

# **Natural Resource Management**

Block 6 Unit 11 Part-II

# Syllabus

- State of resources
- Managing our natural resources
- Water
- Soil and land resource
- Energy sources
- Minerals – the underground wealth
- Social and Political responsibilities for environmental conservation and protection – environmental education, significant political and social movements

# NRM Definition

- **Natural resource management** refers to the management of natural resources such as land, water, soil, plants and animals, with a particular focus on how management affects the quality of life for both present and future generations (stewardship).
- Natural resource management deals with managing the way in which people and natural landscapes interact.
- It brings together land use planning, water management, biodiversity conservation, and the future sustainability of industries
- It recognizes that people and their livelihoods rely on the health and productivity of our landscapes, and their actions as stewards of the land play a critical role in maintaining this health and productivity.
- Natural resource management is also congruent with the concept of sustainable development.
- Natural resource management specifically focuses on a scientific and technical understanding of resources and ecology and the life-supporting capacity of those resources.
- Environmental management is also similar to natural resource management .

# History

- The resource conservation movement in the 20th century recognized that conservation strategies had not been effective in halting the decline of natural resources.
- A more integrated approach was implemented recognizing the intertwined social, cultural, economic and political aspects of resource management.
- A more holistic, national and even global form evolved, from the Brundtland Commission and the advocacy of sustainable development.

# Approach & Ownership Regime

- NRM approaches can be categorised according to the kind and right of stakeholders, natural resources:
- **State Property Regime**
  - Ownership and control over the use of resources is in hands of the state. Individuals or groups may be able to make use of the resources, but only at the permission of the state. National forest, National parks and military reservations are some examples.
- **Private Property Regime**
  - Any property owned by a defined individual or corporate entity. Both the benefit and duties to the resources fall to the owner(s). Private land is the most common example.
- **Common Property Regimes**
  - It is a private property of a group. The group may vary in size, nature and internal structure e.g. indigenous tribe, neighbours of village. Some examples of common property are community forests, grasslands and water resources.
- **Non-property Regimes (open access)**
  - There is no definite owner of these properties. Each potential user has equal ability to use it as they wish. These areas are the most exploited. It is said that "Everybody's property is nobody's property". An example is a lake fishery. This ownership regime is often linked to the tragedy of the commons.
- **Hybrid Regimes**
  - Many ownership regimes governing natural resources will contain parts of more than one of the regimes described above, so natural resource managers need to consider the impact of hybrid regimes.

# Management approaches

- NRM issues are complex as they involve the ecological cycles, hydrological cycles, climate, human beings, animals, plants and geography etc.
- All these are dynamic and inter-related.
- change in one of them may have far reaching and/or long term impacts may be irreversible.
- In addition to the natural systems, natural resource management also has to manage various stakeholders and their interests, policies, politics, geographical boundaries, economic implications and the list goes on. It is very difficult to satisfy all aspects at the same time. This results in conflicting situations.
- United Nations Conference for the Environment and Development (UNCED) -Rio de Janeiro in 1992
- The various approaches include:
  - Top-down or Command and control
  - Bottom-Up (regional or community based NRM)
  - Adaptive management
  - Precautionary approach
  - Integrated approach (INRM)

# Community Based NRM

- CBNRM combines conservation with the generation of economic benefits for rural communities.
- Capacity of indigenous communities to conserve NR acknowledged
- Governance is seen as a key consideration for delivering CBNRM
- The three key assumptions :
  - locals are better placed to conserve natural resources,
  - people will conserve a resource only if benefits exceed the costs of conservation, and
  - people will conserve a resource that is linked directly to their quality of life.
- The UN advocates CBNRM in the CBD and the Convention to Combat Desertification.
- A problem of community based NRM is the difficulty of reconciling and harmonizing the objectives of socioeconomic development, biodiversity protection and sustainable resource utilization.
- Understanding power relations crucial to success of CBNRM
- CBNRM raised new challenges, as concepts of community, territory, conservation, and indigenous are worked into politically varied plans and

# Integrated natural resource management (INRM)

## Definition

- A process of managing natural resources in a systematic way, which includes multiple aspects of natural resource use (biophysical, socio-political, and economic) meet production goals of producers and other direct users (e.g., food security, profitability, risk aversion) as well as goals of the wider community (e.g., poverty alleviation, welfare of future generations, environmental conservation). It focuses on sustainability and at the same time tries to incorporate all possible stakeholders from the planning level itself, reducing possible future conflicts. The conceptual basis of INRM has evolved in recent years through the convergence of research in diverse areas such as sustainable land use, participatory planning, integrated watershed management, and adaptive management.
- INRM is being used extensively and been successful in regional and community based natural management.
- Frameworks and modelling
- There are various frameworks and computer models developed to assist natural resource management.

## Geographic Information Systems (GIS)

- GIS is a powerful analytical tool as it is capable of overlaying datasets to identify links. A bush regeneration scheme can be informed by the overlay of rainfall, cleared land and erosion.
- These are limited by the potential for subjective input and data manipulation.

## Natural Resources Audit Framework

- To assist the establishment of a performance audit role in the governance of regional natural resource management.
- This audit framework builds from other established audit methodologies, including performance audit, environmental audit and internal audit.
- Audits undertaken using this framework have provided confidence to stakeholders, identified areas for improvement and described policy expectations for the general public.

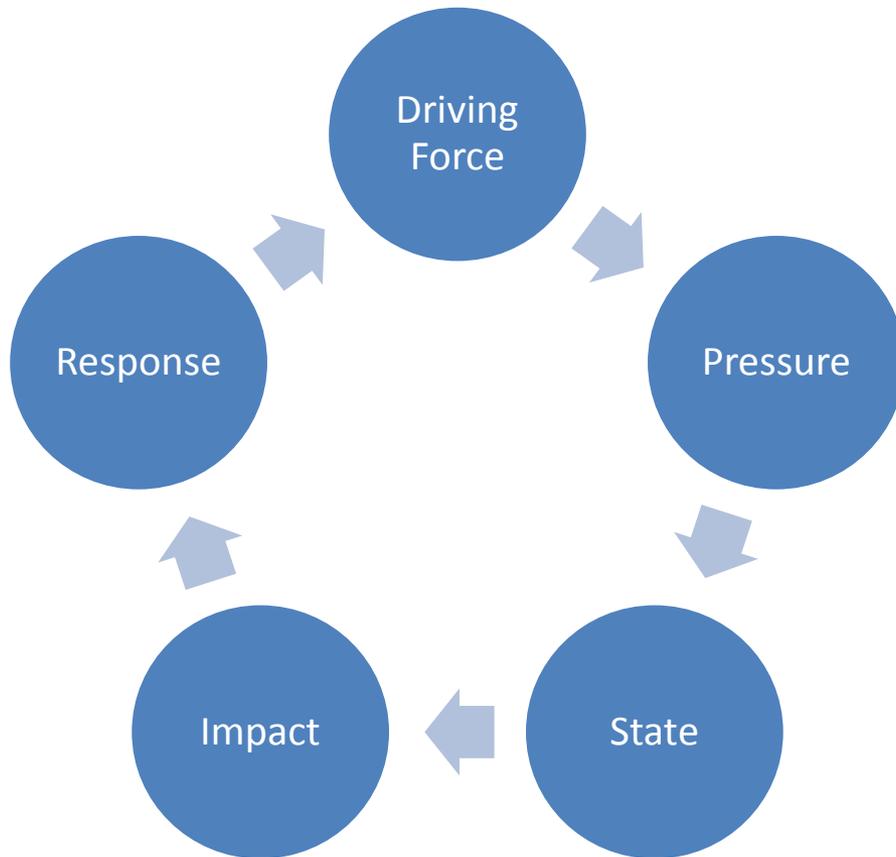
# Biodiversity Conservation

- The issue of biodiversity conservation is regarded as an important element in natural resource management.
- Biodiversity is a comprehensive concept, which is a description of the extent of natural diversity.
- Biodiversity is "the variety of life" and relate to different kinds of "biodiversity organization".
- The "threats" wreaking havoc on biodiversity include; habitat fragmentation, putting a strain on the already stretched biological resources; forest deterioration and deforestation; the invasion of "alien species" and "climate change".
- Since these threats have received increasing attention from environmentalists and the public, the precautionary management of biodiversity becomes an important part of natural resources management.
- Policy making is dependent on "evidences", relating to "high standard of proof", the forbidding of special "activities" and "information and monitoring requirements".
- Before making the policy of precaution, categorical evidence is needed. When the potential menace of "activities" is regarded as a critical and "irreversible" endangerment, these "activities" should be forbidden.

# Land management

- In order to have a sustainable environment, understanding and using appropriate Land management strategies is important. In terms of understanding.
- Important points of land management:
- Comprehending the processes of nature including ecosystem, water, soils
- Using appropriate and adapting management systems in local situations
- Cooperation between scientists that have knowledge and resources and local people that have knowledge and skills
- Examine impacts of local decisions in a regional context.
- Plan for long-term change and unexpected events.
- Preserve rare landscape elements and associated species.
- Avoid land uses that delete natural resources.
- Retain large contiguous or connected areas that contain critical habitats.
- Minimize the introduction and spread of non-native species.
- Avoid or compensate for the effects of development on ecological processes.
- Implement land-use and land-management practices that are compatible with the natural potential of the area.

# DPSIR



- D- Policies, Poverty /Dev
- P- Demand from Sector
- S- Productivity / Waste
- I -Crop Yield decline
- R- Policy / Acts

## Existing Credit Pattern

TEE Papers			Theory Assignment	Internal Assessment		Projects		Total
I	II	III		Unit 1-16	Unit 1-16	Hands on training	Dissertation	
Unit 1-6	Unit 7-10	Unit 11-16	<b>Merged, value Changed</b>	Unit 1-16	Unit 1-16	Hands on training	Dissertation	32 credits
5 credits	4 credits	5 credits		2.5 credits	1.5 credits	4 credits	4 credits	

## Proposed Credit Pattern

Term End Exam (TEE)			Theory Assign	Projects		Total
Paper I Unit 1-6	Paper II Unit 7-10	Paper III Unit 11-16		Hands on training/ Short term Project	Dissertation	
<b>6</b> credits	<b>6</b> credits	<b>6</b> credits	<b>4</b> credits	<b>4</b> credits	<b>6</b> credits	<b>32</b> Credits

**Schedule for Second Contact Session for PGDEM Batch-II**  
**3<sup>rd</sup> August to 9<sup>th</sup> August 2012**

Date	Block	Unit	9: 00 to 10:30		10:45 to 12:15		12.15 1.00	1:00 to 2:30		2:45 to 4:15		4:15 to 5:30
			I- Period	II- Period	III-Period	IV- Period		V- Period	VI- Period	VII-Period	VIII- Period	IX- X Period
3.08.12	BLOCK- VI	11	Recap and Familiarization Session	Concept of Natural Resource Management <b>Lokendra Thakkar, EIES</b>			L U N C H T I M E	Concept of Environmental Management - <b>Dr Santosh Sharma</b> , Vikram University Ujjain		Biodiversity Concepts <b>Dr Elizabeth</b> , MP Biodiversity Board Bhopal		Library/Additional Question-Answers/ Administrative issues
04.08.12		12	Envt. Quality and Monitoring <b>Dr Prem Shrivastava</b> MP PCB	System to Monitor Environment Quality - <b>Dr Prem Shrivastava</b> MPCB				Industrial Ecology and LCA - <b>Dr Santosh Sharma</b> , Vikram University Ujjain		Project Management Bhopal Gas Tragedy - <b>Satinath Sarangi Sathyu</b>		
06.08.12		13	Earth's Atmosphere <b>Dr P K Nandi, UN HABITAT</b>	Application of Green Tech. in Agriculture <b>Dr G S Kaushal, Agriculture Expert Retd Director Agri.</b>				Energy Conservation <b>Mr Surendra Bajpai</b> MPUVN		Green Buildings Concepts <b>Rama Pandeya</b> , SPA		
07.08.12	BLOCK- VII	14	Water Conservation – <b>Mr Manohar Patil</b> EPCO	Hazardous Waste Management <b>Mr H S Malviya</b> MPPCB				Green Chemistry Chemical Pollution Trans-boundary <b>Dr M S Chauhan</b> , MANIT (TBC)				
08.08.12		15	Science of Climate Change <b>Dr D P Dubey</b> , Director IMD Bhopal	Climate Change – Cause and Effects - <b>Dr M L Gupta</b>				Climate Change International and National scenario- <b>Dr M L Gupta</b>		Climate Chnage – NAPCC and SAPCC <b>Lokendra Thakkar</b>		
09.08.12		16	Environment and Biotechnology Issues - <b>Dr Anil Prakash</b> (TBC)	Environment and Biotechnology Issues - <b>Dr Anil Prakash</b> (TBC)				Research methodology (TBA)		Dissertation Topics and Supervisors Guides etc Summing Up		

**Notes**

- Everyday all the students have to be in the class room before 9.00 AM. Please note total 90% attendance is must for appearing in exams.
- Tea / Coffee brake is at 10.30 AM and at 2.30 PM. Lunch time is at 12.15 PM. Please bring your lunch with you.
- The Schedule is suggestive and is subjected to change.