LAND SEA ACT

Interreg Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

COMPENDIUM OF METHODOLOGIES ON HOW TO ADDRESS LAND-SEA INTERACTIONS AND DEVELOPMENT TRADE-OFFS IN COASTAL AREAS

2021

Vides aizsardzības un reģionālās attīstības ministrija

BEF LATVIA

BEF GERMANY

Holbæk Kommune

ZWIĄZEK MIAST I GMIN MORSKICH

TALLINN UNIVERSITY

LÄNSSTYRELSEN VÄSTRA GÖTALANDS LÄN

GÖTEBORGS REGIONEN

HWWI Hamburg Institute of International Economics

Title: Compendium of Methodologies on How to Address Land-Sea Interactions and Development Trade-offs in Coastal Areas

Output of Activity 2.5

Final version: 15 December 2021

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List of Abbreviations

DG MARE	Directorate-General for Maritime Affairs and Fisheries at the European Commission
EC	European Commission
ECMWF	European Centre for Medium-Range Weather Forecasts
EEZ	Exclusive Economic Zone
ESPON	European Spatial Planning Observation Network
ES	Ecosystem services
EU	European Union
HELCOM	Helsinki Commission – an environmental intergovernmental organisation of the Baltic Sea Region
GIS	Geographical Information Systems
GW	Gigawatt
ICDC	Integrated Climate Data Center
ICZM	Integrated Coastal Zone Management
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
KNMI	Royal Netherlands Meteorological Institute
Land-Sea-Act	Interreg Baltic Sea Region Programme funded project “Land-sea interactions advancing Blue Growth in Baltic Sea coastal areas”
LSI	Land-sea interactions
MSP	Maritime spatial planning
NGOs	Non-governmental organisations
OWP	Offshore wind park
SMEs	Small and mid-size enterprises
SWOT	“Strengths, Weaknesses, Opportunities, and Threats” – a strategic planning and management analysis technique, used use in the preliminary stages of decision-making processes
USGS	United States Geological Survey
VASAB	“Vision & Strategies Around the Baltic Sea” - an intergovernmental cooperation of the Baltic Sea Region countries in spatial planning and development

1

Introduction

The interactions between land and sea are fundamental to human wellbeing – coastal areas provide people with a variety of food sources, livelihoods, and economic opportunities, as well as a space for communities to engage in traditional cultural and spiritual practices (Kidd et al, 2019; Kannen et al., 2008). At the same time these interactions involve natural processes such as coastal accretion and erosion, bio-geo-chemical cycles, and the environmental impacts of human activities on land and at sea. Therefore, land-sea interactions (LSI) are recognised as highly complex, consisting of environmental, socio-economic and governance dimensions (EU MSP, 2017a).

As highlighted in a briefing paper from the European Commission (2017b), the dynamics between land and sea should be considered, when carrying out maritime spatial planning (MSP), ensuring that it is conducted in an integrated manner across marine and terrestrial areas. Consequently, terrestrial planning should also consider the ongoing and envisaged developments within the marine space, which will inevitably affect use of onshore coastal areas and might impact coastal environment and landscape.

The Land-Sea-Act project aims to bring together stakeholders involved in coastal management and planning, to find solutions to MSP and Blue Growth challenges around the Baltic Sea. Work Package 2 of the project is focused on spatial planning solutions for addressing development trade-offs in coastal areas. It includes four case studies from Estonia, Latvia, Poland and Germany, which address case specific LSI issues from local to regional scale. The Estonian case is focused on integrated mobility and tourism planning, as well as connecting land-based tourism with the sea on the Northern coast of Estonia. The Latvian case is concerned with developing strategic solutions for balancing national interests for offshore wind energy production with the coastal landscape protection interests of local communities and boosting of sustainable tourism along the Southwestern Kurzeme coast. The Polish case assesses marine cultural heritage in the Gulf of Gdansk and seeks solutions on how to integrate cultural values into MSP, as well as scenarios of development of The Gulf of Gdańsk sub-case study area and The Vistula Lagoon sub-case study area. The German case explores development of measures for climate change mitigation and adaptation and sustainable tourism development in Fehmarn Island. Thereby, the overarching theme of all four cases is related to balancing tourism and sustainable economic development with maintenance of nature and cultural heritage. The case studies involve various methods for mapping and analysis of LSI, scenario building, and development of solutions with active engagement of local stakeholders.

The Compendium of Methodologies of the Land-Sea-Act project (henceforth – the Compendium) gives a brief overview on available methodological frameworks for addressing LSI, as well as collates the various methods tested by the Land-Sea-Act case studies for operationalising of LSI within planning and governance of coastal and marine spaces. The Compendium illustrates how LSI and different development trade-offs in coastal areas can be addressed within the process of the spatial planning at different planning stages, levels and contexts. The target group of the Compendium includes the local, regional and national public authorities, who might be interested to apply similar methods in MSP, coastal planning, or other strategic planning.

2

Background: various approaches for addressing land-sea interactions (LSI)

LSI became a topical issue for European researchers, planners and policy makers in 2014, with the adoption of the Directive establishing a framework for maritime spatial planning (MSP Directive)[1], which requires planning authorities within the MSP process to take into account LSI. However, the MSP Directive does not provide any guidance on how LSI should be addressed in MSP, leaving this up to the planning practice of each Member State. Therefore, a common understanding and agreed methodological framework for addressing LSI is still lacking.

Nevertheless, the concept of LSI and its application in planning is not new. It dates back to the 1970s, when the discussion on Integrated Coastal Zone Management (ICZM) started in the United States and culminated in Europe by the beginning of the 21st century (Kidd et al, 2019). LSI were included as an inherent part of the underlying concept of 'integration', which includes several dimensions of integration – inter-sectoral, spatial, intergovernmental, international and science-management integration (Ballinger, 2015). Within European Union, a large body of good practice and experiences in addressing LSI through ICZM projects, supported by the INTERREG programme, was available by the 1990s and resulted with the EU ICZM recommendation, adopted in 2002[2] (Morf et al., 2019). The EU recommendations define the ICZM as a dynamic, multi-disciplinary and iterative process to promote the sustainable management of coastal zones. Though, the ICZM at that time tended to capture a narrow coastal strip and was mostly implemented through informal local bottom-up initiatives; whereas by introducing the MSP practice, the focus was shifting towards more formalized and marine orientated planning (Kidd et al., 2019). Within the initial proposal of the MSP Directive, the two approaches (ICZM and MSP) were brought together, envisaging that the Member States would have to prepare the strategies for ICZM in addition to MSPs. Several countries, however, opposed such a requirement, arguing that the EU cannot prescribe to Member States how to plan in territorial waters, and therefore in the final text of the Directive, the passage on ICZM was removed, replacing it with a more modest statement about considering LSI.

2.1. Existing experience in the European Union in addressing LSI

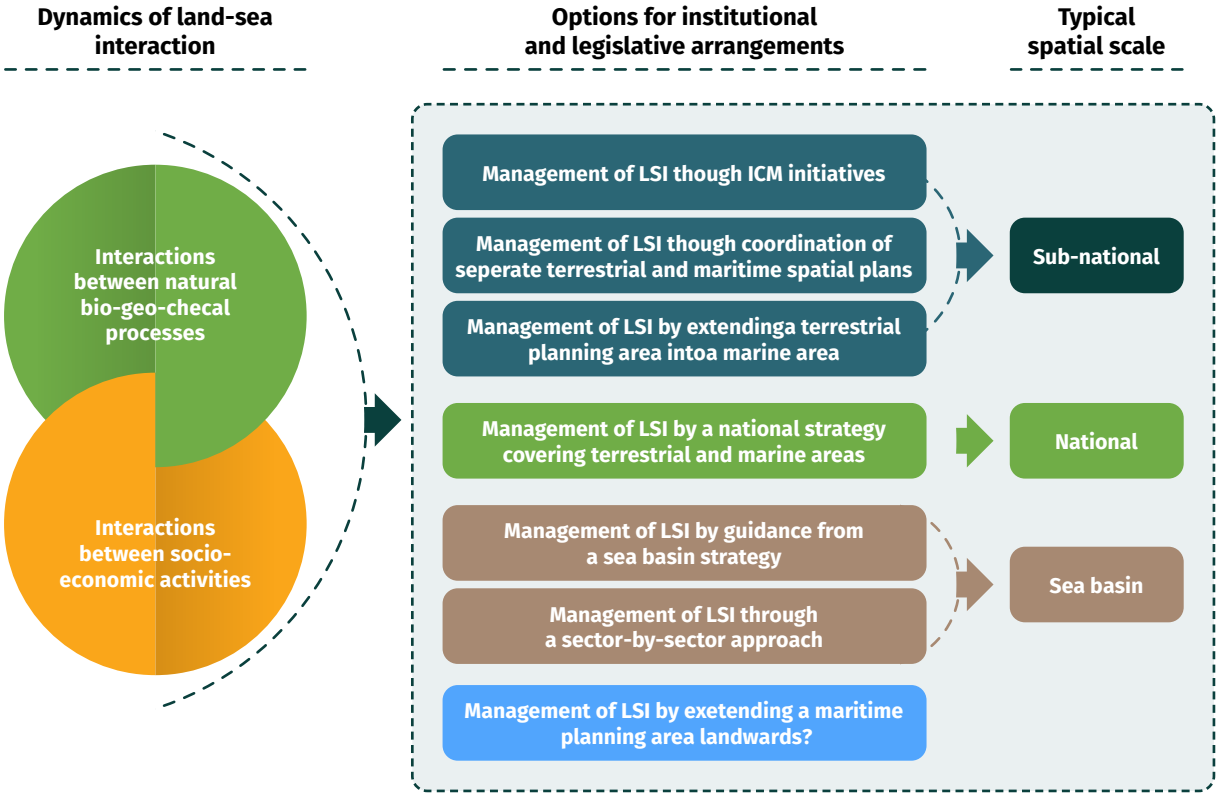
Since then, several EU funded initiatives and international projects have explored ways to address LSI to support the MSP process. Few of the essential initiatives contributing to the operationalisation of the LSI concept are described below.

The EU MSP Assistance Mechanism (on EU MSP Platform), acting on behalf of DG MARE, has published a briefing paper "Maritime Spatial Planning: Addressing Land-Sea Interaction" (EU MSP, 2017b), which briefly describes how LSI are addressed by the MSP Directive and its relation to ICZM, and also proposes a general framework for LSI (see Figure 1) and options for institutional and legislative arrangements to address LSI. Furthermore, the EU MSP Platform organised the "Maritime Spatial Planning Conference: Addressing Land-Sea Interactions (LSI)" in Malta, June 2017, providing an opportunity to discuss the proposed framework among MSP practitioners from local, regional and sea-basin perspective (EU MSP, 2017a).

1 EPC, 2014. Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014: establishing a framework for maritime spatial planning. Official Journal of the European Union L 257/135.

2 EPC, 2002. Recommendation of the European Parliament and of the Council of 30 May 2002 concerning the implementation of Integrated Coastal Zone Management in Europe (2002/413/EC). Official Journal of the European Communities L 148/24.

Figure 1.
A General Framework for Addressing LSI proposed by EU MSP Platform, 2017



As noted in the briefing paper (EU MSP, 2017b) *"...authorities should, firstly, seek to understand the dynamics involved, and, secondly, find institutional mechanisms that are most suited to addressing LSI within their governance context".* As indicated in Figure 1, different institutional and legislative arrangements are suitable for different spatial scales:

- **At the local scale** ICZM or economically driven initiatives can be performed, involving municipalities and other local interest groups.
- **At the regional/sub-national** (or national scale) scale coordination of terrestrial and maritime spatial plans can be arranged by involving MSP authorities in collaboration with coastal and maritime stakeholders. For example, in Finland part of regional plans covers both land and sea (territorial waters). A similar approach is applied in Germany, where the spatial planning of the federal states is extended to territorial waters.
- **At the national scale** LSI can be addressed through a national strategy or plan which encompasses terrestrial and marine areas (such approach is applied in the Netherlands).
- **At the sea-basin scale** (or transnational regions) cooperation can lead to a strategy or protocol for ensuring cross-border coordination of spatial planning and guiding national LSI efforts. VASAB is mentioned as an example of the Baltic Sea Region, which develops long term strategies and visions for the region, including spatial planning and development. The HELCOM-VASAB MSP working group is established to coordinate the MSP process in the region.

It is also acknowledged that the scales are not mutually exclusive, and a higher-level strategy may be implemented or supplemented at a sub-national or local level by other instruments. Furthermore, the spatial governance scales vary between countries – in some sub-national (regional) scale is of great importance, whereas in others only the local and national level exist.

A positive example of cross-scale and cross-sector coordination/cooperation (or multi-level governance) in addressing LSI has been observed in Latvia, where an MSP coordination working group was established, involving different ministries and other national authorities, coastal municipalities, and NGOs. The working group was meeting regularly during the MSP elaboration process.

- **A study commissioned by the European Commission, DG Environment** has examined LSI in the MSP process, resulting in a brochure titled "Land Sea Interactions in Maritime Spatial Planning"[3]. It has identified potentially significant LSI for eight of the most typical marine development sectors: aquaculture, desalination, fisheries, marine cables & pipelines, minerals & mining, ports & shipping, tourism & costal recreation, offshore energy. The LSI related to each of the eight sectors were described following the four steps of the planning process:

  Step 1: scoping – identification of environmental, socio-economic, and technical interactions.

  Step 2: assessment – listing the key data and information sources, that can assist the consideration of the LSI; and the existing policies and guidance relevant to the particular LSI.

  Step 3: analysis – proposing potential analytical tools that can be used to analyse the LSI and potential mitigation measures that might be applied to minimise negative impacts or maximise positive impacts.

  Step 4: planning – suggesting stakeholders to be engaged in discussions around the LSI and management options for addressing the LSI through plan making.

- **The European Spatial Planning Observation Network** (ESPON) has carried out "Maritime Spatial Planning and Land Sea Interactions project (ESPON MSP-LSI)" [4], offering a comprehensive analysis of operationalisation of LSI in marine and terrestrial planning. The project helped clarify the LSI concept and explored the landward impact of the marine activities through several case studies by applying the value chain analysis method. The project suggests "one space" territorial planning as a governance arrangement that encompasses both land and sea (Kidd et al., 2019; ESPON, 2020). The approach developed within the project includes a framework for considering LSI in MSP, definitions of LSI, coastal area and LSI core area, as well as a method for detailed investigations of LSI, which focuses on understanding the main socio-economic impacts of key maritime sectors on the land (see Figure 2). The method is described in steps, starting with initial scoping discussions with relevant stakeholders to characterise the key LSI issues. Following this, the spatialised form of value chain analysis is applied to investigate economic linkages associated with different economic sectors and the 'framework conditions' impacting the performance of that activity in different contexts. This is followed by structured governance analysis covering both a general overview of LSI responsibilities and coverage in marine and terrestrial plans and considerations of governance associated with selected LSI issues. At the final step the findings from the analyses described above are brought together in key messages and recommendations for good management of LSI in MSP and beyond.

3 https://ec.europa.eu/environment/iczm/pdf/LSI_FINAL20180417_digital.pdf
4 https://www.espon.eu/MSP-LSI

Figure 2.
A method for investigating LSI in MSP, proposed by EPSON MSP-LSI project

- **BONUS BALTSPACE project** [5] developed an analytical framework to explore and address various integration challenges in the Baltic Sea Region to support MSP. Integration is understood here as a multi-dimensional concept including policy and sector integration, multi-scale and transboundary integration, stakeholder integration, as well as knowledge base integration. The project also investigated LSI by applying spatial economic benefit analysis of different sea use sectors, including shipping, offshore wind, fishing and marine tourism (Weig, 2017). A tool was developed allowing to explore who is benefiting from marine uses and where those beneficiaries are located geographically and to identify regional hotspots of beneficiaries. More in-depth analysis of shipping and offshore wind industry revealed that economic benefits from these activities can be realised onshore – often hundreds of kilometres from the seashore.

- **Pan Baltic Scope project** [6] investigated LSI in the Baltic Sea Region, based on the experiences of countries at different stages of MSP – both at the beginning and the end of the planning loop. The project considered LSI from a practical, cross-border perspective and tackling them from four dimensions:

  1) the social-ecological interactions,
  2) the relevant governance frameworks,
  3) the related governance processes, and
  4) the necessary knowledge and methods.

The project report "Lessons, stories and ideas on how to integrate Land-Sea Interactions into MSP" (Morf et al., 2019) gives a definition, stating that *"The term land-sea interaction(s) in coastal and marine spatial planning encompasses all natural and human-induced flows and processes between marine and terrestrial environments in both directions, as well as how these interactions are perceived and managed by societies and their different actors through MSP and other governance frameworks and processes (i.e. authorities, enterprises, users, NGOs and what they do about these interactions)."*

5 https://www.baltspace.eu
6 http://www.panbalticscope.eu

2.2. Themes and challenges for addressing LSI within the Baltic Sea Region

The studies presented above highlight various themes and perspectives for addressing LSI, covering ecological, social and economic dimensions. A non-exhaustive list of LSI themes relevant within the Baltic Sea Region is presented in Table 1:

Table 1.
LSI themes in the Baltic Sea Region

Types of interactions	LSI themes
Socio-ecological/ environmental interactions	• Impacts of sea and land uses on marine water quality, marine and coastal ecosystems/ biodiversity/fish stocks etc. • Visual impacts of offshore and coastal developments on landscape/seascape. • Climate change impacts on ecosystems/biodiversity, human well-being, and economic activities.
Socio-economic interactions between land and sea use	• Competition for marine and coastal space/ conflicting and synergetic uses, e.g., impacts of new developments (offshore wind parks, aquaculture) on fisheries, coastal recreation. • Impacts of offshore/maritime developments on cultural heritage, place identity of the coastal areas. • Employment and income generation.
Technical interactions	• Accessibility to landside infrastructure (e.g., for offshore wind parks, marine aquaculture, fisheries, tourism and recreation) – ports, marinas, grid connections, etc.

Several of these themes are addressed or taken into account in the MSP process. However, some of the LSI aspects are often neglected or remain out of scope due to limited resources, knowledge, tight time schedule and focus on marine space.

Despite the various initiatives and projects described previously, a well-established methodological framework for addressing LSI in MSP and terrestrial spatial planning is still missing. The main reason for this is that LSI are always place and context specific, therefore there is no universal approach to identifying and managing LSI. Based on the experiences of studies conducted in the past, the following challenges for addressing LSI in MSP and terrestrial spatial planning have been identified (Kidd & Ellis, 2012; Morf et al., 2019):

- Significant differences between terrestrial planning and MSP - this includes different planning levels and authorities in charge, as well as different traditions, approaches, and rationale for allocation of space.
- Complexity of LSI – it is advisable to work with locally specific LSI systems, which each have their own spatial implications and own multi-level governance requirements encompassing sectoral and spatial governance at local, national and international levels.
- LSI are scale dependent – both in space and time, including local and regional conditions that can vary considerably.
- Considerable diversity of multi-level institutional structures in the land and sea realms, with regard to spatial planning and sector management.

2.3. Analytical tools and methods for addressing LSI

As suggested by the EC (2017) in the brochure on LSI in MSP and considering the experiences of other related projects, the following analytical tools and methods can be applied for addressing various themes of LSI (Table 2):

Table 2.
Suitable analytical tools and methods for addressing LSI

Stages of addressing LSI	Suitable analytical tools and methods
Scoping & stocktaking	Review of existing policies (e.g., content analysis method)
	Reviewing statistics and other available data sources
	Fieldworks for data collection, observation and on-site interviews
	Stakeholder engagement through focus group discussions, interactive workshops, online questionnaires
Assessment	Ecosystem service mapping and assessment
	Landscape quality and visual impact assessments
	Cultural heritage assessment
	Environmental Impact Assessment (EIA)
	Strategic Environmental Assessment (SEA)
	Socio-economic impact assessment
	Spatial/ ecological modelling (including spreading of sediments/ pollutants/ species, environmental impacts, etc.)
Analysis	Analysis of current and future trends
	Spatial analysis of suitable areas for sea/land uses in GIS
	Value chain analysis
	Governance analysis
	Trade-off analysis
Development of planning or management solutions	Scenario building: exploratory and target seeking scenarios
	Strategic and spatial planning (e.g., to define spatial solutions for balancing conflicting interests/avoiding negative impacts)
	Practical tools and measures for governing land/sea uses
	Multi-scalar coastal landscape stewardship
	Stakeholder engagement methods – focus group discussions, interactive workshops

The choice of suitable methods is case specific and depends on available resources, skills and data as well as the scale of the LSI theme or problem to be addressed.

3

Land-Sea-Act approach in addressing various LSI aspects and challenges

Addressing LSI as is required by the EU MSP Directive would mean bringing together different governance arrangements for *dealing with a complex set of interrelationships that are context-specific and extend across multiple spatial dimensions* (Morf et al., 2019). This challenge was undertaken within four of the Land-Sea-Act case studies (Work Package 2: Spatial planning solutions for addressing development trade-offs in coastal areas), which explore spatial solutions for various LSI issues of local to national relevance at different environmental, socio-cultural, political and economic contexts within the Baltic Sea Region. Referring to the general framework for addressing LSI, suggested by EU MSP Platform (see Figure1), the Land-Sea-Act cases are mostly engaged with interactions between socio-economic activities, which to a large extent depend on or interact with natural processes and assets (see Table 3). All Land-Sea-Act cases are sub-national. The approaches for addressing LSI are mainly related to balancing different land and sea use interests by respecting local community values, ecological/ landscape conditions, and cultural heritage. The case study outputs can provide an input into strategic and spatial planning of coastal areas, coordination of terrestrial and maritime spatial plans, as well as supporting management of LSI through ICZM initiatives.

Table 3.

The main themes of socio-economic and natural process interactions addressed by the Land-Sea-Act cases.

LSI themes and trade-offs	EE	LV	PL	DE
Tourism and sustainable economic development vs. maintenance of nature and cultural heritage	×	×	×	×
Connecting land-based tourism with sea	×			×
Integrated mobility and tourism planning	×			
Offshore energy vs. preserving landscapes & sustainable tourism development		×		
Tangible and intangible cultural values in coastal areas		×	×	
Climate change adaptation and sustainable tourism				×
Tourism vs. intensive agriculture				×

Although each case is contextually significantly different, there is a connecting theme related to balancing sustainable use of marine and land resources with maintenance of nature and/or cultural heritage.

At the same time, the LSI cases approach various governance dimensions of the land-sea interface including horizontal (locational context) and vertical (scale dynamics) aspects, which include:

- conflicts between regional/national interests of Blue Growth vs. place-based values of local communities,
- tensions between short-term political gains and long-term perspectives of sustainable marine spaces,
- cross-scalar relations, acknowledging that spatial dimensions of LSI in planning are socially produced,
- new responsibilities of local authorities in planning marine space (e.g., one nautical-mile of coastal sea) and often experienced reluctance or lack of skills in coping with these responsibilities;
- accessibility of coastal areas: advancement of marine recreational culture and private/ exclusive space for leisure vs. everyone's rights to coastal cultural milieu.

The various aspects of socio-economic and ecological interrelationships and related governance challenges are scrutinised in the Synthesis report of Land-Sea-Act case studies (Pikner et al., 2021).

In the following chapter we explore the methods applied in the Land-Sea-Act case studies for addressing LSI governance challenges, relating them to the stages of the spatial planning process.

3.1. Overview on different methods applied by the case studies for addressing LSI issues

Despite covering different themes, spatial scales and governance dimensions, all the Land-Sea-Act case studies were built upon a common, but rather flexible framework following the major stages of the planning process, also suggested as suitable for addressing LSI (EC, 2017). Nevertheless, the borders between different stages are not always strictly defined, additionally the scope of each stage was adjusted to the specifics of the Land-Sea-Act case studies:

- **Scoping and stocktaking stage:** identification of LSI issues and evidence collection, including policy analysis, interviews, survey, fieldworks, and compilation of various data sets.
- **Assessment stage:** assessment of environmental, landscape qualities, culture values, tourism intensity, accessibility, infrastructure that sets the conditions for the addressed LSI based on the collected information; identification of hot spots, trade-offs or problem areas.
- **Analysis stage**: elaboration and analysis of different development scenarios or management options for solving the LSI challenges (including appraisal of their impacts) through application of different analytic tools/methods.
- **Development of planning or management solutions**: elaboration of final proposals, including recommendations, spatial solutions, or practical measures for solving the detected problems.

Land-Sea-Act cases involve a broad range of methods, covering most of those suggested in the above reviewed documents (Table 2). The cases also explored new methods, which thus far have not been commonly applied or reported in the LSI context, e.g., using ecosystem service framework in assessment of LSI trade-offs. The methods applied by each Land-Sea-Act case study at different stages are listed in Table 4.

Since the Land-Sea-Act case studies were project-based activities, exploring possible approaches for dealing with various LSI and are not a part of any formal planning or governance process, they do not include implementation, monitoring and review stages. However, all the case studies were strongly built on stakeholder engagement throughout the planning process, thus involving local knowledge and stimulating social learning.

Table 4.

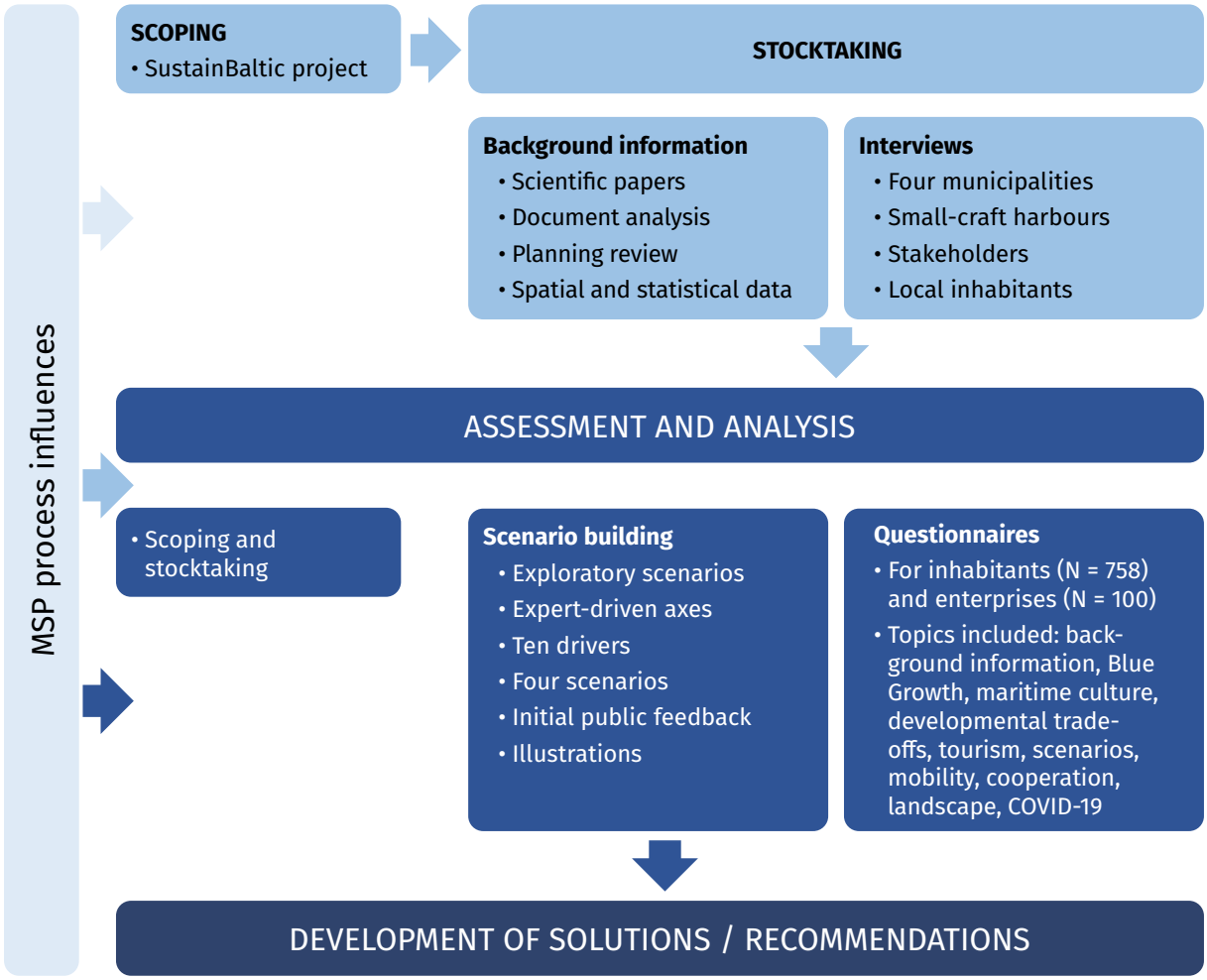
The main actions and methods applied for addressing LSI within the four spatial planning case studies.

Stages for addressing LSI	Actions and methods applied in the Land-Sea-Act cases studies	EE	LV	PL	DE
Scoping & Stocktaking	Scoping of LSI issues through stakeholder engagement:				
	– interactive workshops	×	×	×	×
	– interviews, online questionnaires	×	×	×	×
	– participatory GIS		×		
	Reviewing of existing plans and strategies: e.g., content analysis method	×	×	×	×
	Reviewing of statistics and other available data sources	×	×		×
	Fieldworks: surveys of landscape qualities, tourism intensity/ infrastructure, ecosystem condition; interviews with local people, etc.	×	×		×
Assessment	Ecosystem service and landscape quality mapping and assessment, based on spatial data, expert opinions, and stakeholder involvement;		×		
	Assessment and mapping of cultural values by interviews and stakeholder workshops			×	
Analysis	Analysis of current and future trends/uses: SWOT; tensions between values	×			×
	Trade-off analysis		×		
	Scenario building: exploratory and target seeking scenarios	×	×	×	
	Scenario evaluation: feedback by stakeholders; appraisal of impacts on ecosystem condition, service supply and well-being	×	×		
Development of planning or management solutions	Development of strategic solutions: e.g., a set of climate change mitigation and adaptation strategies				×
	Development of optimum spatial solutions for balancing conflicting interests/ enhancing synergies		×		
	Development of a set of practical tools and measures for organising sustainable tourism				×
	Proposals on multi-scalar coastal landscape stewardship	×			
	Capacity building and social learning through interactive stakeholder workshops	×	×	×	×

3.1.1. Estonian case study: Integrated coastal mobility and tourism planning

The case study aims to understand LSI within the context coastal landscapes and emergent spaces of MSP by focusing mainly on coastal tourism and mobility issues in the middle section of Estonian northern coast (see Figure 3). The conceptual framework of landscape stewardship (care, knowledge and agency (Peçanha Enqvist et al. 2018)) and roles of culture in multi-level governance are used to interpret empirical findings.

Figure 3.
Workflow of the Estonian case study



Scoping and stocktaking stage:

Scoping of the LSI context was largely based on the Interreg project SustainBaltic[7] (2016–2019). Previously a smaller spatial extent in the same area provided plenty of background information. The desktop study included an overview of previous plans, action, development and general plans, visions, strategies, legal framework, statistical and spatial data, which were enriched with fieldwork and interviews with different stakeholders etc. The study mapped values and conflicts and drew a matrix of trade-offs using participatory methods ending up with Integrated Coastal Zone Management plan (Kuusik et al. 2018). The case study concluded with general development recommendations and site-based activities for recreation, mobility, and communities, and entrepreneurship based on the regional specifics to be followed-up with this project.

7 https://sites.utu.fi/sustainbaltic/

The parallel process of development of the national MSP confirmed that coastal tourism is the only branch of Blue Growth with development potential in the case area. The expert team of the case study attended the MSP public hearings, which provided concurrent feedback for investigations.

In order to update information, additional knowledge was gathered from scientific publications, documents, and available data. Meetings with all four municipality officials were organised to understand their needs as the municipal general plans also were under consideration. Interviews held with small-craft harbours, other stakeholders (surfers, the Estonian Heritage Board, MSP planners) and community groups of the case study area reflected on the ongoing MSP process, recreational economies, tourism, mobility, accessibility, second home culture, community, maritime culture, landscape, heritage, governance, human-nature interactions, nature protection, everyday practices, perceived values and articulated trade-offs.

Assessment stage:

All this material was synthesised into four scenarios (see chapter 3.2.3.) and public meetings provided initial feedback alongside discussions on trends and trade-offs. Further consultations were cut off by the COVID-19 pandemic.

The bulk of assessment was done by surveying the inhabitants and enterprises of the case study area on the previously mentioned topics. To achieve sociologically and statistically sound representativeness the Population Register (N = 758 adults / 7505 inhabitants) and the Estonian Classification of Economic Activities (N = 100/770 hand-picked Blue Growth categories – including non-active companies) with 95% confidence level were used.

Analysis stage:

The exploratory plausible scenarios were drawn on the axes of environmental restraints and economic pressure and then titled: A. Fast forward – excitingly, B. Place-based vacation, C. Virtual lenses, D. Patchwork of restrictions. A list of relevant topics influencing tourism and mobility were furnished with short statements for each of the scenarios that eventually were elaborated into four more than a page long narrations. Each of these was depicted by an artist, and the stories had to be "translated" into a place-based visual language through a series of consultations. The feedback (survey, expert interviews and stakeholder meetings) on scenarios and ongoing practices were used to analyse possible impacts of recreational economies and mobility on cultural sustainability of coastal landscapes.

Development of solutions/recommendations:

The results of the study have highlighted the following directions for enhancing LSI in the case study area.

- Balancing the interests of inhabitants, enterprises and municipalities in different spatial contexts.
- Envisaging the road map for small-craft harbours' developmental needs as nodes of tourism and mobility.
- Recognising landing sites to safeguard mobility accessibility and everyone's right to freedom to roam.
- Apply shared economy to alleviate mobility issues in the case study area.
- Reassuring continuance of natural, cultural and military heritage within Blue Growth.
- Reconsidering relying on recreational economies in a post-pandemic world.
- Paying attention to the multi-level governance practice.

3.1.2. Latvian case study: Trade-offs and balanced use of land-sea resources

The cross-cutting theme of the Latvian case study was the application of the ecosystem service approach for assessing the LSI in the Southwestern Kurzeme case study area. The ecosystem service concept was applied for identification of the ecological and socio-economic values of the coastal area, development trade-offs, as well as for assessment of the development scenarios and proposed optimum solutions (see Figure 4).

Stocktaking stage:

The relevant information on tourism and offshore wind energy development potentials and ecosystem and landscape values in the Southwestern Kurzeme case study area was collected, including:

- a review of offshore wind energy and coastal tourism development policies, municipality plans, conditions set by the national MSP,
- a survey on coastal visitors, their impact on the environment and coastal public infrastructure,
- field works to collect information for assessment of landscape qualities and recreational potential,
- an interactive stakeholder workshop to discuss the local LSI related challenges;
- an on-line survey to collect information on the most popular recreational sites (participatory GIS method).

Assessment stage:

Ecosystem service supply and landscape qualities of the case study area were assessed using biophysical mapping, as well as stakeholder engagement methods. Biophysical mapping involved expert assessment of identified landscape and seascape areas according to a selected list of criteria and based on the results of the fieldworks and GIS analysis. Stakeholders contributed to the assessment of landscape qualities during the interactive stakeholder workshop using specially designed web application. Results of the assessment are presented online in the Land Sea Act Map explorer.

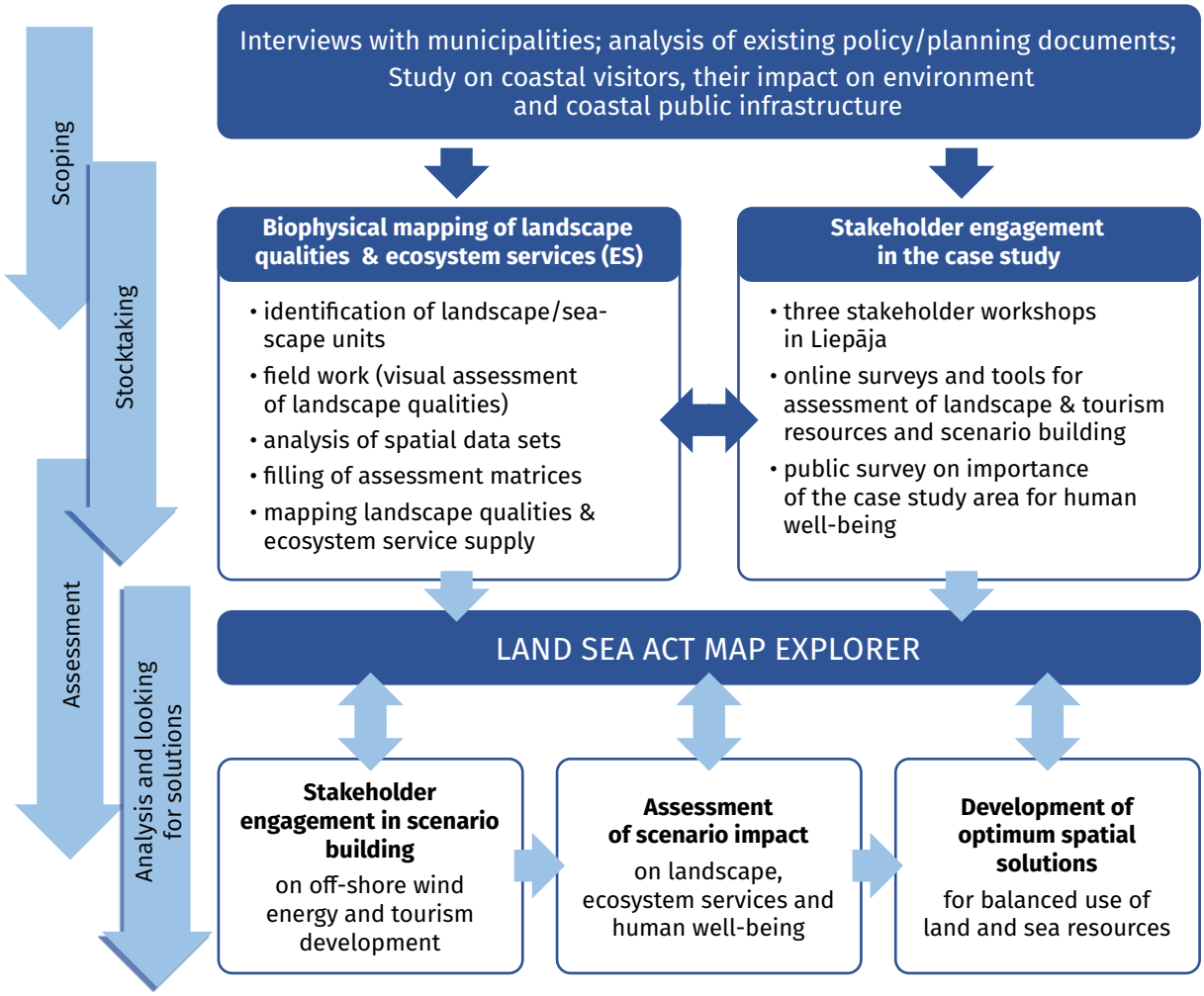
Analysis stage:

Trade-off analysis of ecosystem service supply within identified landscape and seascape units was performed using statistical analysis methods. Offshore wind energy potentials were explored at the interactive stakeholder workshop with the target-seeking scenario method – to achieve the ambitious renewable energy targets for 2050 in balance with sustainable tourism development. Impacts of the proposed scenarios on ecosystem spatial distribution, service supply, and human well-being were assessed. The importance of different human well-being categories was identified using a survey of a nationally representative sample of respondents (N=1000). The Land Sea Act Map explorer was used during the scenario building workshop to inform about spatial limitations and opportunities for offshore wind park development and later also to assess impacts and develop optimum spatial solutions.

Development of solutions/recommendations:

Optimum strategic solutions for balanced use of land and sea resources in the case study area were proposed by the project expert team and discussed with stakeholders. This included two optimum scenarios for offshore wind energy - by 2030 and 2050, as well as proposals for sustainable tourism development based on landscape qualities within the terrestrial part of the case study area.

Figure 4.
Workflow of the Latvian case study in Southwestern Kurzeme



3.1.3. Polish case study: Cultural values in Maritime Spatial Planning and Blue Growth

The Gulf of Gdańsk case study is framed around the notion of cultural values, i.e. tangible objects and intangible practices, experiences and emotions that are linked to the sea and the coast. It also investigates the use of these values in Blue Economy (culture-based and ecosystem-based tourism) and their recognition in the MSP processes. The case study included three general phases concerning data collection, data treatment and data analysis. These phases addressed – to some extent – the past, the present and the future of marine cultural values (see Figure 5). The aim was to explore how the values were acknowledged in the past (stocktaking stage), at present (assessment stage) and their expected futures (scenario building stage).

Stocktaking-stage: the past

The stock-taking stage involved data collection and was based on the analysis of secondary data sources (existing information). Its main purpose was to 'set the scene' for the future explorations of the cultural values through active involvement with local stakeholders and community members. At this stage two sets of documents underwent content analysis. Firstly, an evaluation of the tourism and developmental strategies of the coastal municipalities and provinces around the Gulf of Gdańsk was conducted. Secondly, the assessment of the relevant – i.e., culture-related – remarks submitted within the MSP processes on the Polish coast was done.

Assessment stage: the present

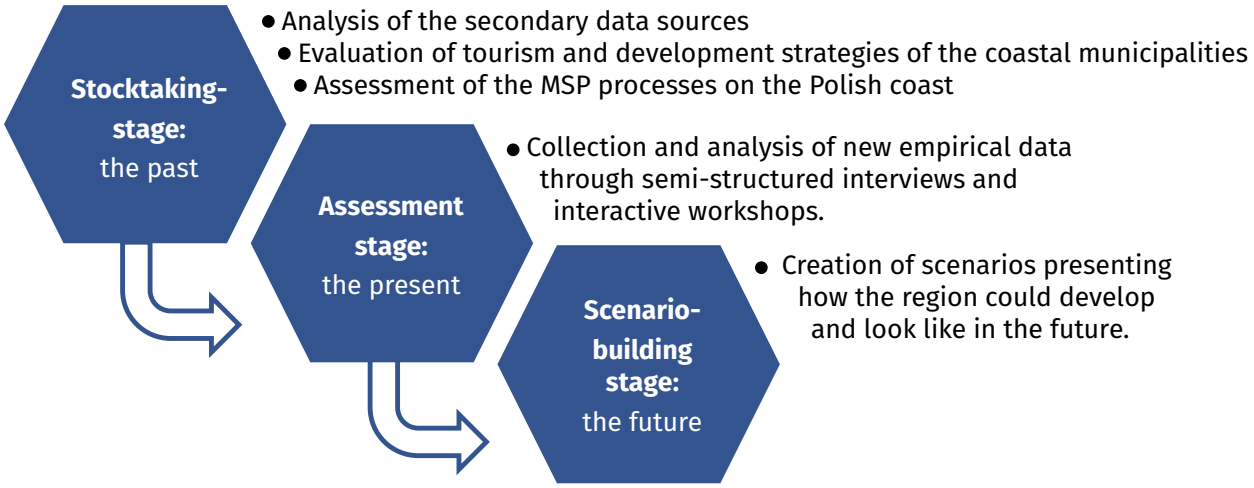
The assessment stage included analysis of new empirical data, gathered predominantly through semi-structured interviews and various forms of interactive workshops and focus group discussions. Here, the analyses were performed within two frameworks that combined scientific research with practice-focused approaches. Firstly, the MSP-supporting framework that was designed to identify cultural values was tested – may they be areas, events, places, or traditions – of the stakeholders and communities around the Gulf of Gdańsk. The aim of this framework was to translate the various values into spatial dimensions and to identify the cultural hotspots of the region. Various features were considered, including those which pointed to 'why' certain values are appreciated, 'to whom' they are important, and 'how' they interact with the sea and the adjacent land. The second framework focused on Blue Growth opportunities in the region, i.e., its marine and coastal tourism. The sustainability levels of these sectors, as well as barriers and opportunities to support transformation of the current practices into a more environmentally friendly model were assessed. Culture-based and ecosystem-based tourism was given special attention during multiple interactions with the representatives of the local communities and businesses.

Scenario-building stage: the future

Finally, in the scenario-building stage factors and driving forces that were the most likely to impact the futures of the region, and especially its cultural values were explored together with a wide range of stakeholders. The stakeholders created '*their visions*' on how the region could develop and look like in the future. These visions or scenarios offered the insights into the stakeholders' expectations, hopes and concerns that could also guide the social interventions or strategic planning in order to deliver more socially accepted or socially desired outcomes.

All these stages could, and actually did, produce some useful recommendations for the managerial processes applicable both for the marine areas and for the coastal zone (or the coast). The second and the third stage also acted as learning processes that – through active stakeholders' involvement – supported capacity building within the region and allowed for social co-production of knowledge.

Figure 5.
Workflow of the Polish case study in the Gulf of Gdańsk



3.1.4. German case study: Climate change adaptation and sustainable tourism

The German case study addressed coastal conflicts and the climate change effects in Fehmarn island, two phenomena that create additional pressures on ecosystems, society and deterioration of coastal landscapes. The case study focused on mapping coastal conflicts and developing approaches to solve them, evaluating climate change impacts, and devising potential adaptation options with the objective of promoting new sustainable coastal tourism concepts (figure 6). The activities of this case study have increased the knowledge base of the municipality and other stakeholders to enable discussions on potential adaptation measures and identification of where conflict potential exists, what future stakeholders envisage for their island, and how future conflicts can be anticipated and resolved early in the light of the current climate projections.

Stocktaking & assessment stage:

Surveys of tourists and local actors carried out during summer 2019 and 2020 have provided a picture of the current knowledge of tourists and tourism sector SMEs about climate change, currently available sustainable tourism offers and development potentials. The surveys included open-ended questions that allowed participants to elaborate on their worries, potential conflicts, and directions that policy making should take.

Field surveys and telephone interviews were carried out to assess the spatial conflicts between tourism and nature assets. These included investigations of the breeding birds and the underwater vegetation in the Orther Bay, as well as an assessment of water sport influence on macrophytes by comparing the vegetation coverage and thalli length of macrophytes between two surfing areas and one nature reserve area. Coastal tourism hotspots were mapped to visualise spatial conflicts and identify precise areas where climate adaptation measures could be implemented.

A criteria matrix was developed to measure accommodations in terms of sustainability with the aim to provide a certificate for sustainable businesses that they can use for their marketing. The measures listed were presented to this important sector with the aim to invite SME to tackle the change from “conventional concepts” to more sustainable approaches.

A similar approach was chosen with tourist (2019) and tourism sector SME (2020) surveying. These surveys addressed many questions regarding climate change with a focus on climate adaptation. The intention was to highlight mitigation and adaptation measures in the context of tourism businesses, aiming to foster the debate and general consciousness for more sustainable tourism approaches amongst local SMEs.

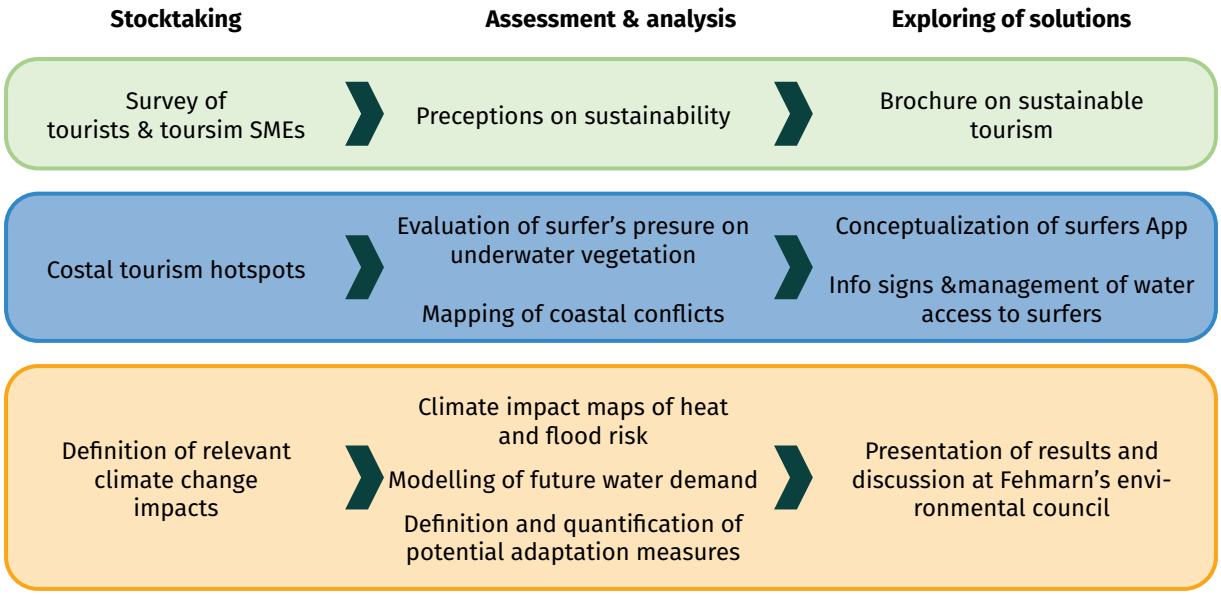
Analysis stage:

- Carrying out SWOT analysis to understand and assess current and future trends to move from traditional economy concepts to blue growth and sustainable marine tourism-oriented concepts.
- Quantification of relevant climate impacts in the island of Fehmarn and establishment of potential adaptation measures: including the production of local climate impact maps highlighting the regions more at risk due to increasing temperatures and flooding caused by rising sea-level; and estimation of additional water demand during the summer months due to climate change by 2030 and 2050.
- Result dissemination among local actors, in the format of sequential discussion rounds and working group meetings.

Development of solutions/recommendations:

- A set of proposals for climate change mitigation and adaptation strategies and sustainable solutions within the marine and coastal tourism sector for combating future impacts of climate change and moving the tourism sector towards more sustainable approaches.
- Conceptualisation of a guidance app to direct flows of water sports tourists to ensure a controlled distribution across the island's coast and avoid overcrowding and harm to marine and coastal ecosystems.
- Production of information materials to communicate environmentally friendly behaviour during vacations.
- Conceptualisation of a sustainable tourism accommodation certification system to promote sustainable housing and energy-efficiency on the island.
- Development and dissemination of a "sustainable holiday brochure", a collection of tips and tourism offers for pursuing sustainable holidays on the island.

Figure 6.
Workflow of the German case study in Fehmarn



3.2. Description of several key methods/approaches with high potential in addressing LSI issues

3.2.1. Interviews as a tool for exploring LSI: the Estonian case study

Background

Interviewing is a qualitative research method, which often is used at the scoping stage of different planning processes and can help in disclosing the LSI issues to be addressed. Qualitative research methods (including interviews) can contribute the following aspects to the spatial planning process (Gaber, 1993):

- seek to understand human behaviour from the social actor's own frame of reference,
- provide "insider" perspective and subjective interpretations of the ongoing,
- provide a process-oriented approach in engaging with actors,
- supplement with uncontrolled situations and observation,
- can create discovery-oriented, descriptive, exploratory, and inductive focus,
- gather rich and deep data that can fill gaps of quantitative research,
- provide multiple ungeneralisable single and holistic case studies,
- assume a dynamic reality.

The notion of an "interview" refers to an interactive process where a view and/or an understanding about the issue of conversation emerges from an interactive dialogue between two or more people. Interviews are often used as part of case study design, which includes several registers of empirical data (e.g., observation, policy documents and narrative stories) for connecting (triangulating) different viewpoints on situations and ongoing processes. Thus, the case study can include several methods and datasets in understanding the phenomena of coastal-marine planning.

There are two strategies for the selection of cases and interview samples (Flyvbjerg, 2006):

- Random selection to avoid systematic biases in the sample (e.g., survey design). The sample size is decisive for further generalisations. Aside from a wide random sample, there is an option to use a stratified sample, which allows for generalisations about certain subgroups within the population.
- Information-oriented selection. The aim is to maximise the utility of information from small samples and single cases. Cases are selected on the basis of expectations about their information content. Here cases can be selected by picking extreme/deviant cases, maximum variation cases, critical cases, or paradigmatic cases.

The interview type (Lepik et al., 2014) is characterised by the following features:

- Structure and standardisation of interview. An open interview has just main keywords for conversation. A semi-structured interview follows main formulated questions but allows flexibility. Fully standardised interviews try to follow exactly the same questions with all interviewees.
- Individual or group interviews. Conversation with one person or many people.
- Interview with a participant or expert-interview. This may also modify themes and vocabulary used in conversation.
- Media and situation of an interview. Face-to-face conversation or via IT-platform. Interview situations in an office, cafeteria, etc. or situations where the conversation takes place near/in environments or places under conversation. A walk-along interview can also be used (Carpiano, 2009) capturing opinions, meaningful places and emotions of interviewees on the move.

The selection of the most suitable interview type would depend on the case study focus and questions in analysing land-sea interfaces.

Implementation of the method in the case study

In the Estonian case study (see focuses in 3.1.1.), interviews were used to gather information on tensions experienced and values related to coastal tourism and coastal accessibility as part of mobility. This method also provided input for building explorative scenarios. The focal point in preparing the structure of the semi-structured interview to approach land-sea interactions and interfaces was the concept of landscape stewardship including knowledge, motivation and care (Peçanha Enqvist, et al. 2018).

Small-craft harbour related values and contested seashore accessibility were chosen as essential land-sea mobility interfaces to be included into the interview structure and for the selection of first interview partners. The topics of the designed semi-structured interviews included a wider approach to tensions between planned coastal spaces and coastal landscape value experiences. Some interviewees got selected because of their involvement in harbour dynamics and in coastal village union's initiatives. The second group of interviewees were specialists of local authorities of four case study coastal municipalities. Two interviews with municipalities were postponed because of COVID-19 disturbances, and this delay allowed to include additional questions about some aspects of the pandemic next to the thematic scenarios. It means that the sample included expert (group) interviews with representatives of the coastal municipalities (usually two or more experts participated in the conversation), individual MSP planners, as well as interviews with community members.

In the expert interviews some thematic visual materials (e.g., an area map on the office wall) were involved, which triggered questions during the conversation. Thus, the structure of the interview slightly depended on the situation and interviewees, but usually the main semi-structured themes got addressed in the conversation. Therefore, some flexibility in conducting semi-structured interviews was useful. The use of visualisation (e.g., drawing on maps) can considerably contribute to thematic conversations about land-sea interactions. For example, this way of engagement was partly used in talking with coastal fishermen in the SustainBaltic project[8] (Printsmann and Pikner, 2019).

Altogether 12 interviews were conducted, two of which were carried out via an IT-platform. Additionally, two walk-along interviews were planned to allow more rich reflections on coastal surroundings and ongoing processes. Unfortunately, these could not be conducted. Each interview lasted about an hour, conversations were recorded and later transcribed using an IT-tool and edited based on the conversation recording. The transcribed interviews were preliminarily systematised based on their main themes to allow for further analyses with more elaborated thematic coding. This case demonstrated that conducting qualitative interviews can be rather time consuming and it is crucial to take that into account in project/study planning.

The results of the semi-structured interviews were used in elaborating the thematic scenarios on coastal tourism, addressing some values and tensions on coastal planning in case study chapters, and formulating relevant questions in the thematic survey for inhabitants and enterprises.

8 SustainBaltic – ICZM Plans for Sustaining Coastal and Marine Human-ecological Networks in the Baltic Region. Interreg Central Baltic project, September 2016 – February 2019. https://www.msp-platform.eu/projects/iczm-plans-sustaining-coastal-and-marine-human-ecological-networks-baltic-region and https://sites.utu.fi/sustainbaltic

3.2.2. Assessment of marine culture: the Polish case study

Background

Identification of marine culture related values is an important aspect from the social perspective of LSI, which would also have to be addressed in Maritime Spatial Planning (MSP) - a process by which authorities organise and analyse anthropogenic activities to achieve ecological, economic, and social goals (EPC 2014; Gee et al. 2017). Ecological and economic values are well-developed and included in MSP which is not true for socio-cultural values.

Some of the explanations of marine culture include: Material and immaterial practices that form the world around us and the ways in which this world is perceived and experienced (Gee & Siedschlag 2019); other by Gee et al 2017: "Wide approach to marine culture: connections and meanings people put on the sea and their relations with this environment"; approach based on cultural ecosystem services: "Benefits humans obtained from the (marine) biodiversity that positively influence their well-being" (IRC, 2019); and the narrower approach: "Meanings and relations are linked with the resources originating from the past; somewhat misses the contemporary dimensions of culture".

The challenges of addressing the marine culture in the Polish MSP are that:

1. Marine culture was reduced to tangible underwater cultural heritage - it was defined rather narrowly, including only objects such as wrecks or remains of ancient constructions under the sea,
2. The concept of paleo-landscape was relatively new for the Polish MSP; it was not used in the proceedings for the whole Polish Marine Areas, but rather raised in stakeholders' concerns during the proceedings for the Gulf of Gdansk,
3. Additionally, the interactions between the sea and the coast (e.g., lighthouses and associated landscapes) were laying outside the scope of MSP.

Implementation of the method in the case study

The main aim of the Polish case study was to reconstruct (cultural) values and opinions that the coastal communities associate with 'their sea' and 'their coast'. The first step of mapping culturally significant locations was to understand what marine culture is by analysing the different concepts listed above. The other aspect important to consider was the historical background and levels of being marine. The Gulf of Gdansk has two fishing communities which have strong bonds with the place (especially those from the Puck Bay), while the second region - the Vistula Lagoon was established after World War II and has little or no marine-environment culture.

Applying different forms of stakeholder interaction was deemed to be the best fit for identifying and mapping places of significant cultural value, their role in the tourism sector, and to develop scenarios for the future. Furthermore, this gives wider perspectives enabling better management of cities/towns.

The case study used semi-structured interviews and interactive stakeholder workshops with various groups of selected stakeholders and local communities to learn about their relations/perceptions with/of the sea and to determine sites of cultural, historical, and social importance. All the information needed to map culturally significant locations was collected in 50-semi structured interviews, covering most important stakeholder groups. During interviews there were four main research questions answered:

1. What exactly is being valued, e.g., a city or part of it, a beach, a viewpoint or specific tourist attraction?
2. Why is it being valued, e.g., for its landscape, for the view, for the use for sport, relaxation or for the nice atmosphere?
3. Who is it for, i.e., is it important at individual, sectoral or community levels?
4. What are its relations with the sea, i.e., is the object sea-related, land-related or are land-sea interactions important to sustain the feature(s) in the long term?

Further analyses of the above mentioned questions were conducted to identify what is valuable, why it is valuable, who it is important for, what are its relations with the sea. Additionally, 24 on-line interactive workshops were organized. These workshops allowed researchers to deepen their knowledge on the investigated issues (i.e., culture and tourism), and to stimulate interactions and discussions between various stakeholders involved in the case study.

Then, the places and features were mapped to identify which parts of the region represent the highest concentration of culturally significant areas. Examples of such places/features include: "Mały Holender" restaurant, the museum of emigration in Gdynia, beach close to Rozewie, viewpoint close to Chłapowo, city districts, coastal towns.

3.2.3. Ecosystem service approach in assessment of LSI: the Latvian case study

Background: ecosystem service approach in land/sea use planning

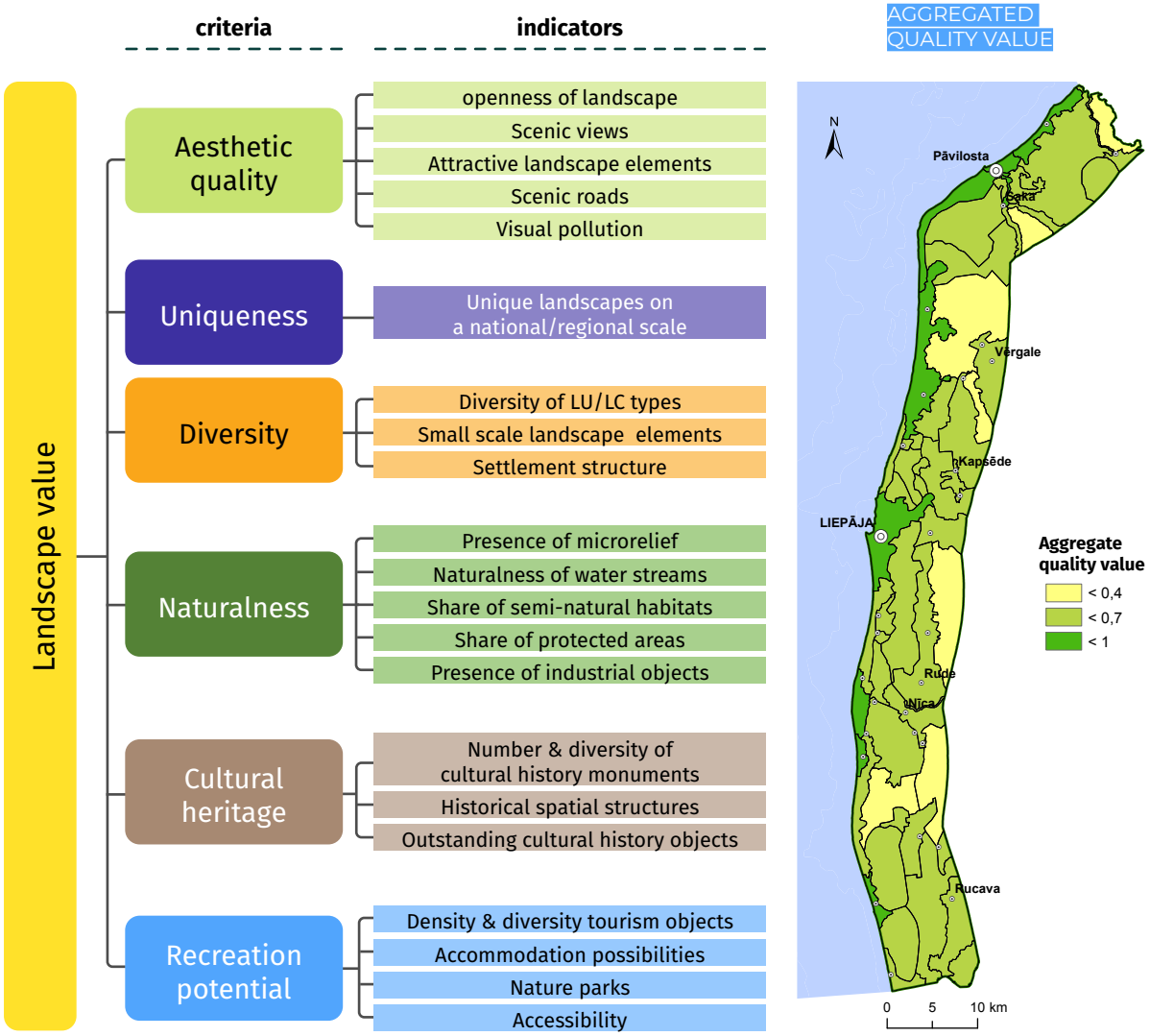
The ecosystem service (ES) concept emphasises the ecosystem structure and functions as a provider of benefits to society (Haines-Young and Potschin, 2010). It is acknowledged as a useful tool to support policy and decision making, because of its holistic view on interactions between nature and humans and potential to address conflicts and synergies between environmental and socio-economic goals. The ES concept can provide a comprehensive framework for trade-off analysis between competing land uses and help facilitate planning and development decisions across sectors, scales and administrative boundaries (Fürst et al., 2017). Furthermore, ecosystem service maps can efficiently communicate complex spatial information and raise awareness about areas important for ecosystem service supply and human dependence on functioning nature.

ES mapping includes various methods – biophysical, socio-cultural and economic. Biophysical mapping methods allow to quantify ecosystems' capacity to deliver ecosystem services based on its physical attributes – ecosystem structure (e.g., land cover, habitat type) and ecosystem processes (Vihervaara et al., 2019). Combining biophysical mapping with participatory (socio-cultural) mapping methods allows to incorporate people's experiences and perceptions and to capture the plurality of the cultural ecosystem service values (Martin et al., 2016; Scholte et al., 2018).

Implementation of the method in the case study

The Latvian case study applied biophysical mapping for assessing the ES supply in the Southwest Kurzeme coastal area – terrestrial part up to 10 km inland, shoreline, as well as marine part, comprising the adjacent territorial waters and EEZ. Since the aim of the case study was to balance offshore wind park development interests with maintenance of the coastal landscape and sustainable tourism development, the specific focus of the assessment was on cultural ecosystem services – landscape qualities and recreational potential (Figure 7), although the provisioning and regulating services were also assessed. ES supply and landscape qualities were assessed at the scale of land(sea)scape areas – relatively homogeneous units, identified by the project experts based on the spatial distribution of specific ecosystem structures and/or similar land-use patterns as well as recognising place identity and cultural heritage. Experts assessed ES supply at each landscape area on a scale of 1–5 using a list of indicators with quantified scale values. The assessment was based on available spatial data (e.g., land cover, forestry data, tourism data etc.), as well as the results of the field survey (in case of assessment of landscape qualities). ES assessment of seascape areas was based on the results of the BONUS BASMAT project (Armoškaitė et al., 2020). The assessment results are available at the Land-Sea-Act map explorer.

Figure 7.
Assessment scheme of landscape qualities in terrestrial part of the Southwest Kurzeme case study



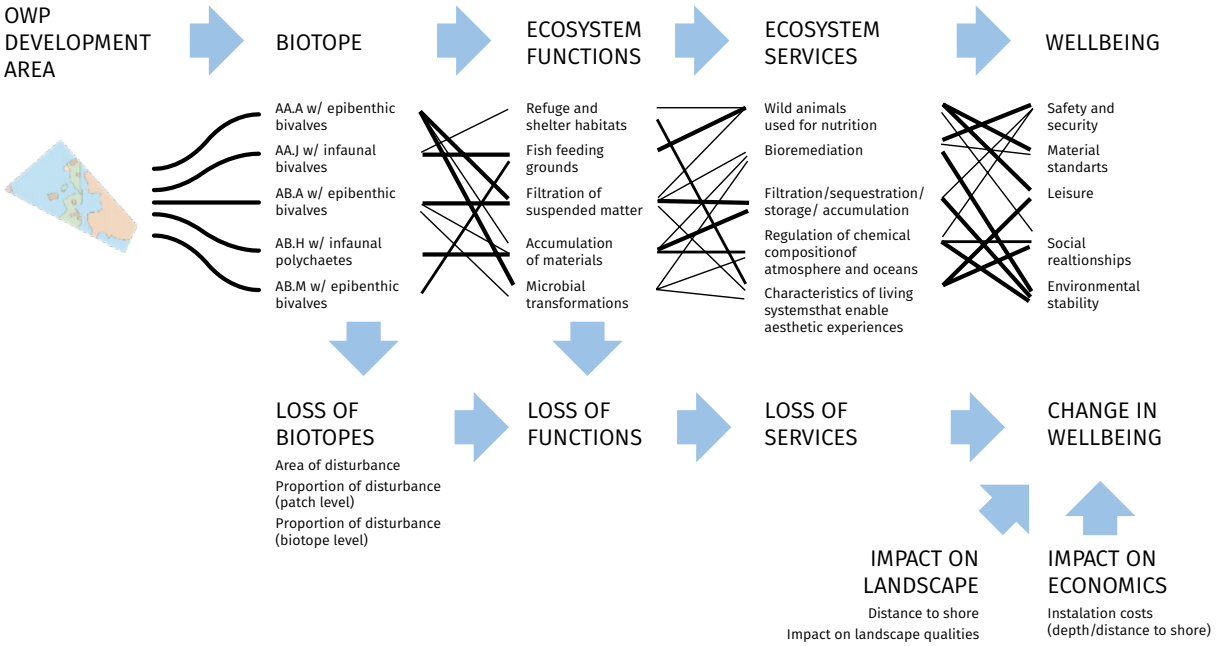
Biophysical ecosystem service mapping was supplemented with socio-cultural mapping methods involving stakeholders of the case study area. Participants of the 1st stakeholder workshop were involved in assessment of landscape areas regarding four landscape qualities (diversity, scenic views, attractive landscape elements, uniqueness) using an interactive ArcGIS Web Application. This method served as a learning process for stakeholders about landscape qualities at the same time enriching study results with local knowledge and verification of expert judgement. Furthermore, a participatory GIS method was applied (using ArcGIS online Survey 123) to learn about stakeholder opinion on recreational value of the cases study area. As a result of the survey 80 responses were collected about sites significant for recreation and tourism and their suitability for different recreational activities.

Application of the ES mapping results in assessment of scenarios and development of optimum solutions

The ES assessment results were used to assess the impacts of the proposed offshore wind park (OWP) development scenarios. To evaluate impacts of individual OWP scenarios (proposed locations) it was assumed that OWP construction will lead to a loss of certain functions of marine ecosystems, but since currently data and knowledge is not sufficient to model this impact and its cumulative character, it was presumed that the underlying benthic biotope and related ecosystem functions

will be lost. Subsequent linkage of the loss of ecosystem functions, ES and human well-being was established thus constructing the framework to compare and discuss the impacts of proposed individual OWP (Figure 8). The estimated loss of ES and related human welling aspects were considered in selection of an optimum solution with least negative impacts (see chapter 3.2.5).

Figure 8.
Impact assessment of proposed scenarios



Cultural ES assessment of the terrestrial part of the case study area was used to elaborate solutions for tourism development. The suitability of different development options within each landscape area was determined depending on the following landscape qualities: aesthetic value, naturalness, cultural heritage value and level of the current use of recreational potential. By using the scores of cultural ES assessment, the landscape units were grouped into three clusters: 1) areas of high aesthetic value; 2) areas of high natural value; 3) areas of high cultural heritage value (some landscape areas can belong simultaneously to clusters 1–3). Recommendations for tourism development were developed addressing the potentials and limitations of each cluster.

3.2.4. From climate data and local knowledge to climate change impacts: the German case study

Background

Climate change is another important aspect of socio-ecological interactions within the land-sea interface. Anthropogenic impacts from climate change may already be occurring across 80% of the world's land area, where 85% of the population resides (Callaghan et al., 2021). Among others, these impacts are largely driven by changes in variables such as temperature, precipitation or sea-level rise that pose additional pressure on socio-economic and natural systems. Given that tourism is a major economic activity in Fehmarn and is largely concentrated over the summer months, evaluating the additional pressures of climate change on natural resources and people during those months becomes important to define adequate adaptation measures. Furthermore, planning for adaptation is better assisted by having a spatial representation of the expected climate impacts, which in turn allows to identify priority areas for action.

Developments towards making the biophysical spatial data more accessible and frequently updated (e.g., satellite, global-consistent and gap-filled weather data) over the last decade open new possibilities to conduct spatially explicit impact assessments. Although growing amounts of available data are welcome, their potential is only fully unlocked when related to local knowledge

and landscape characteristics. In the following sections it is summarized how climate, satellite data and local knowledge were integrated to produce local climate impact maps assisting the exploration of adaptation measures. A set of methods combined into a common analysis framework were applied to evaluate the main climate change impacts - urban heat, water supply and flood risk.

Data collection

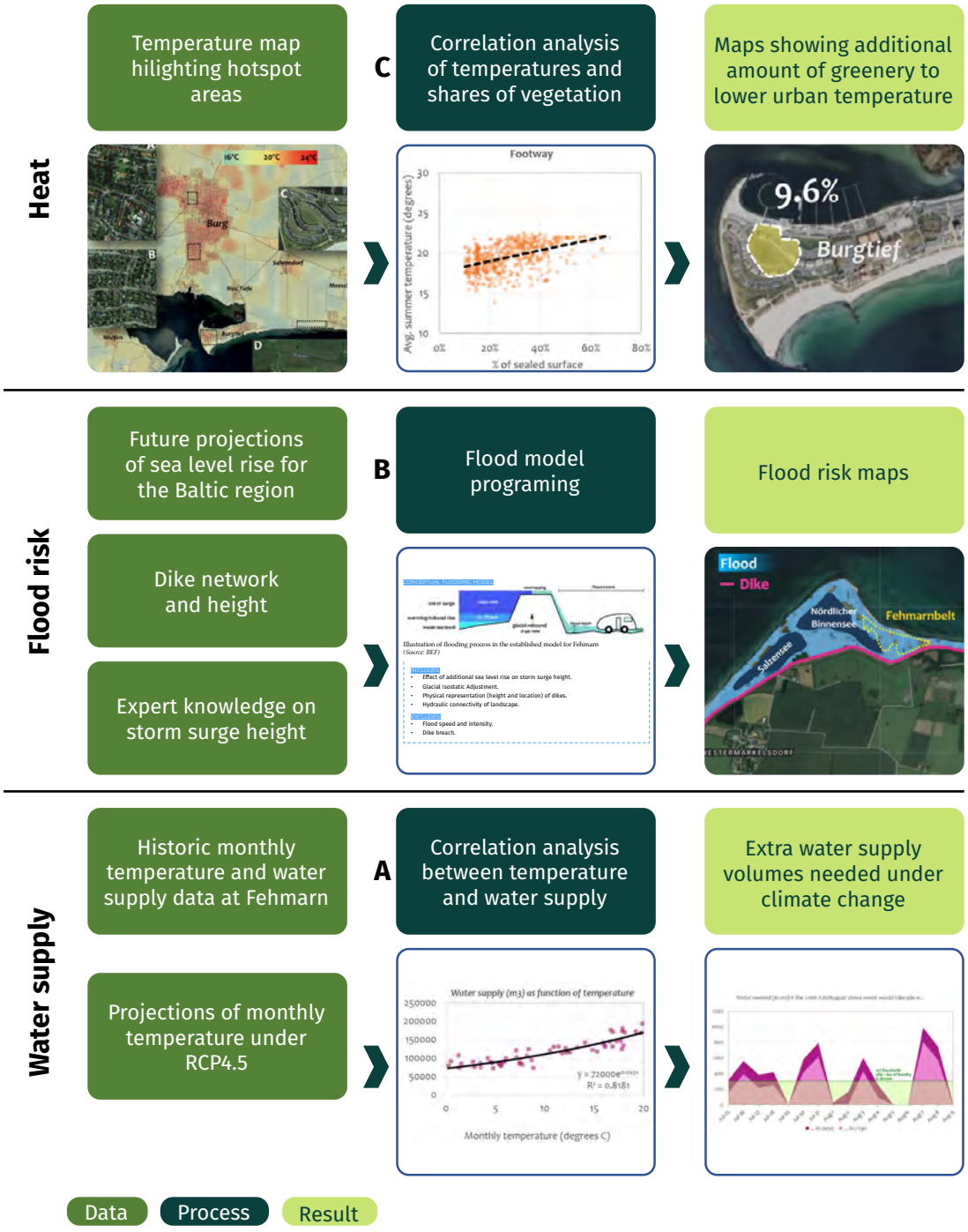
Data required for the quantification of climate impacts (see Figure 9 below) were obtained from authoritative data sources. These included historical temperature over the summer months from ERA5 reanalysis – ECMWF[9]. Temperature projections over the summer months at Fehmarn were extracted from 43 models in KNMI's Climate Change Atlas[10] feeding into the IPCC (model results were then averaged over 2030 and 2050). Mean ensemble projection of sea-level change in the Baltic used in AR5[11] with data extracted from the ICDC University of Hamburg[12]. Surface temperature data was obtained for the summer of 2020 using Landsat8 data from USGS[13] and approximated to air temperature following the relationship proposed in Mildrexel *et al* (2011). Local expert knowledge on the maximum and lowest dike height was combined with dike location survey data to infer on the dike heights across the Fehmarn coast. Expert information on the maximum surge height was taken to inform the modelling of flood risk. Data and knowledge on data usage, reservoir capacity and water supply infrastructure bottlenecks from Fehmarn's *Wasserbeschaffungsverband* were used to constrain a statistical model of water supply to Fehmarn under climate change.

Methods and steps for evaluating climate impacts

Figure 9 summarizes the main analytical steps for the evaluation of climate impacts followed in the Fehmarn case study. Because estimating climate change impacts over diverse areas such as heat, flood risk or water supply, there is no standard methodology that can be applied. Nevertheless, a common analysis framework - reading from left to right in Figure 9 – can be appointed consisting of gathering relevant data on climate/weather and relevant socio-economic and landscape features potentially impacted; establishing a quantitative relation between past climatic stresses and the impact of a particular socio-economic or land space dimension (e.g., month temperature vs water supply, surge height vs flood level); and finally integrating the future evolution of climate in order to evaluate the impact on socio-economic and natural systems. Within such a framework the most relevant and difficult step is quantifying the relations between a given climate-related variable and the associated socio-economic or landscape impact. For the case of climate change impact on water supply a simple statistical model was established correlating monthly data on temperatures with that of monthly water supply (see A in Figure 9). Water supply and temperature were found to be positively and non-linearly correlated. An exponential function was fitted to the data and found to conveniently reproduce the past (2016-2020) variability of water supply. Following, projected temperature data for the year 2030 and 2050 is introduced in the function which allows estimating additional water volumes in those years to those supplied between 2016-2020.

9 https://www.ecmwf.int/en/forecasts/datasets/reanalysis-datasets/era5
10 https://climexp.knmi.nl/plot_atlas_form.py
11 https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter13_FINAL.pdf
12 https://icdc.cen.uni-hamburg.de/las/getUI.do
13 https://www.usgs.gov/science-explorer-results?es=Landsat+8

Figure 9.
An overview of the analytical steps followed to generate climate impact information



For the case of flood risk, a flood model was conceptualised and programmed in the Google Earth Engine, established incorporating expert data on surge levels, regional sea-level rise, and dike height (see B in Figure 9). Expert knowledge on extreme surge levels at Fehmarn was combined with regional sea-level projections to set the 2100 surge-level height under climate change at 2.7-meters. Inundation according to varying levels of surge heights was simulated with the model. Although a full validation of the model on past flood data was not possible, it was observed that the model highlights flood prone areas in locations previously affected by floods, such as the case of the storm surge in 1989 of about 2.2-meters (Source: Landesregierung Schleswig-Holstein) at Wulfener Hals camping place. Next, flood risk maps under a 2.7-meter surge were derived. Finally, regarding heat, summer air temperatures along the street network of Fehmarn are correlated with land-cover to establish a relation between temperature and % of sealed surface (see C in Figure 9). This allows estimating backwards what would be the necessary extra amount of greenery (meaning less sealed surface) to achieve a particular temperature outcome. For the case of Fehmarn, the extra amount of green area needed to lower summer temperatures of locations that are typically above 21 degrees in the summer to an average of 20 degrees was estimated.

3.2.5. Scenario method in addressing LSI: the Estonian, Latvian and Polish case studies

Background

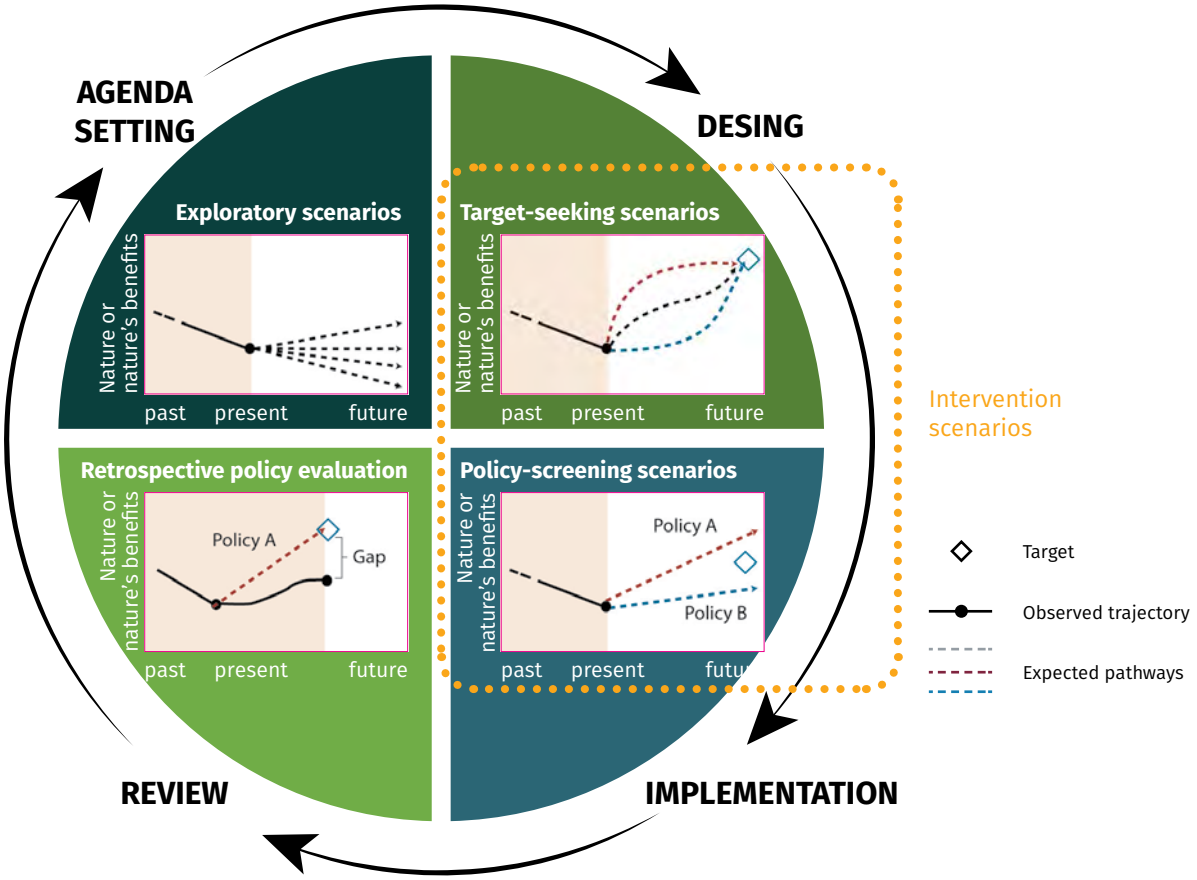
The scenario approach is used in land-use planning for depicting conceivable future situations and elucidating the driving forces behind them. Scenario research is seen as a useful tool in understanding the consequences of policy options available in the future (Schoute et al., 1995). Scenarios have value only if there are several different choices – thinking through all the probable options would warn about unpleasant surprises. Therefore, scenarios do not have to be realistic – these are just thought-provoking tools to unravel complex effects of sought-after trends on spatial scale. Similarly, there is seldom a situation when one scenario is realised to its fullest extent (Antrop, 1997, 1998, 2000, 2005), and the reality is usually a combination of scenarios (compare Palang et al. 2000 and 2019).

Broadly speaking, two types of scenarios were in use, ones that tried to forecast the future, others that aimed to backcast the conditions that would create the desired future (Harms, 1995, Schoonenboom, 1995). IPBES (2016) have developed a methodology for assessment of scenarios in relation to biodiversity and ecosystem services, suggesting different types of scenario building depending on policy or decision-making context (see Figure 10)[14]:

- *Exploratory scenarios* – represent different plausible futures, often based on storylines, and provide means for dealing with high levels of unpredictability, associated with the future trajectory of many drivers.
- *Intervention scenarios* – evaluate alternative policy or management options – through either:
  - *Target-seeking scenarios* – alternative pathways are examined for reaching an agreed-upon future target or
  - *Policy screening ("ex-ante") scenarios* – various policy options are considered.
- *Retrospective policy ("ex-post") evaluation* – compares the observed trajectory of a policy implemented in the past to scenarios that would have achieved the intended target.

14 http://ipbes.net/scenarios

Figure 10.
Different types of scenarios and their applicability in policy making and implementation (Source: IPBES 2016)



Methods and technology use may differ, but most scenario studies share some important common characteristics. This includes the main scenario building phases (Guerra et al. 2017):

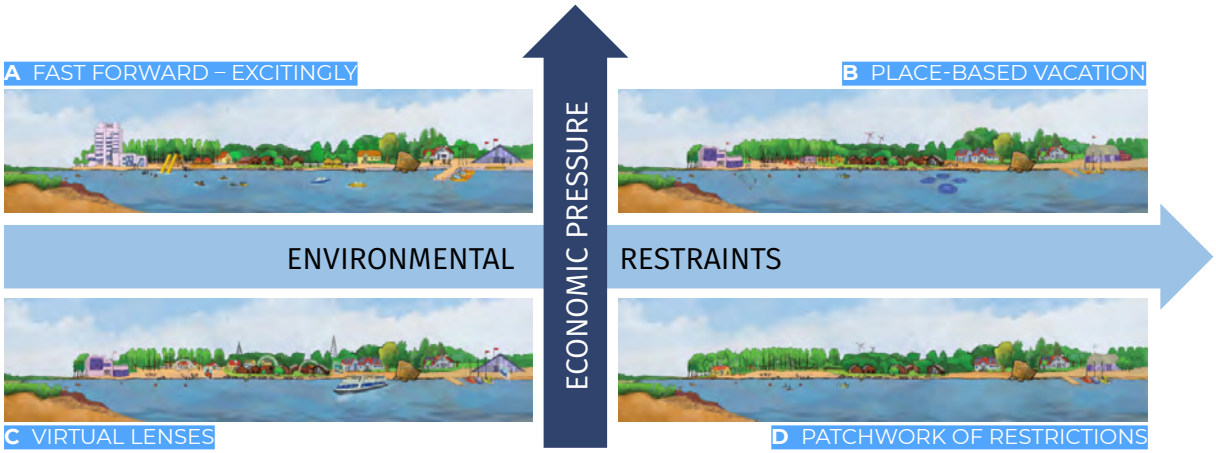
1. Where the major tendencies for a specific region or subject and the drivers of change that underpin these tendencies are defined and formulated sometimes with the help of axes into different plots.
2. Translating the identified scenarios qualitatively or quantitatively into variables and assessing or modelling the impact of these changes on the environment and society.
3. Usually using visualisation techniques such as artistic depictions, map outputs, aerial photography manipulation or applying iterative agent-based modelling.

Furthermore, scenario building usually utilises a participatory approach either by involving stakeholders in identification of the drivers of change, scenario building, initial feedback, or final public assessment of results.

Applications of scenario building in the Land-Sea-Act case studies

The Estonian case study applied the exploratory scenario method to address LSI within coastal tourism and mobility context (see chapter 3.1.1.). Based on the previous scoping, MSP developments and stocktaking stage four plausible scenarios were plotted on two axes and then titled (see Figure 11).

Figure 11.
Four explanatory scenarios on integrated coastal mobility and tourism planning on 'Environmental restraints' and 'Economic pressure' development factor axes



A list of relevant topics (values of tourists and travellers, safety of the Baltic Sea area, trends in global economy (e.g., sharing and circular economy), urbanisation and recreational economy, ICT, mobility and accommodation, environmental condition and climate change, aging population and silver economy, destination shaping and co-creating of heritage, interested parties, stakeholders, and responsible bodies) influencing tourism and mobility were furnished with short statements for each of the scenarios. These notions were eventually elaborated into four more than a page long narrations with the help of university students, a local stakeholder meeting and local schoolchildren's workshops. Each of these scenarios received a depiction by an artist (see Figures 12 and 13), and the stories had to be "translated" into a place-based visual language through a series of consultations.

Figure 12.
The picture shows the current situation (contains fragments from several coastal villages in northern Estonia) (illustration: Aleksandra Ianchenko 2021).

The built scenarios with condensed descriptions and artistic visualisations were assessed via a survey of inhabitants (N = 758) and enterprises (N = 100) of the case study area. Both favoured Scenario B. Place-based vacation (see Figure 13) as the most likely to happen (with open answer explanation possibility), as well as the most pleasant if it were to happen, despite differences in the opinions between inhabitants and enterprises and in the likelihoods of individual scenarios to take place.

Figure 13.
Scenario B. Place-based vacation depicts the recreation economy and coastal mobility influences on the landscape by 2040 (illustration: Aleksandra Ianchenko 2021).

The Latvian case study applied the target-seeking scenario method to explore alternative pathways or options for offshore wind park development within the Southwestern Kurzeme case study area. The "agreed-upon future target" was based on national policy objectives for use of renewable energy and coastal tourism development, as well as estimated capacity for offshore wind energy production in Latvian marine waters by 2050, which is 2.9 GW (Wind Europe, 2019). In addition, the target was specified by stakeholders of the case study area during the interactive workshop and online survey. The participatory approach was also applied for scenario building – during an interactive face-to-face workshop (with *ca* 40 participants) stakeholders were divided in four groups and each group was tasked with seeking suitable locations for the offshore wind parks, taking into account the estimated energy production targets, the limitations and priorities for the sea use defined in the national MSP of Latvia, as well as possible impacts on marine ecosystem and landscape. The relevant spatial data on marine ecosystem features and service supply, sea use information and thresholds of offshore wind park visibility from the coast were presented to stakeholders within an online map explorer developed using ArGIS Online Experience Builder platform. The four groups also discussed the opportunities and targets for sustainable tourism development in the coastal area of the Southwestern Kurzeme.

The four alternatives proposed by the stakeholders for the offshore wind park locations were later assessed by experts, calculating the impacts to marine ecosystem components, coastal landscape qualities, ecosystem service supply and human well-being (see chapter 3.2.1). Based on the assessment results, the experts proposed optimum solutions for offshore wind energy development by 2030 and 2050 and elaborated proposals for targeting tourism development. More information is available in the Land-Sea-Act map explorer[15].

The Polish case study tested the exploratory scenario building method for investigating *'stakeholder visions'* regarding the future socio-economic development of the Gulf of Gdansk/the Vistula Lagoon regions with a focus on maintaining cultural values. The method was implemented through interactive stakeholder workshops. This procedure was conducted both in-person and online. The in-person version differs from the online one in duration and certain interactions. The in-person meeting involved two full days of individual and group activities, conducted in one place. The online version has the same consecutive actions; however, they involve several email interactions, phone discussions, as well as online participatory workshops. In both cases the stakeholders involved in the process represented various social groups, which allowed to collect different narratives addressing the very same issue(s). The discussions are intended to focus on the future of a certain region, e.g., the Gulf of Gdansk or the Vistula Lagoon regions with special focus on cultural values of the areas.

[15] https://experience.arcgis.com/experience/2447e76e306a4e68bf82323e33b72b26/

The adopted procedure involved four steps, which fit both of the above-mentioned forms of workshops. Firstly, the participants responded to the following question: In your opinion, what are the crucial factors, which determine or will shape the future of the region, with special emphasis on cultural values? The responses could include any arbitrary factor, which directly or indirectly influence the cultural values of the region. The cultural values are defined as both material and nonmaterial cultural heritage and peoples' lifestyles (connected to the sea) and the potential for tourism and recreation.

Once all the responses were collected, they were grouped, and the number of factor/barrier numbers were counted. At the grouping stage, factors identical (or almost identical) in content were combined. Similar factors – although, for example, with different emphasis – remain as separate items on the list. Then, the participants are requested to choose 10 most important factors, which they think would be most influential on the region's future and then 10 factors, which may have very uncertain impacts on the region's future. In this way ranking of the factors and indication for those factors that the group has considered to be the most important was created.

The final stage involved participation of the stakeholders in an online workshop (small groups), which was aimed at discussing individual inputs on the wider discussion fora. The workshop was recorded and transcribed. The transcripts were then analysed following the content analysis based on the interpretation of the text.

The approach tested in the Polish case study highlights that the participants are not expected to have been prepared for the meeting, and the moderator simply runs the discussion to gain information based on the participants' knowledge, personal experience and the barriers, which have been chosen by the participants in the earlier stages of the study.

The stakeholders were presented with the results of their voting for the most important factors, which influence the future of the discussed region. Then the group was asked to discuss and hence create up to 3 scenarios for the region's development, using the chosen factors from the list (2 for each scenario). The scenarios involved two crossing factor fields, which facilitated the creation of four scenarios based on the ending points and the extrema of factors' impacts.

These scenarios showed how the region may look based on the combination of discussed factors. Then the group discussed which scenario is the most/least likely to happen. In each scenario case, the stakeholders were asked for their preferred and most likely to happen scenarios.

4

Suitability of different methods for addressing LSI in different contexts

4.1. Suitability of different methods for different LSI themes

The methods for addressing LSI, tested by the Land-Sea-Act case studies, range from technical assessments and calculations, which are based on expert knowledge and scientific data, to various participatory approaches for collection of local knowledge and stakeholder opinions. Those different approaches might have different roles or weight in addressing different aspects of LSI (Table 1). The expert driven methods like ecosystem service assessment and trade-off analysis (Latvian case study), as well as the assessment and mapping of climate impacts on coastal areas (German case study) may be more suitable for investigating the socio-ecological interactions, while participatory methods (e.g., interviews, public surveys, interactive workshops) are essential for exploring socio-economic interactions, including conflicts between different stakeholders' interests in use of marine and coastal space, impacts of offshore developments on landscape, cultural heritage, place identity and values which people attach to coastal areas. When fostering Blue Growth or Blue Economies, approaching different stakeholder groups, e.g., inhabitants, companies and local authorities with the same methods can reveal different goals, developmental tensions, and cooperation difficulties within coastal communities (Estonian case study).

Participatory methods can complement expert assessments by providing local knowledge and values in relation to landscape qualities, tangible and intangible cultural heritage, opportunities for tourism development etc. Combining stakeholder perspectives with expert assessments can allow spatialisation of local values and knowledge, e.g., translating intangible cultural values into maps (Polish case study). Furthermore, integrated (trans-disciplinary) methods, where experts work together with stakeholders, are the most appropriate for analysing development trends and finding solutions for various LSI challenges.

For example, scenario building provides a complex approach to exploring future development potentials and/or solutions within coastal areas, which can be applied for any aspect of LSI and Blue Growth. Scenarios can reveal interactions between different uses of the coastal area, as well as ecological, social, and economic impact of the expected developments. It helps to elucidate sought-after and unacceptable developmental trends and help to picture how these play out in land use or landscape appearance. While more tourism activity could be seen as a growth potential and income generator and thus favoured in claim-based questionnaires or interviews, more traffic, accommodation, and other tourism infrastructural consequences are not as appreciated when presented in complex cause-and-consequence scenarios. Hence, scenario building methods rely heavily on data for describing the background context or baseline and drivers of change, on expert knowledge for data interpretation, as well as on stakeholder perspective on different interests, priorities, and values. Therefore, it can be considered as the most interactive method, which can combine various techniques, including workshops, surveys, assessments and even modelling.

Suitability of various participatory, expert-based, and integrated methods for addressing different LSI themes is presented in **Annex I**. Suitability analysis reveals that most of the methods are applicable or can contribute indirectly to most of the themes. However, the suitability of a particular method will always be site and context specific and depend on availability of resources, skills, and data.

4.2. Suitability of different methods for different LSI scales

As described above, LSIs are always case-specific, and each theme or phenomenon may relate to a particular scale - local, regional, national or even wider. Therefore, **the methods used need to be adapted** to the scale in question, using data at the appropriate resolution, identifying the relevant scope and number of stakeholders, etc.

Land-Sea-Act case studies represent local and regional scales. However, most of the applied methods are not scale specific and can be upscaled to national or even sea-basin scale or downscaled to a local context.

Participatory methods such as interviews and public surveys can be carried out in all of the above-mentioned levels, providing very different results or perspectives. Already on the local level there are different stakeholder groups to be interviewed, which will reveal different attitudes, possibilities, and trade-offs. At the regional or national level more influential actors come into play, e.g., authorities, larger NGOs, which sometimes are more equipped with knowledge of visions, strategies, and EU level politics. By approaching higher levels, the expertise level usually is increased. However, a rather limited number of people (e.g., politicians or representatives of international organisations) would be able to provide input via interviews on sea-basin level. Opinions collected at local or regional level can be also generalised for the national level. Experts or scientists can contribute through interviews or ordered research, providing assessments to the reports, which combine different data levels. Selection of the appropriate level or target group to be interviewed/ surveyed will depend on the character of the LSI issue. For example, the development interests and concerns of a coastal village or community could be identified at the local level, while issues such as the development of ports or offshore wind farms and their associated socio-economic and environmental impacts could concern stakeholders at local, regional, and national level. Depending on the level and size of the target group an appropriate representative sample of respondents shall be selected.

Similarly, scenario building can be applicable to different scales, but depending on the scale it can involve different methods. Interactive workshops with community representatives and other stakeholders can serve well in explorative or target-seeking scenario building at local and regional scales, thus utilising local knowledge and interests, while scenarios of national or sea-basin level would mostly rely on expert opinions, trend analysis or modelling. Feedback about the proposed scenarios or development options can be obtained from different levels or groups of stakeholders through interactive workshops or surveys (for example, in the Estonian case study feedback on the scenarios was gathered through a survey, expert interviews and local stakeholder meetings, while in Latvia during the development of the national MSP, the national scale alternative sea use scenarios were evaluated at four regional stakeholder workshops).

Suitability of expert-based mapping and assessment methods for the different scales depends on data availability, resolution, as well as the character of the phenomena. Cultural value assessment is probably one of the methods, which might be difficult to apply across different scales, as the cultural (and particularly its intangible) value is mainly expressed at the local context. However, the results of the cultural value mapping (e.g., by identifying cultural hotspots) can be upscaled at regional or national level to be recognised within the MSP process. A similar situation applies to landscape quality assessment, which usually requires field surveys at a local scale, but the results can be aggregated at a higher scale. Mapping and assessment of ecosystem services is applicable across different scales but would require selection of appropriate service providing unit and data sources of sufficient resolution.

At the same time, the scale of mapping or assessment should be appropriate to the scale of the impact being assessed or the level of decision-making. In the German case study, for example, the local climate impact maps have helped to raise local stakeholder awareness of the challenges of climate change impacts and related adaptation, while the implementation of measures such as coastal protection or improving water supply often depends on higher levels of governance. It was also noted that when evaluating climate impacts at the coastal zone, adequate resolution of some climate or climate-related data is sometimes not available; model-derived sea-level rise projections are mostly meaningful at broader spatial scales, and the same is true for surge projections under the effect of climate change.

4.3. Suitability of different methods for different LSI governance processes

The methods outlined in the Compendium have a strong focus on stakeholder participation and integration (or balancing) of various interests, sources of knowledge and data, thereby supporting principles of multi-level governance, including transparency, inclusiveness as well as subsidiarity and proportionality in policy making. Integration of participatory methods with expert-based assessments allows addressing complexity and place-based character of the LSI issues, highlighting the aspects that may not have been captured by traditional planning or governance processes and thus contributing to implementation of multi-level governance.

The Land-Sea-Act cases, presented here, were mostly aiming to explore spatial planning solutions for coastal development trade-offs, thus illustrating the planning process, including stages of scoping, stocktaking, assessment, analysis and/or development of solutions. The cases do not cover implementation, monitoring and review stages, which are required in formal governance processes. However, many of the described methods, in particular participatory approaches, could also be applied in these final stages, especially in the review of the plans. Thereby, they can serve as input in the existing planning practices, e.g., strategic or spatial planning process for municipalities, regions or national scale as well as MSP. In Latvia, for example, such integrated approaches for addressing LSI can be used for producing thematic plans, which have recommendatory character, however, should be taken into account in development of other legally binding plans or rules.

The main challenge for uptake of these methods and multi-level governance approaches in addressing LSI is related to hierarchical character and lack of flexibility of existing planning systems. Local authorities are more inclined to follow planning traditions or minimum statutory requirements because they are busy with day-to-day work, dealing with ad hoc situations and have limited budget. Therefore, there is resistance to novel approaches and proactive cooperation across scales and sectors. Uneven capacities or interest in cooperation and upscaling of governance issues at municipality level has been revealed by the recent administrative reforms in Estonia and Latvia. In Estonia this mostly concerned the forming of a new governance level - *kandid* (neighbour(hoods)) – a conglomeration of villages that in many cases didn't exist before. At some places it worked well as in-between administrative units and even constituted unions to meet up with now much bigger municipalities, but that was not the case everywhere. In Latvia several municipalities have even initiated court cases against unification with neighbouring municipalities, demanded by the administrative reform. This kind of multi-level cooperation among municipalities or local communities has waned even more with COVID-19 gathering restrictions - if the personal ties were not strong enough, the online meetings could not replace the informal coffee-table conversation and problem-sharing.

As the interest and capacities of municipalities in addressing of emerging LSI issues and proactive cooperation is rather low, the novel approaches to planning and multi-level governance have so far been mainly tested in frame of various projects such as Land-Sea-Act, Pan Baltic Scope, ESPON MSP-LSI, BONUS BALTSPACE, etc. Mainstreaming these approaches into coastal governance requires capacity building at different levels (including education, training, exchange of experience) and possibly a supportive legal framework.

5

Main lessons learned

- A wide range of well-established methods (interactive workshops, interviews, public surveys, scenario building, spatial data analysis) are available that can be used to address LSI, enabling active stakeholder engagement in developing solutions to coastal challenges.
- Participatory methods are particularly important to ensure multi-level governance of LSI issues, especially at local and regional level. However, these methods need some refinement and adaptation in the context of MSP and LSI due to the wide range of stakeholders, data gaps and problems of visual representation. The use of quantitative assessment to reveal public preferences is still not very common for guiding policy and decision-making, including MSP and coastal governance.
- The combination of qualitative and quantitative methods can serve well in addressing the complex issues of LSI in the planning process. Qualitative methods, including interviews, data and policy review, help identify the key issues to be addressed at the scoping stage, which can then be quantified at the assessment stage through surveys/interviews and spatial data analysis. The random sample of public survey respondents makes it possible to reveal generalised values and tensions related to coastal area planning.
- The use of expert-based research methods such as ecosystem services assessment, climate impact modelling, mapping of intangible culture values helps gain a deeper understanding of the interactions between socio-ecological systems in coastal areas. However, these methods can benefit greatly from integrating local perspectives and knowledge through interviews, surveys, or workshops, which provide a place-based context and increase the credibility of the results.
- However, implementing both participatory and expert-based approaches can be time and resource intensive. Each method has its own limitations and levels of uncertainty that researchers need to be aware of and reflect on.
- COVID-19's restrictions on gathering have hindered the face-to-face involvement of stakeholders, which is an essential prerequisite for active participation. However, this situation has increased the skills and capacity to use various online platforms and tools that can, to some extent, replace traditional face-to-face meetings and, in some cases, even help make the process more efficient.
- Case studies have the advantage of being able to approximate real-life situations and understand values and/or possible solutions directly in relation to local and regional spatial planning challenges, whereas national MSPs are very general.
- It was recognised that the integration of such methods into conventional planning systems is difficult due to existing planning traditions and hierarchies. A flexible legal framework for complex planning cases should therefore be promoted.

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Annex I: Suitability of different methods for addressing of different LSI themes

	Methods	Socio-ecological interactions (humans vs. nature)			Socio-economic interactions (humans vs. humans)			Technical interactions
		Impacts from sea/ land uses to coastal ecosystem	Visual impacts of new offshore & coastal constructions	Climate change impacts to coastal ecosystem and human well-being	Conflicts and synergies of sea/land uses	Impacts of sea/land uses on social (local) values	Impacts of sea/land uses on employment, well-being	Land-sea infrastructure connectivity
Participatory methods	Interactive workshops / focus group discussions	×	×	×	X	X	X	X
	Questionnaires	×	X	X	×	X	X	–
	Participatory GIS surveys	×	X	X	X	X	?	–
	Field works (e.g., interviews) for social data collection	×	X	X	X	X	X	–
Expert-based methods	Review of existing policies (e.g., content analysis method)	×	×	×	X	×	X	×
	Reviewing of statistics and other available data sources	X	X	X	X	×	X	×
	Field works for biophysical data collection	X	X	X	–	–	–	–
	Ecosystem service mapping and assessment*	X	X	×	X	X	X	–
	Landscape quality and visual impact assessments*	–	X	–	×	X	–	X
	Climate change impact assessment	–	–	X	×	×	–	×
	Spatial-ecological modelling	X	X	X	?	?	?	×
	Spatial analysis of suitable areas for sea/land uses in GIS*	X	X	X	X	×	×	X
	Trade-off analysis	X	X	X	X	X	X	?
	Strategic and spatial planning*	X	X	X	X	X	X	X
	EIA and SEA*	X	X	×	–	X	×	X
Integrated methods	Scenario building, incl. analysis of current and future trends	X	X	X	X	X	X	×
	SWOT analysis	×	×	×	X	X	X	×
	Cultural value assessment	–	X	×	×	X	?	×
	Value-chain analysis	×	×	×	X	X	X	×
	Governance analysis	×	×	×	X	X	X	×
	Multi-scalar coastal landscape stewardship	X	X	X	X	X	X	×

* – expert-based methods, which can/should include participatory methods

X – strongly/directly suitable × – complementary or potentially suitable / can contribute indirectly

– – not relevant / not applied ? – suitability unclear

The project Land-Sea-Act (#R098 Land-Sea-Act Land-sea interactions advancing Blue Growth in Baltic Sea coastal areas) aims to bring together stakeholders involved in coastal management and planning, to find solutions to Maritime Spatial Planning and Blue Growth challenges around the Baltic Sea and to elaborate Multi-level Governance Agenda on Blue Growth and Spatial Planning in Baltic Sea Region. The project will guide national, regional and local authorities, as well as stakeholders of various sectors to:

- improve transnational cooperation and facilitate knowledge exchange to foster Blue Growth
- raise awareness, knowledge and skills to enhance Blue Growth initiatives and integrated development in coastal areas
- balance development of new sea uses with coastal community interests by improving coastal governance

Project implementation duration:	January 2019 – December 2021
Project budget:	2.21 million EUR, including European Regional Development Fund co-financing 1.76 million EUR
Project is financed by:	Interreg Baltic Sea Region Programme

Our project homepage: www.land-sea.eu
Look up and follow us on social media #LandSeaAct

LAND SEA ACT

Interreg Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

Ministry of Environmental Protection and Regional Development Republic of Latvia

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