Course Code:MCC102A
Course Title:Environmental Studies

Lecture No: 19
Title: Social Issues and The Environment

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Lecture-19
Intended Learning Outcomes

At the end of this lecture, students will be able to

- Define Rainwater Harvesting
- Describe the types of rain water Harvesting
- Explain case studies of RWH and WSM
- Discuss Water Shed Management

From Unsustainable to Sustainable Development

- Countries that were economically well developed and where people were relatively richer were called advanced nations
- The rest where poverty was widespread and were economically backward were called developing countries.
- By the 1970s most development specialists began to appreciate the fact that economic growth alone could not bring about a better way of life for people unless environmental conditions were improved.

Urban Problems Related to Energy

- Urban centers in hot climates need energy for cooling.
- The early system of fans changed into air-conditioning, which consumes enormous quantities of energy.
- New buildings in our country have taken to using large areas covered by glass.
- High rise buildings in urban centers also depend on energy to operate lifts and an enormous number of lights.

Case Study

Energy efficiency

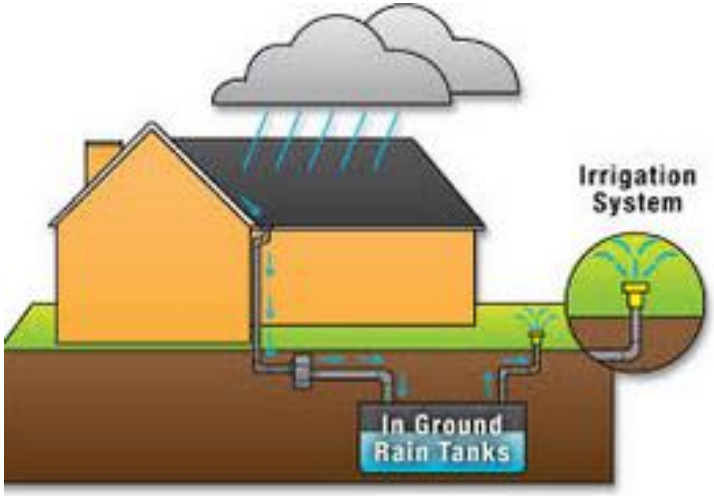
- Urban residential and commercial facilities are responsible for approximately 35% of USA's greenhouse gas emissions.
- Buildings need to be made energy efficient and reduce carbon dioxide emissions, which cause 'heat islands' or pockets of high temperature over these urban areas.

Water Conservation

- As deforestation and desertification spreads due to extensive changes in land use the once perennial rivers are becoming increasingly seasonal.
- In many areas the small streams run dry soon after the monsoon as the water table drops further and further below the surface.
- To this is added serious problems caused by rapid surface flow of water during the rains, which leads to extensive floods with loss of life and property.
- Thus water conservation is linked closely with overall human well being

Rain Water Harvesting– Methodologies

- Roof Rain Water Harvesting
- Land based Rain Water Harvesting
- Watershed based Rain Water harvesting
- For Urban & Industrial Environment –
- Roof & Land based RWH
- Public, Private, Office & Industrial buildings
- Pavements, Lawns, Gardens & other open spaces



Rain Water Harvesting– Advantages

- Provides self-sufficiency to water supply
- Reduces the cost for pumping of ground water
- Provides high quality water, soft and low in minerals
- Improves the quality of ground water through dilution when recharged
- Reduces soil erosion & flooding in urban areas
- The rooftop rain water harvesting is less expensive & easy to construct, operate and maintain
- In desert, RWH only relief
- In saline or coastal areas & Islands, rain water provides good quality water

Rainwater Harvesting Today

Collection
(Catchment)
Flat / sloping roofs

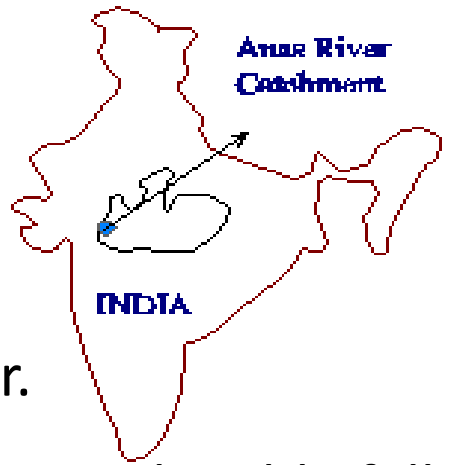
Transportation:
Downtake pipes

Leaf and grit filter, First flush device

Storage in tanks

Recharge into open wells / borewells / percolation pits / trenches

Jhabua Watershed: Case Study



Madhya Pradesh (INDIA), altitude of 380 m to 540m Area – 1800 sq.km

Highly undulating, sparsely distributed forest cover.

~ 57% arable land including cultivable fellow
~18% notified as forest land.

Average rainfall ~ 750 mm per annum.

~ 20-30 events during June-September

~ Classified as drought prone region.

Moisture deficit during January to May months each year.

Jhabua Watershed: Case Study

Major crops:
Maize, Cotton, Peanuts, Soybeans,Gram, Black beans, Oil seeds.

Predominantly tribal population, 92% engaged in agriculture

~ high seasonal migration

~ economically one of the most backward district

Case studies of interest - Implementation

Karnataka

- Gendathur (Karnataka) - a remote village in Mysore district
- The first village to have installed a maximum number of rainwater harvesting systems.
- Each of the 200 houses have a rooftop rainwater harvesting system

Case studies of interest - Implementation

Karnataka

- The Mysore Zilla Panchayat, an NGO (MYRADA) and the villagers worked together
- The villagers contributed 20% of the project cost.
- The villagers of Gendathur use rainwater for all their everyday needs; they even use it for drinking and cooking.

Watershed Management

- The watershed management implies the judicious use of all the resources
- Resources like land, water, vegetation in an area for providing an answer to alleviate drought
- Watershed to achieve maximum production with minimum hazard to the natural resources and for the well being of people.
- The management should be carried out on the watershed basis.
- The task of watershed management includes the treatment of land by using most suitable biological and engineering measures

Principles of Watershed Management

The main principles of watershed management based on resource conservation, resource generation and resource utilization are:

- Utilizing the land based on its capability
- Protecting fertile top soil
- Minimizing silting up of tanks, reservoirs and lower fertile lands
- Safe diversion of gullies and construction of check dams for increasing ground water recharge

Resettlement and Rehabilitation of People: Its Problems and Concerns

- Major projects such as dams, mines, expressways, or the notification of a National Park disrupts the lives of the people who live there and may also require moving them to an alternative site.
- Government is expected to find 'good' arable land to resettle displaced persons and provide them with an adequate rehabilitation package to recover from the disruption.
- Resettlement requires alternate land. However, in our overpopulated country, there is no arable high quality land available.
- Rehabilitation involves more than just giving land.

The Tehri Project: Case Study

- The Tehri Dam in the outer Himalayas in UttarPradesh, when finished will submerge Tehri town and nearly 100 villages

- Since the dam was sanctioned in 1972, local people have been opposing the dam and resisting its construction

- Scientists, environmentalists and other groups have also opposed this dam

The Tehri Project : Case Study

- Little is done to ensure proper rehabilitation and compensation for nearly a lakh of people who will be uprooted from their homes as a result of this dam, with little hope of rehabilitation, as no alternative land is available.

- There is also emotional and psychological trauma caused by forcibly removing people from their homeland where their families have lived for centuries.

Summary

- Rainwater harvesting is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers

- Methods Of Rainwater Harvesting are Surface Runoff Harvesting and Roof top rainwater harvesting

- Watershed management is the study of the relevant characteristics of a watershed aimed at the sustainable distribution of its resources