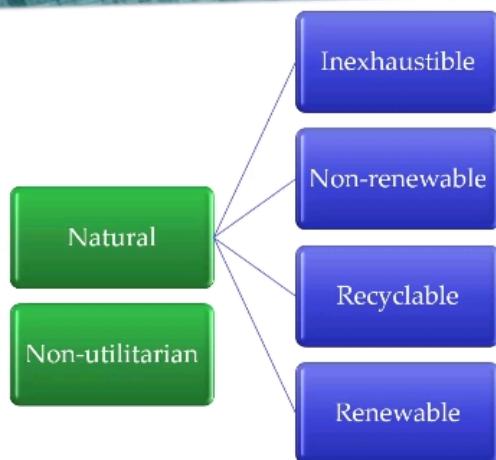




## Dasmann's Classification (1976)





## O.S. Owen (1971)



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## Classification of Resource

The resources can be classified in the following ways:



- Based on Origin
- Based on Exhaustibility/Stock
- Based on Ownership
- Based on the status of Development
- Based on Distribution



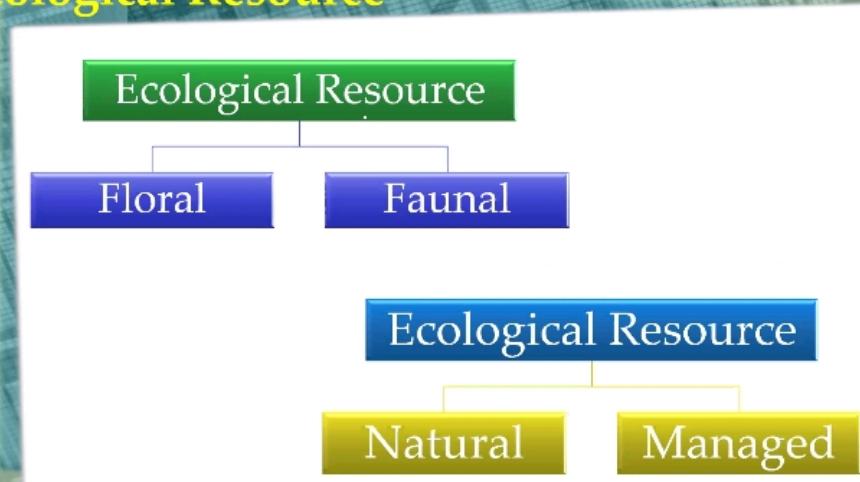


## General Classification



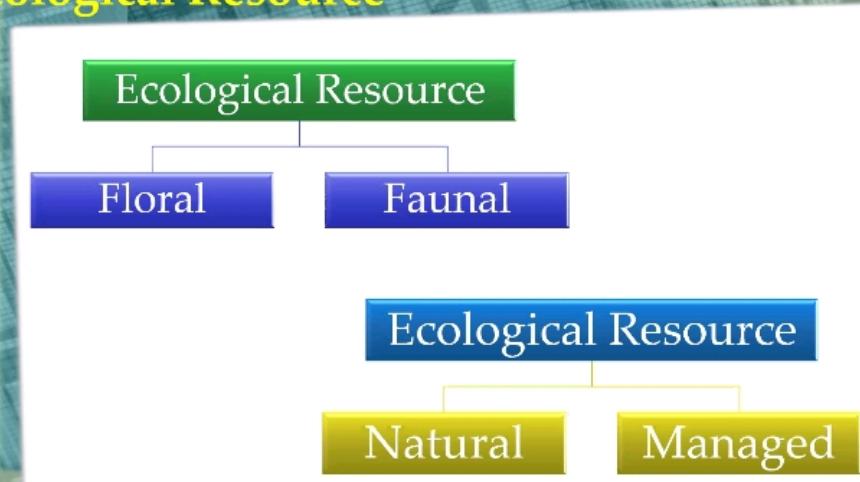


## Ecological Resource





## Ecological Resource





## Importance of Ecological Resource

- Direct Return
- Genetic Reserve
- Ecological Balance
- Educational value
- Research Value
- Natural History Interest
- Local Value



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## Management Perspective

### Spatial

- Spatial Distribution Analysis
- Regional Planning
- Geospatial Technologies

### Environmental

- Sustainability
- Impact Assessment
- Ecosystem Services

### Socioeconomic

- Equitable Distribution
- Economic Development
- Community Involvement



## Resource Planning Concept: *Sustainability*

- Climate Change
- Conflicting Interests
- Data Scarcity



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## Resource Planning Concept: *Sustainability*

Sustainability is the cornerstone of resource planning and management. It involves using resources in a way that meets present needs without compromising the ability of future generations to meet their own needs. This requires a balance between resource extraction, consumption, and regeneration.





## Resource Planning Concept: Efficiency

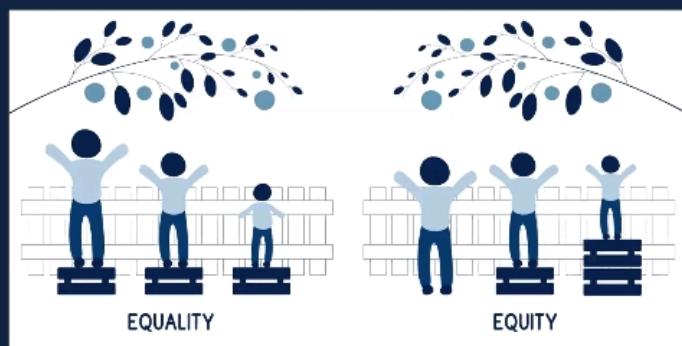
Efficiency in resource use means optimizing the use of resources to achieve the maximum possible output or benefit with the least amount of input.





## Resource Planning Concept: Equity

Equity ensures that resources are distributed fairly among all stakeholders, including marginalized and vulnerable communities. It addresses issues of access and control over resources, aiming to reduce disparities and promote social justice.

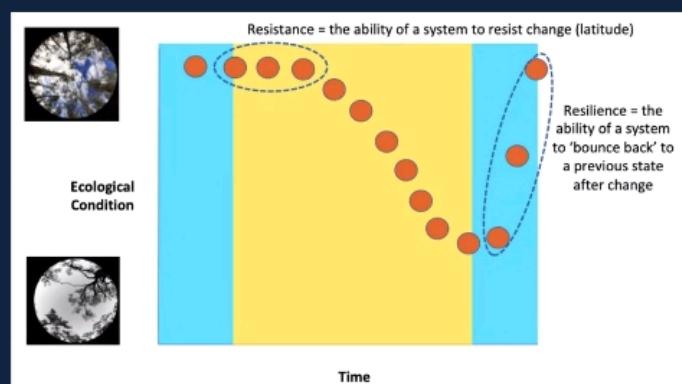




## Resource Planning Concepts: Resilience

How do ecological systems respond to disturbance?

Resilience refers to the capacity of a system to absorb disturbances and still retain its basic function and structure. In resource management, it means building systems that can withstand environmental changes, economic shocks, and social upheavals.



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## Resource Planning Concepts: Holistic Approach

A holistic approach considers the interconnections between different resources and systems. It integrates various sectors (e.g., water, land, energy) and considers the cumulative impacts of resource use on the environment and society.





## Approaches





## Approaches of NRM





## Planning Process





Zoom

Leave

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## Sustainable Natural Resource Management

Sustainable natural resource management (SNRM) is a comprehensive approach to managing natural resources—such as water, land, minerals, forests, and fisheries—in a way that meets current needs without compromising the ability of future generations to meet their own needs.



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Unmute



Start video



Participants 37



Chat



Reactions



Share





## SNRM: Key Principles

Sustainability

Ecological Integrity

Economic Viability

Social Equity

Adaptive Management



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## SNRM: Approaches



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## SNRM: Example

- Integrated Water Resource Management (IWRM)
- Sustainable Forestry
- Marine Protected Areas (MPAs)
- Sustainable Agriculture





## SNRM: Challenges

- Climate Change
- Population Growth
- Economic Pressures
- Governance and Policy
- Conflicting Interests
- Lack of Data and Knowledge
- Financial Constraints



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## SNRM: Strategies for Enhancement

- Capacity Building
- Public Awareness and Education
- Policy Integration
- Innovative Technologies
- Collaborative Partnerships
- Incentive Mechanisms



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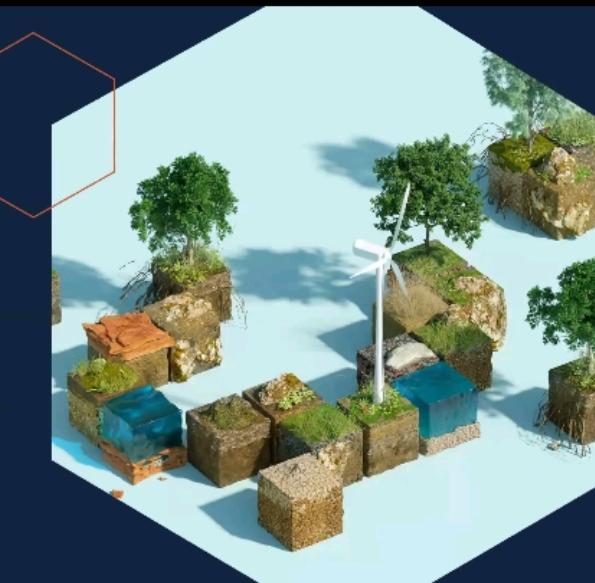


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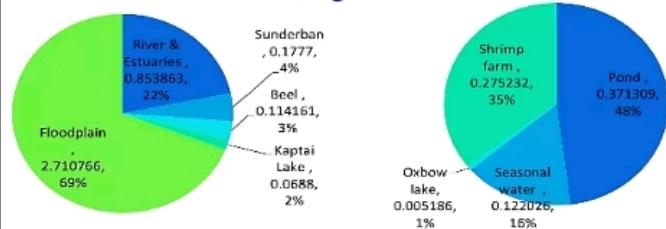
### Management Perspective





## Natural Resources In Bangladesh: WATER

### Inland Open and Closed Water Resources of Bangladesh



Total Area of Inland Waters: 4.7 million ha

Area of Inland Open Waters: 3.9 million ha (84%)

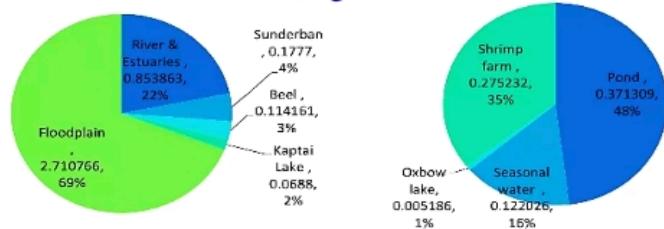
Area of Inland Closed Waters: 0.8 million ha (16%)





## Natural Resources In Bangladesh: WATER

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## Natural Resources In Bangladesh: LAND RESOURCES

#Most of Bangladesh lies within the broad delta formed by the Ganges and Brahmaputra rivers.

#It has 59% of agricultural land, which is the biggest asset of Bangladesh.

#According to BBS 2009 total food crop demand is 22.55 million metric ton and total food crops production is 25.097 million metric ton with a surplus of 2.547 million metric ton.

#Besides, 62 % of the total manpower is engaged in agriculture.



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### Natural Resources In Bangladesh: MINERAL RESOURCES

- # Geologically Bangladesh occupies a larger part of the BENGAL BASIN and the country is covered by Tertiary folded sedimentary rocks (12%) in the north, north eastern and eastern parts;
- # Pleistocene residuum (8%) in the north western, mid northern & eastern parts;
- # Holocene deposits (80%) consisting of unconsolidated SAND, SILT and CLAY
- # Bangladesh is receiving substantial international interest since it is told that it might have huge gas and oil deposits. This is in fact a prime location for hydrocarbon resource.



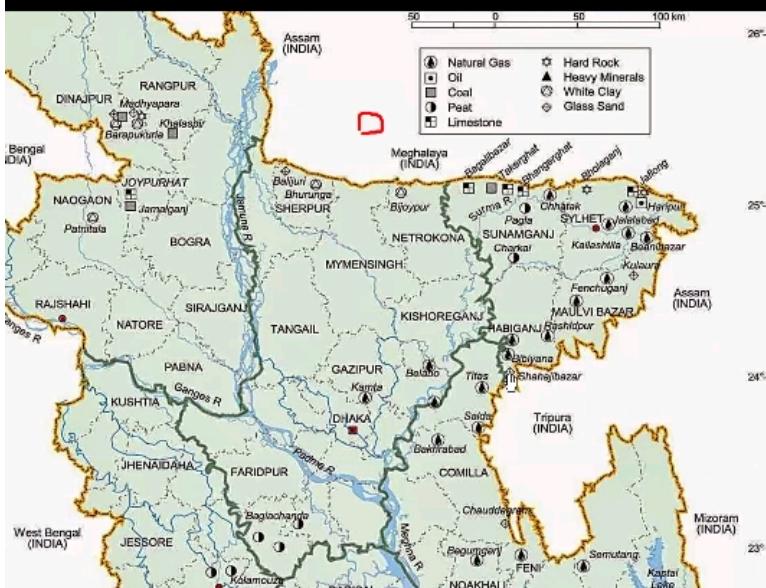
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## Natural Resources In Bangladesh: ENERGY RESOURCES

Use of natural gas	Meet 70% of the total demand of fuel
Total gas block	23 numbers including block 9
Stock of natural gas	28.4 trillion cubic feet
Primarily recoverable natural gas stock	20.51 TCF
Production in 2007-08	486.75 BCF
Cumulative lifted gas	6.003 TCF
Liftable net stock	14.475 TCF
Major consumption on natural gas	211.02 BCF in power sector



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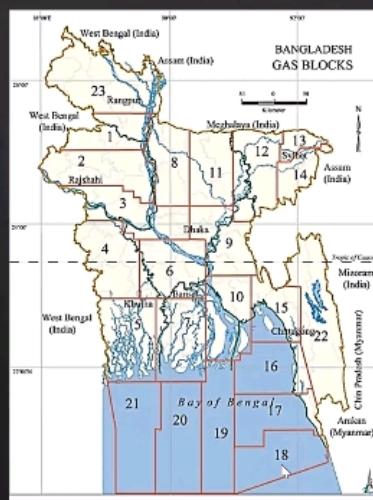
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### Natural Resources In Bangladesh: ENERGY RESOURCES



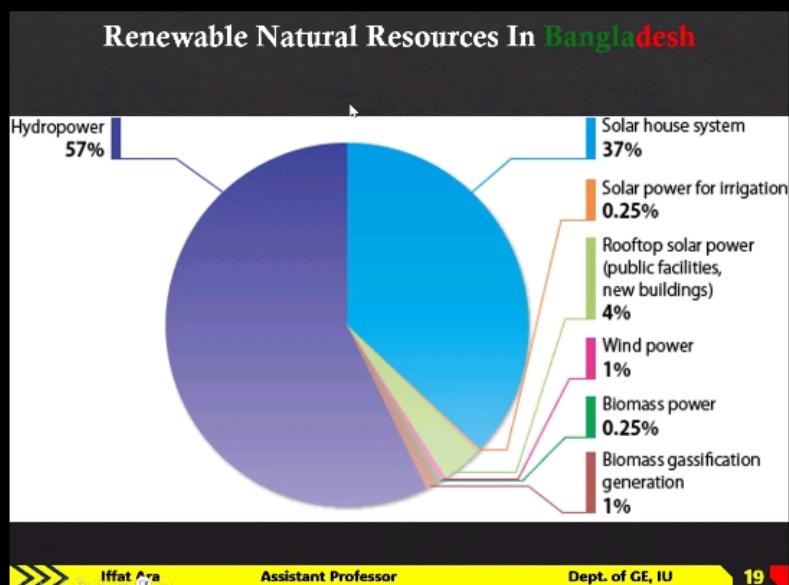
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## Natural Resources In **Bangladesh**: BAY OF BENGAL



Bay of Bengal is an important resource of Bangladesh.

Chittagong Port is one of the biggest seaports of the world.



## Natural Resources In **Bangladesh**: SUNDERBAN

- 525- recorded species of birds, 350 are resident.
- Of the 200 species of mammals,
- The pride of place goes to the Royal Bengal Tiger of the Sunderbans
- Prawns and lobsters are available in plenty for local consumption and export.



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## Natural Resources In Bangladesh





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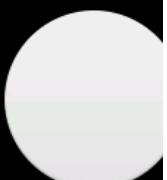
# NATURAL RESOURCE APPRAISAL & MONITORING

GE - 2203

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## Definition

Natural resource appraisal is the process of evaluating the quantity, quality, and economic value of natural resources within a specific area.

This assessment is crucial for sustainable management, conservation, and development of natural resources





## Importance

- Sustainable Management: Helps ensure that natural resources are used responsibly, minimizing environmental degradation.
- Policy Development: Informs government policies and regulations regarding resource use and conservation.
- Economic Planning: Assists in making informed decisions about resource allocation and investment opportunities.
- Conservation Efforts: Identifies areas needing protection to preserve biodiversity and ecosystem services.

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## Constraints

- Data Availability
- Financial Constraints
- Technical Expertise
- Regulatory Challenges
- Temporal Changes
- Stakeholder Conflicts
- Ecological Variability
- Political Factors
- Cultural Sensitivity
- Climate Change Impacts





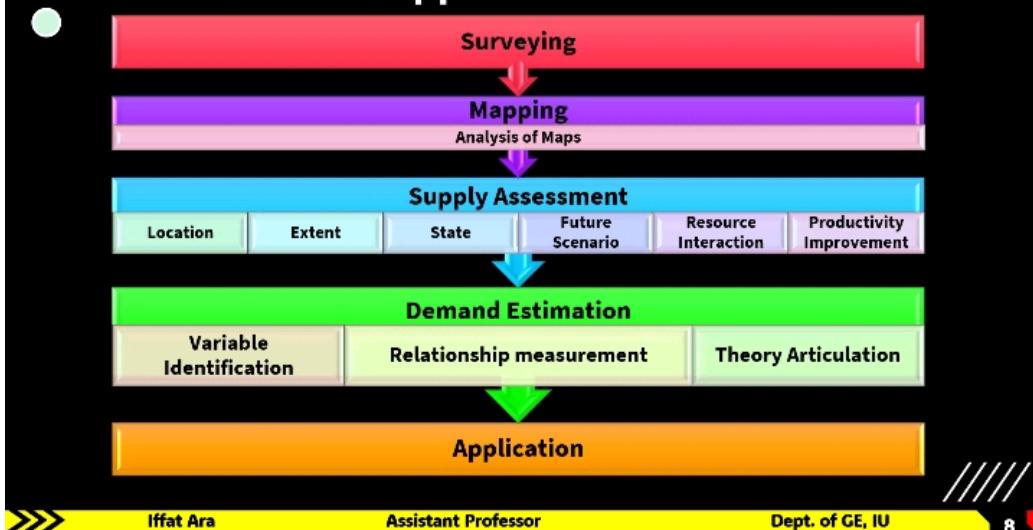
## Methods

- Inventory Assessment
- Market Valuation
- Non-Market Valuation
- Replacement Cost Method
- Cost-Benefit Analysis
- Ecological Valuation
- Remote Sensing
- Geographic Information Systems (GIS)
- Participatory Approaches
- Environmental Impact Assessment (EIA)





## NR Appraisal Process



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## Agricultural Resource

Crop Health Assessment: Remote sensing combined with GIS allows farmers to monitor crop health and optimize irrigation and fertilization practices.

Soil Management: Mapping soil types and conditions to inform sustainable farming practices.





## Mineral and Resource Exploration

Resource Mapping: GIS assists in identifying and mapping mineral deposits, oil reserves, and other natural resources.

Exploration Planning: Analyzing spatial data to optimize exploration efforts and minimize environmental impacts.





## Wildlife Management

Species Distribution Modeling: GIS helps model the distribution of wildlife species based on environmental factors, aiding in conservation planning.

Migration Patterns: Tracking migration routes and habitat use to inform management practices.





## Climate Change and Resource

Vulnerability Mapping: Assessing the vulnerability of resources to climate change impacts using spatial analysis.

Carbon Sequestration: Mapping forests and other carbon sinks to monitor their role in climate mitigation.





## CONTENTS

- - Definition
  - Importance
  - Constraints
  - Process and Methods
  - Evaluation
  - GI technologies and resource monitoring

