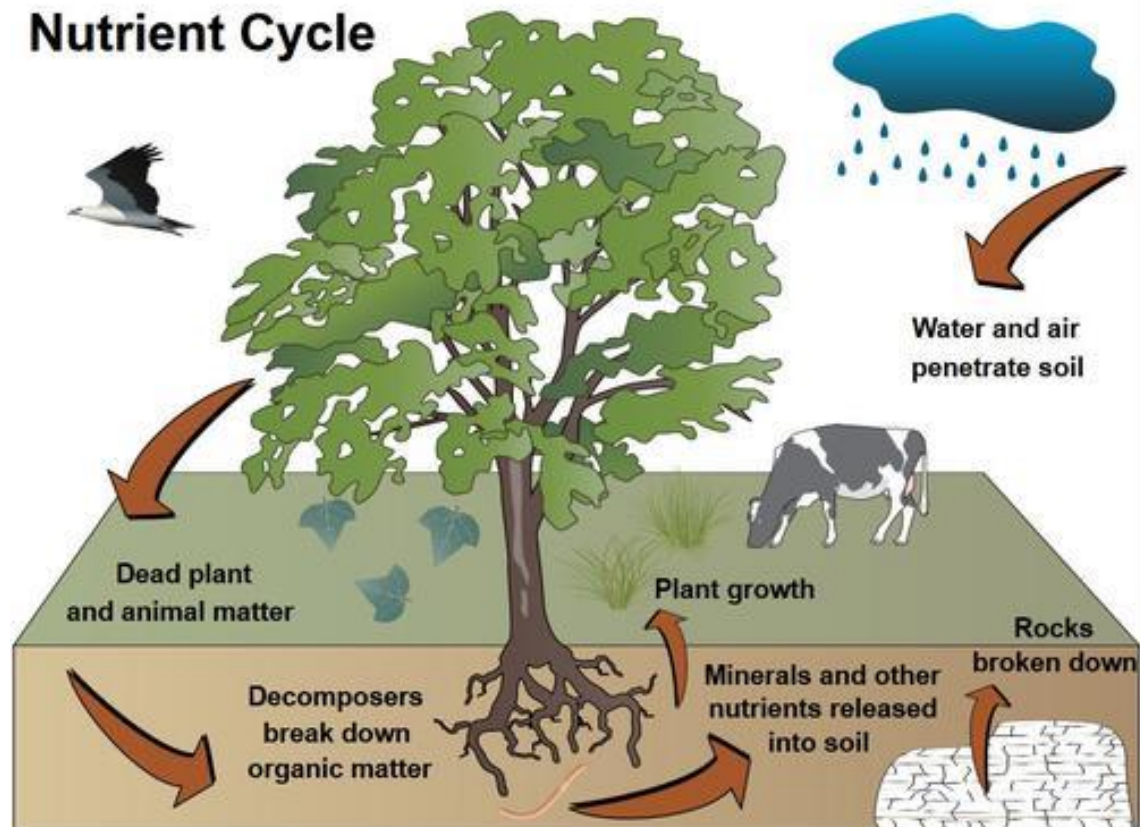
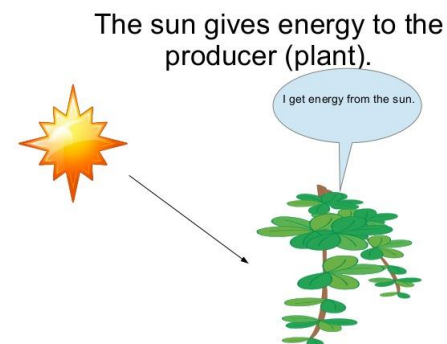
 **Natural Services** – Functions of nature, such as purification of air and water, which support life and human economies.



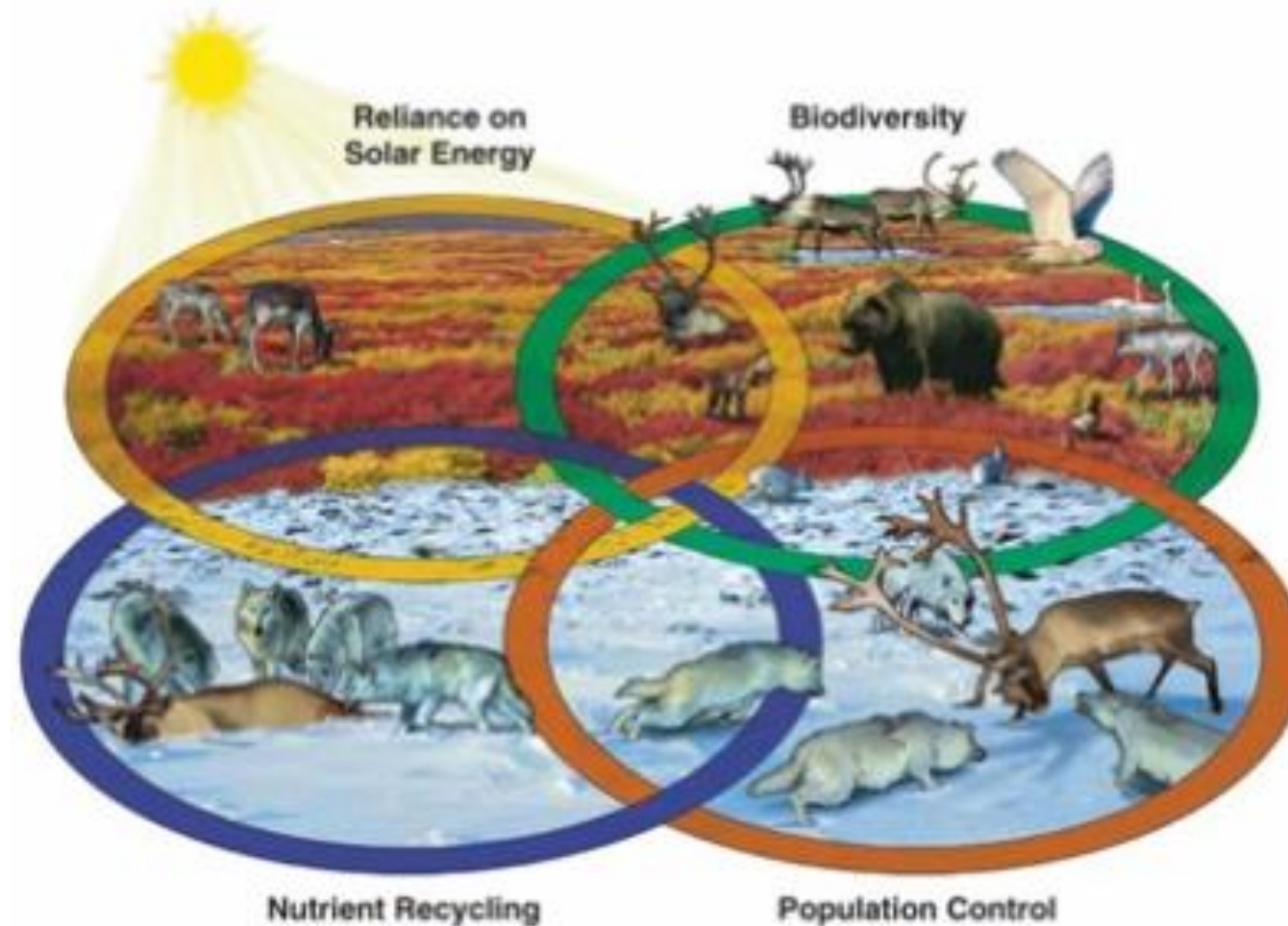
SUSTAINABILITY

 **Nutrient Cycling** – The circulation of chemicals necessary for life, from the environment (mostly from soil and water) through organisms and back to the environment.

 **Solar Capital** – Energy from the sun. Solar energy warms the planet and support photosynthesis.



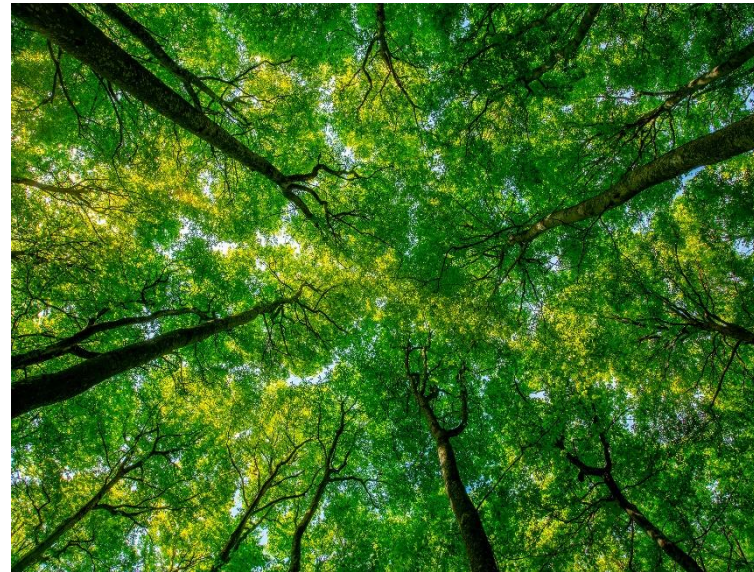
FOUR SCIENTIFIC SUSTAINABILITY PRINCIPLES



FOREST – ECONOMIC AND ECOLOGICAL SERVICES

Ecological Services








- Support energy flow
- Reduce soil erosion
- Absorb and release water
- Purify water and soil
- Influence local and regional climate
- Store atmospheric carbon
- Provide habitat



Economic Services







- Fuelwood
- Lumber
- Pulp to make paper
- Livestock grazing
- Recreation
- Jobs

EFFECT OF DEFORESTATION

-  Decreased **soil fertility** from erosion
-  **Runoff of eroded soil** into aquatic systems
-  Premature **extinction of species** with specialized niches
-  **Loss of habitat** for native species and migratory species such as birds and butterflies
-  Regional **climate change** from extensive clearing
-  **Release of CO₂** into atmosphere
-  Acceleration of **flooding**



HOW TO MANAGE AND SUSTAIN FOREST?

-  Identify and protect forest areas high in biodiversity
-  Rely more on selective cutting and strip cutting
-  No clear cutting on steep slopes
-  No logging of old-growth forests
-  Plant tree plantations primarily on deforested and degraded land
-  Include ecological services of forests in estimating their economic value.



MAJOR THREATS TO AQUATIC BIODIVERSITY



 Habitat loss

 Invasive species






 Pollution

 Climate change

 Overfishing



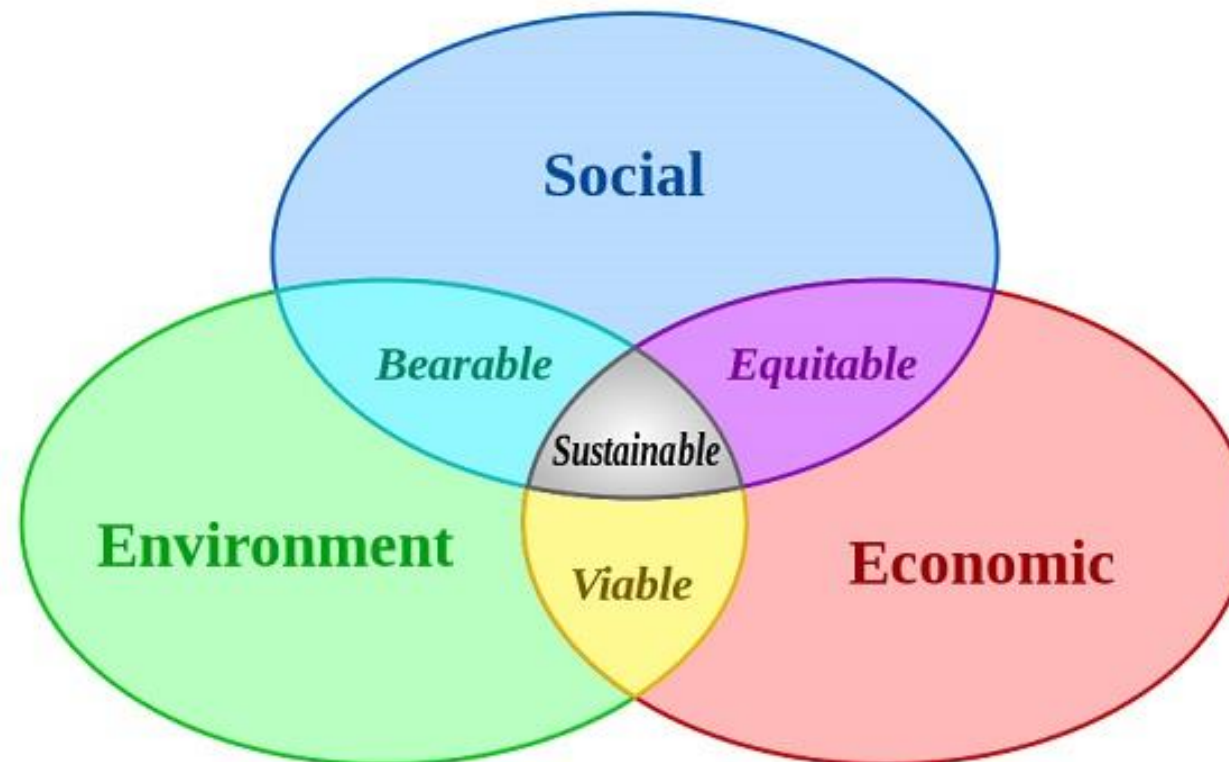
HOW TO PROTECT AND SUSTAIN MARINE BIODIVERSITY?

-  Using laws and economic incentives to protect species
-  Marine reserves to protect ecosystems
-  Integrated coastal management
-  Identify severely threatened areas and protect those with high plant diversity (biodiversity hotspots)
-  Rehabilitate and restore damaged ecosystems



SUSTAINABLE SOCIETIES

 How can environmentally sustainable societies grow economically?





SUSTAINABLE SOCIETIES

SUSTAINABLE DEVELOPMENT GOALS



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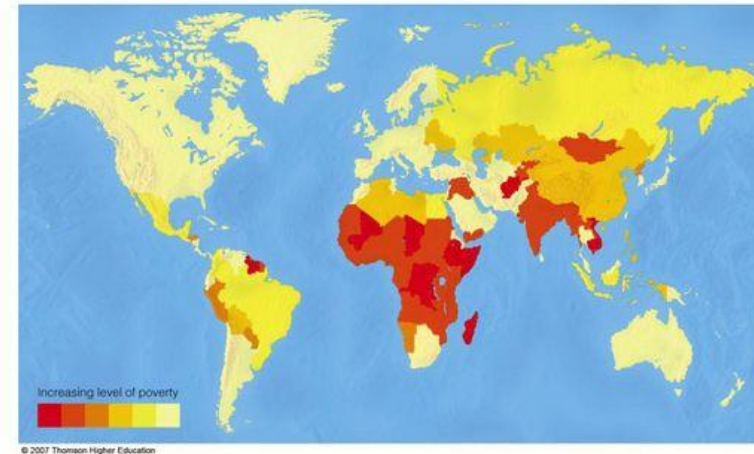
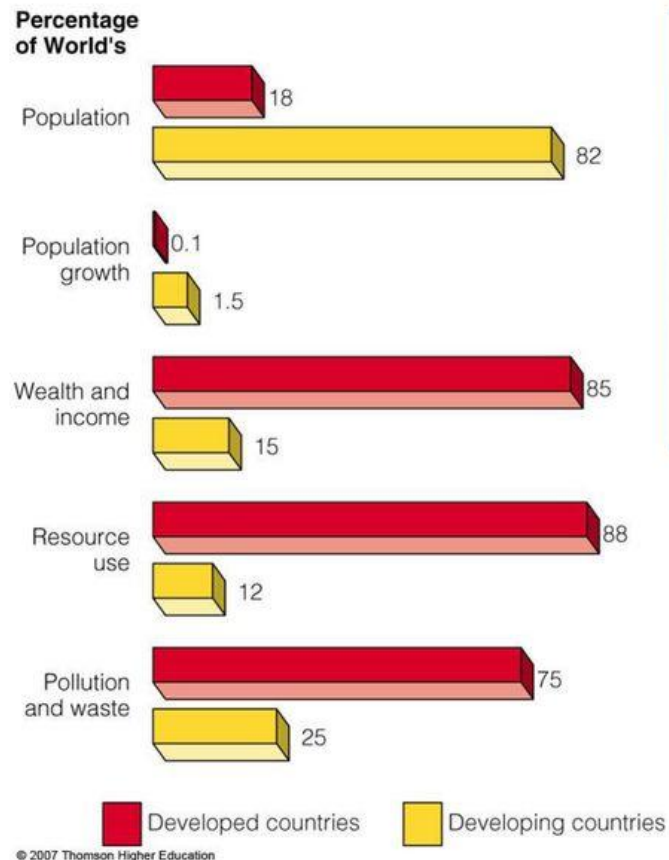
SUSTAINABLE SOCIETIES

-  Societies can become more environmentally sustainable through economic development dedicated to improving the quality of life for everyone **without degrading the earth's life support systems.**
-  Using political and economic systems to discourage environmentally harmful and unsustainable forms of economic growth that degrade natural capital, and to encourage **environmentally beneficial and sustainable forms of economic development** that help sustain natural capital.

SUSTAINABLE SOCIETIES



Global Outlook



Comparison of developed and developing countries.

ECOLOGICAL FOOTPRINTS

 **Measures human demand in nature.**

 **Quantity of nature it take to support** people or an economy.



ECOLOGICAL FOOTPRINTS

 How are our ecological footprints affecting the earth?

Which of our activities influence the state of the Earth?



BUILT ENVIRONMENT
HOUSES
ROADS
INFRASTRUCTURE
ENERGY PLANTS



AGRICULTURE
FOOD
ANIMAL FEED
BIOFUEL
TEXTILES



FISHING
YIELD FROM THE
OCEAN AND RIVERS



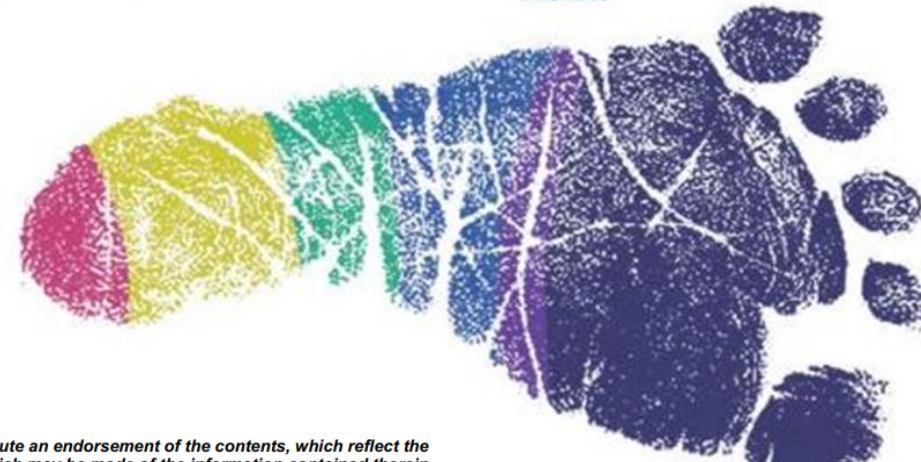
FOREST USE
LOGGING
CONSTRUCTION
FURNITURE
PAPER
FIREWOOD




GRAZING LAND
MEAT
DAIRY PRODUCTS
LEATHER
WOOL



FOSSIL FUELS
PRODUCTION
TRANSPORTATION
HEATING
COOLING
ETC.



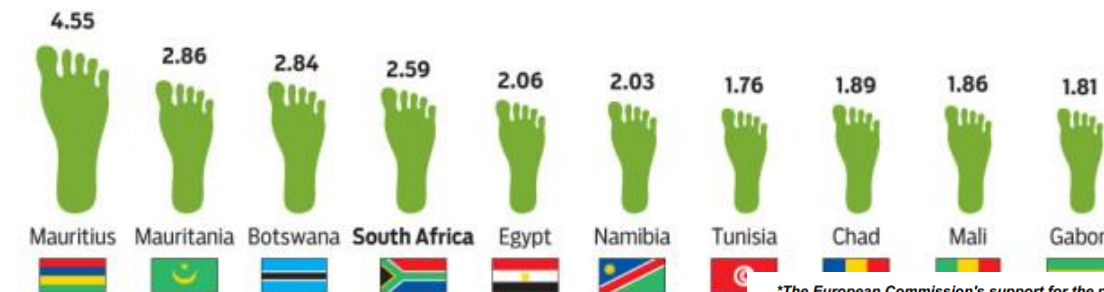
ECOLOGICAL FOOTPRINTS

 Ecological footprint analysis is widely used around the Earth as an **indicator of environmental sustainability**.

Top 10 countries with the biggest ecological footprint per person



Top 10 African countries with the biggest ecological footprint per person










* United Arab Emirates

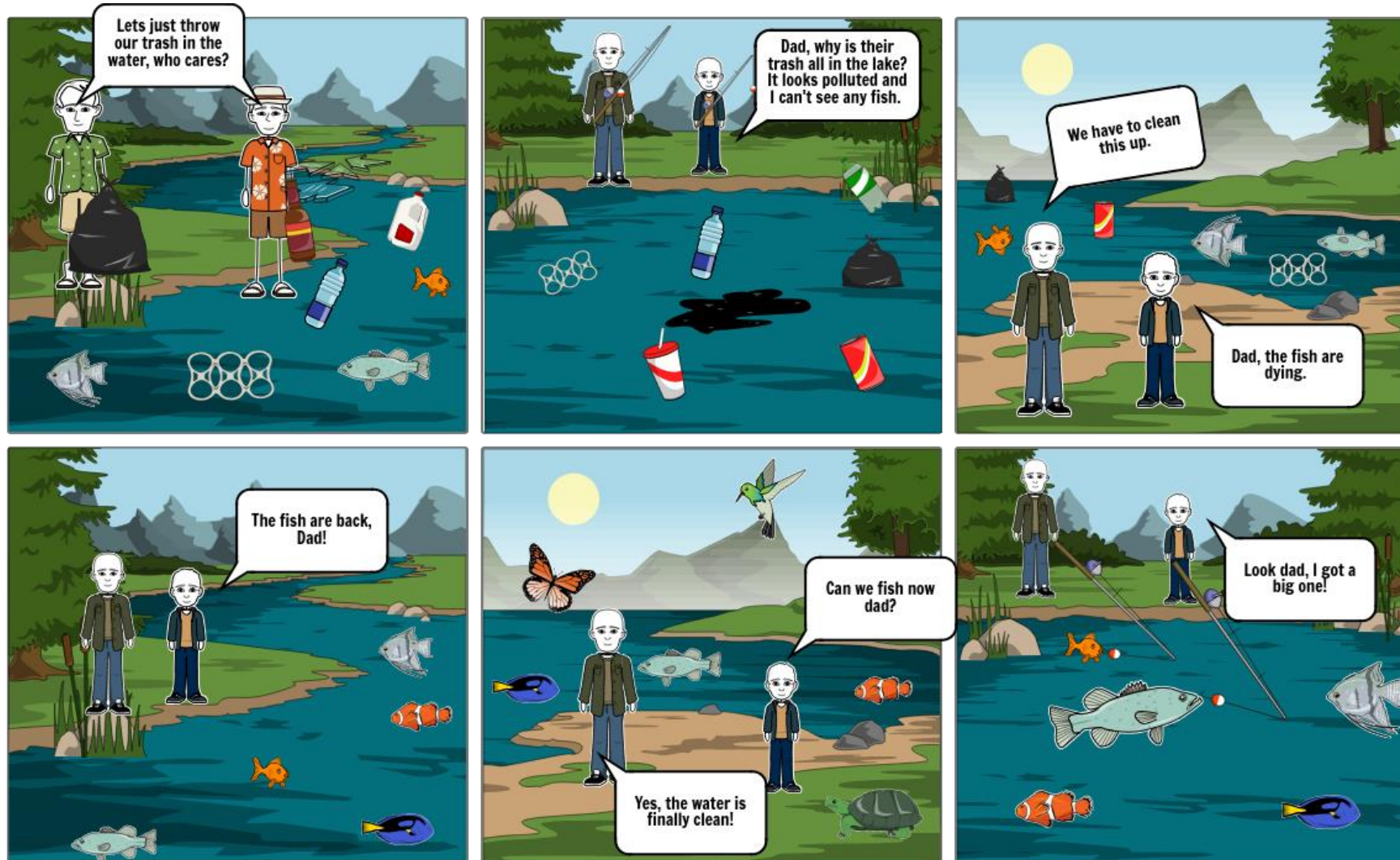
Source: WWF

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POLLUTION

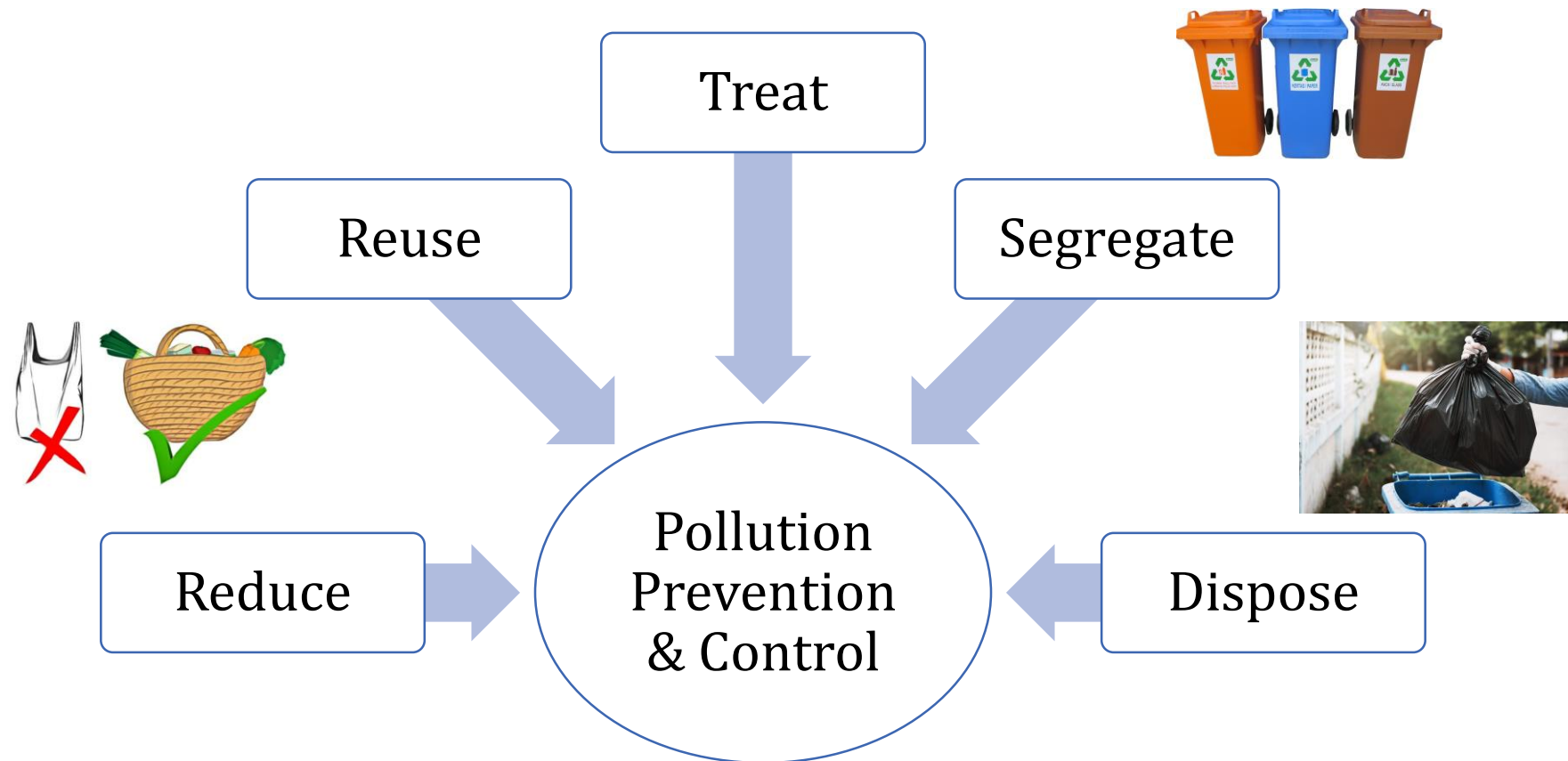
-  **Introduction by human**, directly or indirectly, of substances or energy into natural environment which **resulting in such deleterious effects** as harmful to living resources and hazards to human health.
-  **Preventing pollution** is more effective and less costly than cleaning up pollution.
-  Pollutants **can enter the environment naturally**, such as from volcanic eruptions, or through human activities, such as burning coal and gasoline and discharging chemicals into rivers and the ocean.
-  Pollutants and three types of unwanted effects:
 -  They can disrupt or degrade life-support systems for humans and other species.
 -  They can damage wildlife, human health and property.
 -  They can create nuisance such as noise and unpleasant smells, tastes and sights.

POLLUTION



POLLUTION

Pollution prevention



ENVIRONMENTAL PROBLEMS

 Why do we have environmental problems?

 Four basic causes of environmental problems.

Causes of Environmental Problems



Population
growth



Unsustainable
resource use






Poverty



Excluding
environmental costs
from market prices

WHAT CAN WE DO FOR OUR EARTH?

-  Any proposed solution has short and long-term advantages and disadvantages that must be evaluated.
-  What is our role?
-  Why should we care about the environment?

*We do not inherit the Earth from our Ancestors,
We borrow it from our Children*

HOW TO LIVE MORE SUSTAINABLY

Current Emphasis	Sustainability Emphasis
Pollution cleanup	Pollution prevention
Waste disposal	Waste prevention
Protecting species	Protecting habitat
Environment degradation	Environmental restoration
Increasing resource use	Less resource waste
Population growth	Population stabilization
Depleting & degrading natural capital	Protecting natural capital





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