INTEGRATED COASTAL ZONE MANAGEMENT
Theme 4: Sustainable development of coastal zones in Yemen

Management Strategies and Instruments
Henk Ritzema
Alterra-ILRI
Wageningen University and Research Centre
The Netherlands
Objectives: after finalizing this module you should

• Know what the ICZM concept is about, what important ICZM issues in Yemen are and the role of the IWRM can play in the sustainable management of coastal zones in Yemen;
• Be able to identify the user functions, forces and processes in the coastal zones of Yemen and how they cause pressure on the natural system;
• Be able to apply the principles of IWRM to sustain development in the coastal zones of Yemen;
• Know which information is needed in ICZM and how to obtain this information by monitoring and research programs.
Methodology

User functions and processes in the coastal zones of Yemen

Role of IWRM in coastal zone management

Sustainable development of coastal zones in Yemen

Excursion
Theme 4: Sustainable development of coastal zones in Yemen

Subjects:

4.1 Management strategies & instruments (6 hours)

4.2 Information Needs, Monitoring and Indicators (6 hours)

4.3 Practical & exercises (12 hours):
   Assignment no. 8: Which technologies are available?
   Assignment no. 9: Constraints and opportunities
   Assignment no. 10: Development of a monitoring plan
Management strategies and instruments: Subjects

- Towards a strategy for integrated coastal zone management.
- Factors affecting the planning process of integrated coastal zone management.
- Implementation instruments and methods for integrated coastal zone management.
- Environmental impact assessments for integrated coastal zone management.
Towards a strategy for integrated coastal zone management

Environmental Impact Assessment
- Prediction of a proposed project’s effort on renewable coastal resources, biodiversity, and the quality of the human environment

Strategy planning
- Process that explores options and develops an optimum strategy for a management program

Programme development
- Master plan that defines options from human progress and recommends on governmental and private actions

Alterra-ILRI
Step 1: Strategy planning: Process

1. Preliminary investigations
2. Data collection
3. Analysis
4. Dialogue
5. Negotiations
6. Draft writing
7. Finalizing ICZM strategy
Strategy planning: Stakeholders

Many stakeholders ↓
ICZM has to provide a framework for coordination

Question: do you know other stakeholders in the Yemen?
**Definition:** The region where the tidal processes are capable of affecting man’s activity or of being influenced by man. This roughly extends tidal areas between the following limits:

- On the seaward side up to the limit of conventional construction or dredging activity (typically of the order of 30m water depth);
- On the landward side up to the limit of the action of the sea, including all those areas that might be subject to flooding by seawater and up all estuaries and rivers to the tidal limit (the point where water levels are no longer influenced by tidal propagation).

**Question:** what is the definition of the coastal zone in Yemen?
Strategy: Setting (2)

- Is the emphasis national or regional?
- Who are the expected beneficiaries of the ICZM program, both social and economical?
- Can these beneficiaries fund the ICZM program?
- Who are the major proponents and opponents of the proposed ICZM programme?
- What are the natural hazards and how can a ICZM program help to overcome these hazards?
Strategy planning: Objectives

- Maintain a high quality coastal environment
- Protect species diversity
- Conserve critical habitats
- Enhance critical ecological processes
- Control pollution
- Identify critical lands
- Identify land for development
- Protect against natural hazards
- Restore damaged ecosystems
- Encourage participation
- Provide planning guidance
- Provide development guidance

Assignment:

i) List the objectives for your region

ii) Are there conflicting objectives?
Strategy planning: Multiple Use

- Fisheries
- Aquaculture
- Agriculture
- Mining
- Water supply
- Urban development
- Biodiversity
- Ports and harbour development
- Recreation/tourist development
- Human settlement
- Industrial development

**Assignment:**

i) List the land and water resources requirements for all the user functions.

ii) Are these user functions conflicting?
Strategy planning: Integration

Coastal Resources

Management Measures

Users

Rehabilitation

Exploitation

Urban development
Navigation
Ports and harbour dev.
Recreation
Human settlement
Industrial development

Economic pressure ↔ Political pressure

Fisheries
Aquaculture
Agriculture
Mining

Economic pressure

Political pressure
Strategy planning: Coordination

| Many stakeholders ↓ | ICZM has to provide a framework for coordination |

Assignment:

i) List all stakeholders and group them per land use functions.

ii) To the have the same interest or are they conflicting?
Strategy planning: Institutional

ICZM requires involvement of all levels of government:
- Local
- Provincial/district
- National/central.

Why?

**Assignment:**

i) List all government agencies involved in ICZ and describe their functions/roles

ii) Are they in line with each other or is there overlap, point of conflict?.

The ICZM should be mandated ➔ legislation is needed !!!
ICZM is complex, numerous stakeholders are involved, flexible and never-ending (why?), thus follow an incremental approach:

- Year by year
- Function by function
- Resource by resource
- Issue by issue
- Region by region

Assignment:
For your region, describe how ICZM is done at present.
Strategy planning: Participation

- Newspaper
- Hotline
- Telephone survey
- Printed materials
- Focus groups & workshops
- Radio
- Video & Television
- Schools & community groups
- Open houses & displays
- Referendum
- Schools
- Community groups
- Schools
- Community groups
- Referendum
- Open houses & displays
- Video & Television
- Focus groups & workshops
- Printed materials
- Telephone survey
- Hotline
- Newspaper
Strategy planning: Data collection

Data should:
• Enhance the decision-making process
• Clearly depict the trade-offs between the present situation and an integrated approach
• Lead to the clearest and least ambiguous set of objectives and/or mandates for the implementing agency.

Examples:
• Users of coastal areas and resources
• Coastal renewable resources
• Environmental impacts
• Upland effects
• Socio-economic effects
• Critical habitats
• Critical species
• Resource problems, issues and conflicts
• Natural hazards
• Natural reserves

Assignment: Specify these examples for your region.
Strategy planning of a ICZM program: Process

- Data collection
- Analysis
- Dialogue
- Negotiations
- Draft writing
- Finalizing ICZM strategy
- Preliminary investigations
Strategy planning: Summary

Developing an ICZM strategy is complex thus:

- Keep it simple
- Keep it politically and administratively viable
- Avoid unrealistic goals
- Avoid excessive complexity
- Provide a framework for coordination
- Keep it flexible

- And remember ICZM is a tool to create a mechanism for sustainable development of the coastal resources
Example of an ICZM strategy

1. Investigation of issues and needs
2. Review of policies
3. Formulation of goals and objectives
4. Pre-planning review activities and preliminary strategy report: resources, legal/institutional, socio-economic, plan boundaries, etc.
5. Organisation of planning program: funding, staff, facilities, equipment, operational strategy
6. Implementation of master planning program: data collection, analysis, mapping, public hearings, etc.
7. Drafting, redrafting, and production of final plan
Towards a strategy for integrated coastal zone management

Step 1
Environmental Impact Assessment

Step 2
Strategy planning
Programme development
Step 2: Program development

- Master plan
  - Sector plan
  - Sector plan
  - Sector plan
The Master Plan:

- Identifies options for development that are economically sound, socially just and that maintain the natural resource base
- Recommends governmental and private actions, specifying:
  - (Re-)orientation and jurisdiction
  - Land use, protected areas, etc
  - Regulatory program – permits and reviews
  - Environmental impact assessment
  - Operational management
  - Information services
  - Reviews and evaluation

Assignment:
Check if there is a master plan in the region your group has selected?
ICZM aims to improve coordination between government agencies at all levels and in new fields.

Check if there is overlap in the existing jurisdiction.

Legal authorities often have to be reshaped.
Master Plan: Land use, protected areas, etc

Land and water resources are often scarce and ecological sensitive

Priority setting is needed → zoning is required also for protected areas and restoration and rehabilitation areas

Enforcement & Conflict management is often required
Master Plan: Regulatory program – permits and reviews

Strategic Plan that includes:
- Issues
- Possible solutions
- Legal and institutional arrangements

Master plan that includes:
- Review
- Analysis
- Coordination functions

Reviews are needed!!

Environmental Impact Assessments

Special coastal Development permits
Master Plan: Environmental impact assessment

Ecology
- sedimentation
- habit modification
- critical habitats
- aesthetic values
- historical/archaeological values
- public assess
- navigation

Water Quality
- flushing
- dissolved oxygen
- erosion

Cultural
- Shoaling
- boating
- erosion
- aesthetic values
- critical habitats

Permitting issues
Potential
Environmental Solutions
Master Plan: Operational management

- A central ICZM coordination office
- A project review/permit system
- Empowerment to ensure compliance with the program, its requirements, guidelines and standards
Master Plan: Information services

- Newspaper
- Hotline
- Telephone survey
- Printed materials
- Focus groups & workshops
- Radio
- Open houses & displays
- Video & Television
- Schools & community groups
- Referendum
- Public

Schools & community groups

Referendum

Open houses & displays

Video & Television

Focus groups & workshops

Printed materials

Telephone survey

Hotline

Newspaper

Public
Master Plan: Master Plan: Reviews and evaluation

Reviews are needed!!

Strategic Plan that includes:
- Issues
- Possible solutions
- Legal and institutional arrangements

Master plan that includes:
- Review
- Analysis
- Coordination functions

Environmental Impact Assessments

Special coastal Development permits

ALITERRA-ILRI
Environmental impact assessment for ICZM

- Constraints in using EIA’s in ICZM practices
- Towards more sustainable development
- Indicators for coastal sustainability
- Group assignment during the excursion
Constraints in using EIA’s in ICZM practices

- Limited availability of important data on marine and coastal aspects
- Limited information sharing: no methodology
- Deficiencies in the EIA to use environmental information: no possibilities for revisions
- Lack of empowerment of the participating stakeholders: only used to supply information, not involved in the analysis and decision-making
- Limitations faced by the stakeholders: information inaccessible – “technical/expert” language
Recommendation to improve EIA

- Increase the use of specific marine/coastal environmental information
- Increase stakeholder participation
- Set-up of an Information System that provides information based on the stakeholder’s needs (not all stakeholders want the information in the same format)
Towards more sustainable development

Sustainable development does not mean *no* growth, it means *not wasting* resources

Use principles based on this principle, e.g. 
- Minimize the amount of resources (water, energy, etc)
- Use renewable resources
- Concentrate developments
- Increase infiltration of rainwater
- Design through a participatory approach
- Design in harmony with the surroundings
Your challenge: translate these principles in indicators (1)

**Land and Development**
- Percentage of coastline urbanized
- Amount of agricultural land developed per year
- Amount or percentage of development occurring on coastal infill
- Extend of farmland or rural land lost each year and over time

**Water**
- Extend of fishable and swimmable water; changes in water quality over time
- Extent of pervious and impervious surfaces; changes in pervious and impervious cover

**Air**
- Number of days in violation with clean air criteria
Your challenge: translate these principles in indicators (2)

Wetlands
- Acreage of coastal wetlands converted, each year and over time
- Acreage of existing and protected wetlands

Natural Habitat
- Change in natural habitats
- Extent and status of endangered species
- Extent and status of biodiversity hot pots

Energy and Resource Use
- Water consumption (per capita and/or per resource: surface water, groundwater and/or sea water)
- Energy consumption (per capita)
- Renewable energy consumption (per capita)
- Recycling rate
- Solid waste generated per year
- Number of treatment plants with tertiary and advanced treatment
Your challenge: translate these principles in indicators (3)

Assignment:

Select an indicator related to IWRM and quantify this indicator so that it can be used in ICZM

A performance indicator should be:
• Science based
• Reproducible
• Transparent
• Manageable
• Cost-effective
Group assignment during the excursion (1)

During the excursion to Aden, we will visit, among other,
- Environmental Protection Authority in Aden
- Local Government Council
- Marine Science Centre
- Al-Heswa Desalination Plant, and
- Aden Refinery.

Assignment:
Make 5 groups and let each group select one of these organizations
Group assignment during the excursion (2)

Each group makes a brief report of the visit to the organization, with special emphasis on the following:

- Main user functions
- Used resources
- Other users for the same resources?
- Conflicts of interest?
- Are sustainable development principles used?
- Have EIA been made?
- Were these EIA’s focused on coastal zones
- Indicators used?
- Three strong points
- Three recommendations for improvement
Objectives: after finalizing this module you should

- Know what the ICZM concept is about, what important ICZM issues in Yemen are and the role of the IWRM can play in the sustainable management of coastal zones in Yemen;
- Be able to identify the user functions, forces and processes in the coastal zones of Yemen and how they cause pressure on the natural system;
- Be able to apply the principles of IWRM to sustain development in the coastal zones of Yemen;
- Know which information is needed in ICZM and how to obtain this information by monitoring and research programs.
Management strategies and Instruments

The challenges is yours !!