

# INTEGRATED COASTAL ZONE MANAGEMENT

Theme 4: Sustainable development of coastal zones in  
Yemen

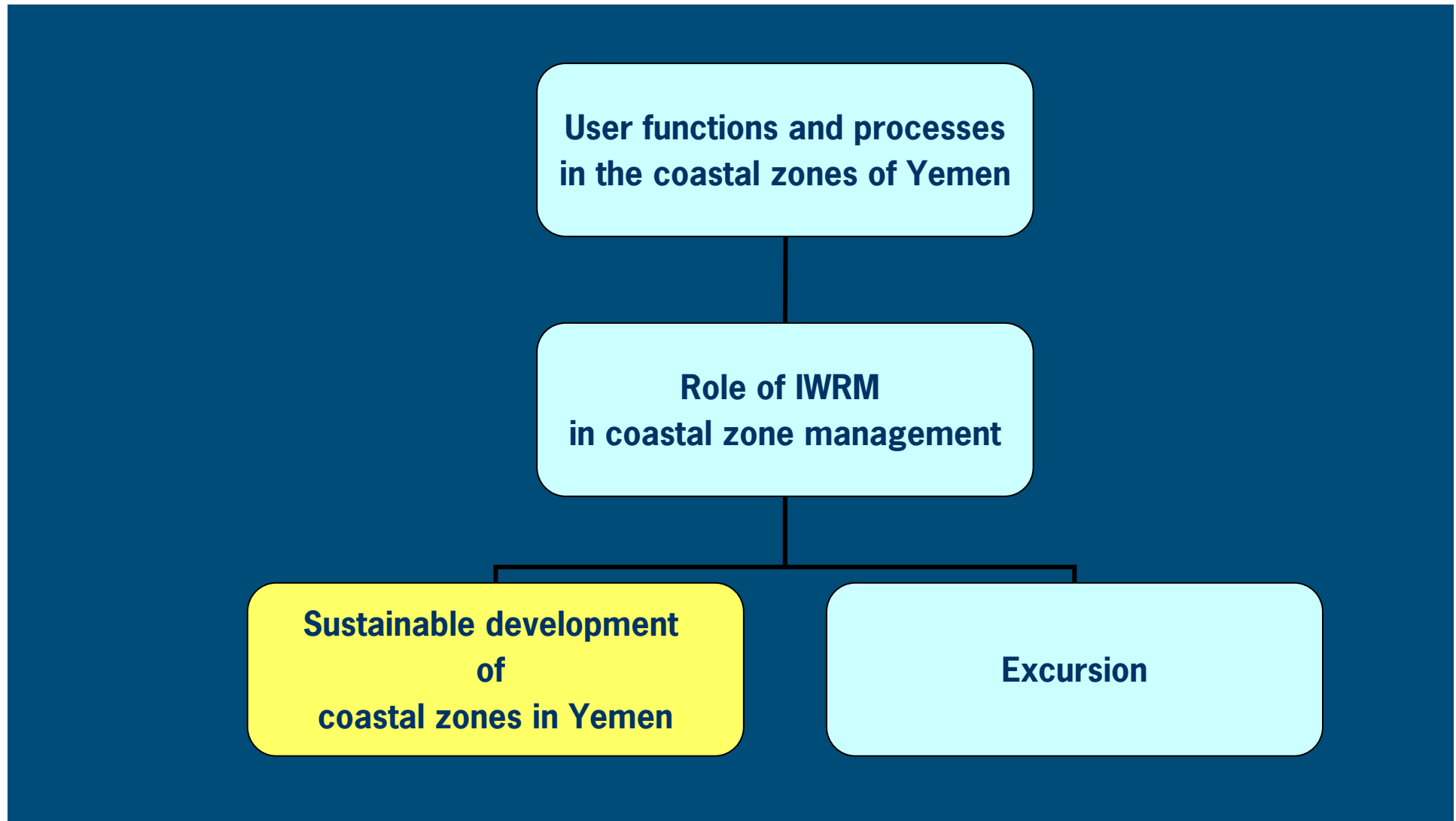
## Management Strategies and Instruments

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## 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



## Theme 4: Sustainable development of coastal zones in Yemen

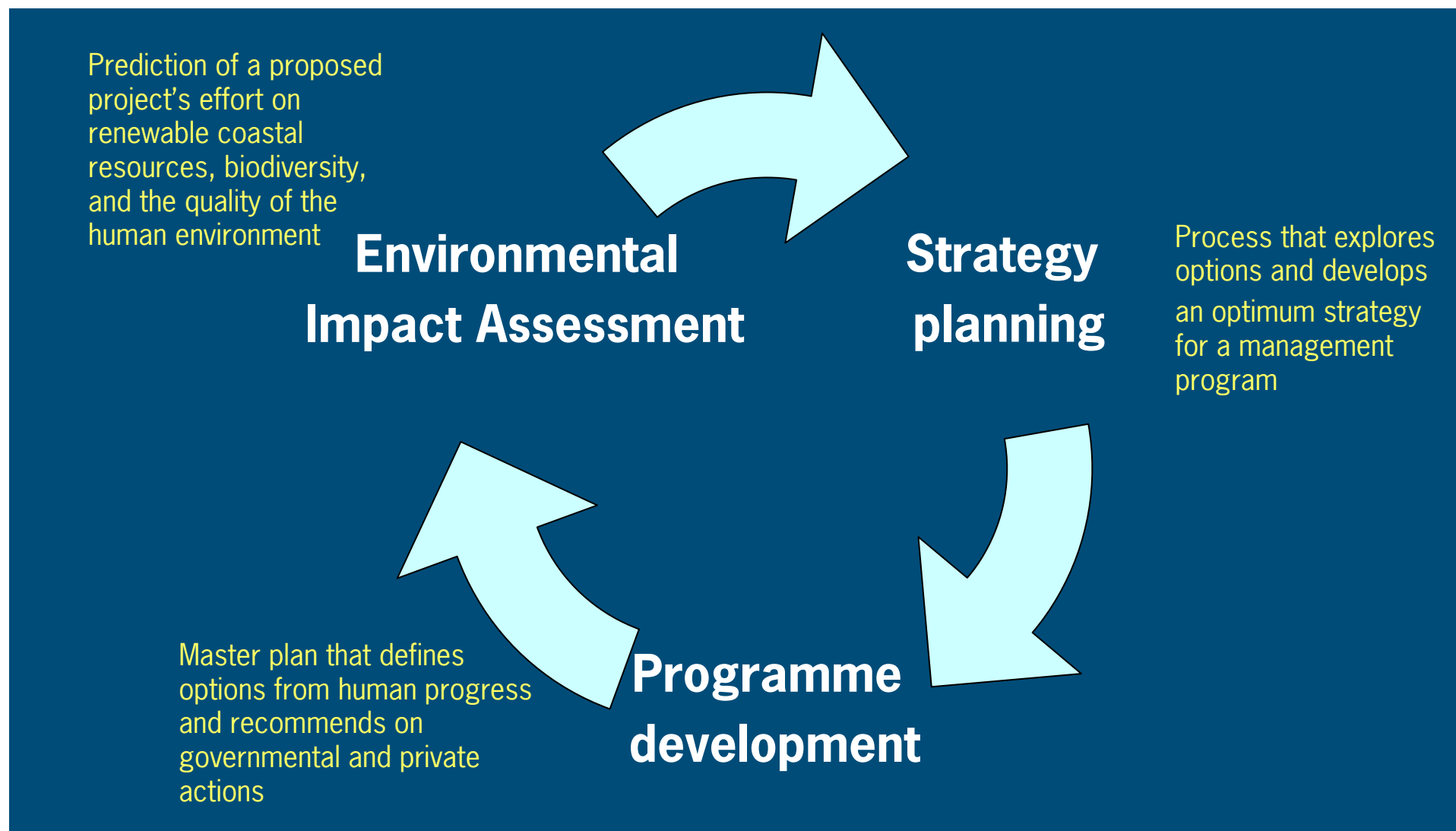
### Subjects:

- 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



# Step 1: Strategy planning: Process



# Strategy planning: Stakeholders



Many stakeholders  
↓  
ICZM has to provide a framework for coordination

**Question:** do you know other stakeholders in the Yemen?

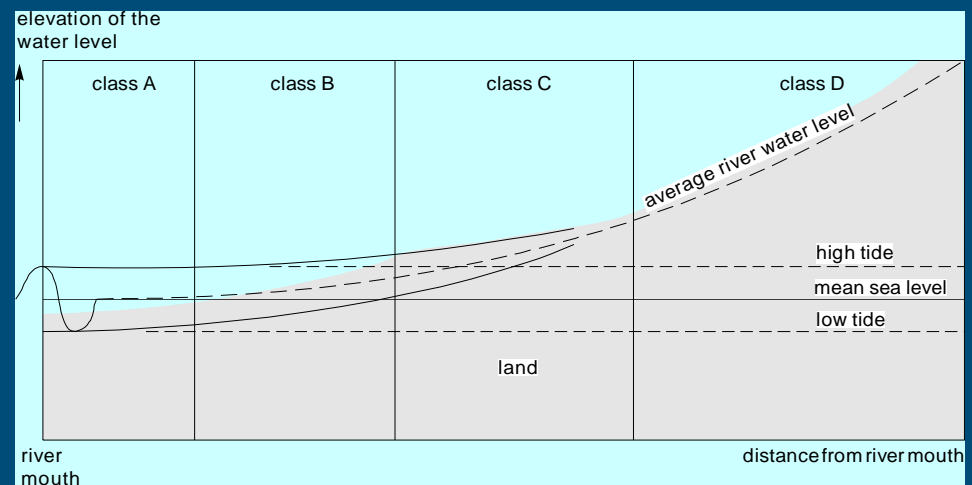


# Strategy planning: Setting (1)

**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:

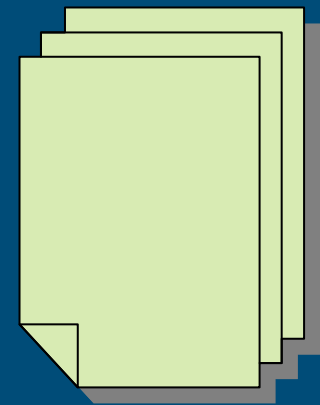
- i) List the objectives for your region
- ii) Are there conflicting objectives?

# Strategy planning: Multiple Use

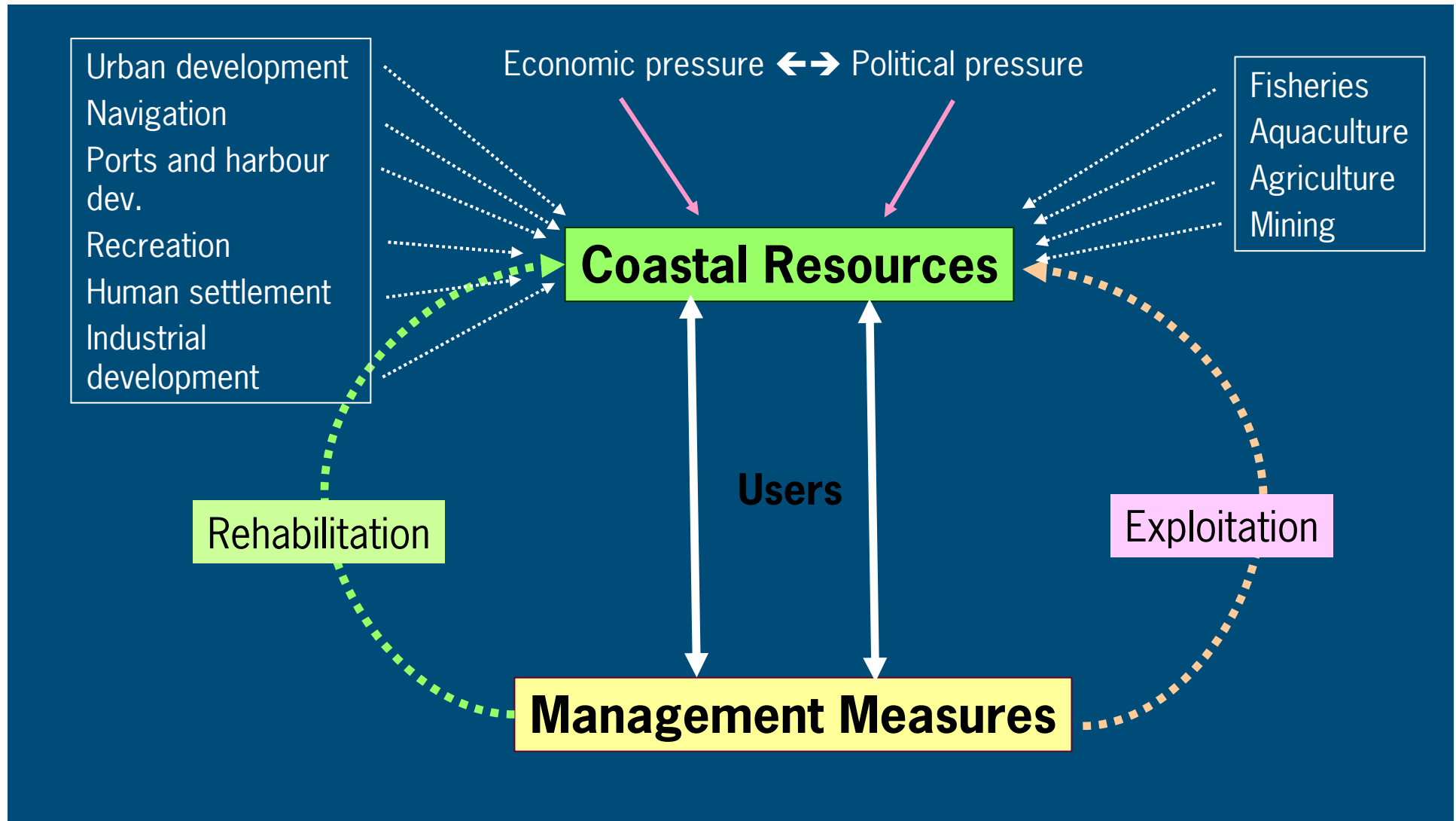
- Fisheries
- Aquaculture
- Agriculture
- Mining
- Water supply
- Urban development
- Biodiversity
- Ports and harbour development
- Recreation/tourist development
- Human settlement
- Industrial development

## Assignment:

- i) List the land and water resources requirements for all the user functions.
- ii) Are these user functions conflicting?



# Strategy planning: Integration



# 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 !!!

# Strategy planning: Incremental approach

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 IZCM is done at present.





# Strategy planning: Participation



# 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



# Strategy planning: Summary

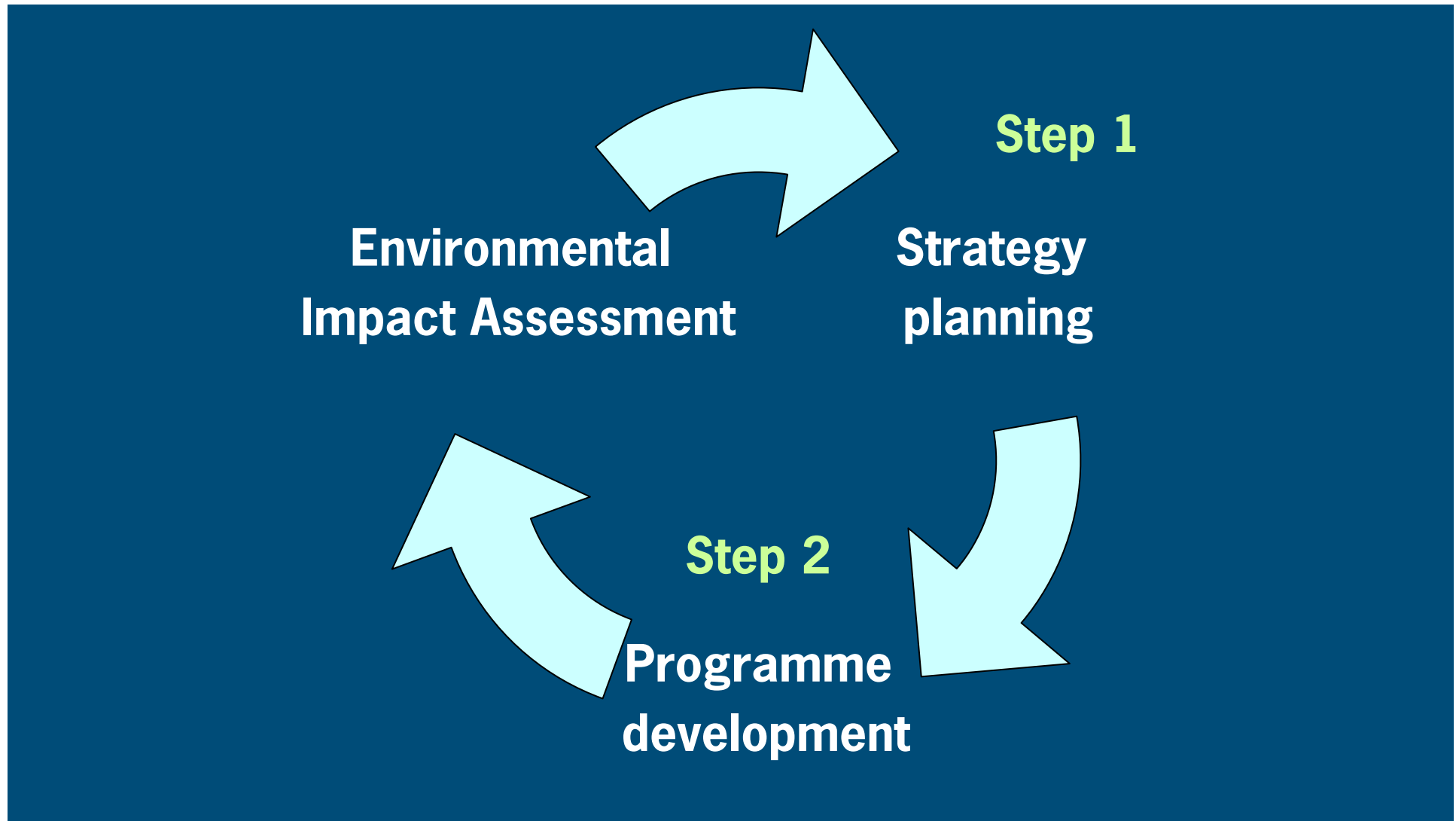
Developing an ICZM strategy is complex thus:

- Keep it simple
  - Keep it politically and administrative 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

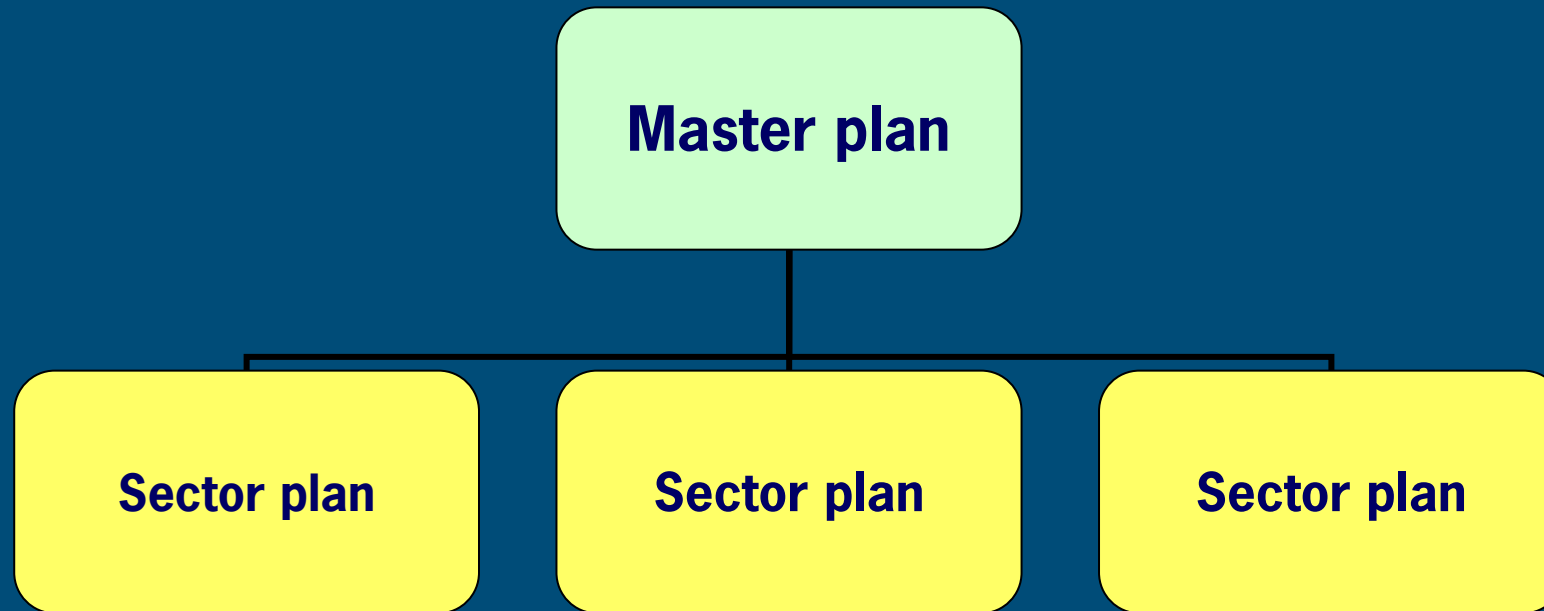
# Example of an ICZM strategy

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 2: Program development



# Program development: Master 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 ?



# Master Plan: (Re-)orientation and Jurisdiction

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

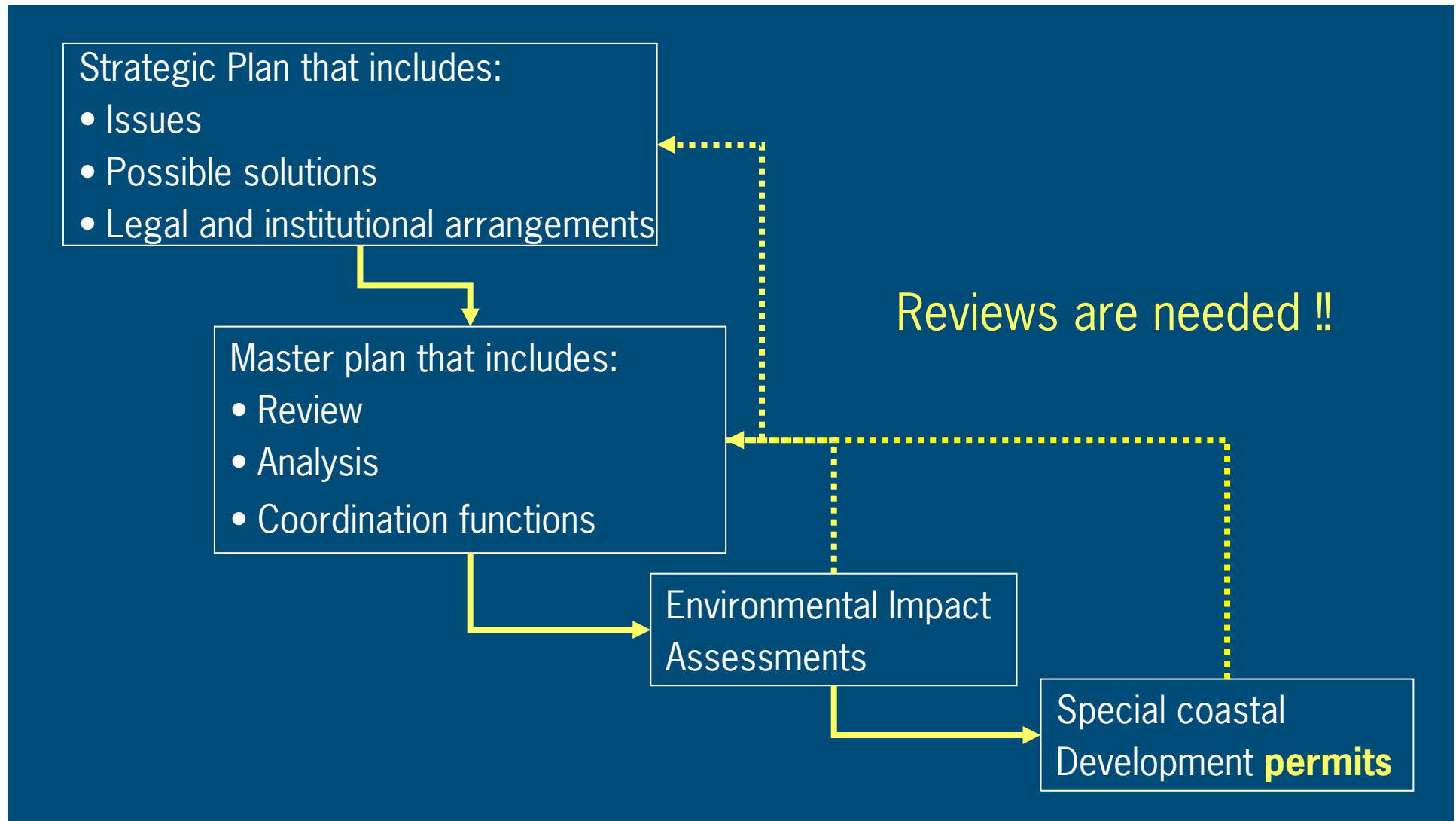


Priority setting is needed → zoning is required  
also for protected areas and restoration and  
rehabilitation areas

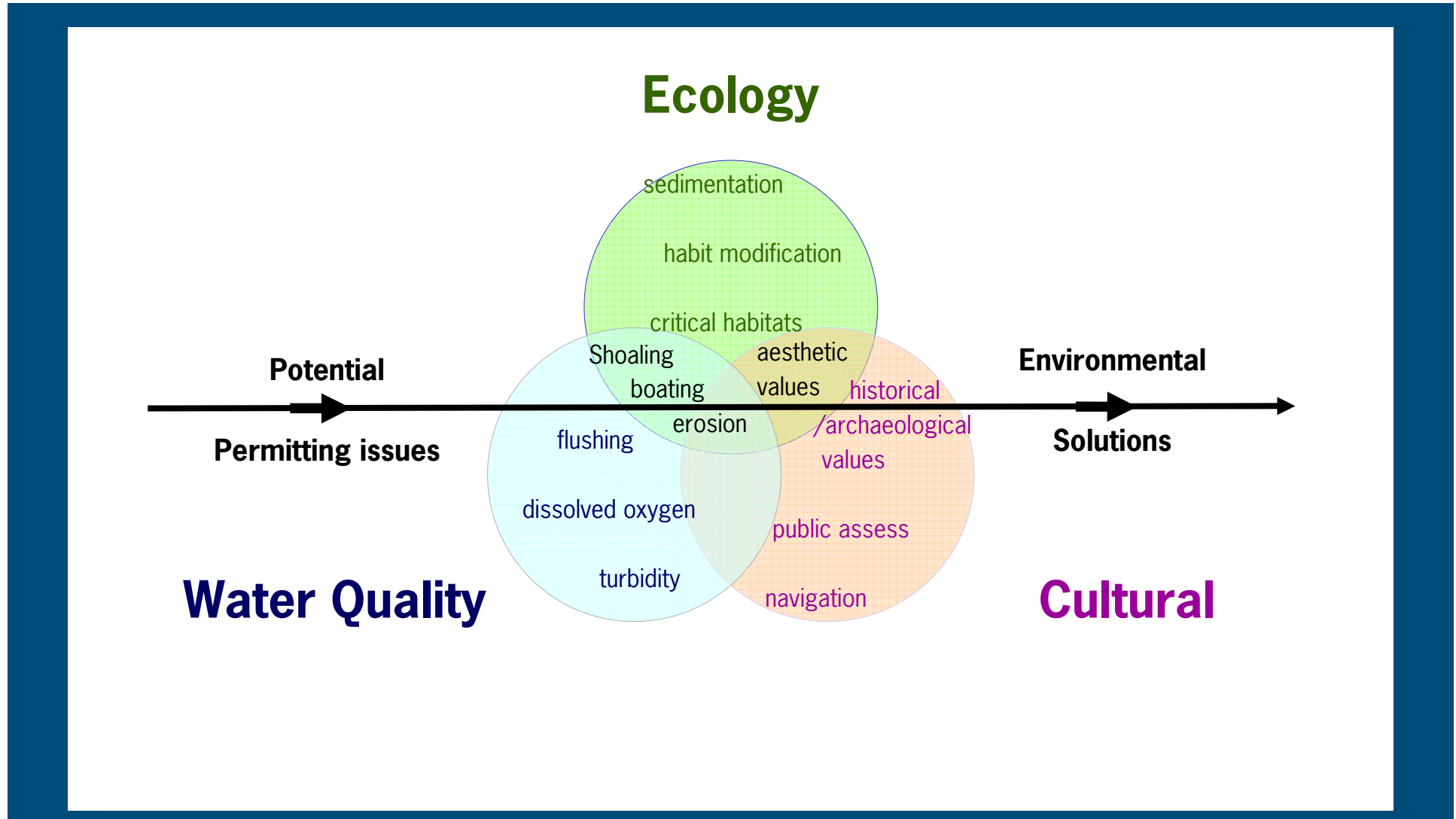


Enforcement & Conflict management  
is often required

# Master Plan: Regulatory program – permits and reviews



# Master Plan: Environmental impact assessment



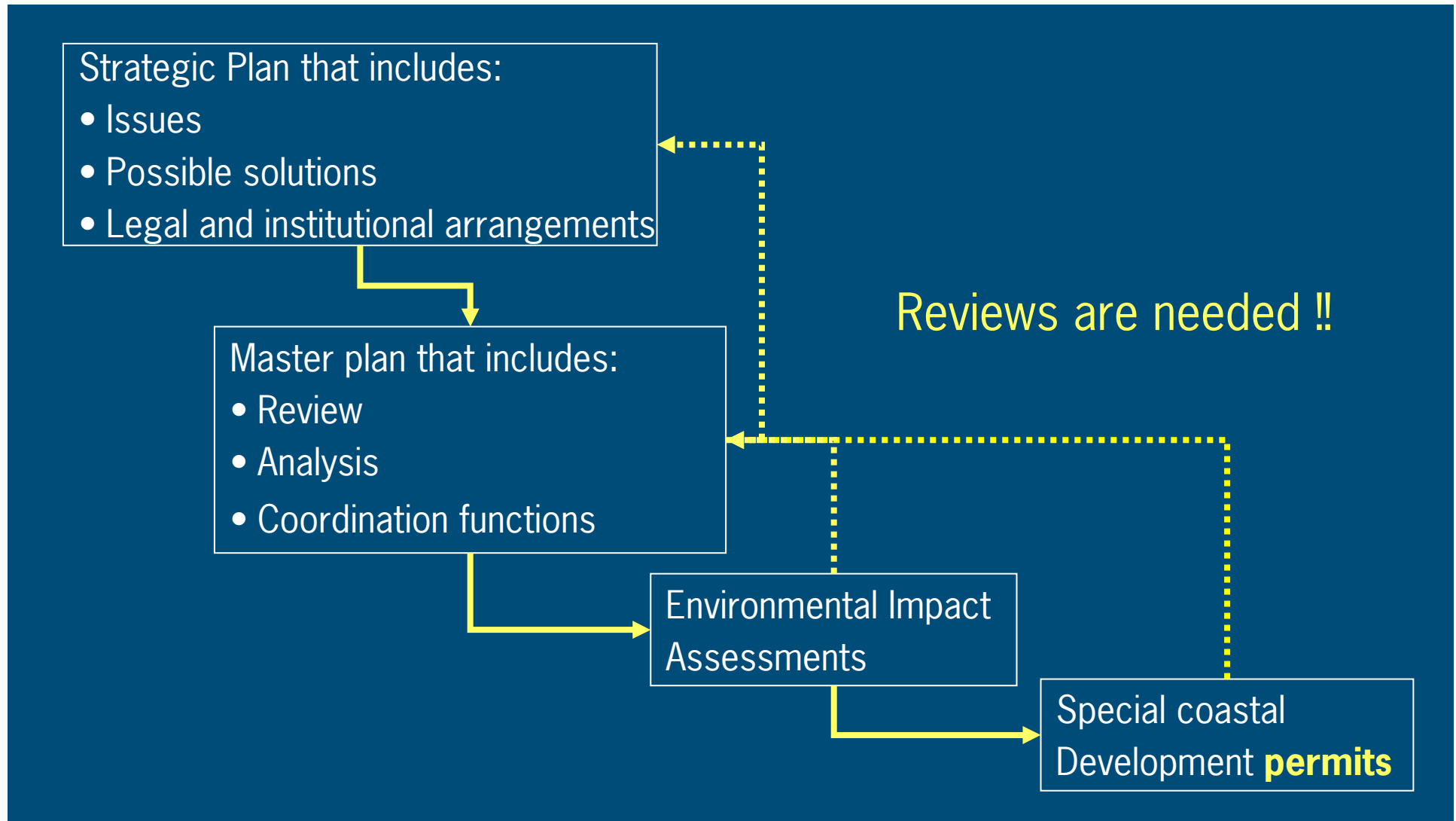
# Master Plan: Operational management

- 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



# Master Plan: Master Plan: Reviews and evaluation



# 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



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# Management strategies and Instruments

The challenges is yours !!



Thank you



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