



# OVERVIEW OF INTEGRATED RESOURCE AND ENVIRONMENTAL MANAGEMENT CONCEPTS



# Lesson Learning Goals

At the end of this lesson you should be able to:

- Discuss limitations of the conventional approach to environmental management
- Define integrated resource and environmental management (IREM)
- Identify key IREM characteristics
- Describe benefits, using examples, of adopting an IREM approach

# Characteristics of Conventional Management Approach

- Examines each resource sector and/or environmental component in isolation (e.g., water, air, forests, fish)
- Focuses on biotic components; limited, if any, consideration of ecological processes (e.g., hydrological process)
- Targets only specific resources of interest; typically those of commercial value
- Conflicting management policies

# Pieces of the Management Puzzle



# Limitations of the Conventional Approach

- Ignores interdependencies; solution in one sector often causes problems in another (e.g., unsustainable forestry practices can severely impact fishery habitat)
- Jurisdictional and temporal fragmentation; each government agency has own mandate
- Ignores sectors/components which are not well-defined (e.g., who is responsible for protecting groundwater?)

# Limitations of Conventional Approach (Cont'd)

- Ignores impacts to ecological processes unless it directly relates to particular resource being managed (e.g., fisheries)
- Ignores cumulative effects from multiple stressors (i.e., seemingly unrelated development actions and management policies can affect the same environmental receptor)
- **IGNORES THE BIG PICTURE!**

# The Alternative

- A holistic and comprehensive approach to resource planning and management that encompasses ecological, social, and economic objectives
- IREM aims to address the entire suite of environmental and socio-economic elements as part of a complex, interwoven system

# Why is IREM Needed?

1. A problems exists:
  - impacts to the natural environment are threatening life-sustaining processes
  - persistent global poverty translates into lower priority given to environment
  - greater development-related pressure is continually being exerted on resources
    - » exponential population growth
    - » increasing per capita demands for consumption



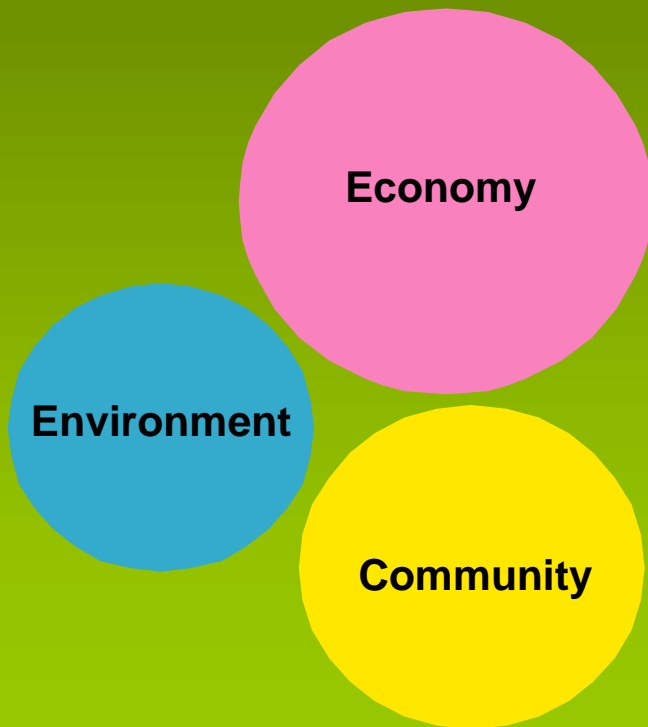
# Why is IREM Needed? (Cont'd)

2. Traditional management approaches have not proven effective in managing resources efficiently while protecting the environment
3. IREM supports the principle of sustainable development, i.e.,

“human living within ecological limits”

# Conventional versus IREM

## Conventional Approach



## Integrated Approach



# Benefits of IREM

- Long-term protection of resources being managed
- Enhanced potential for non-deleterious multiple resource uses
- Reduced expenditure of energy and money on conflicts over competing uses
- More rapid and effective rehabilitation of damaged ecosystems

# What to Think About

- Area units of management
- Institutional and legal frameworks
- Ecosystem approach
- Adaptive approach
- Ecological economics
- Conservation biology
- Planning process
- Regional context
- Cumulative effects assessment
- Ecological risk assessment

# IREM Characteristics

- IREM aims to integrate ecological concerns into societal decision making
- Essential that IREM be **premeditative** (i.e., before land and resource use decisions are made)
- IREM emphasizes **visioning** and **proactive planning** - consciously defining and attaining specified desired states - versus merely reacting once problems materialize
- It is just as much **prevention** as remediation

# Dual Perspective of IREM

- **Holistic (broad) view:** focuses on the system - the interrelationship among elements and considers multiple issues simultaneously
- **Focused (narrow) view:** concentrated efforts on key areas to achieve system goals as identified in the broad analysis

# Long-Term Horizon

- Considers future generations
- Synchronizes environmental management with nature versus conventional social deadlines (e.g., political terms of office, annual budgets)
- Time frames are extended to centuries, rather than months, years and decades
- Combines necessary short-term **tactical responses** and **long-term strategic plans** that address fundamental causes of environmental problems

# Ecosystem Perspective

- Includes the whole system, not just parts of it
  - » uses a broad definition of environment
  - » focuses on the interrelationships among the elements and recognizes the dynamic nature of an ecosystem
  - » views humans as a part of nature, not separate from it
  - » incorporates the concepts of carrying capacity, resilience and sustainability
  - » encompasses both urban and rural activities



# Ecosystem Perspective (Cont'd)

- Based on natural geographic units, such as watersheds or river basins
- Embraces all levels of activity: local, regional, national, international
- Emphasizes the importance of species other than humans (i.e., a non-anthropogenic view)
- Based on an ethic in which progress is measured by the quality, well-being, integrity and dignity it accords natural, social and economic systems

# The Need to be Adaptive

- Surprise, uncertainty and the unexpected are the norm
- Ecological (i.e., human and non-human) systems are in perpetual motion
- It is not possible to anticipate all change and eliminate through management
- Uncertainty should not be reason for inaction
- Management must be flexible and responsive to change

# Adaptive Management

- Experimental approach to management
- Continual course adjustments needed as understanding increases and social priorities change
- Communication and interaction among those who design, choose and endure the policies (i.e., environmental managers, decision makers, the public)
- Involves continuous evaluation and modification
- **INVOLVES CONTINUAL LEARNING**

# Uncertainty and the Precautionary Principle

- Precautionary principle says that when there are threats of serious irreversible damage, lack of scientific certainty is not an acceptable reason for postponing a cost-effective measure to prevent environmental degradation
- Fundamental concept of sustainable development in terms of guiding day-to-day management actions

# Implications of the Precautionary Principle

- Regulatory action may be required before scientific certainty is established
- Must allow ecological **space** to compensate for lack of knowledge
- Link **burden of proof** to proposed development rather than status quo (e.g., burden of proof is on project proponent to demonstrate that the proposed project or development will **not** cause environmental impacts)

# Concluding Thoughts

Important points to remember are:

- Fundamental shift is needed in conventional (i.e., traditional) resource management practices
- IREM represents an alternative management strategy which focuses on interrelationships among ecosystem components
- IREM recognizes the dynamic, changing nature of ecosystems in seeking to anticipate problems in resource planning and management