

Course Code: CE 447

Course Title: Climate change and sustainable development

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**LECTURE: 09**

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## Lecture plan

- Sectors of Environmental implication
- Impacts of agricultural sector on Environment
- Pollutants from different industries
- Effects of mining industries on environment

## What are the sectors of Environmental Implications?

- Agricultural sector
- Industrial sector
  - Mining industry
  - Textile
  - Paper & Pulp
  - Meat
  - Food
  - Tannery
  - Cement
  - Petrochemical
  - Pharmaceuticals
  - Electronic goods manufacturing industry
  - Fertilizer/pesticides
  - Construction industry
  - Automobile industry
  - Chemical industry
- Water Development, Flood Control & Irrigation
- Energy sector
- Transport & Communication
- Infrastructure development
- Tourism
- Water supply & Sanitation sector

## Describe the impacts of Agricultural sector on environment

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Agriculture has a profound impact on the environment on the following:

**Air pollution:** drift of agricultural chemicals (pesticides, herbicides, fungicides, fertilizers) pollen, dust

**Water pollution:** leaching of nutrients and eutrophication. Contamination of groundwater and surface water by pesticides, herbicides and fertilizers.



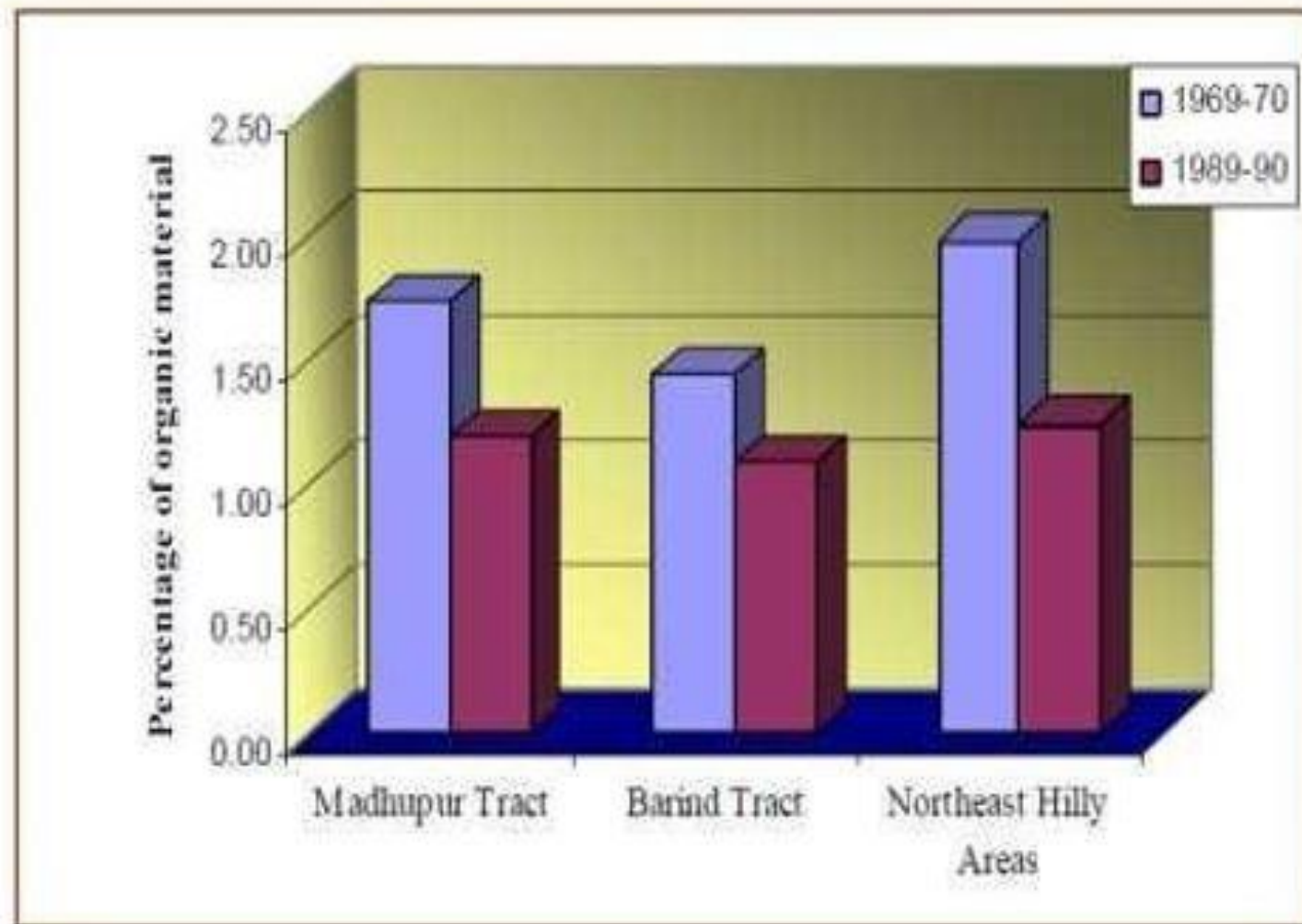
## Describe the impacts of Agricultural sector on environment

- **Water quantity:** High yielding needs huge amount of water for irrigation.
- **Soil degradation & pollution:** irreversible losses of soil due to soil sealing & erosion, contamination from increased use of pesticides, fertilisers etc., acidification, salinisation and compaction. Loss of organic matter, soil biodiversity and fertility loss is due to unsustainable practices of agriculture.

## Describe the impacts of Agricultural sector on environment

- **Greenhouse gas emission:** Agriculture is a significant contributor of  $\text{CH}_4$  and  $\text{NO}_2$  gases.
- **Biodiversity loss:** Key factors causing the decline in biodiversity include habitat disturbance and changes in the food chain. As the agricultural production has intensified, all levels of biological diversity (genetic, species, and habitats) have declined in farming environments.
- **Human health:** Toxicity of chemicals in food chain and ultimately affect human health

# Agricultural Sector



Changes in Organic matter from 1969-70 to 1989-90 (Karim *et. al.*, 1994)

## What measures can be taken in Agricultural sector to protect the environment?

- **Some measures:**

- Developing measures that will encourage flexibility in land use. Crop management in relation to climate change is a present concern.

- Increasing water management efficiency in order to sustain agricultural production under changing climatic condition

- Identification and preservation of plant and animal genetic diversity as key natural resources sustaining future agrifood, aquaculture and bioenergy production.

- The application of agrochemicals which does not adversely affect the fertility as well as the organic properties of soil and which also produce adverse impact on man and animals should be regulated.



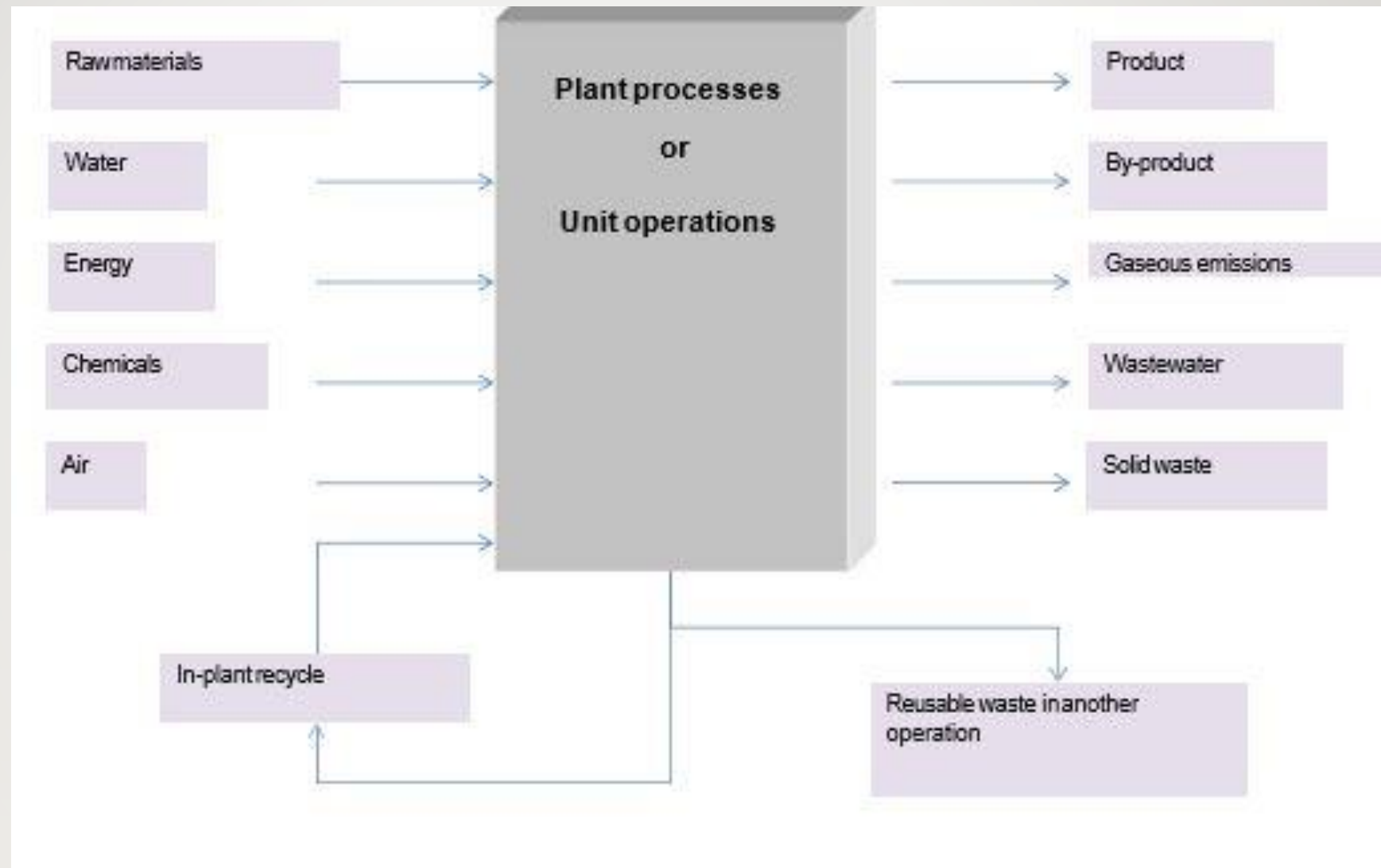
## What measures can be taken in Agricultural sector?

Continued.....

- Production, import and use of the harmful chemicals should be phased out gradually and should be prohibited as soon as possible
- Integrated pest management should be used. Through protection and multiplication of snakes, frogs, lizards, turtles and other wild animals, natural methods of pest control should be encouraged.
- Organic farming should be encouraged. Organic farming should promote and enhance agro ecosystem health, including biodiversity, biological cycles and soil biological activity . Organic farming focuses on sustainability, environmental protection and animal welfare by reducing or eliminating chemical inputs such as fertilizers, pesticides.

## Industrial sector

- Industrialisation creates employment, eradicates poverty, promotes gender equality, and labour standards, and enhances greater access to education and healthcare.
- Industrial processes poses negative environmental impacts, causing climate change, loss of natural resources, air, soil and water pollution and extinction of species.
- Pollution contributed is industry specific.



# Pollutants from Different Industries

(<http://www.eolss.net/sample-chapters/c09/e4-11-02-00.pdf>)

Industrial Sectors	Pollutant Forms			
	Gas	Solid Waste and Solids	Water	Other
Iron and Steel	SO <sub>x</sub> , NO <sub>x</sub> , HC, CO, H <sub>2</sub> S, Toxic Chemicals	Slag, Wastes, Sludge from effluent treatment	BOD, COD, Oil, Metals, Acids, Phenol, Cyanide	Noise, Particulate
Textile and Leather	SO <sub>x</sub> , HC	Sludge (chromium) from effluent treatment	BOD, Solids, Sulphates and Chromium, Dyes	Odour, Noise, Particulate
Pulp and Paper	SO <sub>x</sub> , NO <sub>x</sub>	Sludge from effluent treatment	BOD, COD, Solids, Chlorinated organics compounds	Odour, Noise, Particulate
Petrochemicals, Refineries	SO <sub>x</sub> , NO <sub>x</sub> , HC, CO, H <sub>2</sub> S, Toxic Chemicals	Spent catalysts, Tars, Sludge	BOD, COD, Oil, Phenols and Chromium	Odour, Noise, Particulate
Chemicals	Organic Chemicals	Sludge from pollution treatment and process waste	COD, Chemicals, Metals, Solids and Cyanide	Organic Heavy and Toxic Chemicals

## Water Pollution by Industries in Bangladesh

([http://reedconsultingbd.com/media/k2/attachments/Are\\_textile\\_industries\\_the\\_main\\_source\\_of\\_water\\_pollution\\_in\\_Bangladesh\\_March\\_Final\\_2011.pdf](http://reedconsultingbd.com/media/k2/attachments/Are_textile_industries_the_main_source_of_water_pollution_in_Bangladesh_March_Final_2011.pdf))

Industry	Water Pollution	Pollution Product (PP)	Ranking	Polluters
Textile	Big	335	1	Dyes, Chemicals
Leather	Extreme	188	2	Chemicals, Heavy metals
Agriculture	Moderate	108	3	Pesticides (DDT), Fertilizers
Paper	Moderate	67	4	Toxic Chemical
Construction	Small	0.14	5	Construction Materials
Transport	Small	0.02	6	Chemicals

## What are the effects of Mining Industry on the environment? Explain

- Air:** Mines produce dust from bursting operations and haul roads. Coal mines release CH<sub>4</sub> and other GHGs. Smelter operations with insufficient safeguard have the potential to pollute the air with heavy metals, sulphur dioxide and other pollutants.
- Water:** mining industry uses large quantities of water. Mining releases sulphur oxides into the air which reacts with water and produces sulphuric acids. This, together with various trace elements affects surface water and groundwater and impacts the eco system.

## What are the effects of Mining Industry on the environment? Explain

- Land:** The movement of rocks during mining activities and the overburden materials overlying the mineral deposits impacts land severely.
- Health & Safety:** Mining operation is very dangerous and hazardous. **Underground mining is more hazardous than surface mining because of poor ventilation, visibility and danger of falling of rocks.** The greatest health risk arise from dust which may lead respiratory diseases and from exposure to radiation depending upon the mine type.