SWIM and Horizon 2020 Support Mechanism

Working for a Sustainable Mediterranean, Caring for our Future

Visit to a site where combined ICZM – IWRM (including groundwater) is applied

The Integrative Methodological Framework (IMF): Integrating the Integrated

Presented by:

Prof. Michael SCOULLOS, Team Leader

Buna/Bojana, Montenegro

16-18 July 2018

This Project is funded by the European Union

Part I

Theoretical and Operational Background

The concept of Integrative Methodological Framework (IMF)
What is all about…

A long-term development of management efforts & experiences merging, on the one hand “mature” theoretical approach based on the evolution of principles and concepts about integrated management(s) (ICZM, IWRM…) and on the other hand practical experience gained from previous efforts to implement on the ground, and frequently in a complimentary way, integrated managements at coastal, river basin and groundwater level.

The IMF background

The coastal zone, simplistically defined as the area of interaction between the land and the sea, is a territory that attracts humans throughout history. It includes enclosed gulfs, bays and estuaries that are suitable for developing settlements and economic activities, for building marine and riverine ports, often hosting fertile plains and sites abundant with surface and groundwater.

The IMF background

Terrestrial, freshwater and marine ecosystems found in the coastal zone are among the most productive in the planet. These ecosystems are also among the most complex to study, and to manage, and the most threatened ones. Coastal zones are the site of active geological processes including erosion, sedimentation, alongshore and onshore sand transport, shoreline changes, wind/tidal flooding and dunes accretion.

The IMF background

They represent open and dynamic systems with numerous interactions within themselves ("internal") as well as with the wider natural and man-made environment beyond their boundaries ("external"). Significant changes, at any point in any part of these systems, may generate chain reactions far from their point of origin and possibly in a totally different system, whose environmental conditions could be subsequently altered (UNEP, 1995).

To “Integrate” the “Integrated”: ICZM

ICZM is a dynamic process for the sustainable management and use of coastal zones, taking into account at the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts (ICZM protocol).

The objectives of integrated coastal zone management (ICZM) are to:

(a) **facilitate**, through the rational planning of activities, **the sustainable development of coastal zones** by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development;

(b) **preserve coastal zones** for the benefit of current and future generations;

(c) **ensure the sustainable use of natural resources**, particularly with regard to water use;

(d) **ensure preservation of the integrity of coastal ecosystems**, landscapes and geomorphology;

(e) **prevent and/or reduce the effects of natural hazards** and in particular of climate change, which can be induced by natural or human activities;

(f) **achieve coherence between public and private initiatives** and between all decisions by the public authorities, at the national, regional and local levels, which affect the use of the coastal zone.

LDK CONSULTANTS

To “Integrate” the “Integrated”: IWRM

IWRM, is a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environnent (GWP,TEC, 2000).

Integrated Water Resources Management (IWRM)

According to the widely accepted Global Water Partnership (GWP) definition, is a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment.

CROSS-SECTORAL INTEGRATION

Enabling environment

Institutional roles

Management instruments

WATER FOR PEOPLE

WATER FOR FOOD

WATER FOR NATURE

WATER FOR INDUSTRY AND OTHER USES

LDK CONSULTANTS

To “Integrate” the “Integrated”: IRBM

IRBM, emerged as a "process of coordinating conservation, management and development of water, land and related resources across sectors within a given river basin, in order to maximise the economic and social benefits derived from water resources in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems." (GWP, TEC Paper No.4 on IWRM, 2000)/Compatibility with WFD.

In the EU countries and beyond, the EU WFD is used as an "interpretation" (to a certain extent) of the IWRM.

Water Framework Directive

- River Basin
- Participatory Processes
- Good ecological & chemical status

To “Integrate” the “Integrated”: CAGM

Coastal Aquifer and Groundwater Management and Planning (CAGM) was proposed by UNESCO IHP and aims to protect, enhance and to the extent possible, restore the status of all bodies of coastal groundwater.

Integration and a variety of aspects of management

Besides ICZM, IWRM and the Coastal Aquifer and Groundwater Management (CAGM), there are other more specific managements such as the Integrated Urban Water Management (IUWM).

Furthermore, there are important notions that are directly involved with "integrated management and planning" including the following:

- Holistic Approach/Holistic Management
- Ecosystem Approach or Ecosystem Based Approach (EBA)
- Sustainable Development Plans, Planning and Management
- Environmental Management and Planning, Physical/Space Planning (urban planning, e.g. city planning and management)
- Environmental Resource Management (ERM)

LDK CONSULTANTS

The links of ICZM and IWRM with physical, spatial, marine/maritime planning, etc.

Physical Planning is strongly related to land-use planning, urban design, transport planning, landscape planning, building plans, etc.

Spatial Planning refers to the methods used by the public sector to influence the distribution of people and activities in spaces at various scales as well as the location of the various infrastructures, recreation and nature areas.It operates from the large-scale national or regional down to the local.

Marine/Maritime Spatial Planning (MSP) is commonly understood as a public process for analysing and planning the spatial and temporal distribution of human activities in sea areas to achieve economic, environmental and social objectives.

Environmental Planning (EP) and **Integrated Environmental Management (IEM)** refer to the identification of desirable objectives for the physical environment, a subsystem of which is the coastal one, including social and economic objectives and the creation of administrative procedures and programmes to meet those objectives.

Environmental Resources Management (ERM) is the wider category within which water, in particular, and other natural resources management approaches are included.

CONSULTANTS

Within the evolution of Integrated Managements “new” notions and aspects were introduced, namely the :

(1) Water-energy-food-ecosystem security / nexus

(2) “S2S”, “Source to the Sea” approach

(3) Integrated Urban Water Management (IUWM), where water and land planning are interlinked (Physical and City Planning consensus).

(4) The Agenda 2030 and the SDGs.

(5) The Biosphere Reserves/MAB UNESCO approach

LDK CONSULTANTS

The 12 Principles of the Ecosystem Approach (ECAP) or Ecosystem Based Approach (EBA)

1: Recognise objectives as society's choice.

2: Aim for decentralised management (i.e. subsidiarity).

3: Consider the extended impacts, or externalities.

4: Understand the economic context and aim to reduce market distortion.

5: Prioritise ecosystem services

6: Recognise and respect ecosystem limits.

7: Operate at an appropriate scale, spatially and temporally.

8: Manage for the long-term, considering lagged effects.

9: Accept change as inherent and inevitable.

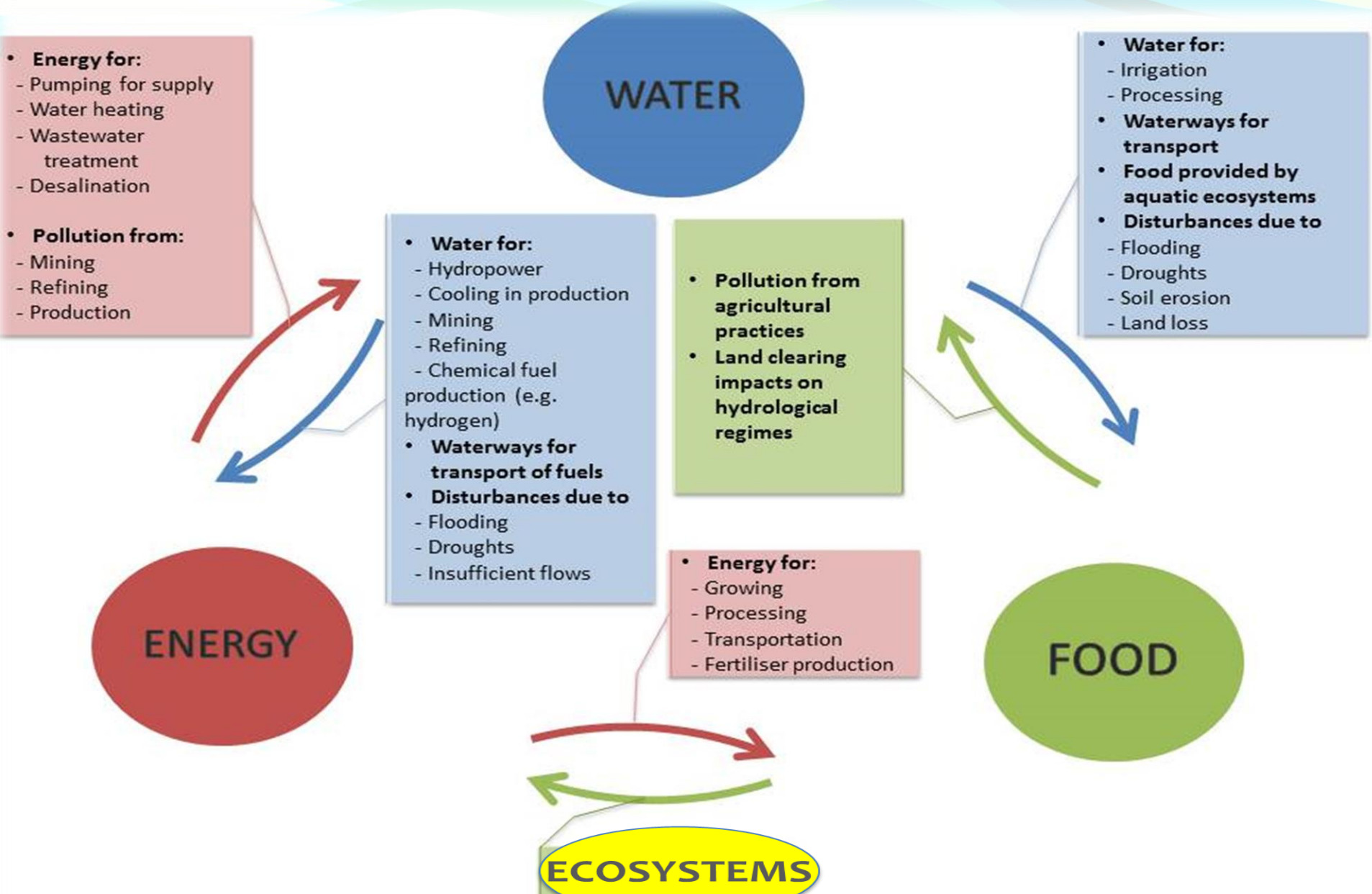
10: Balance use and preservation.

11: Bring all knowledge to bear.

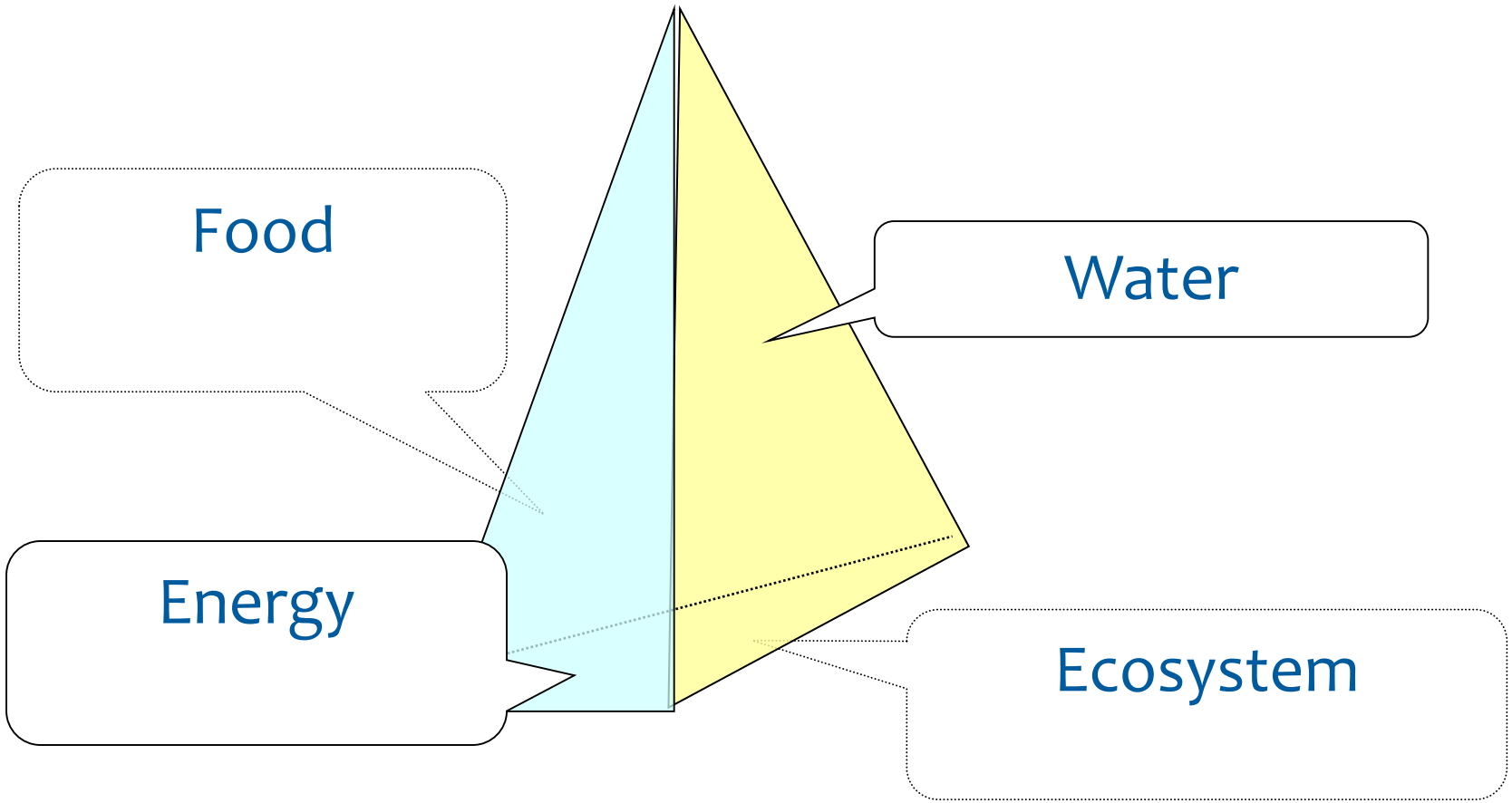
12: Involve all relevant stakeholders.

LDK CONSULTANTS

The 'nexus' of water, energy, food and ecosystems



Prerequisite for sustainable development in a specific area is an integrated management across the entire 'nexus' of water, energy, food and ecosystems



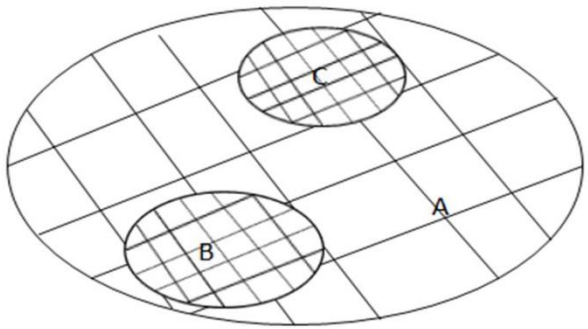
SDGs

In 2015 all UN Member States unanimously decided to achieve 17 Sustainable Development Goals and 169 targets by 2030.

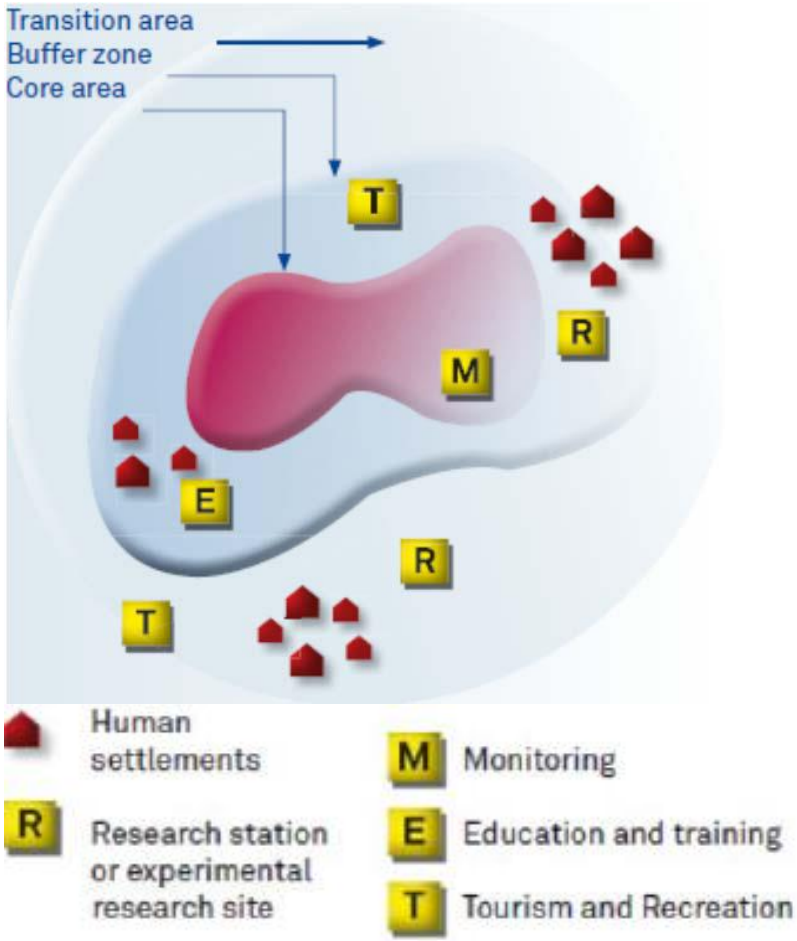
Many of the specific activities to achieve the SDGs could (and should) be included within the Integrated Plan.

LDK CONSULTANTS

The “Man and the Biosphere” (MAB/UNESCO) approach

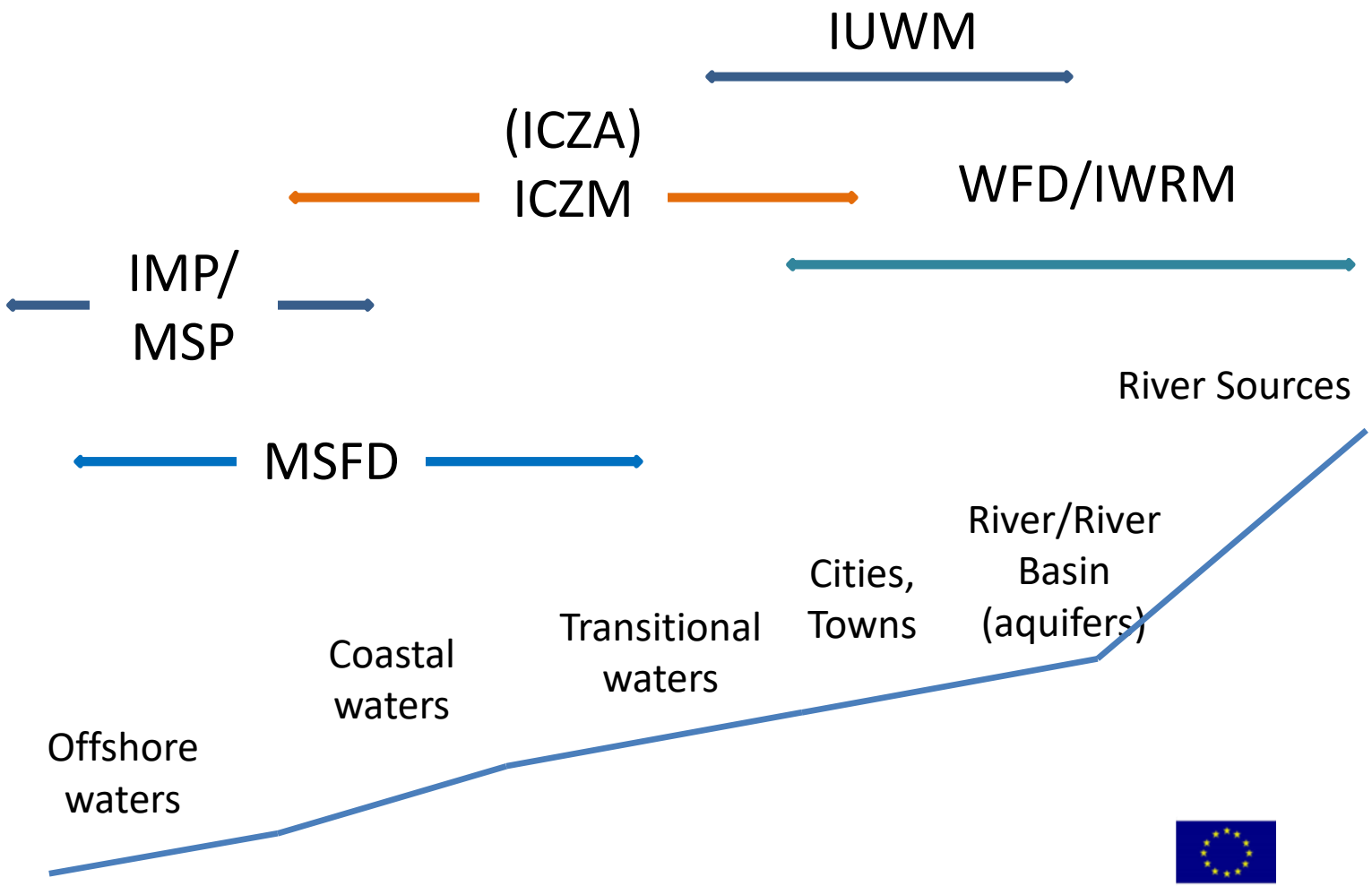


The concept of differentiated intensity of management: in C>>B>A



Biosphere Reserve zonation

Currently various management tools are applied



Integration and various aspects of management

Management includes the sum, or better, the “cluster” of all kinds of measures, approaches and tools, employed in order to handle them in the most appropriate way. Most often management is defined through five functions: to plan, to organise, to equip, to direct and to control.

“Integrated management” allows for more complete understanding and accurate representation of the whole, respecting, however, the differentiations within it. It is still a “coordinated” approach but is not a “homogenous” one.

On the other hand, the “holistic” approach considers the “holon” (the whole), as an entity recognizing that the whole includes and represents more functions and characteristics than the sum of its parts/components.

Obviously, the two approaches are complementary.

LDK CONSULTANTS

Specific Objectives of the IMF

The specific objectives of the IMF are to:

1. Provide the rationale and the technical tools for a collective and coherent response to the multiple policy goals and directives that relate to the utilization, development and protection of coastal areas at national and local level and their natural and ecological resources.
2. Ensure that policy instrument mixes are consistent and mutually supportive.
3. Produce policy outcomes appropriate to specific coastal zone problem context.
4. Secure best knowledge base and support the interdisciplinary approach needed for the successful preparation of an integrated Plan.
5. Add value to individual approaches in order to obtain maximum synergy responding to the principle that '*the whole is greater than the sum of the parts'.*

LDK CONSULTANTS

Specific Objectives of the IMF

6. Satisfy different legal requirements through a shared, efficient and effective use of often limited human and logistical resources available for such process, including reducing costs for planning and particularly for the setting and implementation of management options identified in the Plan.

7. Respond effectively to the more dynamic environment resulting from climate change and development impacts.

8. Achieve shared ownership by the involved sectors through better coordination and integration of them in the planning process.

9. Achieve sustainable coastal development in the Mediterranean estuaries and wetlands.

10. Simplify monitoring, evaluation and reporting.

LDK CONSULTANTS

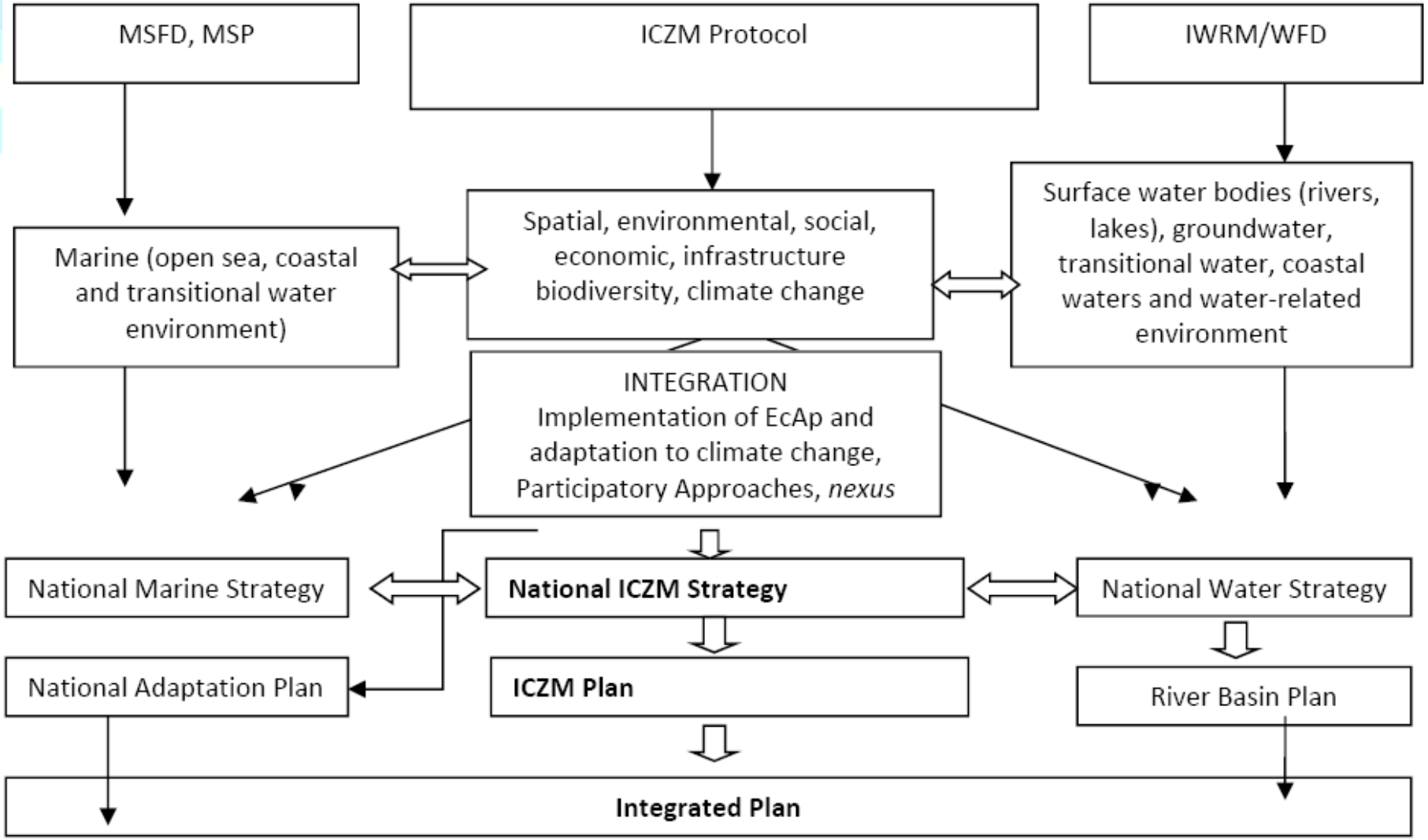


Figure 1: Coastal zone relevant international legislations and resulting obligations

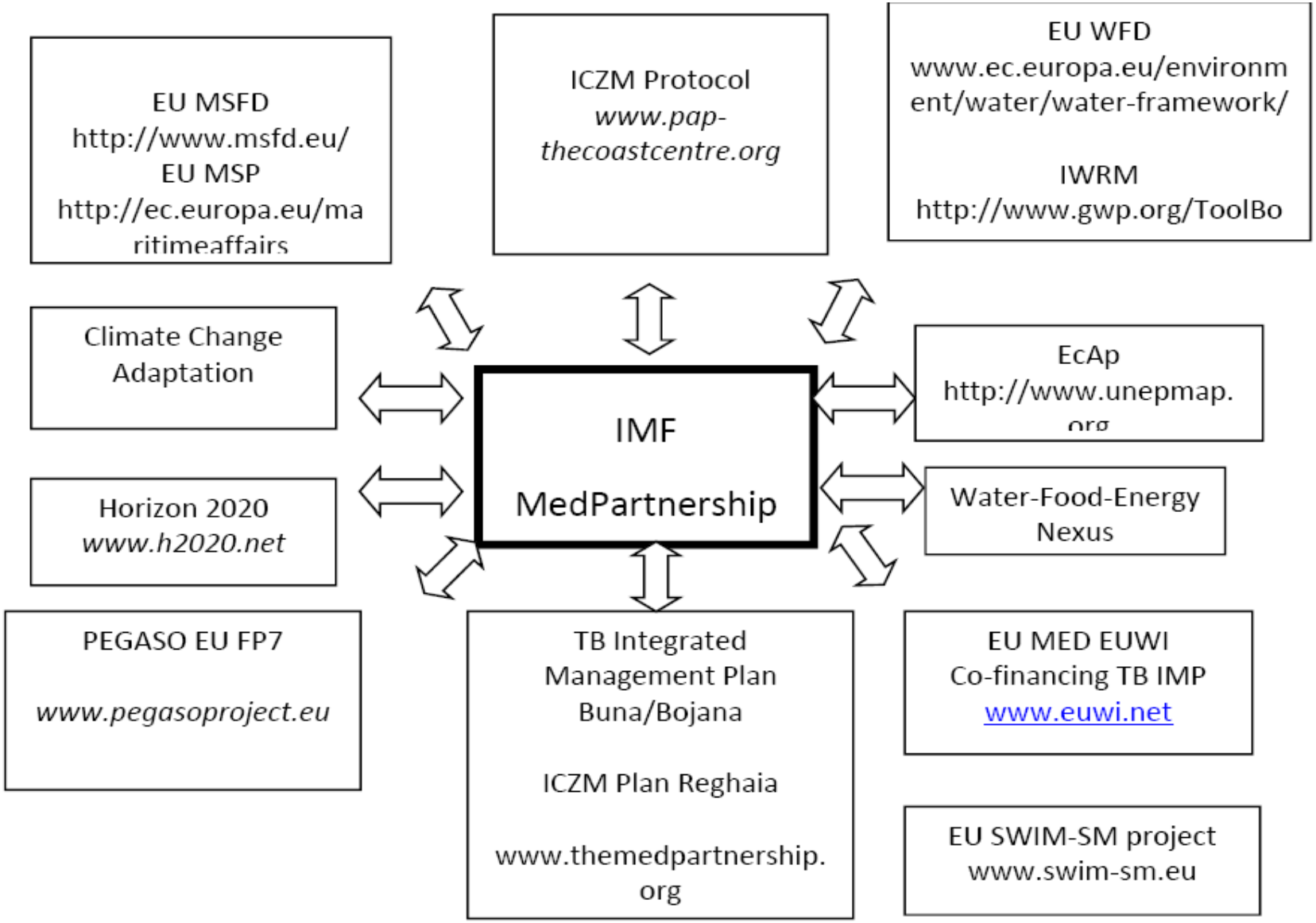


Figure 2: Synergies created

The Sustainable Development Objective of Integrated Plans

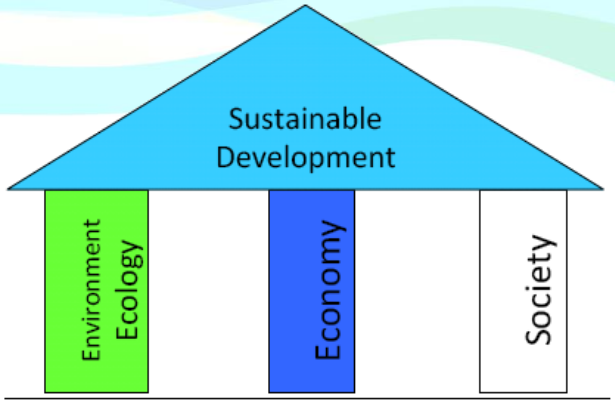


Figure 7: The Sustainable Development and its pillars according to Rio (1992)

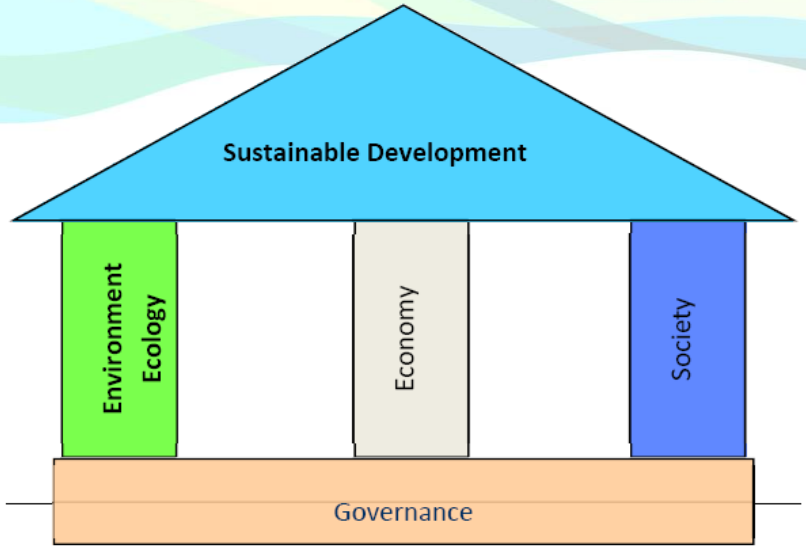


Figure 8: The proposed place of Governance in the Sustainable Development Structure

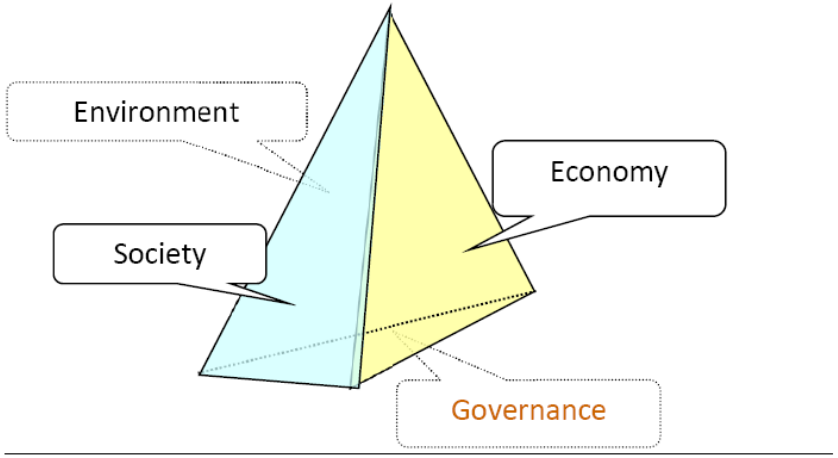


Figure 9: The tetrahedron of Sustainable Development: the new structure for Sustainable Development

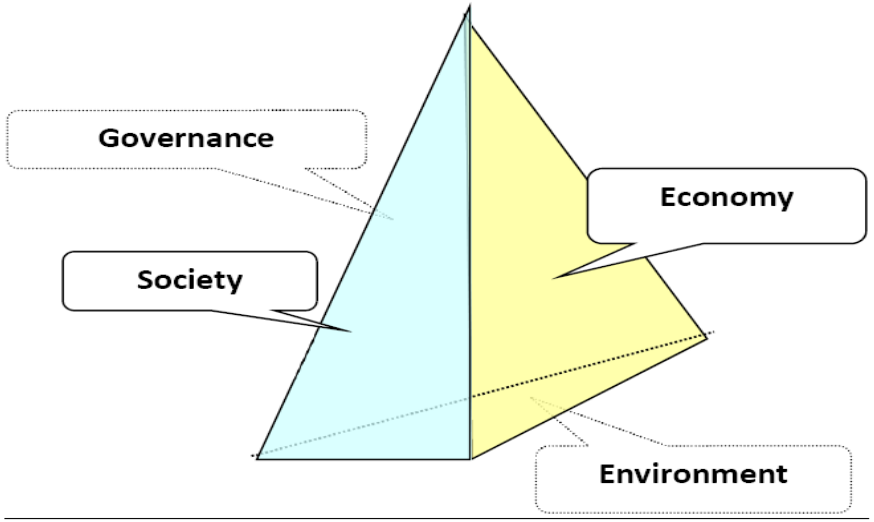


Figure 10: The "anthroposphere" based on the natural environment

The Role of Governance

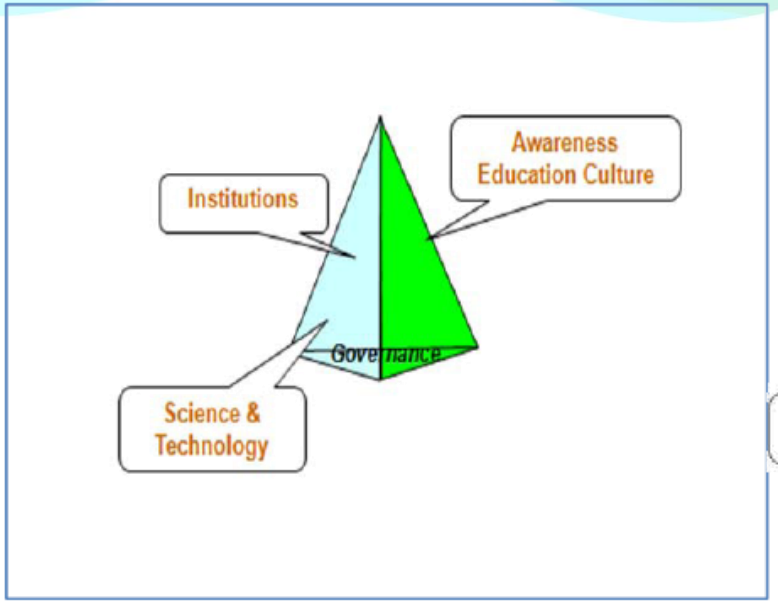


Figure 11: The analysis of Governance, Tools to Obtain Sustainable Development

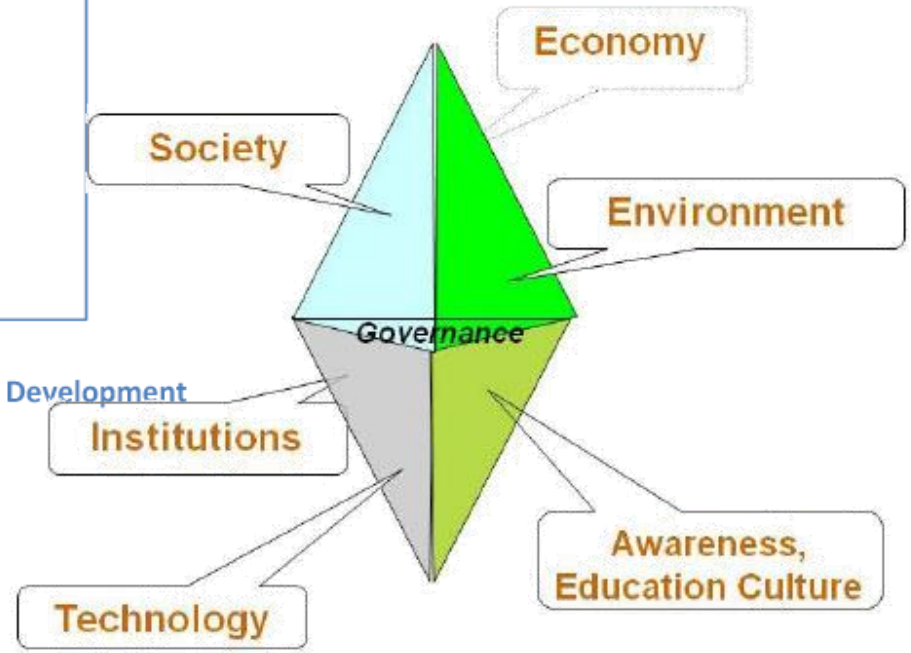


Figure 12: Sustainable development and tools to achieve it

LDK CONSULTANTS

Basic concerns: Multi - and trans – disciplinarity; Implementability; Relevance and Adaptability; Priority vs. Sectoral Approach

Traditionally, integrated plans and management, both IWRM and ICZM, were inspired and informed by natural processes and mechanisms involving circulation of water (water & sediment) and energy (photosynthesis, energy production and consumption). Understanding of the basic processes in nature requires a *multi* and *trans* disciplinary approach. Multi and trans- disciplinarity should include other fields of knowledge and expertise, as well.

So, the basis of integration is the proper understanding of all the following:

- Basic biogeochemical processes in nature.
- Basic socio-political and economic parameters.
- Basic cultural and behavioral features of the groups/stakeholders involved.
- Governance strengths and bottlenecks.

LDK CONSULTANTS

Various aspects of integration of ICZM with IWRM & other frameworks (1/7)

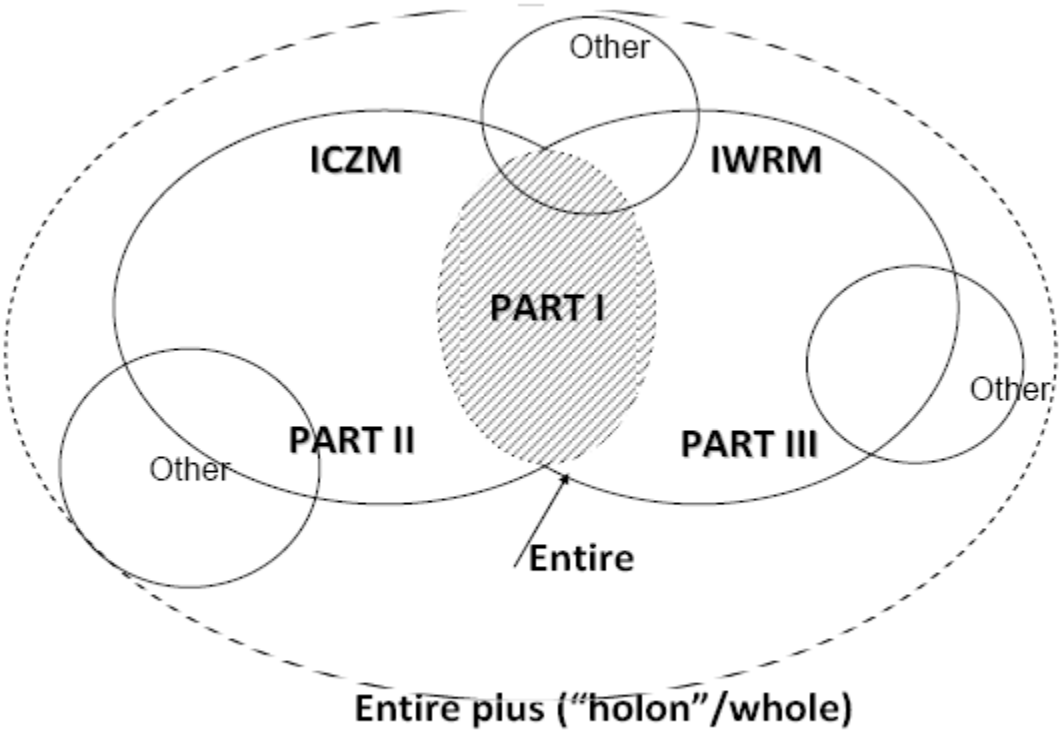


Figure 13: Visualisation of ICZM, IWRM and other management practices

Various aspects of integration of ICZM with IWRM & other frameworks (2/7)

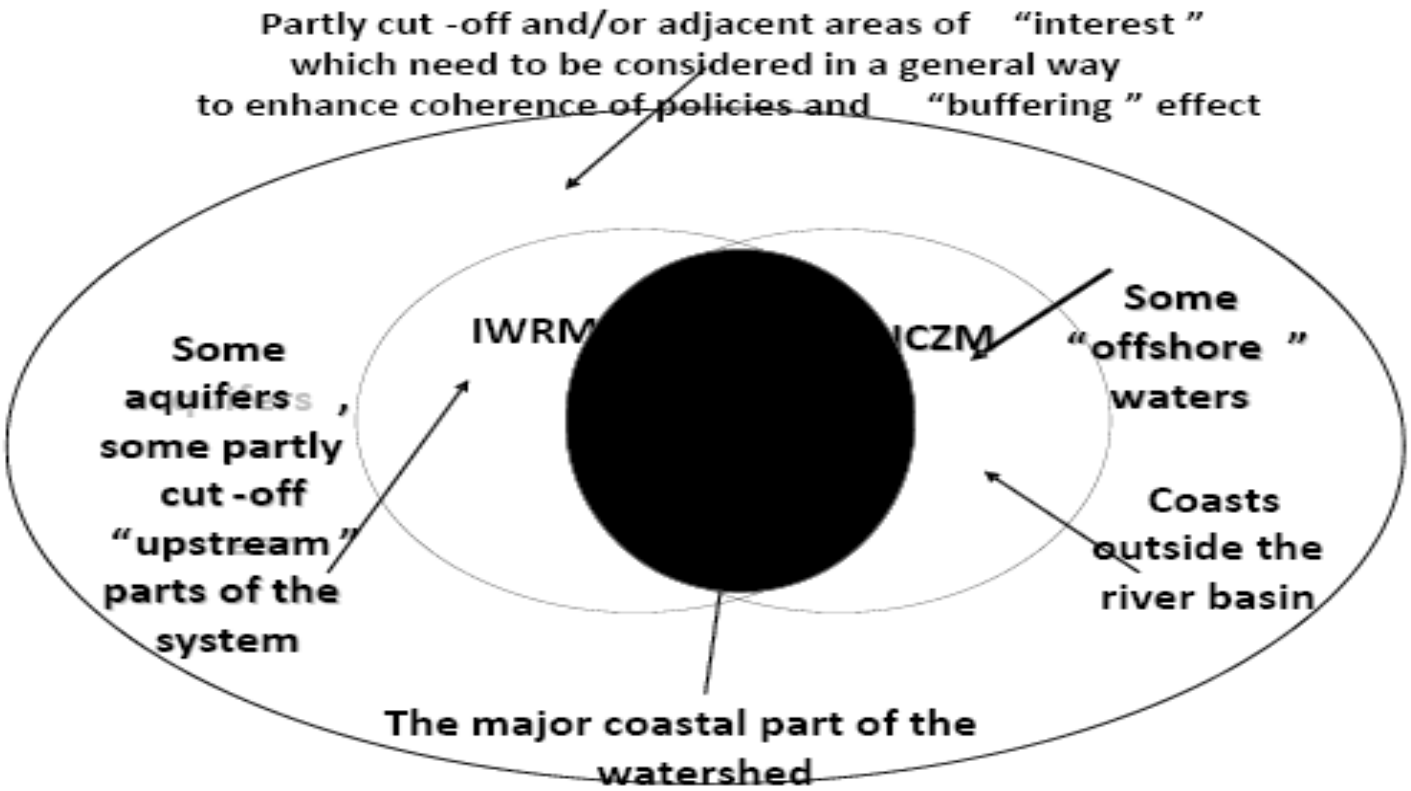


Figure 14: Integration and Geographical Coverage

Various aspects of integration of ICZM with IWRM & other frameworks (3/7)

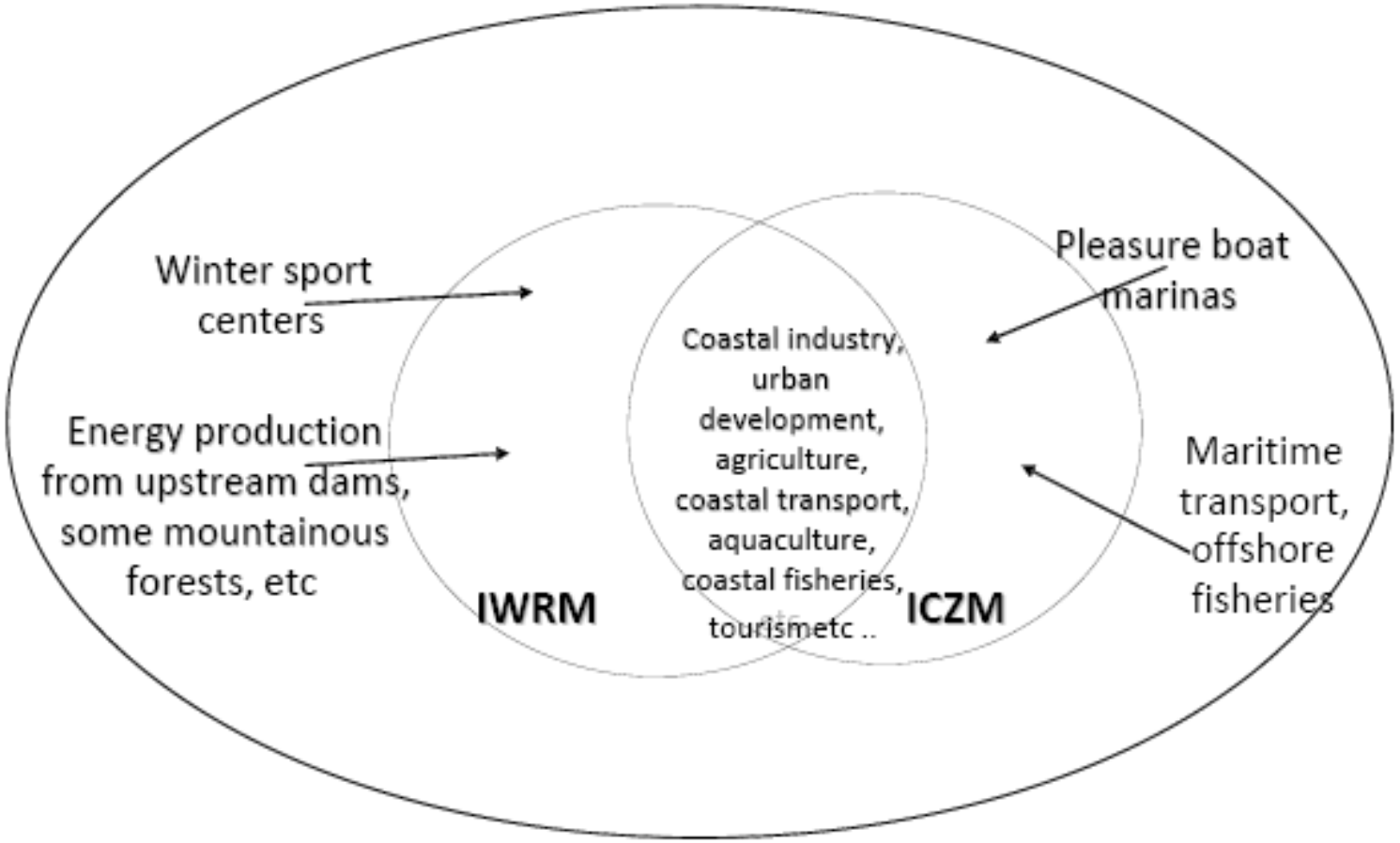


Figure 15: Integration across sectors

Various aspects of integration of ICZM with IWRM & other frameworks (4/7)

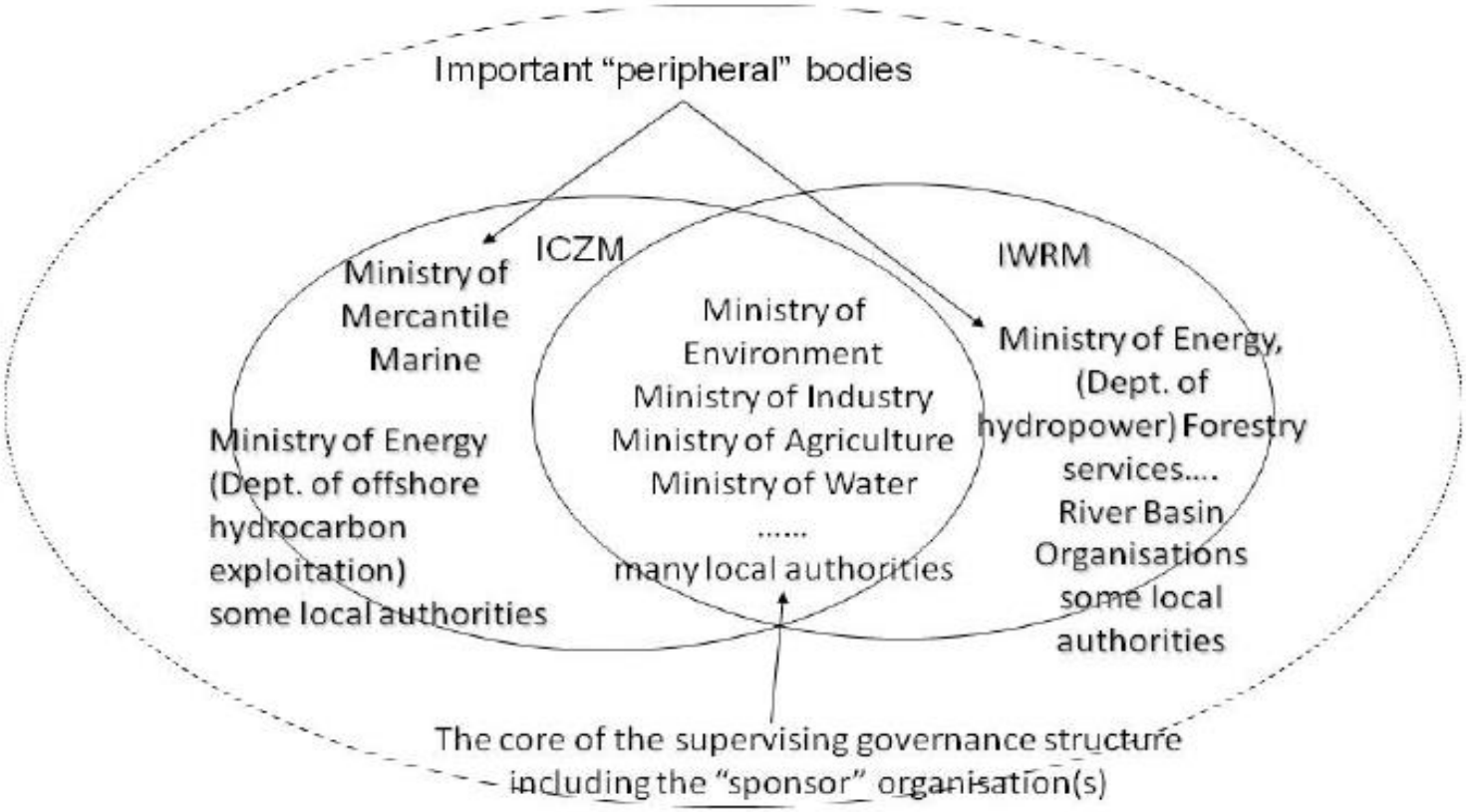


Figure 16: Coordination for Integration

Various aspects of integration of ICZM with IWRM & other frameworks (5/7)

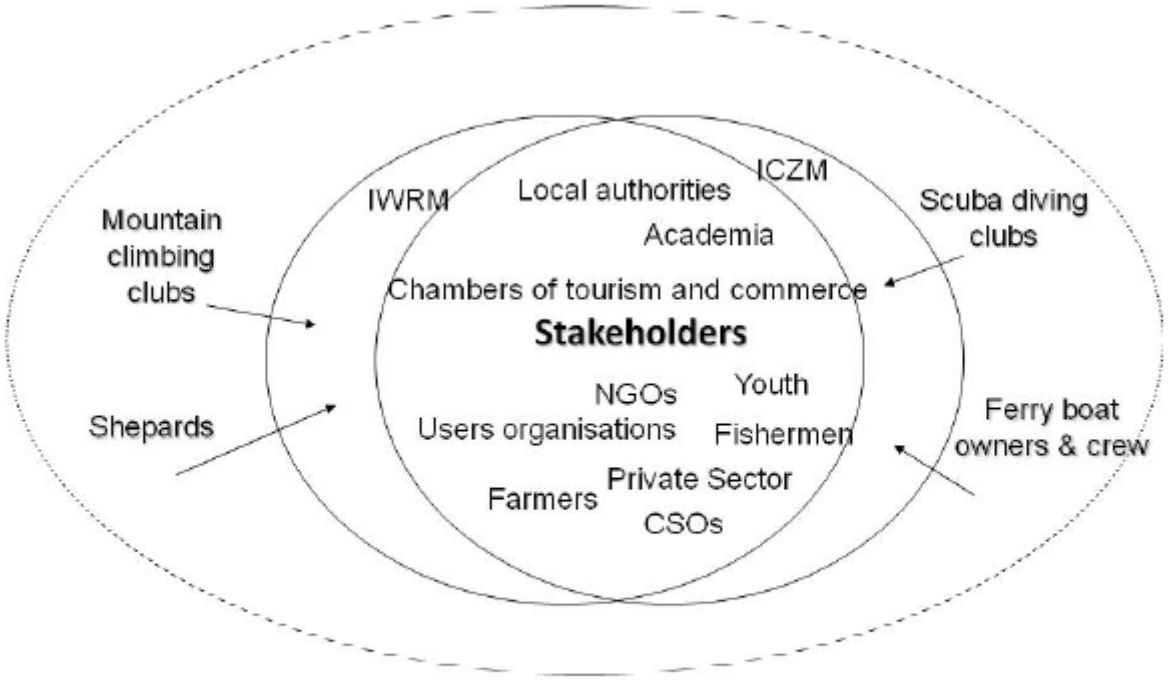


Figure 17: Stakeholders involved in Integration

Various aspects of integration of ICZM with IWRM & other frameworks (6/7)

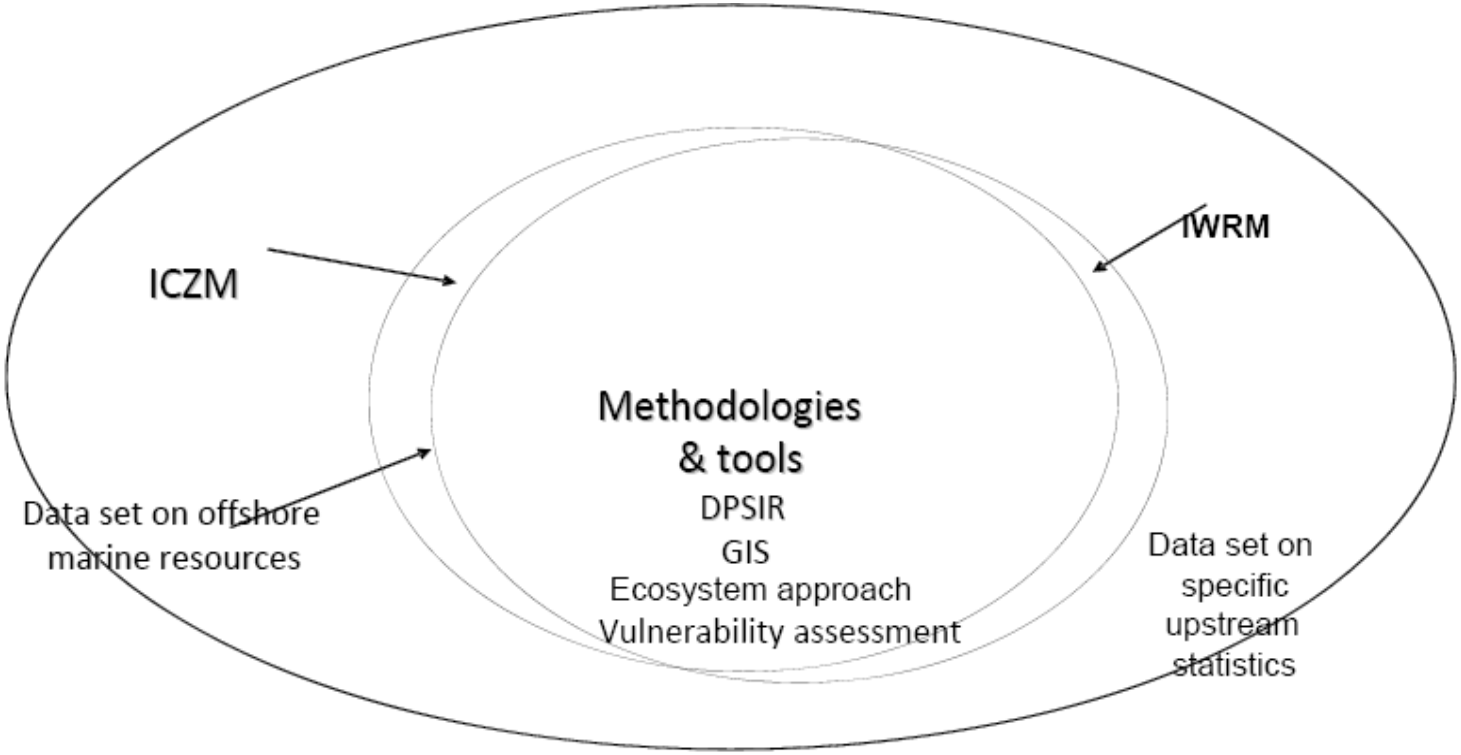
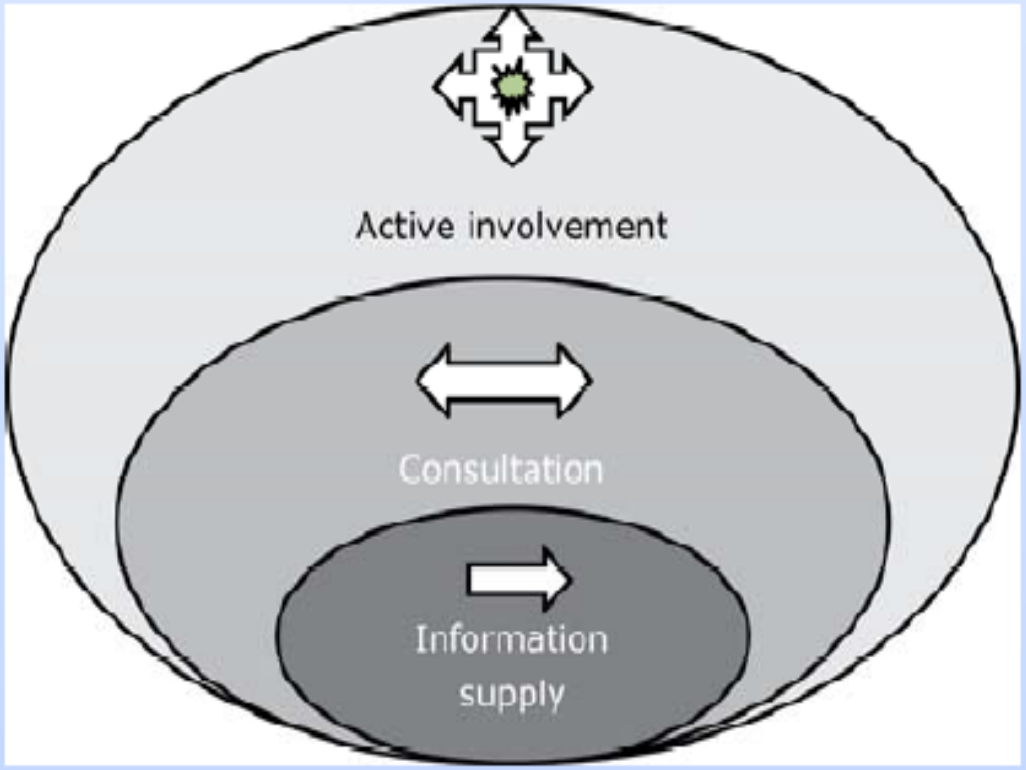


Figure 18: Methodologies employed for integrated planning and management

Various aspects of integration of ICZM with IWRM & other frameworks (7/7)

Figure 21: Three levels of public participation, after WFD Guidance document no 8 (CIS Working group, 2.9, 2003)



Part II

Designing and implementing the Integrated Plan.

In this part we apply a step-wise approach for the design/compilation/drafting and implementation of an Integrated Management Plan following the IMF Methodology.

The DPSIR Framework is in essence an analytical approach. It could be performed rapidly (in a preliminary way), in advance of every other step in order to gather the necessary information to broadly orient our thinking and planning.

Similarly, it is necessary to remember that integration is in essence a “tool” and “prerequisite” for proper “implementation” and it is, therefore linked with a number of other “I”s, which are “qualities” that the integrated plan should have.

DPSIR framework
Driving Forces-Pressures – State of the Environment-Impacts -Responses

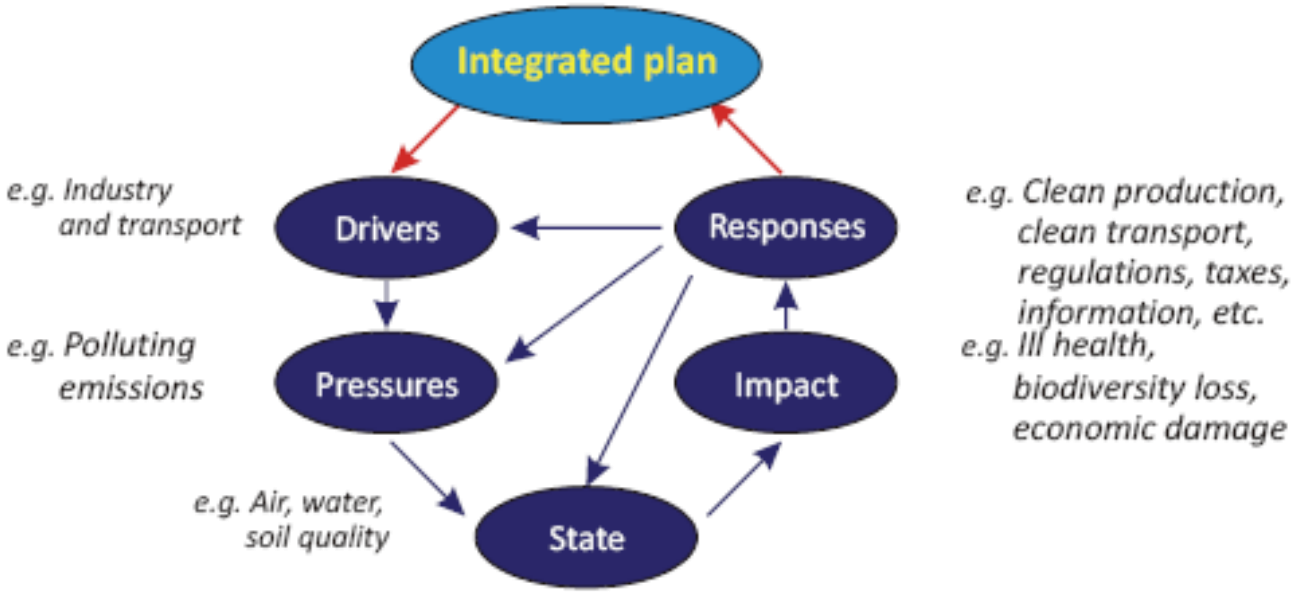


Figure 5.1. DPSIR Framework informs the preparation of the Integrated Plan

The seven I's

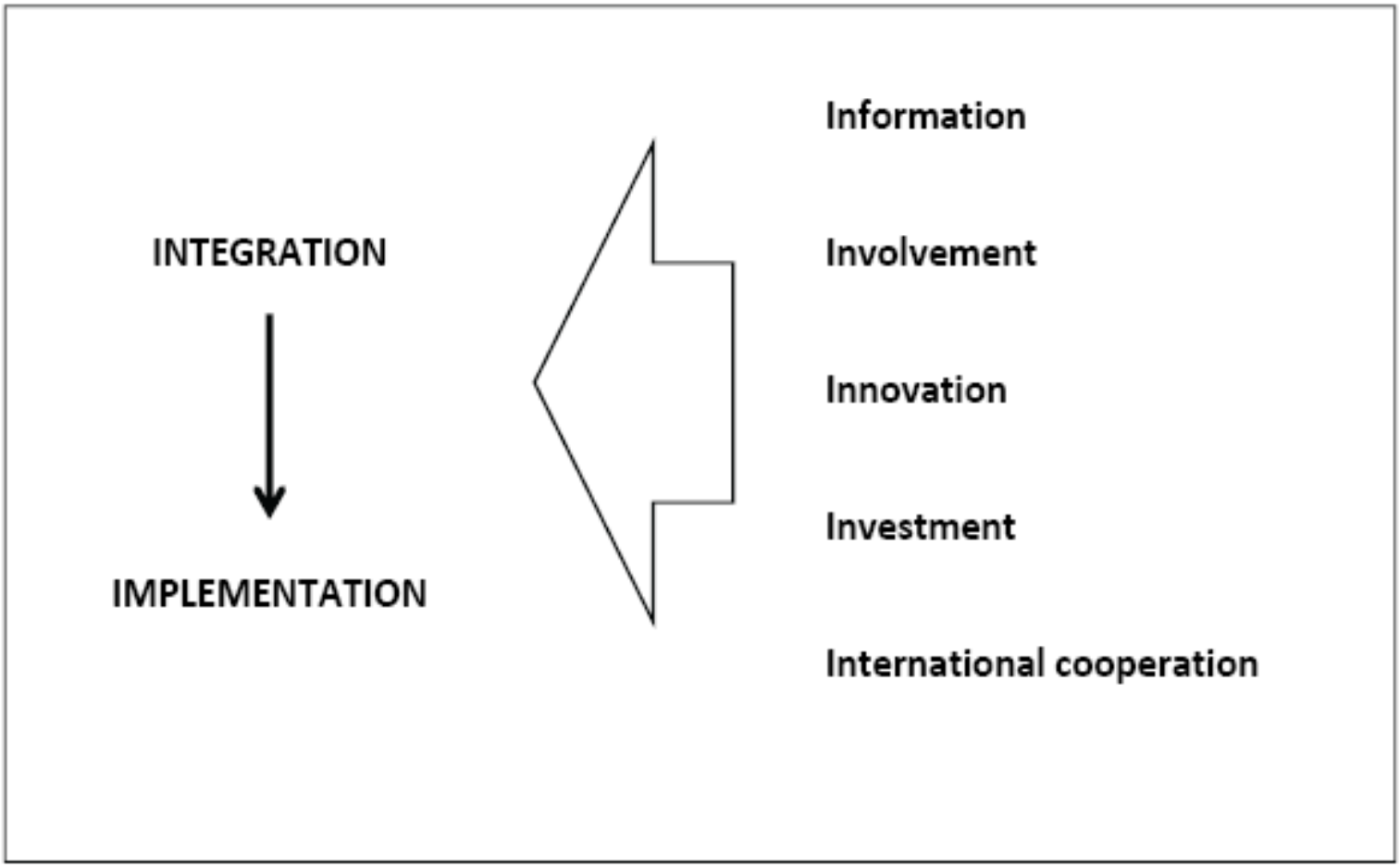


Figure 5.2. The Seven I's

Plan preparation overview

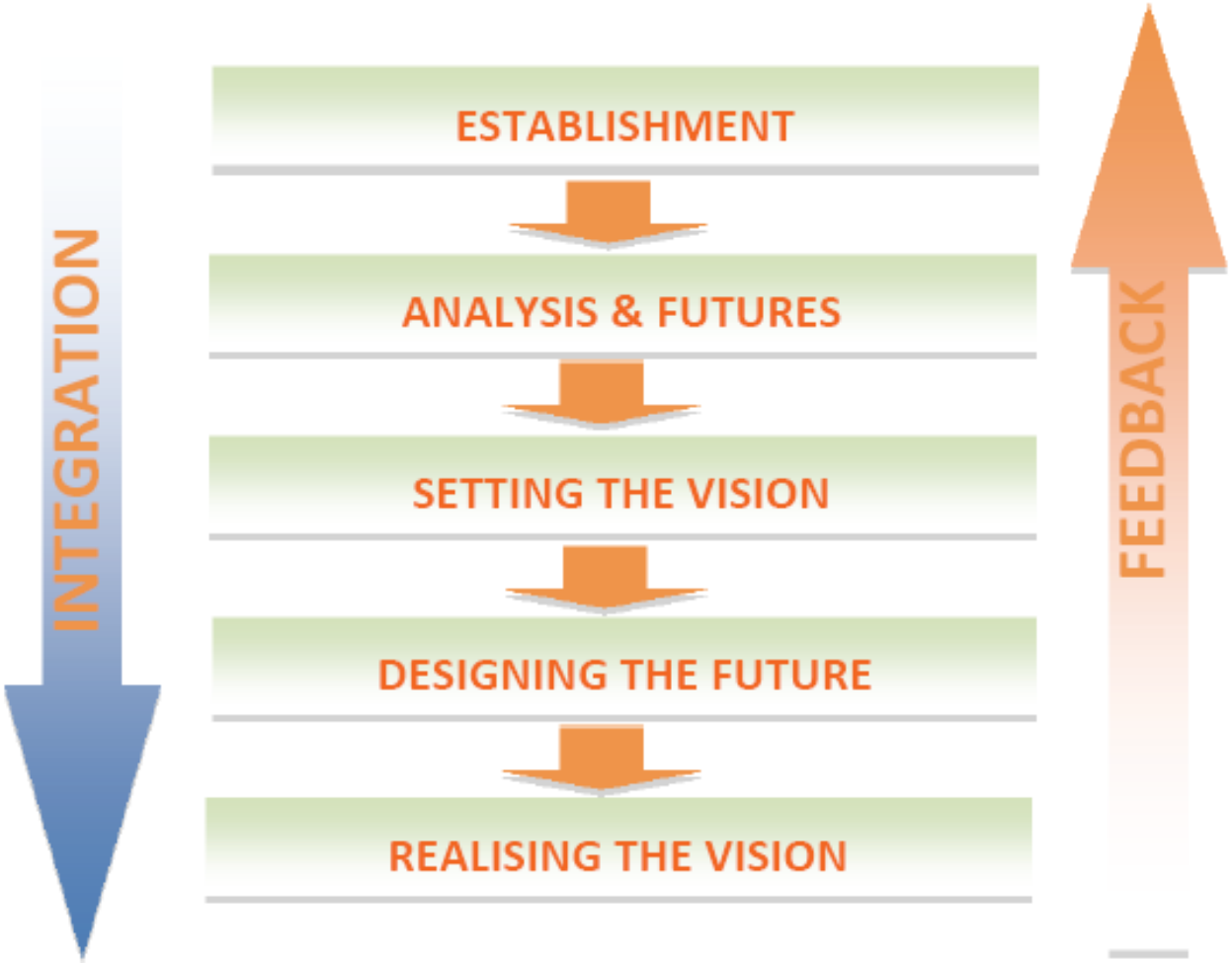


Figure 5.3. Plan preparation and implementation process: overview

Plan preparation-details

Figure 5.4. Plan preparation and implementation process: detail

1. Establishment

1. Defining the initial territorial scope by identifying the boundaries of the specific plan area (including its coastal front) and the ecosystems involved
2. Scoping of the major river basin issues
3. Defining the governance context
4. Engaging stakeholders and preparing communication strategy
5. Proposing a potential vision for the plan area
6. Deciding on Strategic Environmental Assessment (SEA).

2. Analysis and Futures

1. Building the evidence: closer analysis of key issues where needed and undertaking the DPSIR policy cycle, in more depth and detail.
2. Identifying futures: building alternative scenarios and, if conditions allow, testing (including pilot actions and identifying potential future funding sources).

3. Setting the Vision

1. Building consensus – reaching agreement among stakeholders and the wider community on the key problems, issues and priorities for the plan area
2. Preparing the vision statement (setting the direction) – observing the priorities and the consistency of the objectives of the plan
3. Measuring success – selecting the necessary set of (at least preliminary “core”) indicators to measure the success of both the planning process and its outcomes.

4. Designing the Future/The Plan

1. Formulating the Management Plan and pilot actions that may constitute the basis of a workplan, simultaneously observing the planning process and programme formulation
2. Establishing the inter-sectoral management/governance, facilitation and consultation structures for the long-term, post-plan period
3. Embedding-obtaining formal approvals for funding/institutional support and legal adoption

LDK CONSULTANTS

5. Realizing the Vision

1. To implement legal, economic and spatial instruments & management processes/ mechanisms
2. To raise public awarenesss and enhance partnerships
3. To secure financing & investment
4. To monitor & review the implementation of the Plan providing constant feedback into the review of the plan and programme.

Adaptive Management (1/4)

"**Adaptive Management**" is not another type of management but rather a quality that all integrated management plans should have. Key principles of the Adaptive Management are the following:

- **Flexibility and adaptability of the measures** to implement ICZM and IWRM including groundwater management and any other compatible planning inputs.
- Regular **update of sustainability targets** to take into account the changes observed (opportunities and bottlenecks) in the system.
- Provisions for integration of the outcomes of future scientific research.

The main instruments/methods employed for its implementation are:

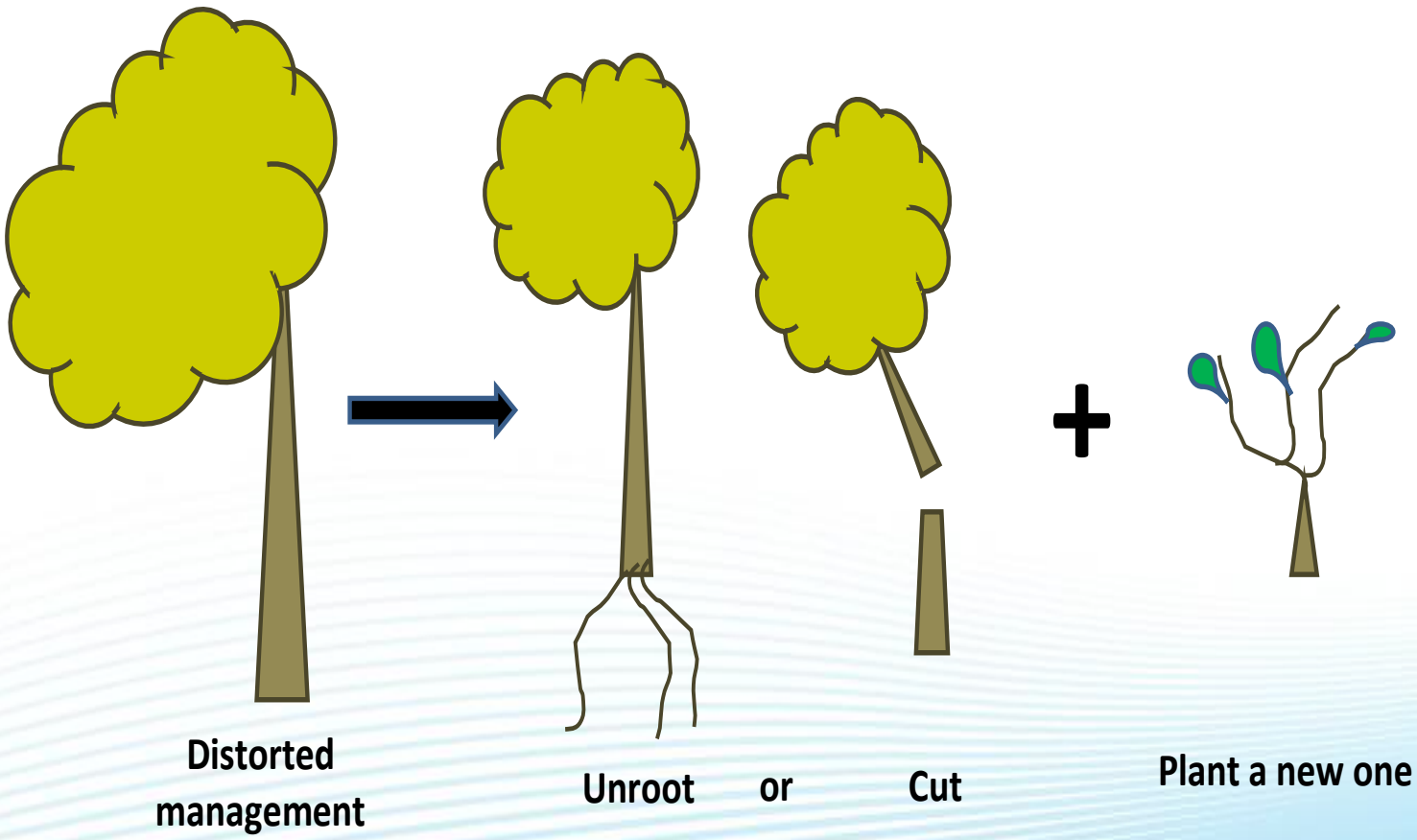
-Monitoring programmes: measuring progress towards targets (GES or "fit for purpose/use"), using sets of targets

-Update and ameliorate strategies according to the outcomes of the monitoring process.

LDK CONSULTANTS

Adaptive Management (2/4)

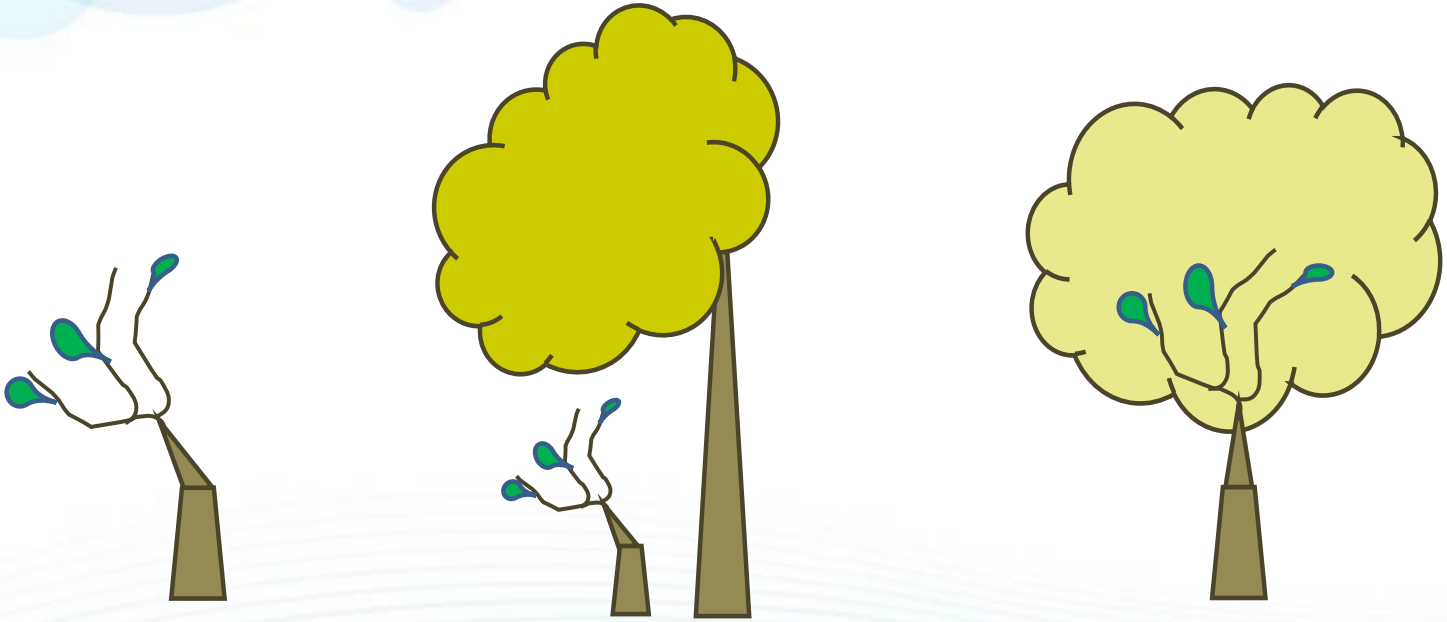
The Common Approach



Adaptive Management (3/4)

The Usual Result…

Very rarely…



The new management distorted due to inherent conditions

or

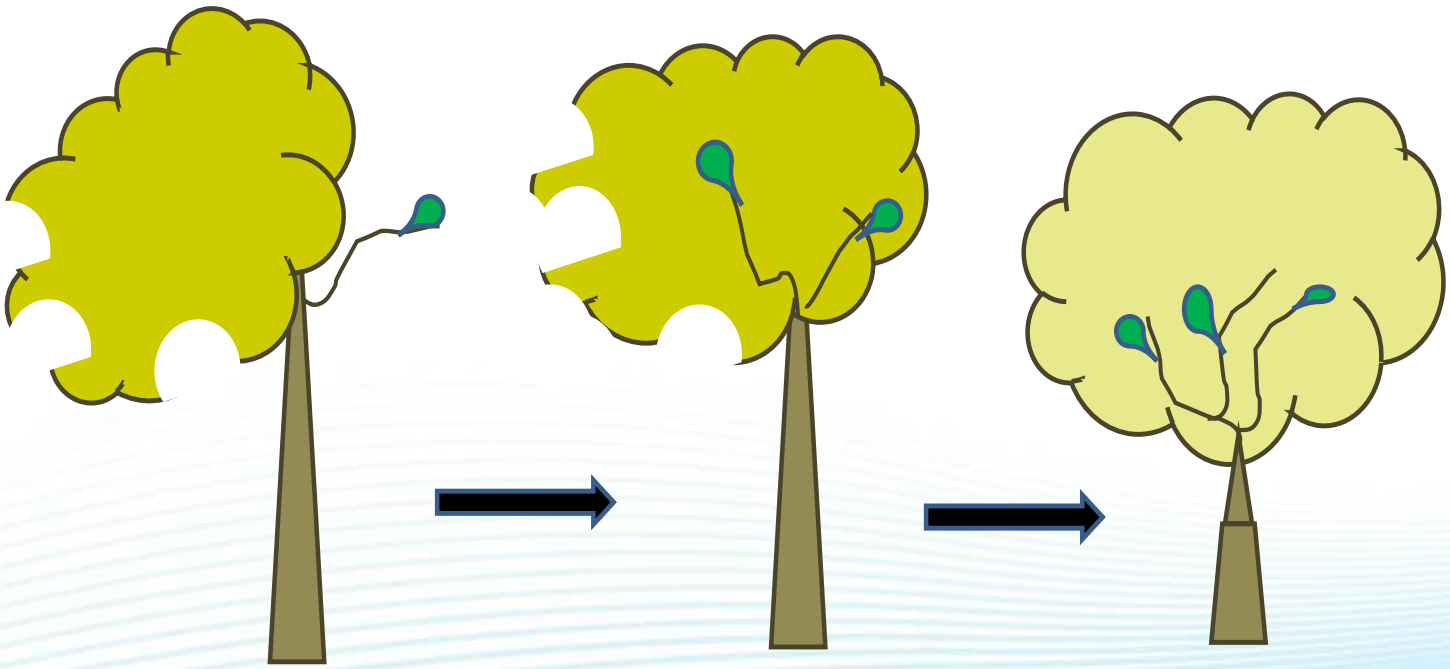
Distorted due to resilience of the old system

www.h2020.net

LDK CONSULTANTS

Adaptive Management (4/4)

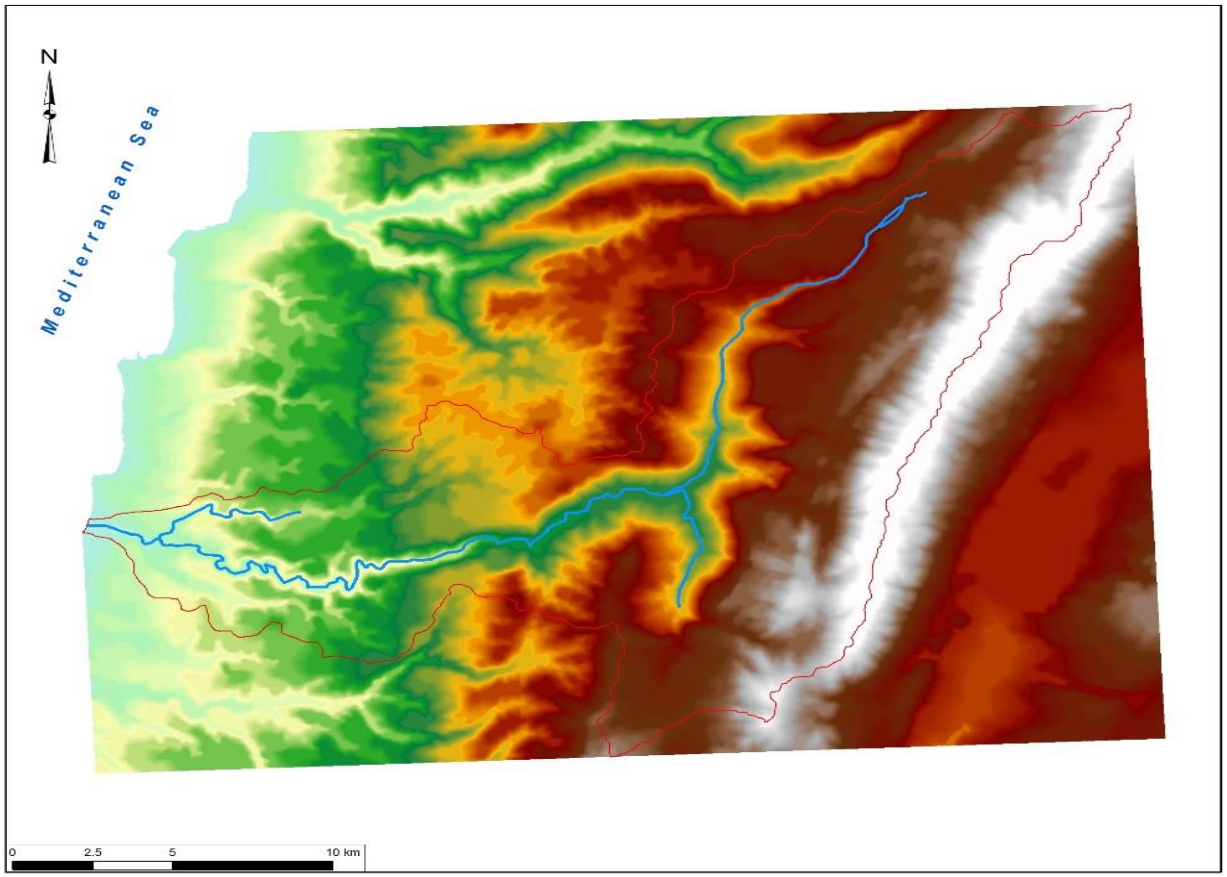
Adaptive management

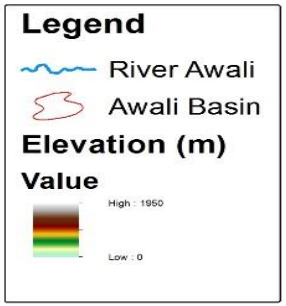


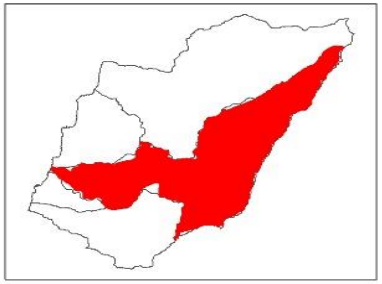
Experiences **from selected case studies Buna Bojana, Lake Bizerte, Awali, etc.**

Awali Basin Lebanon

Awali Basin: Topographic map







Experience from the Lake Bizerte, Tunisia

CARTE DU RÉSEAU D'ASSAINISSEMENT STRUCTURANT

European Investment Bank

Horizon 2020

INVESTMENT COMPONENT | MeHSIP-PPIF

EUROMED

LDK CONSULTANTS

ATKINS

COMETE engineering

Experience from the Buna-Bojana Transboundary basin

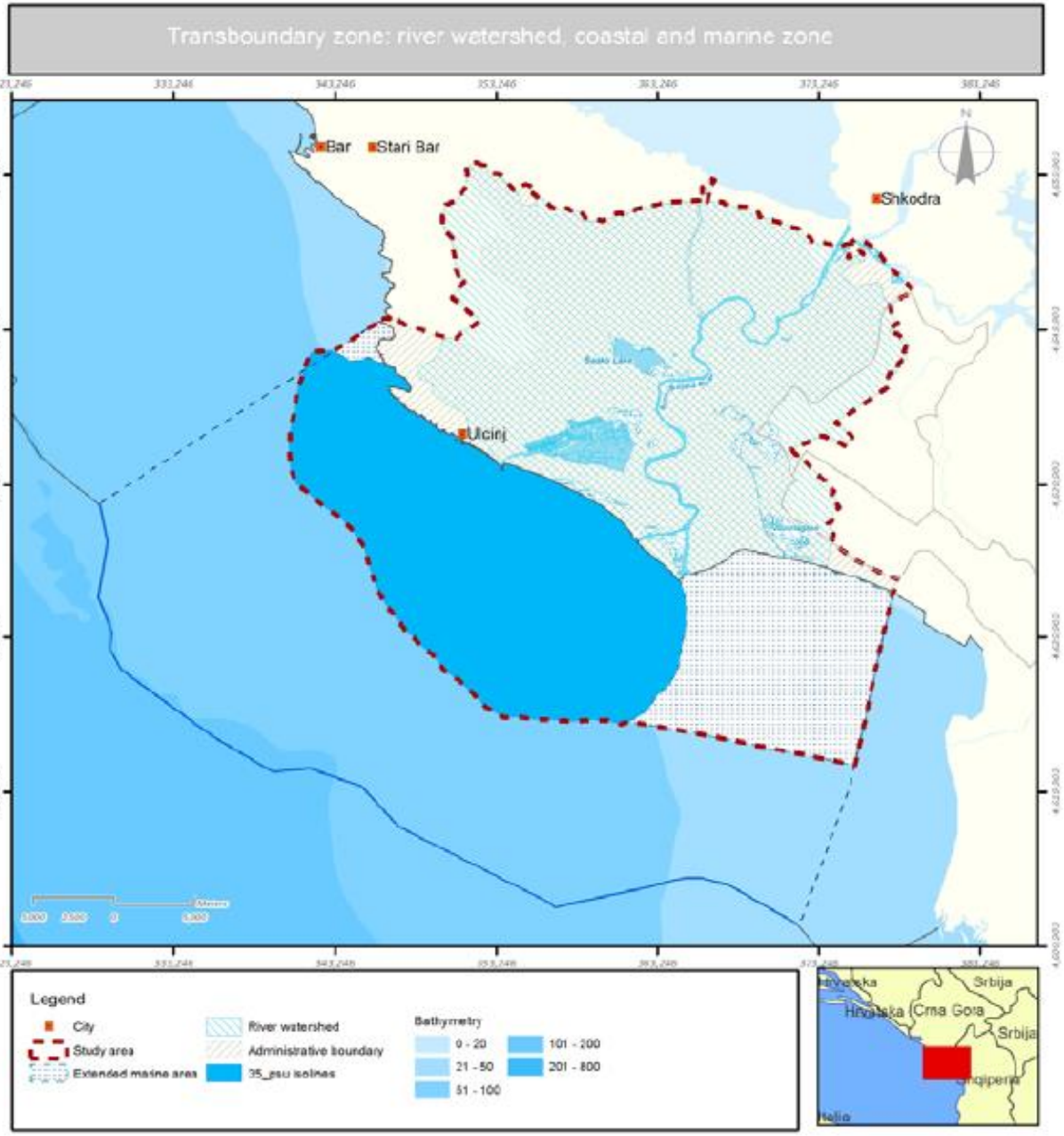


Figure 19: Transboundary zone: sub-basin, aquifer and marine zone

Thank you for your attention!

scoullos@swim-h2020.eu
scoullos@chem.uoa.gr