



Module 02

SUSTAINABLE DEVELOPMENT

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NAURU - Pleasant Island



NAURU - Pleasant Island

- Area: 21 km²
- Population: 7000
- Nauru had everything they needed - food, water, shelter, magnificently spreading trees for fresh air, shade, animals, birds and ocean full of fish
- Two hundred years ago, an English sailor discovered Nauru and called it Pleasant Island.





Another century later, it was discovered that Nauru has the richest pile of phosphate rock on the globe.



Phosphate Mining
in Nauru



NAURU - Pleasant Island

- For most of the next century, millions of tons of phosphate was mined and shipped to other countries.
- Now an average Nauruan family has at least two vehicles. They possess all electronic gadgets for their convenience including microwave ovens, stereo equipment and multiple televisions per family.



- 9 out of every 10 Nauruans today are obese and average young men weigh more than 135 kilos.
- The average life span of a Nauruan is expected to be about 55 years.
- Diseases like hypertension, heart disease and diabetes are very common.

BEFORE



NAURU - Pleasant Island

NAURU - Pleasant Island?



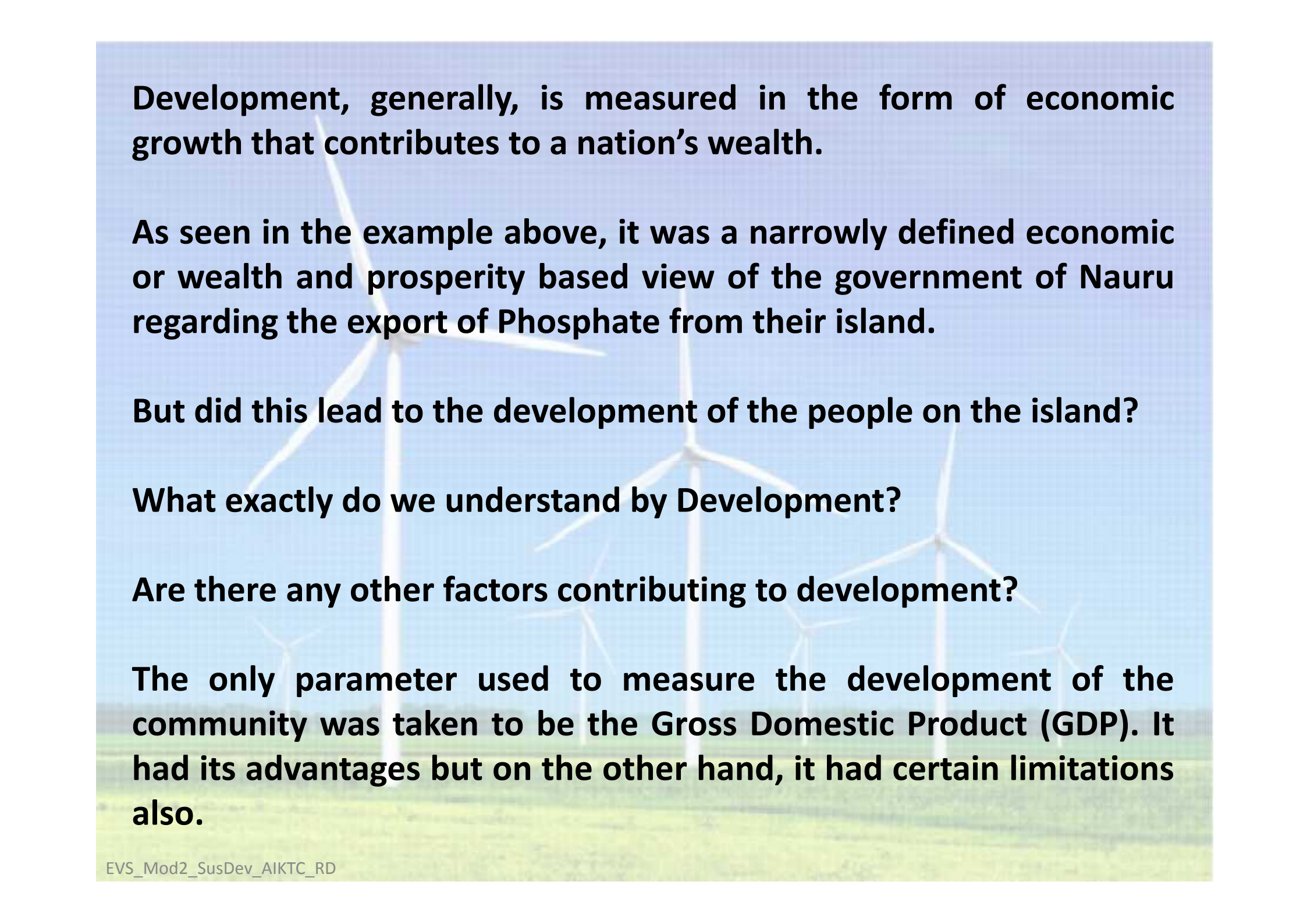
AFTER



What kind of development do you think is going on in the island?

Is it sustainable?

What do you think has gone wrong in the Pleasant Island?



Development, generally, is measured in the form of economic growth that contributes to a nation's wealth.

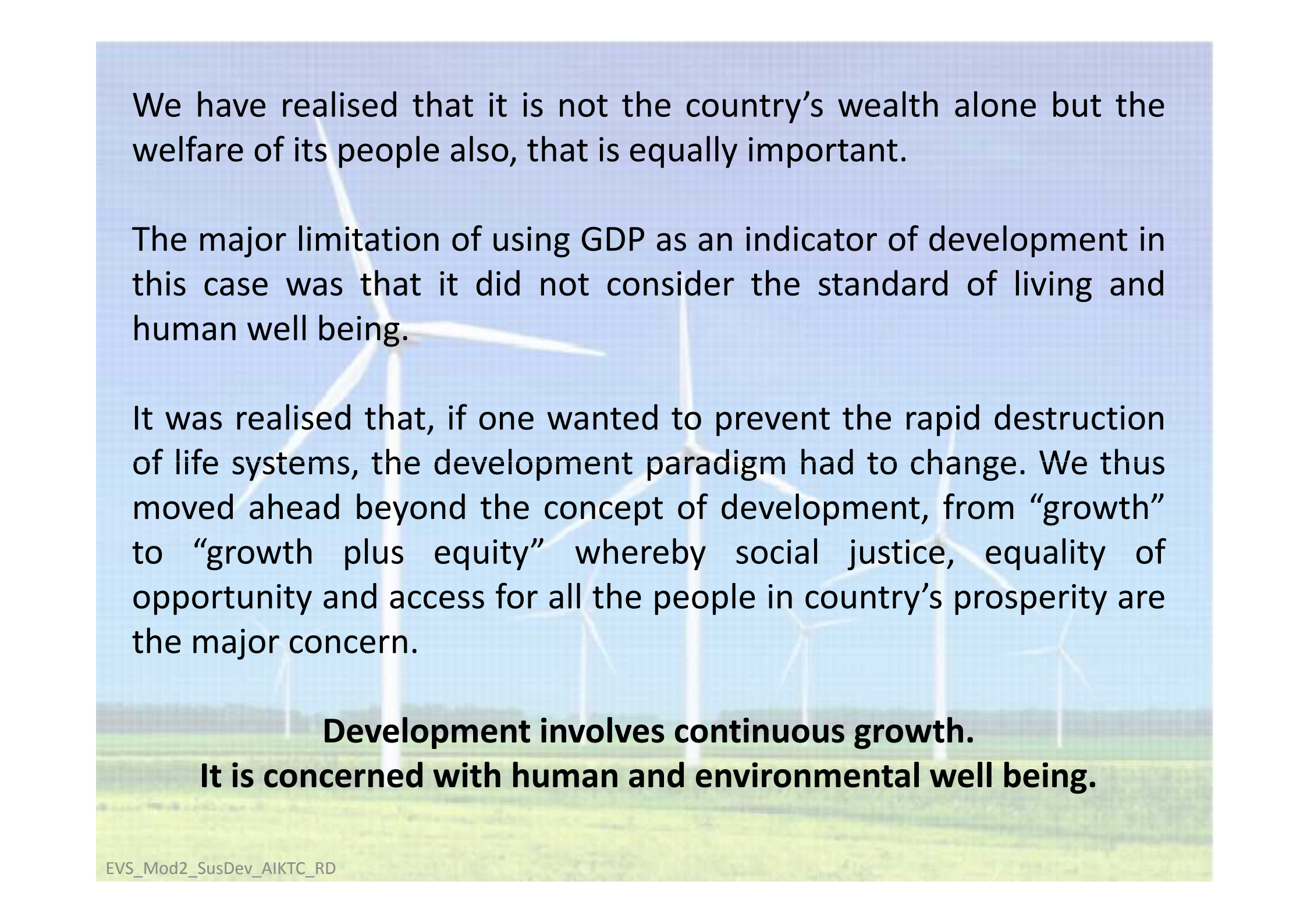
As seen in the example above, it was a narrowly defined economic or wealth and prosperity based view of the government of Nauru regarding the export of Phosphate from their island.

But did this lead to the development of the people on the island?

What exactly do we understand by Development?

Are there any other factors contributing to development?

The only parameter used to measure the development of the community was taken to be the Gross Domestic Product (GDP). It had its advantages but on the other hand, it had certain limitations also.



We have realised that it is not the country's wealth alone but the welfare of its people also, that is equally important.

The major limitation of using GDP as an indicator of development in this case was that it did not consider the standard of living and human well being.

It was realised that, if one wanted to prevent the rapid destruction of life systems, the development paradigm had to change. We thus moved ahead beyond the concept of development, from “growth” to “growth plus equity” whereby social justice, equality of opportunity and access for all the people in country's prosperity are the major concern.

**Development involves continuous growth.
It is concerned with human and environmental well being.**

What is Sustainable Development?



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

- Gro Harlem Brundland (1983)



Prime Minister of Norway



Dr. Karl Henrik Robèrt

In 1989, this Swiss scientist put together a group of 50 science scholars: physicists, chemists etc. to find a more scientific definition of sustainable growth. A few points that they agreed upon were...

- We live in the biosphere. ✓
- Within this biosphere there are plants and animals who coexist with each other with the help of energy and nutrient cycles.
- The biosphere is open in terms of energy.
- The biosphere is closed with respect to matter.
- Geological cycles bring matter from the lithosphere to the biosphere.

Sustainability is the capacity of our human society to continue indefinitely within these natural cycles.

Root Causes of Unsustainability:

- We extract large amount of matter from the lithosphere to the biosphere.
- We create substances that accumulate in nature.
- We physically inhibit nature's ability to run cycles.
- We create barriers to people meeting their basic needs worldwide.

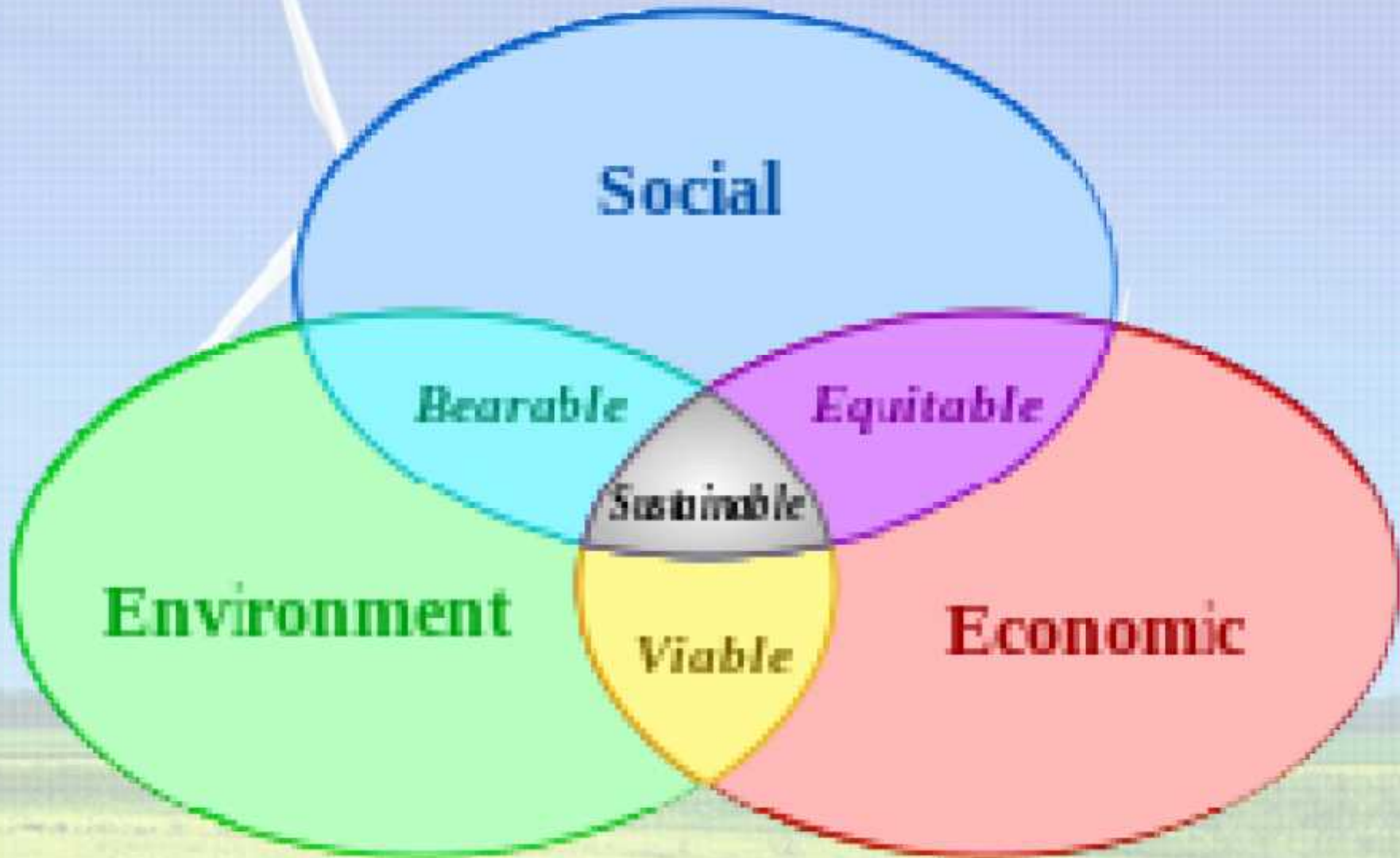
What is Sustainable Development?

Sustainable development is a process for meeting human development goals while maintaining the ability of natural systems to continue to provide the natural resources and ecosystem services upon which the economy and society depend.

Sustainable development is the organizing principle for sustaining finite resources necessary to provide for the needs of future generations of life on the planet. It is a process that envisions a desirable future state for human societies in which living conditions and resource-use continue to meet human needs without undermining the "integrity, stability and beauty" of natural biotic systems.

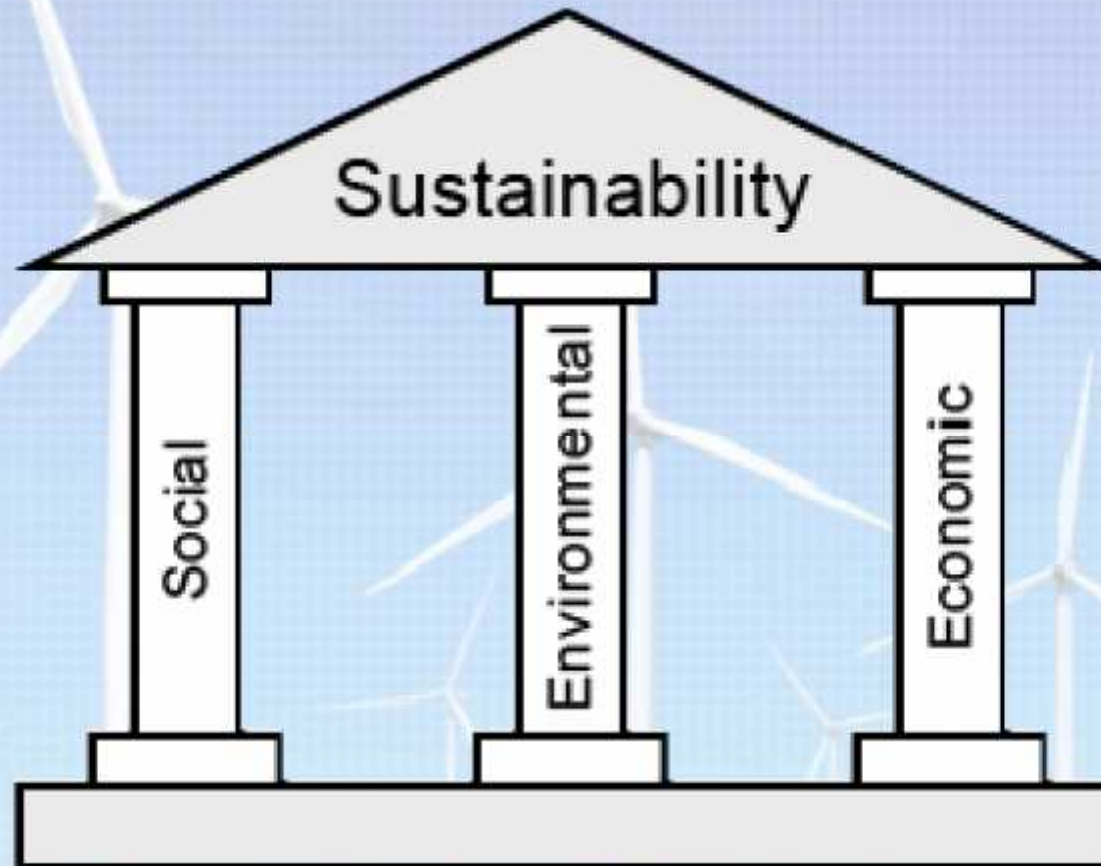
BRIEF INTRODUCTION TO

Three Pillars of Sustainable Development





THREE PILLARS OF SUSTAINABILITY



**If any one pillar is weak then the system as a whole is
UNSUSTAINABLE.**



ENVIRONMENTAL SUSTAINABILITY

- Environmental interaction should be pursued with the idea of keeping the environment as pristine as naturally possible.
- Environmental becomes unsustainable when natural capital is used up faster than it can be replenished.
- Environmental sustainability is intertwined with the concept of **carrying capacity**. *The carrying capacity of a biological species in an environment is the maximum population size of the species that the environment can sustain indefinitely, given the food, water, habitat and other necessities available in the environment.*
- Theoretically, the long-term effect of environmental degradation is the inability to sustain human life; which on a global scale could lead to human extinction.



ENVIRONMENTAL SUSTAINABILITY

- **Reducing poverty and achieving environmental development must be done in conjunction with a healthy planet.**
- **It is to be recognised that environmental sustainability is a part of a global economic and social well-being.**
- **Unfortunately, exploration of the natural resources by the powerful and rich often harm the most vulnerable poor people who depend upon natural resources for their livelihood.**



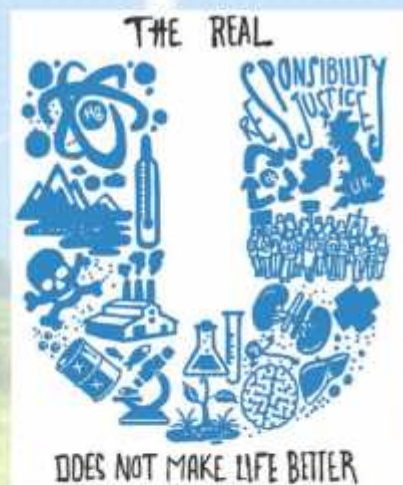
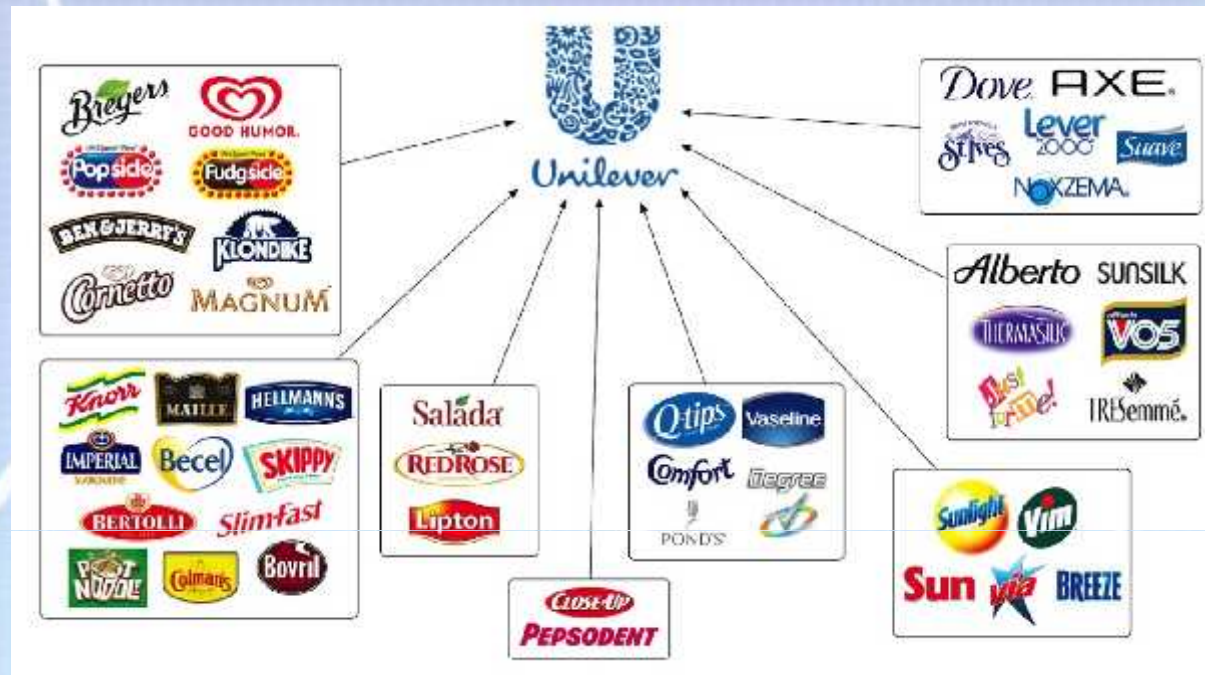


ENVIRONMENTAL SUSTAINABILITY

What should be done?

- **Integrate the principles of sustainable development into country policies & programs and reverse the loss of environmental resources.**
- **Reduce biodiversity loss.**
- **Reduce the proportion of people without sustainable access to safe drinking water and basic sanitation.**
- **Achieve a significant improvement in the lives of slum dwellers.**

CASE STUDY: KODAIKANAL MERCURY POISONING





ECONOMIC SUSTAINABILITY

- **Economic sustainability is the responsible use of natural resources in such a way that the business continues to function over a number of years; consistently returning profit.**
- **Identify the various tactics that make it possible to utilize the available resources to the best advantage.**
- **Encourage the use of those resources that is both efficient and responsible, and likely to provide long term benefits.**
- **Choose raw materials that are environment-friendly.**
- **Design a waste disposal that does not damage the local environment.**



ECONOMIC SUSTAINABILITY

- The goal here is to establish profitability over the long-term.
- A profitable business is more likely to remain stable and continue to operate from one year to the next.
- From this viewpoint, economic sustainability may be viewed as a tool to make sure that the business has a future thereby continuing to the financial welfare of the owners, the employees and the community where the business is located.



ECONOMIC SUSTAINABILITY



- Our current economic system is seriously flawed.
- It is based on the notion of perpetual economic expansion on a finite planet.
- But no economic system is sustainable unless it accommodates the ecosystem on which it depends.





ECONOMIC SUSTAINABILITY



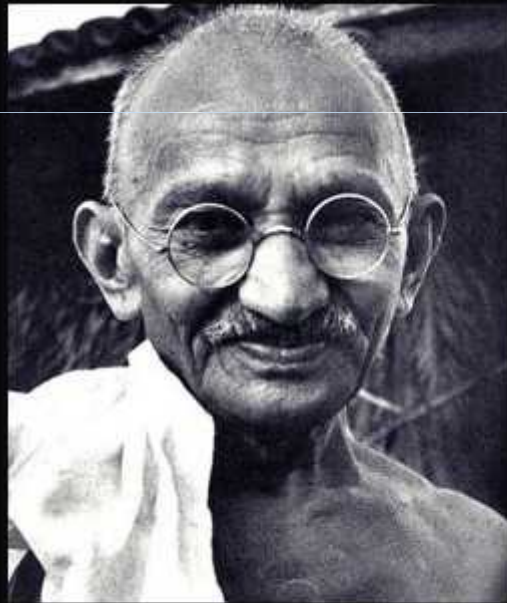
We urgently need to apply human ingenuity for the goal of using far less from nature to meet our needs.

But our current goal seems to be exploiting nature so that we can meet the invented and *false needs* that advertisers continually push at us in a grow-or-die economy.

ECONOMIC SUSTAINABILITY



- We need to distinguish between need and greed *in spite of what the media assures us we “need”*.



The Earth provides enough to satisfy every man's need but not for every man's greed.

(Mahatma Gandhi)



ECONOMIC SUSTAINABILITY

What should be done?

- **Community Based Economics**
- **Regional trade**
- **Communities should be largely (if not entirely) self-sufficient in the production of its necessities.**
- **What is extra, can be exported through foreign trade.**
- **Support “fair trade”, which protects communities, labours and the environment.**



SOCIAL SUSTAINABILITY



- **Social sustainability is the idea that the future generations should have access to the same or greater social resources as the current generation (inter-generational equity) while there should be equal access to resources within the current generation (intra-generational equity).**
- **Social sustainability include:**
 - **Human Rights**
 - **Labour Rights**
 - **Corporate Governance**



SOCIAL SUSTAINABILITY



Philosophy:

- The way of living towards a socially sustainable way may not necessarily provide a promotion of luxury and wealth, but the development of reverse-consumerism.
- The ideal sustainable lifestyle is not to end consumption, but to understand the minimalistic nature of it.
- The biggest challenge therefore in achieving a socially sustainable system is challenging the current infrastructure and common expectations.



SOCIAL SUSTAINABILITY



What should be done?

- **Basic needs of healthy food, clean water, safe shelter, adequate clothes, work and income MUST be fulfilled.**
- **Profits of development should be distributed equally amongst society.**
- **Physical, social and mental welfare of the population should be prioritized.**
- **Creativity in education should be encouraged.**
- **Our cultural and biological heritage should be preserved.**
- **Promote harmonious living with mutual support.**
- **Democracy should be practiced for active participation and involvement of the citizen.**

THE FOURTH PILLAR : CULTURAL SUSTAINABILITY



Worship of the peepul tree by some cultural groups forbids to cut the peepul tree.

Idol immersion in the sea causes water pollution.



WHY IS THIS IMPORTANT?



These two care about the environment only.

These two care about the economics only.



But what we really need is all of them to work together to save the
Three Pillars of Sustainable Development



THREE “R”s – CONTROL MEASURES

The waste hierarchy refers to the three “R”s of

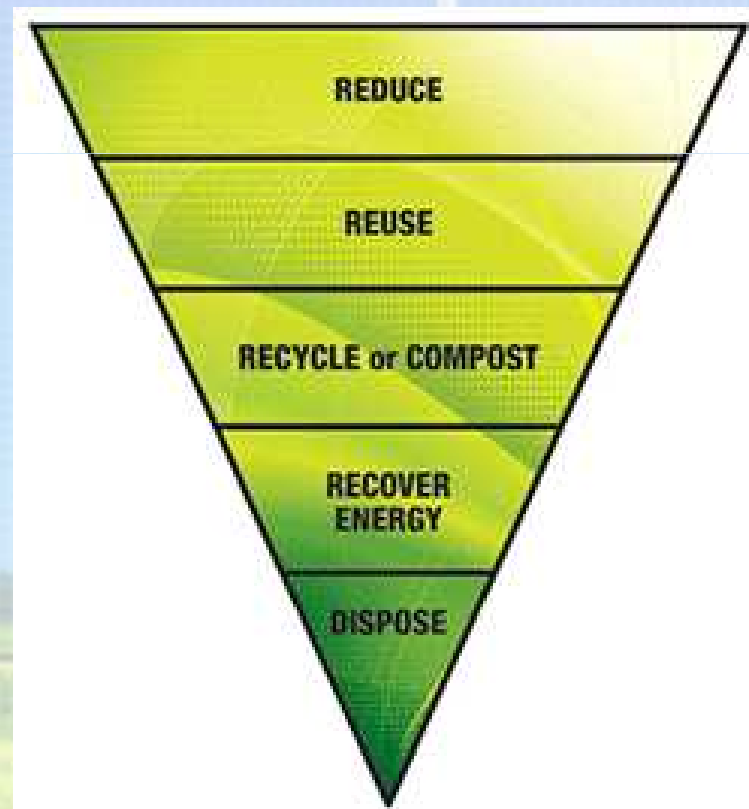


which classifies waste management strategies according to the desirability



THREE “R”s – CONTROL MEASURES

- The three “R”s are meant to be a waste hierarchy, in order of importance.
- However, in Europe, the waste hierarchy has 5 steps:



THREE “R”s – CONTROL MEASURES

- The waste hierarchy has taken many forms over the past decades, but the basic concept has remained the cornerstone of most minimization strategies.
- AIM of the waste hierarchy is:

TO EXTRACT THE MAXIMUM PRACTICAL BENEFITS FROM PRODUCTS AND TO GENERATE THE MINIMUM AMOUNT OF WASTE.



Cardboard and Paperboard
(cereal boxes)



Glass



Aluminum and Steel Cans



Paper
(White and pastel office paper, newspaper, phone books, magazines and catalogs.)



All Plastics
(#1 - #7)



Styrofoam

THREE “R”S – CONTROL MEASURES

1 ton of paper from recycled pulp SAVES:

17 trees

3 cubic yards of landfill space

7999 gallons of water

390 gallons of oil

**also prevents 60 pounds of air pollutants*



12 textures in which recycled papers are available

THREE “R”s – CONTROL MEASURES

There are two social problems contributing to our waste management problems:

1. We have become an USE AND THROW society
2. We have NIMBY* and LULU** syndrome



*NIMBY = Not In My Back Yard

**LULU = Locally Unacceptable Land Use

Solid waste is either:

1. Burnt off in an incinerator



OR

2. Disposed off in a landfill





THE 1st R – REDUCE

- This is the most significant option to reduce waste.
- If we don't generate the waste, then we do not have to devise ways to dispose it off.
- To reduce waste, we usually have to make significant lifestyle changes.
- We need to reduce the amount we buy in the first place. We only need to purchase the amount we need. By becoming more environmental shoppers, we can reduce the waste we generate.





THE 1st R – REDUCE

- **Select Durable Items:**

- ✓ **easy to repair**
- ✓ **have good warranty**
- ✓ **are energy efficient**
- ✓ **functional over a longer period**
- ✓ **non-polluting**





THE 1st R – REDUCE

- Consider packaging:

- ✓ Avoid over packaged items

- ✓ Use refillable and reusable containers

- ✓ Use bulk packaging

- ✓ Use concentrates and less processed food





THE 1st R – REDUCE

- Support reduction:
 - ✓ Buy recycled materials
 - ✓ Buy goods that can be recycled
 - ✓ Use appropriate technology
 - ✓ Reduce toxic chemical use





THE 2nd R - REUSE

- We think that items that are old, empty, worn, broken, ugly or marred as useless. So we throw them away without thinking much about the consequences.



- The process of reusing is started with the assumption that every material is a resource rather than refuse.



THE 2nd R – REUSE

- Waste, after all, is in the eye of the beholder.
- What is one person's trash is another person's treasure.
- If we really look at things we are throwing away, we can learn to see them as materials or resources that can be reused to solve everyday problems and satisfy everyday needs.
- We need to start exploiting the resources in our trash.
- Once we have our mind set that we can use trash for positive uses, we can begin to brainstorm and generate ideas.
- Reusing saves money, conserves resources and satisfies the human urge to make things.



THE 2nd R - REUSE

- Strategies to Reuse:

- ✓ Repair

- ✓ Sell

- ✓ Donate





THE 3rd R – RECYCLE

- Recycling generates industry
- Recycling creates jobs
- Cost avoidance of recycling
- Finding markets
- Collecting recycles:
 - Curbside collection
 - Drop off centres



What all can be recycled?



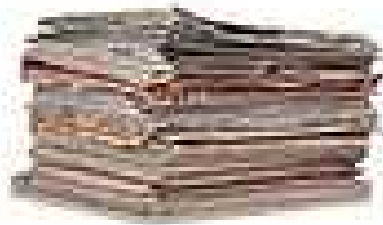
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Styrofoam



APPROPRIATE TECHNOLOGY

- **Appropriate technology** is an ideological movement (and its manifestations) originally articulated as **intermediate technology** by the economist **Dr. Ernst Friedrich "Fritz" Schumacher** in his influential work, *Small is Beautiful*.
- Though the nuances of appropriate technology vary between fields and applications, it is generally recognized as encompassing technological choice and application that is small-scale, decentralized, labor-intensive, energy-efficient, environmentally sound, and locally controlled.
- Schumacher and many modern-day proponents of appropriate technology also emphasize the technology as people-oriented.



APPROPRIATE TECHNOLOGY

- It advocates the small, local and mainly village based technology to help villages become self-reliant.
- It disagrees with the idea of technology that only benefits a few at the expense of the majority.
- Appropriate technology is most commonly discussed in its relationship to economic development and as an alternative to transfers of capital-intensive technology from industrialized nations to developing countries.
- However, appropriate technology could be found in both developing and developed countries.
- Mahatma Gandhi is often cited as The Father of the Appropriate Technology Movement.



RESOURCE UTILIZATION AS PER CARRYING CAPACITY

- The **carrying capacity** of a biological species in an environment is the maximum population size of the species that the environment can sustain indefinitely, given the food, habitat, water, and other necessities available in the environment.
- Determining the carrying capacity for most species is fairly straightforward.
- But for humans, determining carrying capacity is much more complex.
- The definition is expanded to include not degrading our cultural and social environment in ways that would affect future generations.



RESOURCE UTILIZATION AS PER CARRYING CAPACITY

- For populations that grow exponentially, growth starts out slowly, enters a rapid growth phase and then levels off when the carrying capacity of that species has been reached.
- The size of the population then varies slightly above or below the carrying capacity.
- **Reproductive time lag** may cause the population to overshoot the carrying capacity temporarily.

Reproductive time lag is the time required for the birth rate to decline and the death rate to increase in response to resource limits.



RESOURCE UTILIZATION AS PER CARRYING CAPACITY

- In this situation, the population will suffer a crash or dieback to a lower level near the carrying capacity.
- Some individuals may immigrate to an area with more favourable condition.
- The carrying capacity of an area is not static.
- It can be lowered by resource destruction or increased by technological advances.
- ***Resource utilization should therefore not exceed to the point that it may cause decrease in carrying capacity.***



Thank you!