METHODOLOGICAL GUIDELINES ON LSI AND APPLICATIONS

MSP as a tool for the implementation of ICZM Protocol in the Mediterranean

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MOTIVATIONS AND AIMS

The EU Directive on MSP specifies that the planning process should take into account land-sea interactions and promote the collaboration between MSs (e.g. Art. 4, Art. 6, Art. 7)

LSI analysis is not a new discipline, nor represents an additional requirement

The guidelines intend to support MSP planners with a possible operative framework for the LSI analysis, identifying specific actions to be carried out in close connection with the MSP process

The guidelines should be considered as a flexible tool, possibly useful to organize available knowledge or to gather new information in a structured framework, avoiding duplication of effort.

BACKGROUND CONCEPTS

The proposed methodological guidelines build upon literature and previous experiences (e.g. ESaTDOR-ESPON program 2013, CAMP Italy project 2017)

The guidelines have been prepared under the SUPREME and SIMWESTMED project, considering suggestions provided by the partners though the process

The guidelines have been tested on pilot cases of the Mediterranean, under the SUPREME and SIMWESTMED projects

BACKGROUND CONCEPTS

The methodological guidelines are intended to support integrated planning and management of marine inshore and offshore activities in harmonized manner within MSP, considering the **functional integrity of land-sea continuum**

Two typologies of LSI interactions should be considered: interactions due to natural processes and interactions among land and sea-based human activities

Two directions of LSI interactions should be considered: from land to sea and from sea to land

Temporal dynamic of interactions should be considered

THE PROPOSED GUIDELINES: OVERVIEW

The methodological guidelines foresee the compilation of a **catalogue of interactions**, populated with semi-quantitative and quantitative information

The use of a GIS as mapping tool can support the analysis, particularly its advanced phases

The guidelines propose a **step-wise, tiered approach** and identifies **14 Steps**

Stakeholder engagement is a key component of the proposed methodological guidelines

STEPWISE APPROACH

LSI ANALYSIS PART	CONSISTS OF:		PROVIDES AS OUTCOME:
PART A - Stocktaking	Preliminary analysis, identification of most relevant elements	8 Steps (actions to be undertaken) are identified	Identification of key interactions
PART B – In depth analysis	Detailed analysis incl. quantification and precise spatial analysis	4 Steps (actions to be undertaken) are identified	Detail analysis of key interactions
PART C – Informing the plan	Identification of Hot spot areas and Key messages on LSI	2 Steps (actions to be undertaken) are identified	Key messages to be considered in the plan

STEPS OVERVIEW

PART A

Step 1. Define spatial domain
Step 2. Identify interactions
Step 3. Localize interactions
Step 4. Describe and qualify interactions
Step 5. Identify key policies – legislative – planning aspects
Step 6. Identify key governance aspects
Step 7. Identify and engage stakeholders
Step 8. Select key interactions

PART B

Step 9. Pathways of interactions
Step 10. Spatialize interactions
Step 11. Quantify interactions
Step 12. Analyse temporal dimension

PART C

Step 13. Identify LSI hot-spot areas
Step 14. Identify key messages from LSI analysis

A TIERED APPROACH

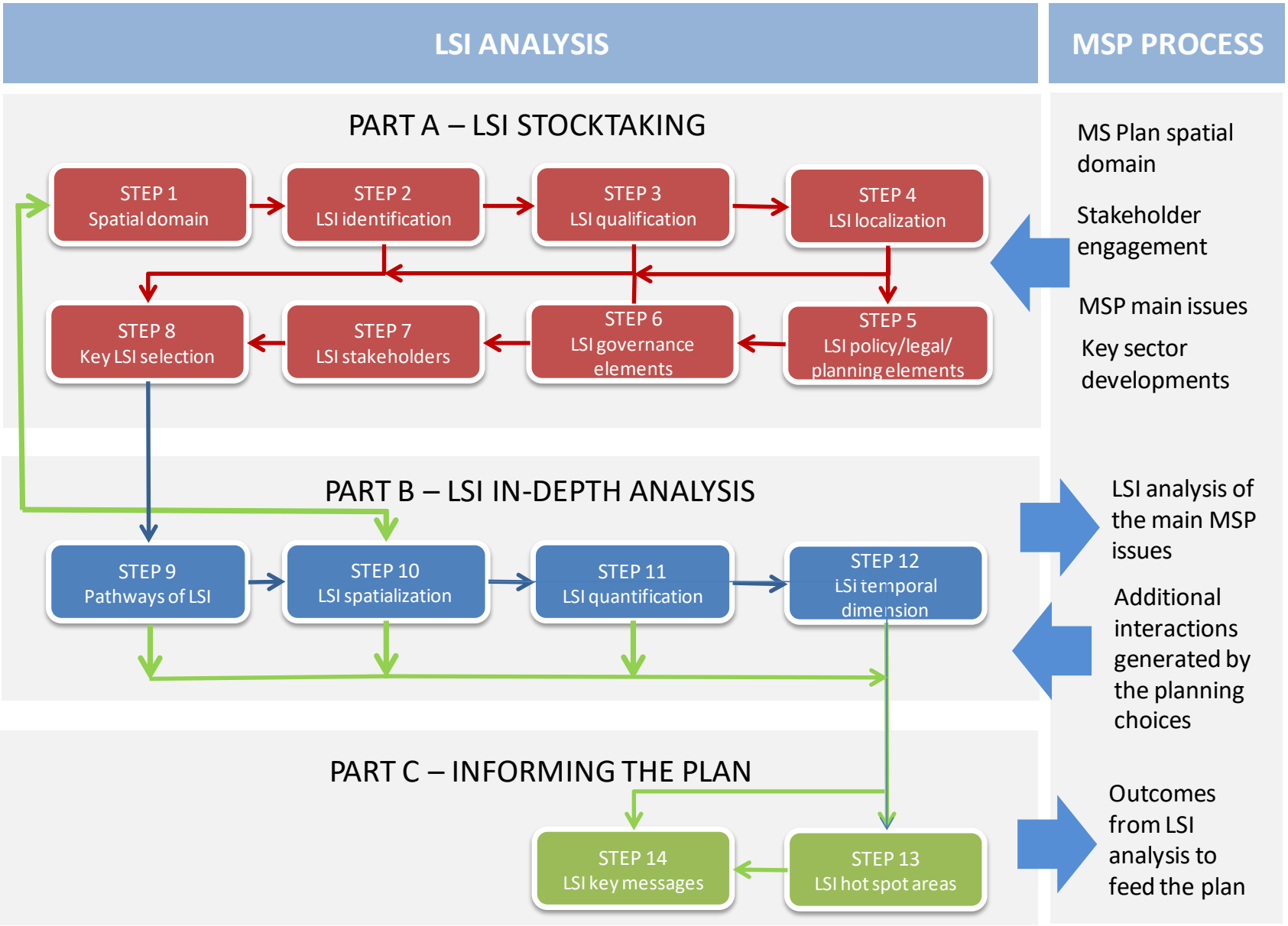
The tiered approach applies:

- To contexts where planning is in a preliminary phase
- To contexts where planning is more advanced

In **more advanced contexts** the methodological guidelines could be applied starting with PART B or using PART A to re-organized available knowledge according to the needs of the in-depth analysis. The tiered approach provides **flexibility** to the proposed methodology

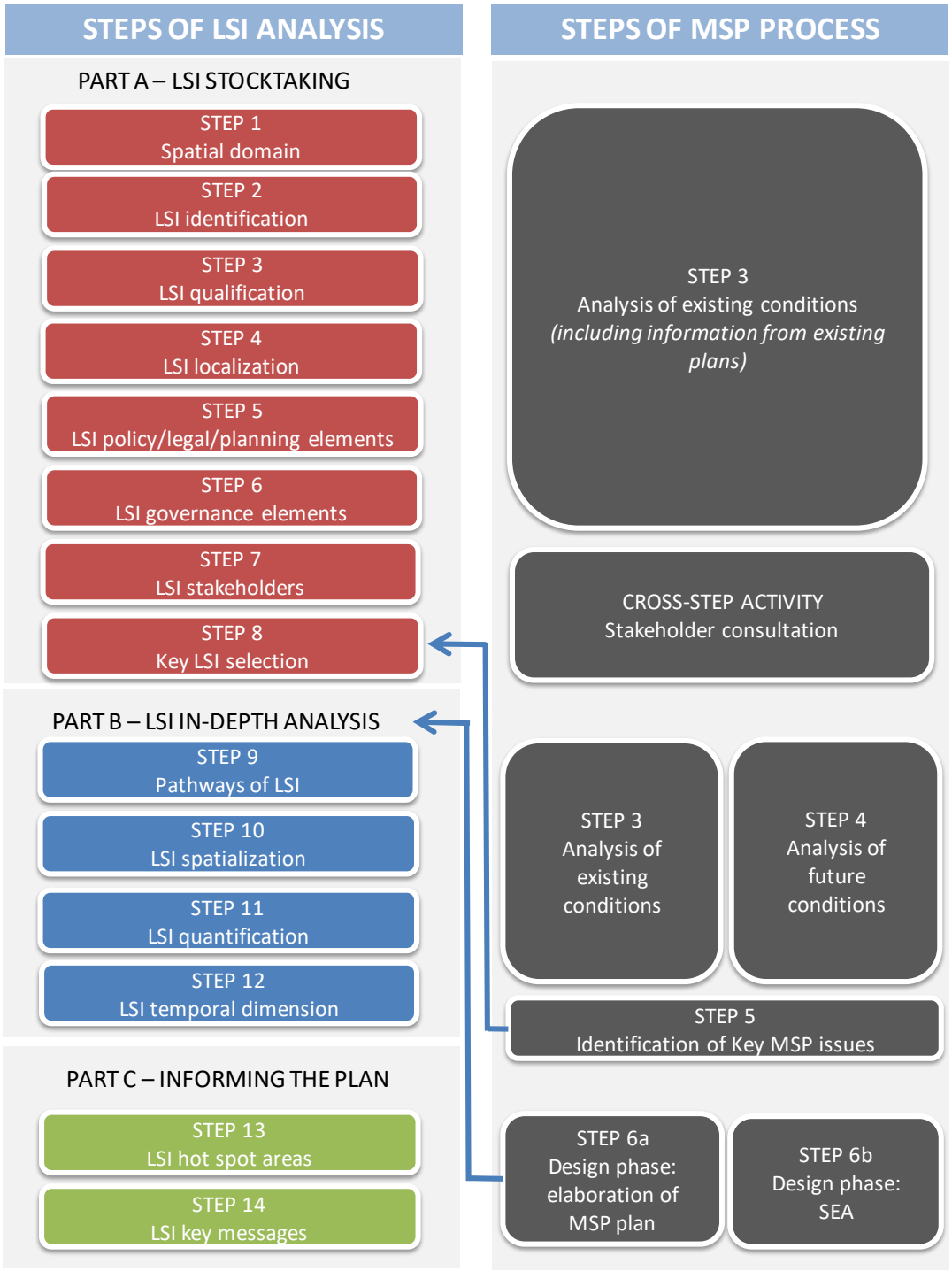
Given this approach, some steps in PART B represent a **deepening of the analysis** carried out thorough corresponding steps in PART A.

STREAMLINED WITH THE MSP PROCESS



The proposed steps shall be run within the corresponding steps of the plan preparation, in **order to avoid duplication of effort and optimize timing**

Correspondence illustrated with MSP steps identified in the Conceptual Framework for MSP in the Mediterranean



METHODOLOGICAL GUIDELINES

PART A

STEP 1: DEFINE THE SPATIAL DOMAIN

The geographic scope of LSI analysis **is case-specific** and **related to the specific MSP context**.

The spatial domain of **LSI depends firstly from the spatial domain of the maritime plan**.

LSI analysis is generally applied to the entire MSP area.

LSI analysis aims to identify **hot-spots of interactions** but the methodology **is flexible enough** to be implemented only in **already known LSI hot-spots**.

Criteria to delimitate the area of LSI analysis: scale of the plan, coast characteristics, administrative boundaries on land, maritime boundaries, data availability.

PART A

STEP 2: IDENTIFY INTERACTIONS

A catalogue of interactions is compiled considering:

a. Interactions due to natural processes:

   i. Land → Sea interactions

   ii. Sea → Land interactions

b. Interactions due to uses and activities:

   iii. Land → Sea interactions

   iv. Sea → Land interactions

PART A

STEP 3: LOCALIZE INTERACTIONS

In this step information about the geographical location of interactions is included in the catalogue, to prepare a **general map for the study area**, identifying, at a first level of approximation, the geographical distribution of interactions.

Results from this step will be capitalized in Step 10

PART A

STEP 4: DESCRIBE AND QUALIFY INTERACTIONS

Each interaction is **shortly described**: what it is about? why the interaction exists?

Each interaction is also then evaluated and **qualified** as positive (+), negative (-) or neutral (0) considering the environmental, economic and societal dimensions

PART A

STEP 5: IDENTIFY KEY POLICY, LEGISLATIVE, PLANNING ASPECTS

A general overview of policy, legal and planning aspects is provided in this step

This step can either be undertaken here (PART A) or included in step 9 (PART B); in the latter case the policy, legislative and planning aspects will be considered only in relation with the key interactions selected in step 8

Strong overlap with MSP steps

PART A

STEP 6: IDENTIFY KEY GOVERNANCE ASPECTS

Aim of this step - closely linked to the results from step 5 – is providing and **overview of main regulatory stakeholders** in the area, relevant for LSI

This step can either be undertaken here (PART A) or included in step 9 - Pathways of interactions (PART B); in the latter case the governance aspects will be considered only in relation with the key interactions selected in step 8

Strong overlap with MSP steps

PART A

STEP 7: IDENTIFY AND ENGAGE STAKEHOLDERS

Stakeholder engagement in LSI analysis is a **part of the overall process of stakeholder engagement** across the entire MSP process

Relevant stakeholders are identified with reference to the interaction catalogue.

Some stakeholders involved in LSI can be the same ones involved in MSP (e.g. those with specific interests in the sea space) but others are to be engaged specifically for LSI (e.g. those with specific interests in the coastal area and inland territory in relation with the sea)

Strong overlap with MSP steps

PART A

STEP 8: SELECT KEY INTERACTIONS

The main aim is to prioritize interactions and select the most relevant ones to be considered for **further steps**

A **stakeholder driven** process is suggested

The **MSP relevant issues can be used to prioritize interactions**: their relevance for each of the issues can be scored.

Semi-quantitative or quantitative approaches can be used for prioritization.

Spatial specificities should be taken into account in prioritization.

PART B

STEP 9 – PATHWAYS OF INTERACTION

Mechanisms behind each selected interaction are identified and described. They can relate to **flows of matter** (e.g. water discharged by a river system, landed fish, extracted materials), flow of **monetary values** (e.g. revenues from economic sectors), flow of **information** (e.g. results from monitoring site at sea or on land)

Additionally (if needed), **policy - legislative -planning aspects** could be in-depth analyzed: synergies / reinforcement, conflicts / contradictions and / or gaps related to these aspects are discussed

PART B

STEP 10 – SPATIALIZE INTERACTIONS

The specific spatial domain of each interaction is identified and mapped. It includes: the area where the interaction is generated, the area exposed to impacts/benefits, the area in between. The following elements can be considered:

- **Typology and extension of the LSI processes**: widely diffused (e.g. flow of goods, large-scale transport or nutrient loads from large drainage basin) or spatially restricted (e.g. coastal erosion or local consumption of marine resources)
- **Spatial and temporal distribution** of human activities
- Distribution of **ecological elements**: interfaces, ecological connections, ecological barriers

PART B

STEP 11 – QUANTIFY INTERACTIONS

Interactions are **possibly quantified**, based on available data and knowledge. This step corresponds to pressures / impacts analysis of negative interactions and to evaluation of positive impacts (benefits, added values) for positive interactions

Quantitative information concerning pressure / impact / benefit indicators are included in the catalogue in a synthetic format

Based on the quantitative knowledge, each interaction is ultimately classified as of: low, medium, high or very high intensity

PART B

STEP 12 – ANALYZE TEMPORAL DIMENSION

In this step interactions are **qualified** as with:

- Irrelevant temporal dimension
- Temporal dimension relevant on the short term (e.g. on a cyclic base: daily, seasonal; on a non-cyclic base: inter-annual variability)
- Temporal dimension relevant on the long term (e.g. changes in environmental conditions along years; trends in sector development)

In addition, interactions are evaluated under the **future scenarios** identified by the planning process

PART C

STEP 13 – IDENTIFY LSI HOT SPOT AREAS

Hot spot areas are those areas with **high intensity of key LSI**. Outcomes from step 10 (spatialize interactions) and step 11 (quantify interactions) are considered to identify these areas

Firstly, three distinct maps are prepared considering separately the three components of sustainability; hot spots for: environmental, economic and societal interactions. Interaction indicators to be considered in this step are selected on a case-specific base.

Finally, an **integrated map** is produced combining the previous ones

PART C

STEP 14 – IDENTIFY KEY MESSAGES FROM LSI ANALYSIS

Comments about synergies / conflicts / gaps derived from the analysis of **policy, legislation and planning** context, and of **governance** system.

Most relevant LSIs in the planning area (max 10 interactions) with a short description of their nature

key stakeholders to be engaged in order to deal with most relevant LSI interactions

Localization of **hot-spot areas** of LSI and their characteristics

The possibility to involve **stakeholders** in selecting key messages is evaluated on a case base

METHODOLOGICAL GUIDELINES

LSI GUIDELINES APPLICATION AND TEST

The methodological guidelines have been applied and tested in seven cases in the frame of SUPREME and SIMWESTMED projects

LSI TEST CASES: 1 France, 2 Italy, 1 Malta, 1 Croatia, 2 Greece

LSI GUIDELINES APPLICATION AND TEST

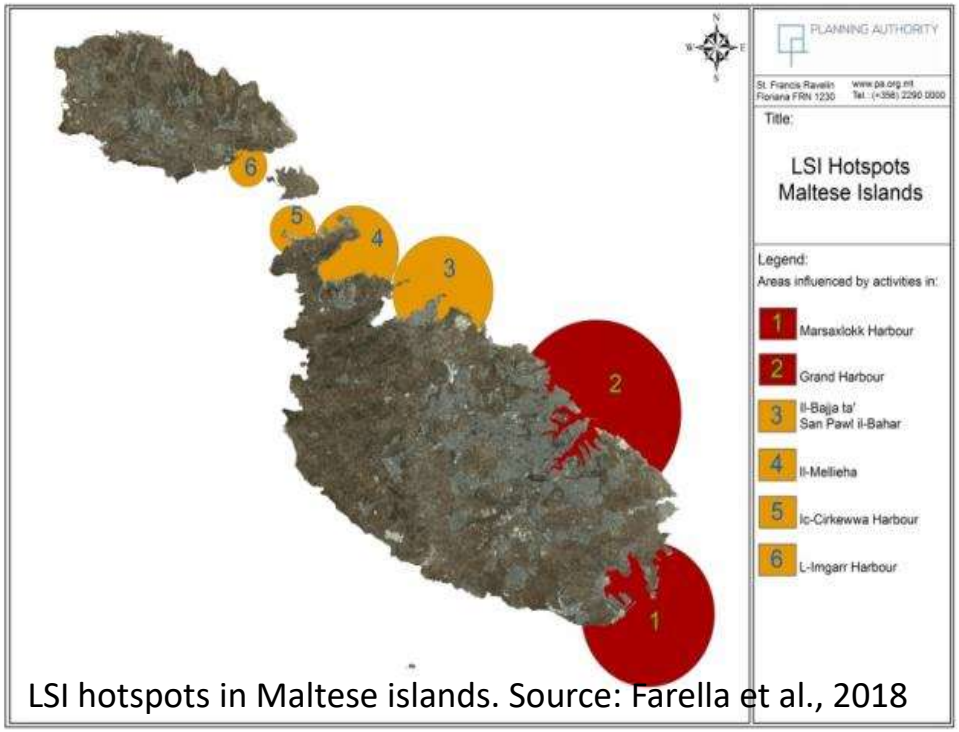
MALTA CASE STUDY

LSIs hotspots

-Urban settlements near Grand Harbour, Marsaxlokk Harbour and along the north coast

- inter-island ferry terminals.

Extent of LSIs decreasing with distance from the coast.



LSI hotspots in Maltese islands. Source: Farella et al., 2018

LSI issues to be considered in MSP

- urban development and associated infrastructure (including road networks): concentration of human settlements provides high demand of various maritime activities

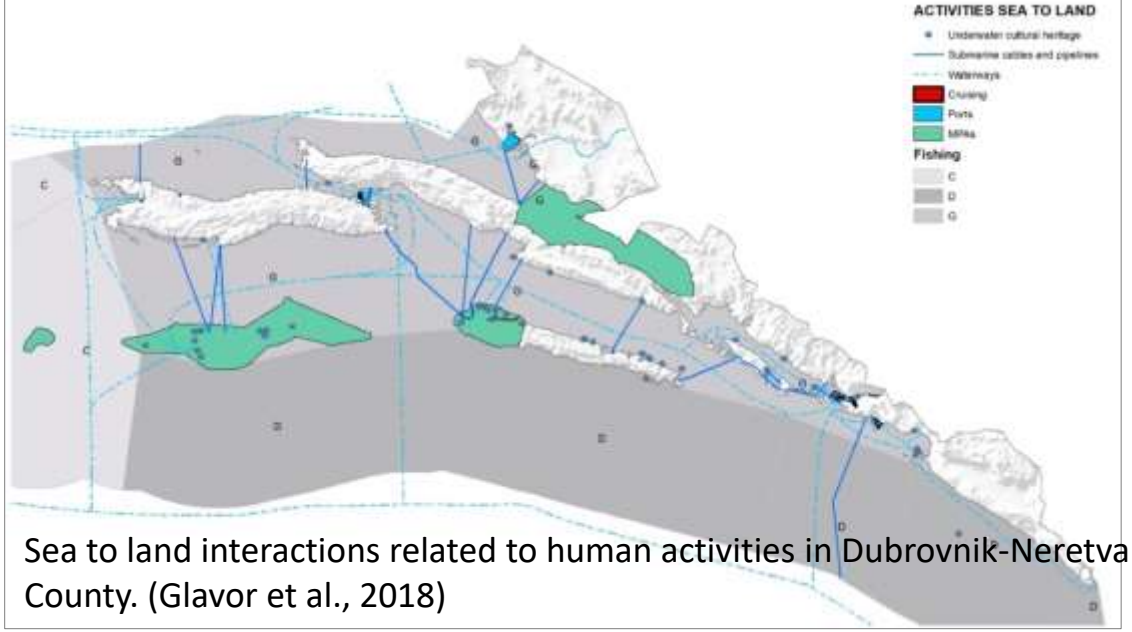
- presence of agriculture and rural areas along the coast : they extend on or impact natural areas providing important habitats for the life cycle of species dependent on the marine environment (e.g. nesting grounds for seabirds and sea turtles).

LSI GUIDELINES APPLICATION AND TEST

DUBROVNIK- NERETVA CASE STUDY

Most relevant natural LSI: storm, saline intrusion and seiches
Most relevant anthropogenic LSI: cruising and UCH

Sea to land interactions related to human activities have negative impacts (except natural protection and conservation of UCH). Cruising is a controversial activity with positive effect on the overall economy but serious impacts on environment and other non-touristic economic activities



Sea to land interactions related to human activities in Dubrovnik-Neretva County. (Glavor et al., 2018)

Also **land to sea interactions** related to human activities are characterized by significant negative impacts. Most significant ones are those related to coastal tourism and aquaculture.

FEEDBACK FROM THE TEST CASES

GENERAL REMARKS

✓The guideline shall be adopted in a flexible manner to reflect the state of MSP development in a country

✓The concrete application of the methodological guideline requires dedicated efforts in terms of resources and time and data availability

✓The geographic scale influences the LSI analysis in terms of selection of relevant formation, availability of needed information, depth of the analysis, type and entity of the interactions identified. When applying the methodological guideline, the scale of analysis shall be clearly defined.

✓Collaboration, co-production of knowledge and sharing of needs and priorities between maritime based and terrestrial planning communities are fundamental to pave the way toward the best practice of planning.

FEEDBACK FROM THE TEST CASES

GAPS AND NEEDED IMPROVEMENTS

✓ Evaluation of interactions includes a certain degree subjectivity
Recommendation: involve different stakeholders and combine results

✓ The use of broad attributes (positive, negative and neutral) to evaluate LSI effects (environmental, societal and economic effect) can be too loose
Recommendation: introduce other attributes to take into consideration specific conditions

✓ Land-sea interactions can be very different in terms of intensity and spatial domain.
Recommendation: develop criteria and approaches to properly identify boundaries of the LSI analysis both landward and seaward

✓A more detailed definition of LSI is needed to avoid confusion (e.g. to with conflicts and synergies concepts) and also for other terms

✓*Recommendation*: develop a manual/glossary

FEEDBACK FROM THE TEST CASES

ADDED VALUE OF LSI ANALYSIS AND THE GUIDELINES

- ✓enable to collect and structure a detailed information
- ✓provide a glimpse of the bigger picture
- ✓identifies areas where knowledge is missing
- ✓enables to deal with a large variety of sectors
- ✓identifies authorities that can be involved to strengthen integration

CONCLUSIONS

✓The application of the methodological guideline resulted useful in test cases for the identification and representation of current and future land-sea and sea-land interactions

✓Result of LSI analysis can serve as a basis for further planning of coastal and marine areas, including the integration of specific LSI-oriented measures in the plan

✓LSI analysis should be conducted in the initial phases of the plan development

✓Data availability plays a very important role for the elaboration of coastal and marine plans, including therefore the analysis of LSIs

✓Data gaps shall be clearly highlighted, while effort should focus on data production, integration and public sharing

Thank you

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