

# **Sustainable Development**

## **Concepts , Issues and Challenges**

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Paper presented by

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



# Historical Background

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- UN Conference on Environment and Development, or the 1992 Earth summit in Rio de Janeiro – unanimously adopted Agenda 21, a blueprint for sustainable development.
- Millennium Development Goals – UN General Assembly resolution 55/2, outlined 8 targets aimed at reducing poverty and promoting sustainable development
- World Summit on Sustainable Development – reaffirmed the commitment to Agenda 21 and Millennium Development Goals

# Pillars of Sustainable Development

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- Economic Development – poverty eradication
- Social Development – active participation of women; education; good governance
- Environmental Protection – prevent environmental degradation and patterns of unsustainable Dev.  
At the local, national, regional, and global levels

# Economic Development

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- Poverty eradication
- Halve, by 2015, the proportion of the world's people with income less than \$1/day
- Basic health services for all, reduce health threats
- Increase food availability
- Combat desertification, mitigate effects of drought and floods
- Provision of clean drinking water
- Enhance industrial productivity

# Changing Unsustainable Patterns of Consumption and Production

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- *Cleaner production technologies*
- *Developing cleaner, more efficient energy technologies*
- *Maintain urban air quality and health, and reduce greenhouse gas emissions*
- *Sound management of chemicals throughout the life cycle, and of hazardous wastes*

# Protecting the Natural Resource Base

- Prevent water pollution to reduce health hazards and protect ecosystems
- Watershed and groundwater management
- Support desalination of seawater, water recycling
- Ensure the sustainable development of oceans, marine environmental protection



# Priority Areas for Action

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**Priority areas for action, identified by UN Secretary-General Kofi Annan**

- **Water and sanitation**
- **Energy**
- **Health**
- **Agriculture**
- **Biodiversity protection and ecosystem management**



# Water and Sanitation

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“Water is not only the most basic of needs but is also at the center of sustainable development.”

- Around 1.2 billion people still have no access to clean drinking water
- Around 2.4 billion people do not have adequate sanitation.



# Water and Sanitation

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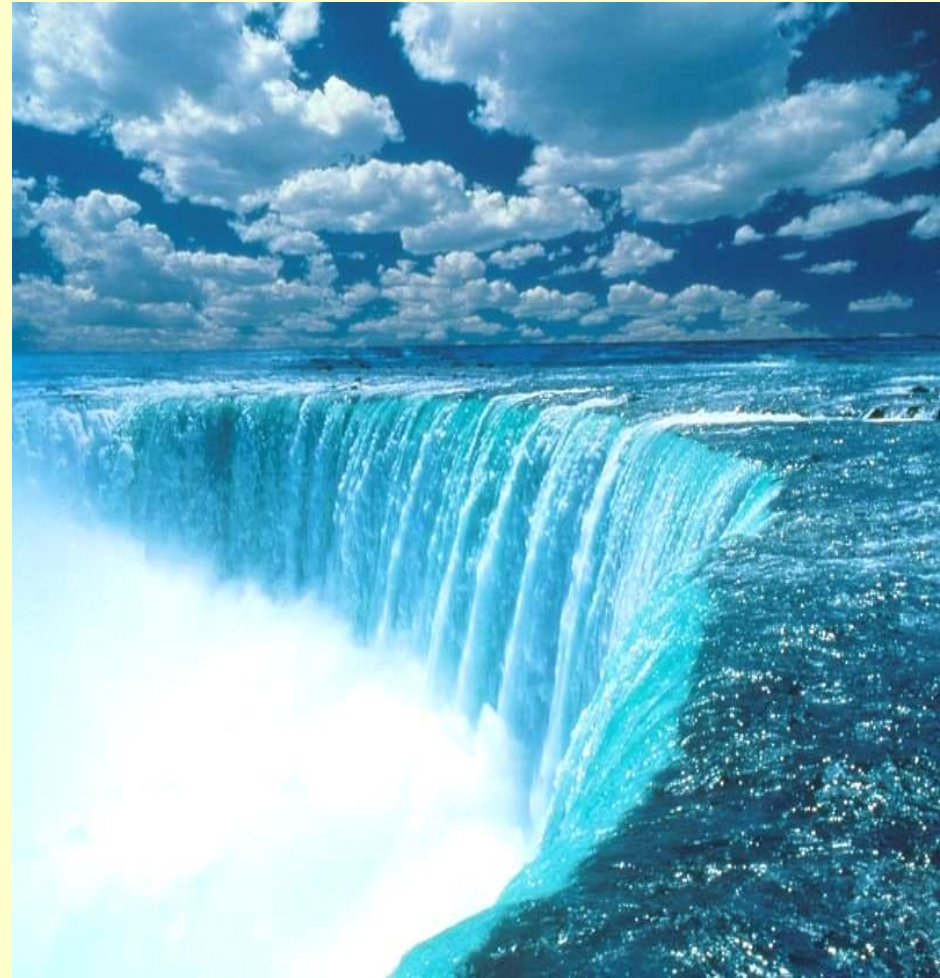
## Some key issues:

- Prevent water pollution to reduce health hazards
- Protect ecosystems
- Introduce technologies for affordable sanitation, industrial and domestic wastewater treatment
- River basin, watershed and groundwater management
- Support desalination of seawater, water recycling
- Marine environmental protection - oceans, seas, the Earth's ecosystem

# Energy

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“Some 2 billion people lack access to electricity and rely on traditional fuel sources such as firewood, kerosene, or biomass for their cooking and heating.”



# Energy

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## Some key issues:

- Focus on access to energy in rural areas
- Energy conservation and energy efficiency – building design & management, better mass transportation, advanced and innovative cleaner technologies
- Promotion of renewable energy
- Action on climate change – ratification by countries of the Kyoto Protocol

# Health

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“Good health is vital for eradicating poverty and achieving sustainable development.”

Some key issues:

- Reduce mortality rates in 2015: by 66.7% for children & infants under 5; by 75% for maternal mortality rates
- Control & eradicate communicable diseases, reduce HIV prevalence, combat malaria, tuberculosis
- Ensure that chemicals are not used and produced in ways that harm human health
- Reduce air pollution

# Agriculture

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“Agriculture is central to sustainable development. About 70% of the poor in developing countries live in rural areas and depend in one way or another on agriculture for their survival.”

## Some key issues:

- Address serious soil fertility problems
- Diversification of crops
- Increase water-use productivity
- Apply R&D to increase productivity in crops and livestock
- (Sustainable development in the agriculture, forestry and fishery sectors conserves land, preserves water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable." (FAO 994))



# Take a look at the Global Agriculture

between 1960 and 2000:

- world population doubled from 3 to 6 billion people
- global economy increased more than sixfold

to meet this demand:

- food production increased 2 ½ times
- water use doubled
- wood harvests for pulp and paper production tripled
- timber production increased by more than half

Who is eating?

# Livestock Development

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- Livestock development
  - Sustainable animal production
  - Improving productivity of animals
  - Feed supplementation for increasing livestock production
  - Improving fertility and disease diagnosis





# Fertilizer Use

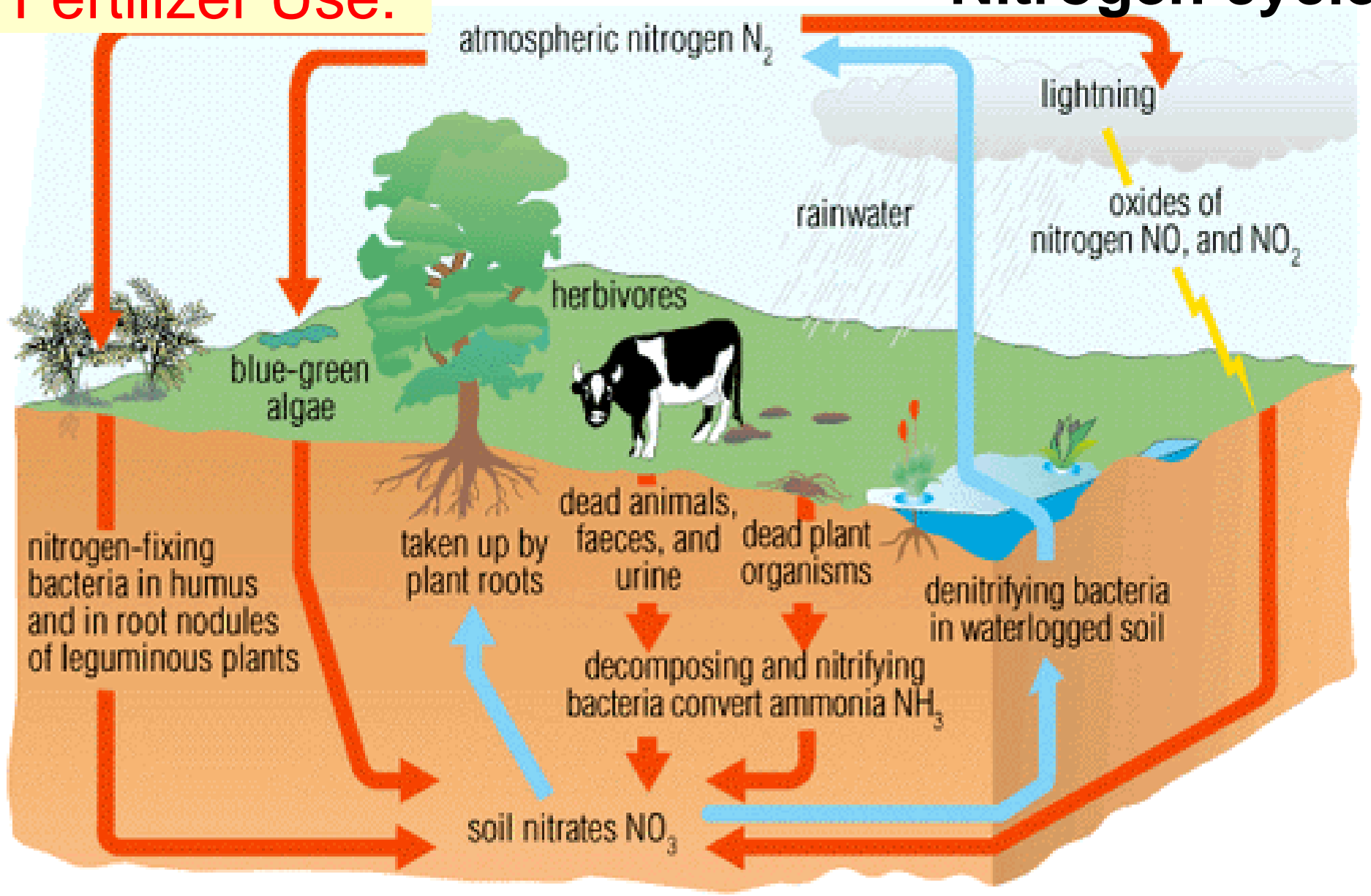
With high yielding varieties of crops, most soils are unable to supply the needed amounts of plant nutrients.

Fertilizers are chemicals that supply plant nutrients, mostly N, P and K.

Manufacture of N-based synthetic fertilizers requires fossil fuels as raw materials.

# Fertilizer Use:

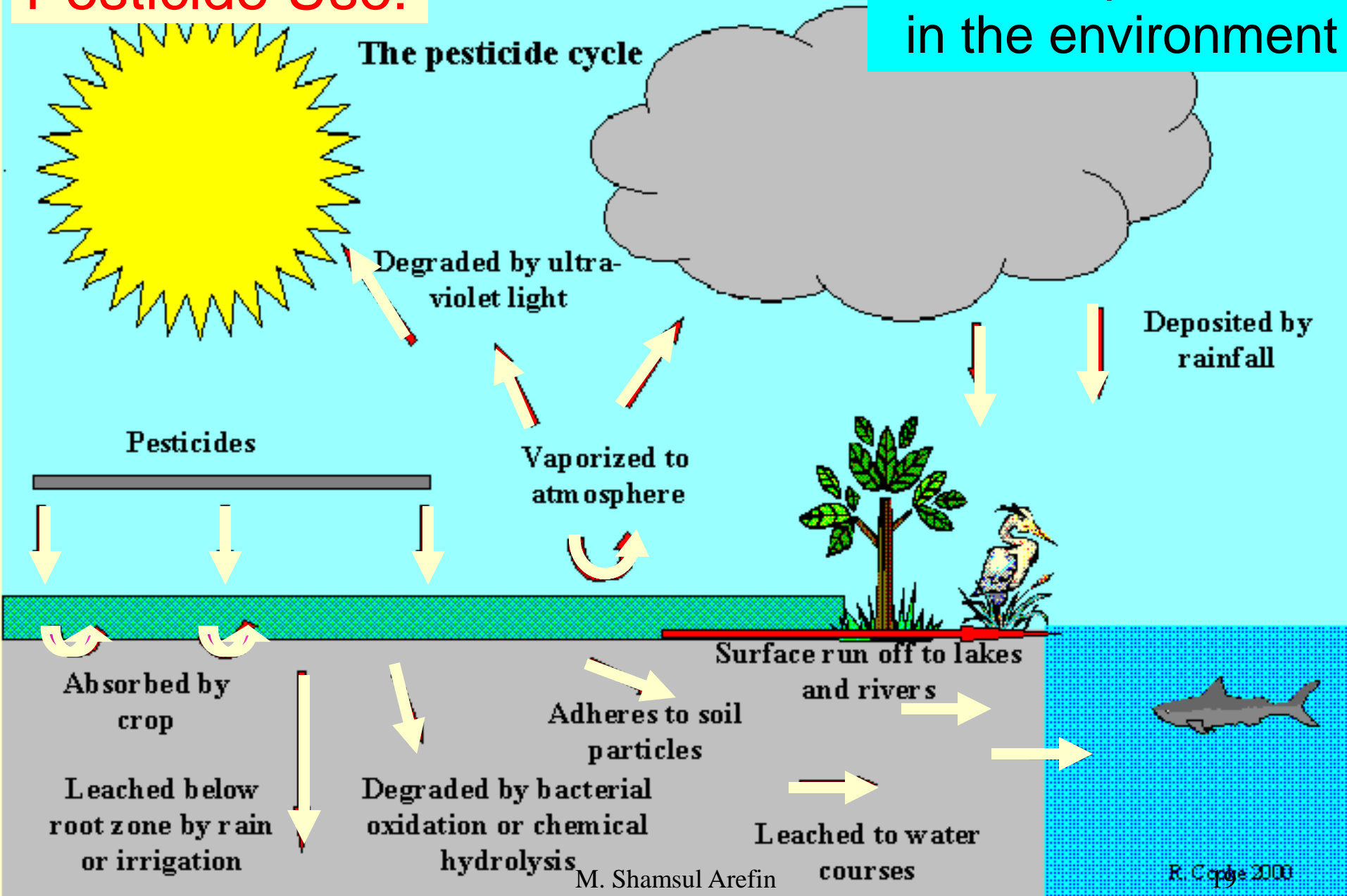
# Nitrogen cycle



# Pesticide Use:

# Fate of pesticides in the environment

The pesticide cycle



M. Shamsul Arefin

R. Cope 2000

Source: <http://www.ecifm.rdg.ac.uk/pesticides.htm>

# ***Biodiversity***

Biodiversity is a modern term which simply means " the variety of life on earth". This variety can be measured on several different levels.

❖ **Genetic** - variation between individuals of the same species. This includes genetic variation between individuals in a single population , as well as variations between different populations of the same species.

**Species** - species diversity is the variety of species in a given region or area. This can be determined by counting the number of different species

**Ecosystem** - Communities of plants and animals, together with the physical characteristics of their environment (e.g. geology, soil and climate) interlink together as an 'ecosystem'. Ecosystem diversity is more difficult to measure because there are rarely clear boundaries between different ecosystems

# ***Biodiversity***

- ❑ **Biodiversity** - is a term we use to describe the variety of life on Earth.
- ❑ It refers to the wide variety of ecosystems and living organisms like animals, plants, their habitats and their genes.
- ❑ **Biodiversity** is the degree of variation of life forms within a given ecosystem.
- ❑ Rapid environmental changes typically cause mass extinctions.

# Interesting, right?

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