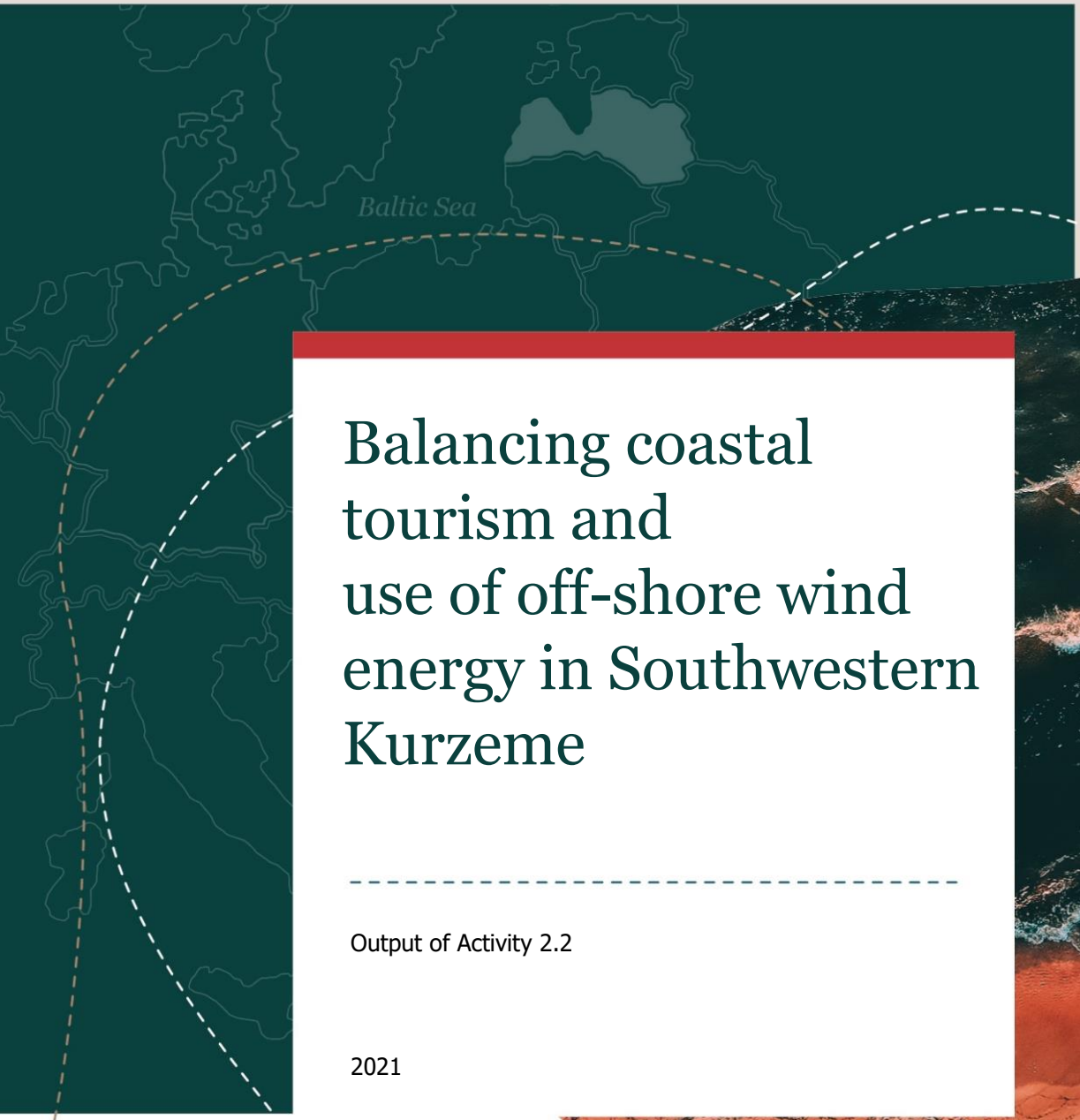
Interreg Baltic Sea Region Programme funded project
Land-Sea-Act (R098)
"Land-sea interactions advancing Blue Growth in Baltic Sea coastal areas"

Case study Southwestern Kurzeme, Latvia



Balancing coastal tourism and use of off-shore wind energy in Southwestern Kurzeme

Output of Activity 2.2

2021

LAND SEA ACT

Interreg Baltic Sea Region

EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

Land Sea Act project partners worked in six geographical locations in six countries around the Baltic sea – Sweden, Denmark, Germany, Poland, Latvia and Estonia.
This is one of six case study reports that will share insights, achievements and solutions for the Maritime Spatial Planning and Blue Growth challenges in coastal areas with different land and seascapes, legislative and governance systems, and various stakeholders.

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Acknowledgement: Authors would like to thank all involved stakeholders for active participation in implementation of the case study.

Year: 2021

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1. Introduction

Understanding of land-sea interactions is critical to the successful delivery of maritime spatial planning (MSP), as marine and coastal activities are often closely interrelated. Coastal landscape can be perceived as an interface where new offshore developments interact with place identity and well-being of coastal communities and thereby raising concerns and debate among stakeholders.

Land-Sea-Act case study of Southwestern Kurzeme, Latvia aimed to develop proposals for balancing national interest in offshore wind park (OWP) development with that of local communities in preserving the landscape and boosting coastal tourism and recreation. For that purpose, multiple values of land- and seascapes were assessed by applying an ecosystem services approach. Particular attention is devoted to mapping and assessing landscape qualities. The assessment results were applied in discussing alternative scenarios or pathways for achievement of ambitious goals for offshore wind energy production by 2050, which would be in balance with sustainable tourism development and preserving coastal landscape and nature assets. Thereby, the case study has developed an ecosystem-based assessment framework for addressing LSI, which allows to integrate multiple economic, social and ecological values, including coastal landscape and ecosystem service trade-offs in complex decision-making situations such as development planning of coastal areas.

The case study report provides an overview on the policy context that guided the formulation of the case study objectives and the main concepts and approaches applied (chapter 2), and describes the governance, planning, and stakeholder context in which the case study is embedded (chapter 3), highlights the land sea-interaction challenges and diverse coastal-marine values recognised by the stakeholders as well as the elaborated path or solutions for addressing the challenges (chapter 4), reflects on obstacles and opportunities for co-planning to support sustainable transition of the coastal areas (chapter 5) as well as summarises key lessons learned and recommendations for replicating and upscaling of the applied approaches (chapter 6).

2. Framing of the case study

a. Development aims addressed in the context of coastal governance and blue economy

The case study addresses tourism and offshore wind energy production as two essential sectors in coastal governance and enhancing blue economy. The development objectives considered by the case study are defined by the strategic planning documents of Latvia.

Sustainable tourism and recreation as well as offshore renewable energy production are declared as strategic priorities of the national **Maritime Spatial Plan of Latvia**, adopted by the Government in May 2019 (Ministry of Environmental Protection and Regional Development, 2019). The long-term vision of the plan for 2030 anticipates that tourism will be a sector with high export potential, providing employment and income to the coastal areas, complying with environmental standards, adapted to climate change, and not posing a threat to the coastal ecosystem. It also suggests that the infrastructure, developed for tourism, raises the quality of life in local municipalities. The vision also envisages that "*Latvia reasonably uses the renewable energy sources available in the sea, supporting the energy security of the country, while causing no damage to the environment, marine ecosystem or significant losses to other users of maritime resources and space [..]. When issuing licences and permits for the use of renewable energy resources, the cumulative impact thereof is also evaluated and an incommensurable burden on the marine ecosystem and landscape or the cultural heritage is not allowed [..]*." The strategic objectives of the plan are defined as follows: i) rational and balanced use of the marine space, preventing inter-sectoral conflicts and preserving free space for future needs and opportunities; ii) the marine ecosystem and its ability to regenerate is preserved, ensuring the protection of biological diversity and averting excessive pressure from economic activities; iii) integrated use of marine and terrestrial areas by promoting development of maritime related businesses and the development of the required infrastructure.

Sustainable tourism development is also addressed by the **Latvian National Long Term Thematic Plan for Development of the Coastal Public Infrastructure** (Ministry of Environmental Protection and Regional Development, 2016). The vision of the plan describes the coastal zone as a unique, diverse, sustainable, and economically developed space and attractive destination for foreign tourists. It also highlights the coastal landscape as the most essential asset and resource for development. Strategic objectives of the plan include i) development of a unitary network of public infrastructure, which is balancing nature conservation and economic interests and facilitating development of a joint tourism product, as well as ii) good coastal governance based on cooperation between municipalities, state authorities, entrepreneurs, landowners and NGOs.

The objectives for renewable energy production are prescribed by the **National Energy and Climate Plan of Latvia 2021-2030**, adopted by the Government in January 2020. The objectives set by the plan include ensuring that at least 50% of the share of renewable energy in Latvia's final energy consumption, reducing share of imported energy in domestic energy consumption to 30-40% as well as fully connecting electricity infrastructure to the European continental grid and ensure at least 60% interconnection. The plan also envisages to establish by 2030 one at least 800 MW offshore wind park in cooperation with Lithuania or Estonia.

According to the European-wide assessment of offshore energy potential (Wind Europe, 2019) Latvia could reach 2.9 GW of offshore wind energy production capacity by 2050, which would require ~580 km^2 of marine space. This target was applied for scenario building in the case study.

b. The localities/ regions and main stakeholders engaged

The case study area is located in the Kurzeme Region on the South-western coast of Latvia in the Eastern part of the Baltic Sea, including terrestrial part, up to 10 km inland from the shoreline, as well as a marine

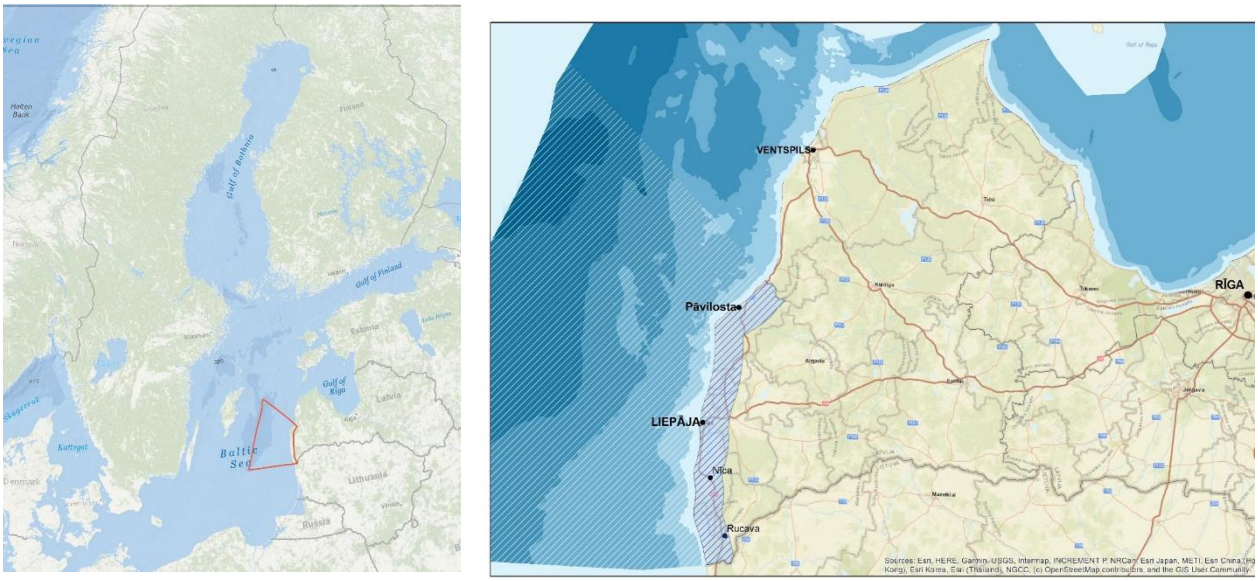
part, comprising the adjacent territorial waters and EEZ. Administratively it is a part of the newly established Dienvidkurzeme municipality and includes five parishes (Rucava, Nīca, Liepāja, Grobiņa and Pavilosta), Liepāja city (with 78 thousand inhabitants), Pāvilosta town (with 860 inhabitants), 10 coastal and 7 inland villages and other smaller settlements.

The coastal ecosystems in the terrestrial part of the case study area are characterised by sandy (as well as stony and pebble) beaches, wooded and grey dunes, coniferous forests, wetlands, lakes, and rivers as well as grasslands and arable land, including polders. Maritime ecosystem is formed by benthic habitats on sandy and mixed substrates, reefs, as well as the Gotland Deep and its slope covered by muddy sediments. Coastal waters are important for fish spawning and nursery as well as for birds during migration season and winter.

Important economic activities in the case study area are coastal tourism, fishing, and shipping (it includes one large port in Liepaja and a small recreational port in Pāvilosta). The terrestrial part is used for agriculture, forestry and, more recently, wind energy production. Wind turbines have been installed in the onshore part and there is emerging interest from developers to build offshore wind farms in the adjacent territorial waters and Exclusive Economic Zone.

The main stakeholder groups directly engaged in the case study are representatives of local authorities, national and regional environmental & nature conservation authorities, and other governmental institutions as well as representatives of the tourism and renewable energy production sectors. The anticipated offshore wind energy development is raising concerns among local stakeholders regarding negative impact on landscape and coastal tourism. At the same time, stakeholders are worried about expansive, uncontrolled tourism development and insufficient tourism infrastructure, resulting in damage to fragile coastal habitats and landscape.

Figure 1. Case study are – Southwestern Kurzeme and adjacent marine area



c. Main approaches and concepts applied

The case study involved several approaches and concepts for assessing land-sea interactions and development of solutions for balancing conflicting interests in offshore wind energy production and preservation of coastal landscape as resource for tourism development and well-being of coastal communities:

1) Ecosystem services and landscape assessment using combined/multiple methods:

Concept of ecosystem services emphasises the natural environment/ecosystem structure and functions as a provider of benefits to society (Haines-Young and Potschin, 2010). The case study had a particular

focus on cultural ecosystem services and aesthetic or landscape value. Cultural ecosystem services can be defined as interactions between an environmental space or its physical settings and the cultural or recreational practices that take place there (Fish et al., 2016; Bryce et al., 2016). Landscape is recognised as an essential resource for tourism development and boosting the local economy (Domon 2011). This has been acknowledged by the Latvian National Long Term Thematic Plan for Development of the Coastal Public Infrastructure, highlighting coastal landscape as the most essential asset and resource for development (Ministry of Environmental Protection and Regional Development 2016).

Mapping of ecosystem services was carried out at the land(sea)scape scale – the unit of assessment or service providing area was defined as land(sea)scape area. Landscapes are recognised as basic spatial units suitable for communication in planning and research (Hazeau et al. 2011), for mapping of ecosystem services (Müller et al. 2010) and for defining landscape quality objectives (Sowińska-Świerkosz and Chmielewski 2016). Identification of land(sea)scape areas was performed according to spatial distribution of specific ecosystem structures and functions, thus defining land(sea)scape area as structurally and functionally homogeneous areas with similar land-use patterns (only terrestrial part) and development history (only terrestrial part). Identifying such landscape/seascape areas also involves recognising place identity and cultural heritage and highlighting LSI. Due to overall heterogeneity of ecosystem structures and functions as well as quality and scale of available spatial data and knowledge, the case study area was divided in three spatial sections – offshore/marine, shoreline (beach) and onshore/inland. Land(sea)scape areas in each of the sections were allocated using section specific criteria. 13 offshore seascapes were delineated based on bathymetry and benthic habitat distribution data. Area (shoreline, beach) adjacent to the shore were mapped in greater detail and their qualities were assessed in connection with onshore landscapes. 17 seashore landscapes were delineated based on seashore width, material texture (sand, gravel, pebbles) and morphology. 55 onshore landscapes (up to 10 km) were outlined based on landcover type, land-use and function patterns, historical development and visual features.

Mapping of ecosystem services in offshore seascapes was based on study of Armoškaitė et al. (2020) by analysing links between marine ecosystem components and their functions and services. Mapped ecosystem services were determined by the set of services described in the aforementioned study (2 provisioning, 6 regulating, 3 cultural services). Ecosystem services in onshore landscape areas were mapped based on previous studies - provision of ecosystem services in farmland (Villoslada et al., 2018) and analysis of land-use type distribution and intensity. In shoreline landscapes particular attention was devoted to mapping and assessing cultural ecosystem services and landscape qualities. Extensive field survey was carried out (both terrestrial and marine) to evaluate landscape qualities and tie them to cultural ecosystem service assessment.

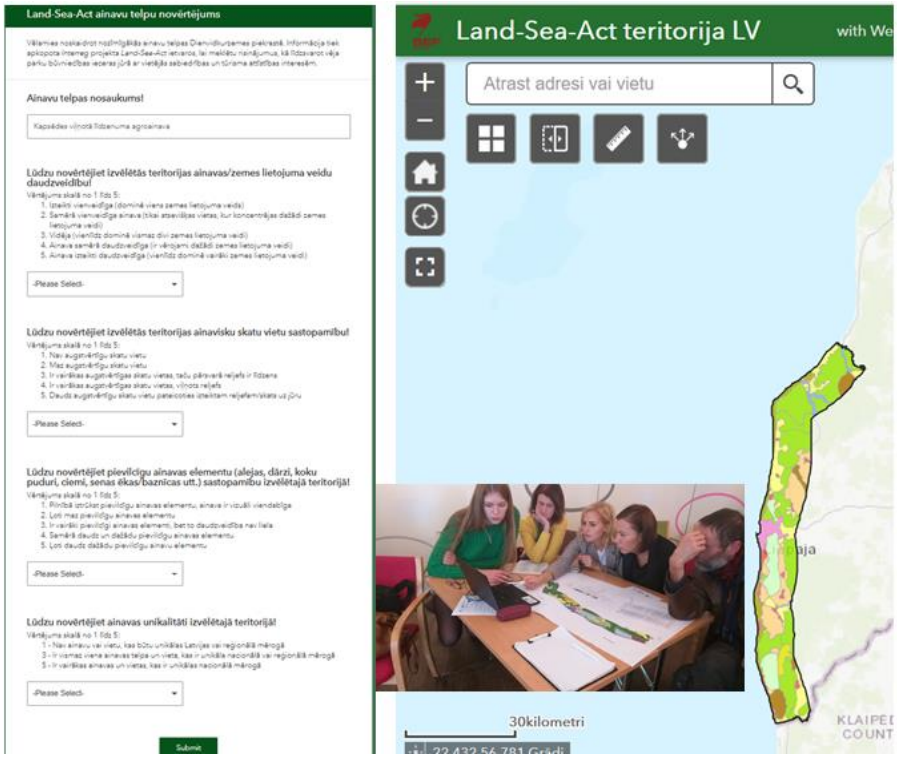
2) Trade -off analysis in supply of coastal ecosystem services:

Interactions among ecosystem services occur when multiple services respond to the same driver of change or when interactions among the services themselves cause changes in one service to alter the provision of another. Ecosystem service trade-offs arise when the provision of one service is enhanced at the cost of reducing the provision of another service, and ecosystem service synergies arise when multiple services are enhanced simultaneously. Both trade-offs and synergies can be managed to either reduce their associated costs to society or enhance landscape multifunctionality and human wellbeing (Bennet et al., 2009). Ecosystem service mapping results, including cultural ecosystem services and landscape quality value can be used to assess development trade-offs and support more sustainable sea/land use solutions and management of multiple ecosystem services across landscapes (Brown and Hausner 2017; Raudsepp-Hearne et al., 2010). To assess potential trade-offs and synergies between ecosystem services within the spatial section of landscape assessment (offshore, shoreline, onshore), pairwise correlation and principal component analysis was carried out. The trade-offs and synergies between ecosystem services from different spatial sections of case study were assessed based on previous studies and expert judgment.

3) Participatory methods/stakeholder engagement in mapping of cultural ecosystem services and defining objectives for coastal development:

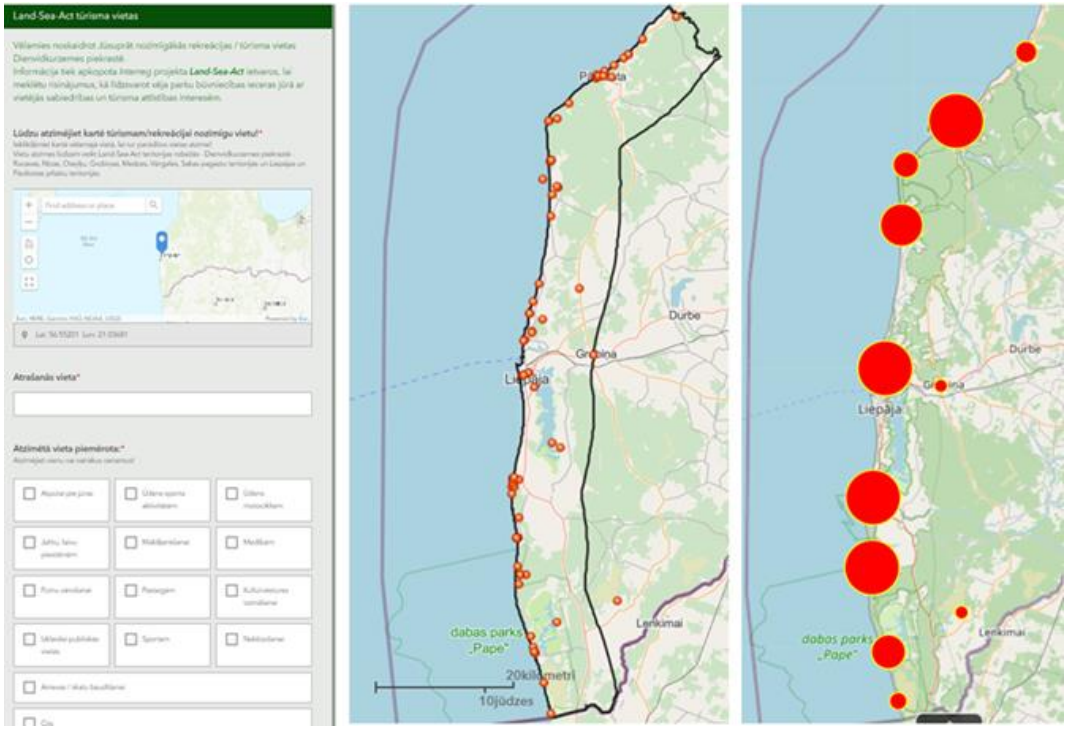
Although the mapping of cultural ecosystem services, including recreational potential, often is based on physical attributes (Martínez-Harms & Balvanera 2012), the participatory mapping methods allow to incorporate people's experiences and perceptions and to capture plurality of ecosystem values (Scholte et al. 2018). The case study applied participatory online GIS tools and surveys to collect local knowledge to articulate the cultural ecosystem service values and address LSI. During the first stakeholder workshop in Liepāja, October 2019, stakeholders were asked in a group work (ca. 5-6 people per group) to assess the expert defined landscape units in scale 1-5 regarding four landscape qualities - diversity, scenic views, attractive landscape elements and uniqueness. Assessment was performed using the ArcGIS Online questionnaire (see Figure 2).

Figure 2. Stakeholders assess the landscape qualities of identified landscape units, using ArcGIS Online survey tool



Another ArcGIS online survey was created (using the participatory GIS method) to collect information about sites important for recreation and tourism. Respondents of the survey were allowed to submit information about as many sites they like, indicating also for what kind of recreational activity the site is suitable. The survey was first tested during the stakeholder workshop in Liepāja, October 2019 and released online in August 2021 to reach a wider group of stakeholders. In total 80 recreation sites were collected (see Figure 3).

Figure 3. Participatory GIS survey on important sites for recreation and tourism using ArcGIS Online tool



Local knowledge collected from stakeholders on landscape qualities and important sites for recreation was used to supplement and verify the expert assessment. The results show that cultural ecosystem services are not only related to the outstanding natural beauty of landscapes and seascapes, but also the opportunity to have physical interaction and experiences (e.g., traditional bathing, different water sports, including diving, windsurfing and kitesurfing, long-distance walks).

4) Scenario building by applying "target-seeking scenarios method" and assessment of scenario impacts to coastal ecosystems, services and human well-being:

A target-seeking scenario (normative) method (IPBES, 2016) was selected to explore possible pathways to meet offshore wind energy production targets and sustainable tourism development in the case study area. This method was employed because the long-term goals for national maritime and renewable energy policies by 2030 are established (see section 2.a); however, the optimal solution has not been determined; various alternative options can be created and evaluated. Moreover, new, ambitious national renewable energy policy goals by 2050 are being negotiated as a result of adoption of the European Green Deal. Furthermore, the national strategic and spatial planning documents (MSP and Long Term Thematic Plan for Development of the Coastal Public Infrastructure) as well as local planning documents encourage sustainable tourism development in the coastal areas, however the options for balancing these interests with offshore wind energy development are not yet defined. The target seeking scenario method supports capturing multiple and contrasting views on how to reach the goals as stakeholders are involved in the co-design process of the future.

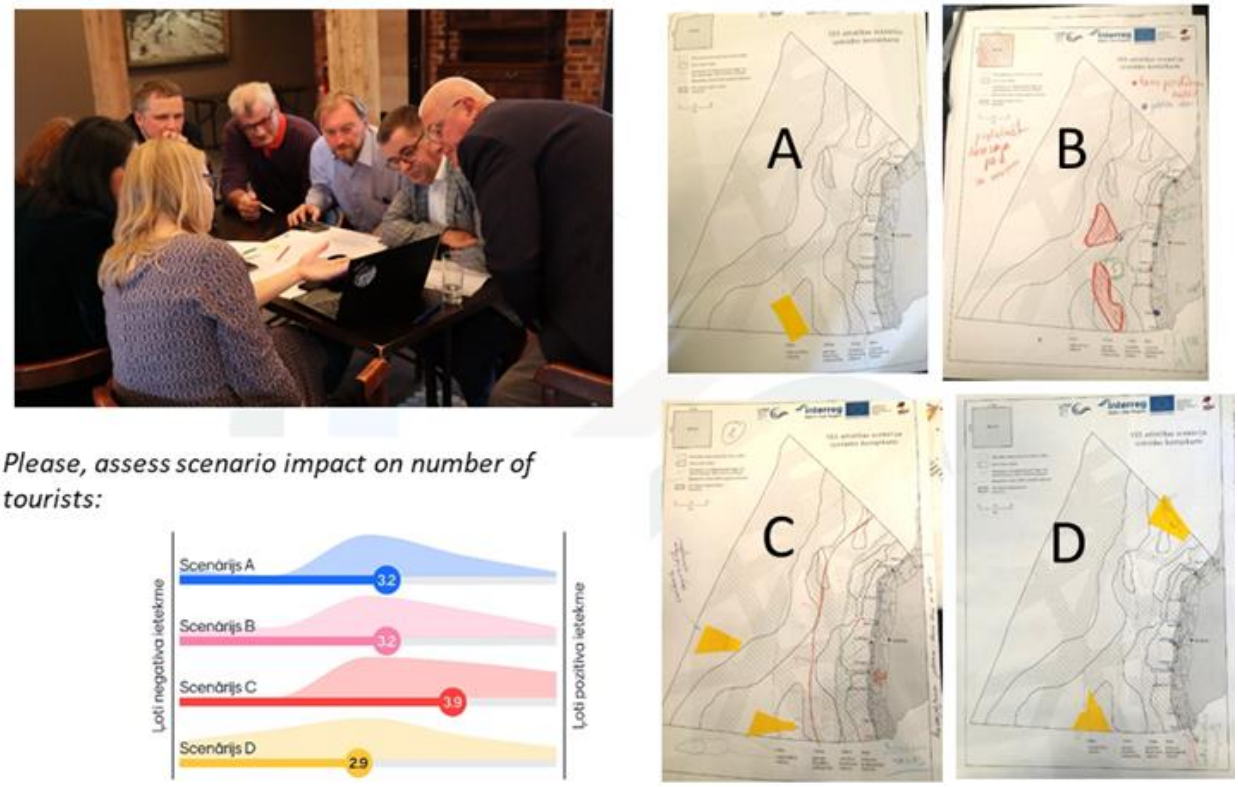
The target for scenario building was defined based on the established national policy objectives - aiming at sustainable development of the coastal area by balancing the interests of renewable (wind) energy production at sea with the development of coastal tourism, preservation of landscape and environmental quality. In order to obtain the stakeholder views/agreement with the proposed target as well as to specify conditions for its achievement, an online Google survey was launched in August -September 2020, including 34 statements and asking the respondents, if they agree or disagree and to what extent. The statements referred to requirements and expected impacts of tourism and offshore energy development as well as preservation of coastal landscape and environmental qualities. The online questionnaire was distributed to the stakeholder group invited to the scenario building workshop (the same stakeholder group that participated in the assessment of landscape qualities and cultural ecosystem services (See

section 3) above). In total 31 responses were received, representing mostly national and municipality authorities as well as few representatives from tourism, education and other sectors.

The online survey was followed by an in-person scenario building workshop with around 40 participants, which represented national and local officials, spatial planners, nature conservation experts as well as tourism sector and wind energy developers. The workshop took place in September 2020. The participants, divided into four mixed groups, discussed options for offshore wind energy and tourism development in the study area. Each group proposed possible locations for offshore wind park/s to meet Latvia's 2030 and 2050 targets for offshore wind energy production as well as priority areas for tourism development, considering possible impacts to coastal ecosystem and its landscape qualities. All the ecosystem service and landscape quality assessment results and other relevant spatial data (e.g. ecological and sea use information, thresholds of offshore wind park visibility from coast, etc.) were presented to stakeholders within an online map explorer developed using ArGIS Online Experience Builder platform.

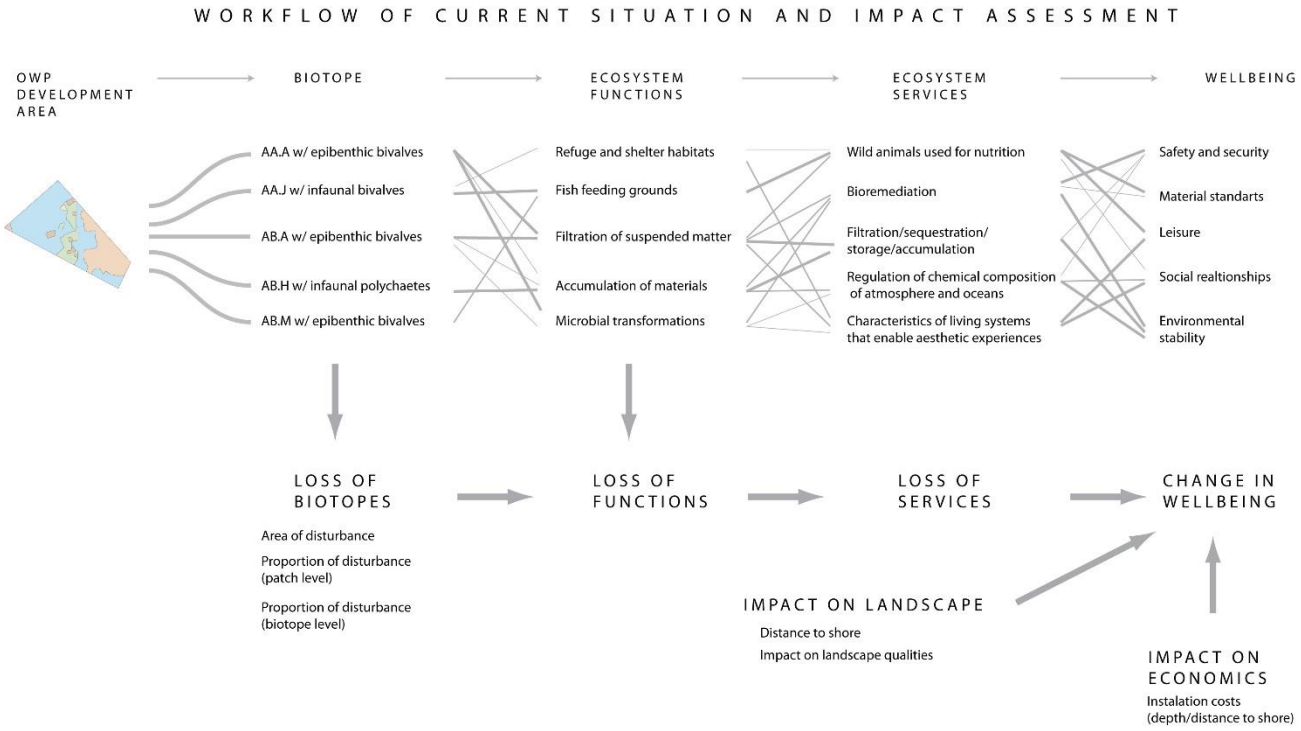
The four alternative spatial scenario or pathway (A, B, C, D) developed by the workshop participants are shown in Figure 4. Participants were also asked to provide an intuitive assessment of the four scenarios (using an interactive online tool Mentimeter) in terms of impact on the number of tourists, leisure opportunities, employment, landscape, nature and the environment.

Figure 4. Scenario building workshop in Liepāja, September 2021



After the scenario building workshop, the project expert team carried out an in-depth impact assessment of proposed scenarios on marine ecosystem components, coastal landscape qualities, ecosystem services and human well-being. To evaluate impacts of proposed individual offshore wind park scenarios it was assumed that there will be loss of functions of impacted marine ecosystems, but as at the moment there is not sufficient data and knowledge to model this impact and especially its cumulative character it was presumed that there would be total loss of ecosystem functions and benthic biotope (habitat). The loss was calculated as the percentage of loss of biotope - both the loss of exact patch of biotope, as well loss of biotope in the case study area. Subsequent linkage to the loss of ecosystem functions, ecosystem services and human well-being was established thus constructing the framework to compare and discuss the impacts of proposed individual OWP (see Figure 5).

Figure 5. The workflow of scenario impact assessment)



5) Public survey on contribution of the case study area to human well-being

Public survey was selected as a method for gauging the views of a wider society. For the goals of the case study, understanding the opinion of a wider society was crucial as any spatial planning activities (including OWP and tourism development) can have a major impact on the interests and well-being of inhabitants. Public survey was chosen for this purpose as it enables effective collection of data on the opinion of a wider society in a relatively short period of time. Additionally, while workshops, seminars and public consultations are a great way to engage in dialogue with stakeholders and co-work on ideas, they are often visited only by the most active members of the society. Public surveys can help to reach members of society that would not engage in other more time-consuming participatory activities.

The main aim of the public survey was to identify linkages between nature areas of the case study area and human well-being. For the purposes of the study, seven well-being categories were identified based on the scientific literature (Millenium Ecosystem Assessment 2005, Rogers et al. 2012, Liu & Opdam 2014):

- safety & security,
- Financial and material security,
- recreation,
- health & life satisfaction,
- social relations,
- education / learning from nature,
- joy of a diverse nature.

For every well-being category a simplified definition was developed to ensure they are easy-to-understand for ordinary people (Table 1).

Table1

Simplified definitions of well-being categories used in the public survey

Safety & security	The role of the Southwestern Kurzeme coast's nature areas in personal security (e.g., protection from natural disasters, military security, energy independence that wind farms can bring).
Financial and material security	The role of the nature areas and resources of the Southwestern Kurzeme coast in personal material well-being (e.g., the opportunity to work in fishing or hospitality, also fishing, mushroom and berry picking).
Recreation	Recreational opportunities provided by the nature areas of the Southwestern Kurzeme coast (e.g., sunbathing, walking, sports activities, swimming, etc.).
Health and life satisfaction	The role of the Southwestern Kurzeme coast's nature areas in personal physical and mental health (e.g., the opportunity to engage in health-enhancing activities on the coast, to de-stress).
Social relations	The role of the Southwestern Kurzeme coast's nature areas in shaping personal social relationships (e.g., opportunities to spend time with family and friends, the chance to meet like-minded people), also the opportunity to feel a sense of belonging to a place.
Education / Learning from nature	Contribution of the Southwestern Kurzeme coast's nature areas to personal knowledge and skills on nature topics.
Joy of a diverse nature	The joy and satisfaction a person get from knowing that the coast of Southwestern Kurzeme has a diverse nature, various plant and animal species.

The survey sought to understand the links between each well-being category and nature areas of the Southwestern Kurzeme coast. Survey consisted of three main parts: demographic questions, questions about respondent's relationship to the study area and questions related to seaside recreation and the importance of the Southwestern Kurzeme coastal ecosystem to the well-being of respondent. The survey content was developed by the project expert team, but the surveying process was outsourced to a professional sociology company to ensure the representativeness of the respondent pool. For the goals of the study, it was important to ensure sample representativeness both on national and local scale to gain an insight into the potential differences between local inhabitants and other people. The survey was tested in April 2021 and conducted online (CAWI) using stratified random sampling method in May 2021.

After the survey was closed, the project expert team analysed the collected data by statistical methods that aimed to identify main linkages between well-being and nature areas of the Southwestern Kurzeme coast. The identified linkages were later considered when developing strategic solutions for tourism and OWP development in the case study area. For more detailed information on the survey results, see Section 4a.

6) Development of optimal solutions for OWP and sustainable coastal tourism development

The optimal solutions for offshore wind energy production in the case study area were elaborated by the project expert team based on the results of the scenario building workshop and impact assessment of the proposed scenarios (see Figure 11 in chapter 4). The main criteria used in defining the optimal solutions were the following:

- respecting national and EU policy targets for offshore wind energy production;
- focusing on OWP plots proposed at the scenario building workshop;

- priority is given to areas with least impact to biologically valuable benthic habitats (e.g., reefs) and related ecosystem services and human well-being categories (based on assessment framework presented in Figure 5);
- avoiding areas important for birds and fish reproduction;
- priority is given to areas with least impact to valuable landscapes (e.g., plots located outside of visibility from coast or not conflicting with natural/unique landscape character);
- respecting zones of allowed priority uses as defined in the Latvian MSP 2030;
- considering possible connections to the electricity transmission grid and other factors determining technical suitability of the site for OWP (e.g., depth and distance from the coast).

The project expert team assessed each of the proposed OWP plots against the above listed criteria using the Land-Sea-Act Map explorer and impact assessment calculations, finally delineating two optimal solutions for OWP development by 2030 and 2050 (see section 4.b)

7) Development of solutions for suitable tourism development in the coastal area:

The solutions for sustainable tourism development of the coastal areas were developed by the project expert group, considering the increasing demand for recreation in the coastal areas, as highlighted by the study on coastal visitors and their impact on environment and public infrastructure (Ministry of Environmental Protection and Regional development, 2020) as well as results of the scenario building workshop (September 2020). At the same time findings from the social survey were taken into account, which indicated that people in Latvia highly value possibilities for enjoyment of nature and leisure provided by the Southwestern Kurzeme coastal area. Therefore, the proposed solutions for targeting the tourism development in the case study area are aiming not only at economic interests of the tourism sector, but also respectful attitude to nature values, landscape qualities, cultural heritage, and place identity of each site.

A suitable model/pattern of tourism development of each terrestrial landscape area was defined using results of the cultural ecosystem service assessment, including the following criteria:

- aesthetic value of the landscape area;
- naturalness of the landscape area;
- cultural heritage value of the landscape area;
- level of the current use of recreational potential.

By using the scores of cultural ecosystem service assessment, the landscape areas were grouped in three clusters: 1) areas of high aesthetic value; 2) areas of high naturalness value; 3) areas of high cultural heritage value. Recommendations for tourism development were developed addressing potentials and limitations of each cluster and level of use of recreational potential. Some landscape areas belong simultaneously to clusters 1-3, therefore in defining the suitable model for tourism development the following order of priorities were applied: preserving of naturalness; preserving of cultural heritage; maintaining the landscape aesthetic value. The three clusters and recommendation for each landscape area is presented at the Land-Sea-Act map explorer.

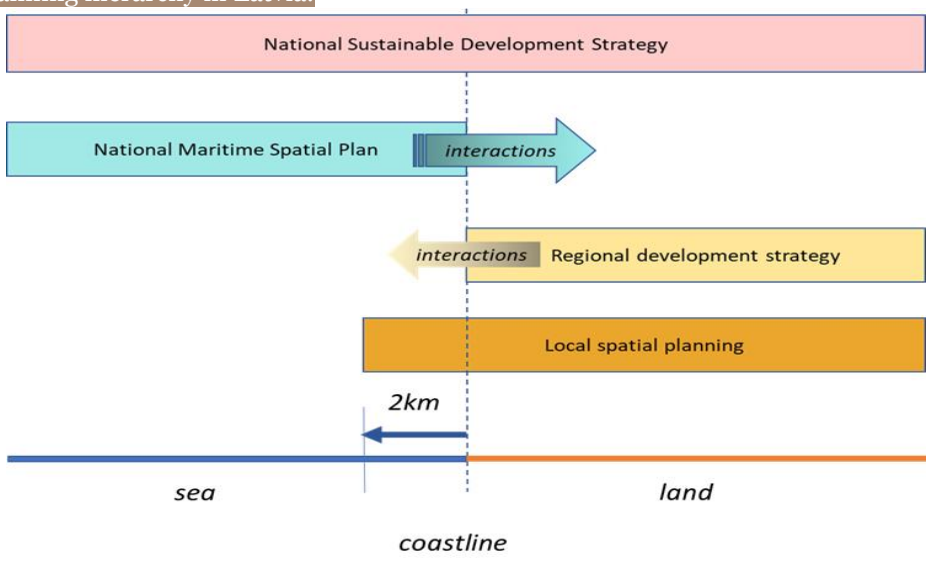
3. Planning-governance complexity and possible trade-offs in coastal change & Blue Growth

a. How the single local-regional case is linked to wider LSI and Blue Economy challenges and locations/regions elsewhere

In Latvia as well as in other countries spatial and development planning is a hierarchical process where responsibilities and spatial boundaries (most often administrative) are clearly regulated by law (Figure 6). The hierarchy means, amongst others, a 'top-down' approach, which requires lower administrative level documents to be developed in coordination with a higher-level planning document. Thus, local spatial plans shall be in line with sub-nation (regional) plans and national development plans and their priority goals and ambitions. Southwestern Kurzeme case study connects local level and national level as the case study covers several coastal municipalities of one planning region in Latvia. Such "intermediate" planning level is very relevant for addressing issues common for several municipalities (e.g., coastal tourism development), issues that can be solved beyond local levels (e.g. landscape and heritage protection) whereas national level is too general to address place-based characteristics. Moreover, setting-up an issue or problem-oriented planning case (offshore wind energy versus tourism development) could be an effective approach to implement multi-level governance. Both Blue Economy sectors are among priorities in Latvia and in the Baltic Sea Region thus there will be a need for finding spatial solutions and compromises to foster development. The approach and methods applied in the Southwestern Kurzeme case study can be replicated on a wider scale as the Baltic Sea countries implement mapping and assessment of ecosystem services.

In the land-sea interface, the separation of responsibilities between maritime and terrestrial planning domains is another challenge when addressing multiple uses and interests holistically and spatially. The Southwestern Kurzeme case study demonstrates the efforts to establish the coherence of the maritime spatial plan with other relevant planning processes, which are critical to ensure sustainable development in the coastal zone of Latvia.

Figure 6. Planning hierarchy in Latvia.

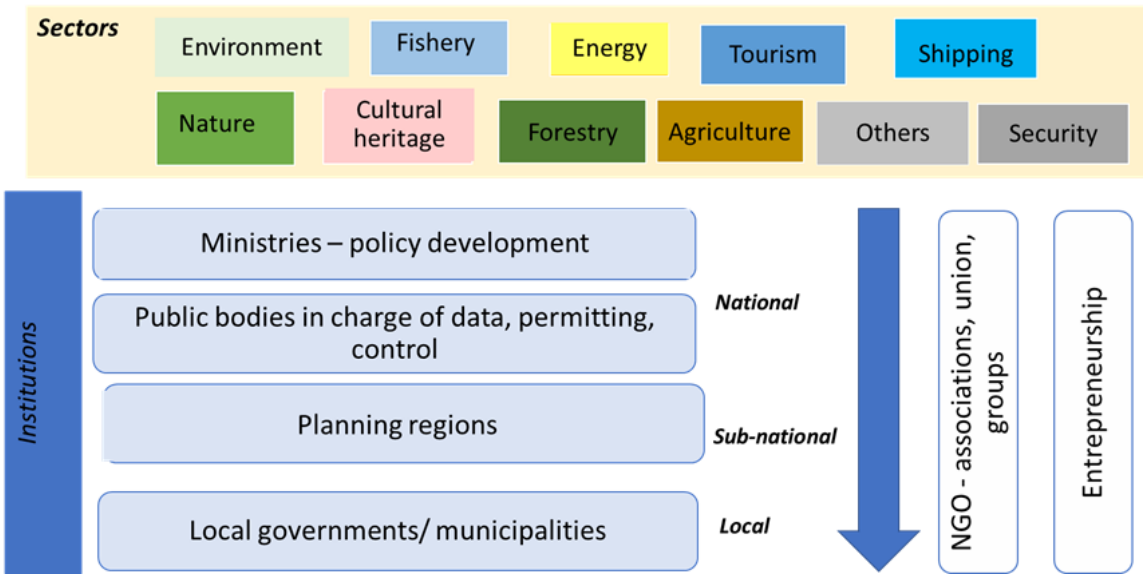


b. Main stakeholders and their multilevel (interscalar) embeddedness in case´s context

Stakeholder involvement is an important element of spatial and development planning, especially when complex issues are being addressed and stakeholders would be affected by the planning outcomes. The Southwestern Kurzeme case study relied heavily on active stakeholder involvement in different stages of the planning process. It also included the involvement of the wider community in the process of mapping and assessing recreational services in the case study area.

Relevant stakeholders (Figure 7) were identified at the beginning of the case study implementation by analysing their interests in the context of marine and land use as well as spatial and development planning. It was important that all levels of planning and governance were involved through-out the process, - from local authorities to national ministries in charge for policy development. The land-sea interface requires the involvement not only of marine stakeholders but also terrestrial stakeholders such as forestry and agriculture. Latvia has recently adopted its MSP, which also had a strong stakeholder involvement process, therefore the same methodology for stakeholder identification was followed in this case study (Veidemane et al, 2017).

Figure 7. Stakeholder mapping scheme for the case study



c. What kind of contradictions/trade-offs emerged in planning and use of coastal spaces?

Trade-offs identified during stakeholder engagement process

The main contradiction or trade-off addressed by the case study is the national interests of offshore wind energy production for reaching the climate objectives vs. interests of local communities in preservation of coastal landscape and boosting sustainable tourism development. It is assumed that OWP would have a negative impact on seascape and thus impact the overall landscape value of the coastal areas. Furthermore, there are concerns among stakeholders that OWP might negatively impact the coastal ecosystem, e.g., benthic habitats, fish population and bird migration roots. Therefore, the stakeholders have suggested that offshore wind parks should be placed outside the visibility (at least >30 km) from areas of relatively natural landscape and high nature value.

Another contradiction revealed by the case study is the desire of the tourism sector for increasing the number of tourists and related incomes vs. concerns of local authorities, inhabitants, and the nature conservation sector about the anthropogenic pressure on the coastal ecosystem caused by uncontrolled tourism and related disturbance to local people and waste management (littering) issues.

Trade-offs identified based on results of the ecosystem service mapping and assessment

Statistical analysis of trade-offs in ecosystem service supply was performed separately within the three sections of the case study area, using the ecosystem service mapping and assessment results. Analysis of distribution of ecosystem services in onshore landscapes revealed a relatively large number of interactions among them. Pairwise correlation revealed that provisioning services connected to intensive agriculture create trade-offs with regulating services (flood control, erosion control, wind control, pollination, and global climate control); provisioning services connected to forestry generate trade-offs with cultural services (recreation, aesthetics, cultural heritage). There were minor trade-offs observed between certain regulating services (filtration/accumulation/storage, flood control) and cultural services (aesthetics and heritage). Analysis also disclosed that there are certain synergies between analysed ecosystem services, especially among regulating services related to control of material flow. As well there were synergies among cultural services (recreation and aesthetics) and agricultural provisioning services. Principal component analysis showed that there is important bundling of certain services which have to be accounted for in management decisions, but the trade-offs revealed in this analysis did not differ from described by pairwise correlation.

Trade-off analysis at the shoreline was focused on relationships among cultural ecosystem services and certain landscape qualities connected to regulating services associated with biodiversity. There was a strong trade-off between naturalness of shoreline (associated with such regulating services as maintenance of habitats and pollination) and cultural ecosystem services connected with recreation and landscape aesthetics.

Analysis of distribution of ecosystem services in the seascapes revealed few minor trade-offs - between active recreation and global climate control (as the main carbon sequestration takes place in far waters) and active recreation and scientific interest.

Ecosystem services supply analysis does not reveal the interactions among service distributions in different spatial sections of the case study area. To address these and emphasize LSI we performed scenario analysis based on stakeholder attitudes (see chapter 4b).

4. Considerations of the case study in analysing and planning of LSI

a. How stakeholders conceptualise and see importance of diverse coastal-marine values in LSI

Stakeholder views on coastal and marine values and LSI related challenges were identified during the 1st stakeholder workshop (Liepāja, October 2019), online surveys on landscape qualities, recreation sites, and coastal development objectives (September 2020) as well as national scale public survey on importance of the Southwestern Kurzeme coastal area for human well-being held in May 2021 (see section 2.c).

During the 1st stakeholders' workshop, the following LSI challenges were noted in relation to the case study area:

- OWP will have an impact on some tourism destinations, landscape, bird migration as well as real estate value;
- Pressure from tourism to the fragile coastal ecosystem is increasing (particularly from so-called uncontrolled "bush" tourism). Improvement of infrastructure is needed to reduce the negative impact.
- Access to the sea shall be improved for the public as well as for emergency transport and services.
- The main environmental concerns are related to impact from intensive agriculture, coastal erosion, climate change and transboundary pollution.
- Governance of coastal areas shall be improved by strengthening cooperation and coordination between national and local authorities, entrepreneurs, and other local stakeholders.

The online survey on coastal development objectives has revealed the high importance of tourism for the local economy, but also an agreement that tourism infrastructure improvements shall support the well-being of the local population. Installation of new nature trails and improved access to the sea are seen as the most essential improvements of infrastructure. There is no consensus among stakeholders regarding support to construction OWP within marine waters of the case study area in order to promote environmentally friendly energy, though majority of stakeholders agree that OWP would have a negative impact on landscape, and they shall be placed outside of valuable landscape and nature areas. Stakeholders also agree that landscape is an essential resource for tourism development and important for preserving the place identity. Also, the environmental quality is recognised as an essential precondition for well-being of local population and tourism development.

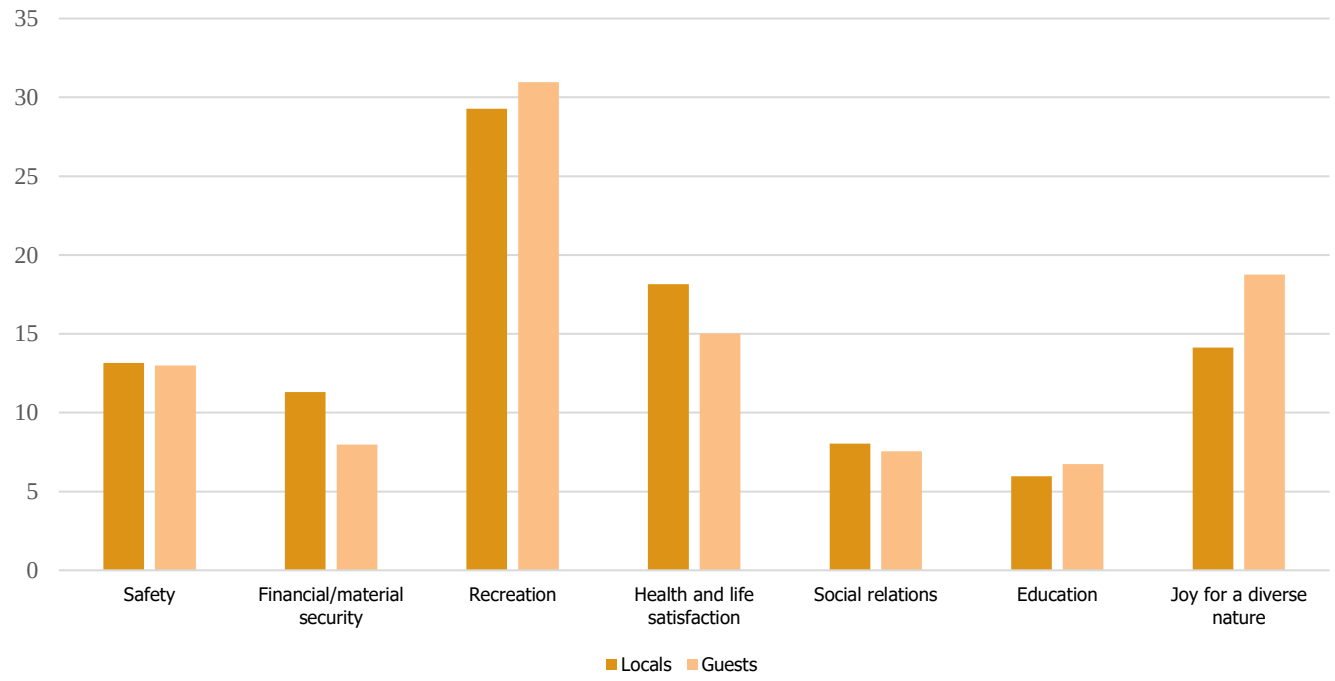
The online (Participatory GIS) survey on sites for recreation and tourism confirms that preference is given to areas of high aesthetic value, uniqueness, diversity, cultural heritage, and recreational opportunities, while more natural areas are less visited.

Relative importance assigned by stakeholders to different well-being categories (safety & security, financial and material security, recreation, health and life satisfaction, social relations, education/learning from nature and joy of a diverse nature) was assessed by the public survey in May 2021 (n=1000, including 90 local inhabitants). The selected survey sample was representative on a national and local (case study area) scale. For more details on the survey methodology see Section 2c.

The survey results showed that the nature areas of the Southwestern Kurzeme coast are indeed important for the public well-being. The importance of the nature areas is especially high regarding well-being categories related to the connection with nature and non-material values, such as joy of a diverse nature

and recreation opportunities. The survey also identified differences in opinions between locals and visitors (respondents who stated that they have visited Southwestern Kurzeme coast but do not live there). Figure 8 illustrates the relative importance assigned by respondents to well-being categories in the context of Southwestern Kurzeme coast's nature areas, as well as differences in opinion between locals and visitors.

Figure 8. Summary of replies for a survey question: "Please rate how important the role of the Southwestern Kurzeme coastal nature areas is for your quality of life! Divide 100 points into the given categories according to the principle - the greater the importance, the more points."



The highest ranked well-being category in the context of coastal nature areas of the Southwestern Kurzeme for both groups of respondents was recreation. It was followed by the closely related health and life satisfaction and joy of a diverse nature. The results highlight the need to ensure preservation of nature values and naturalness when planning development of any activities, including OWP and tourism. Loss of these values might have a major negative impact on the public well-being, especially for local inhabitants.

Regarding the differences in opinions, they occur mostly in the well-being categories "financial and material security" and "Joy of a diverse nature". While both respondent groups do not value financial and material security in the context of nature areas of the Southwestern Kurzeme coast too high, this category is relatively more important to the local inhabitants. Visitors, on the other hand, value higher the joy for a diverse nature.

The survey also enlightened on some aspects related to human preferences when choosing a coastal place to visit for recreation (Figure 9). Survey results demonstrated that the most important factors that impact the choice is the cleanliness of the site, followed by attractive landscapes and perceived nature values, repeatedly indicating the importance of preserving landscape and nature values in the coastal areas. Survey results also illustrated the need to ensure that stretches of natural beach without amenities (except infrastructure for reducing human pressure) are preserved beside the beaches with high amenity level (Figure 10).

Figure 9. Average rating of factors that influence the choice of place for recreation (1 – not important at all, 4 – highly important)

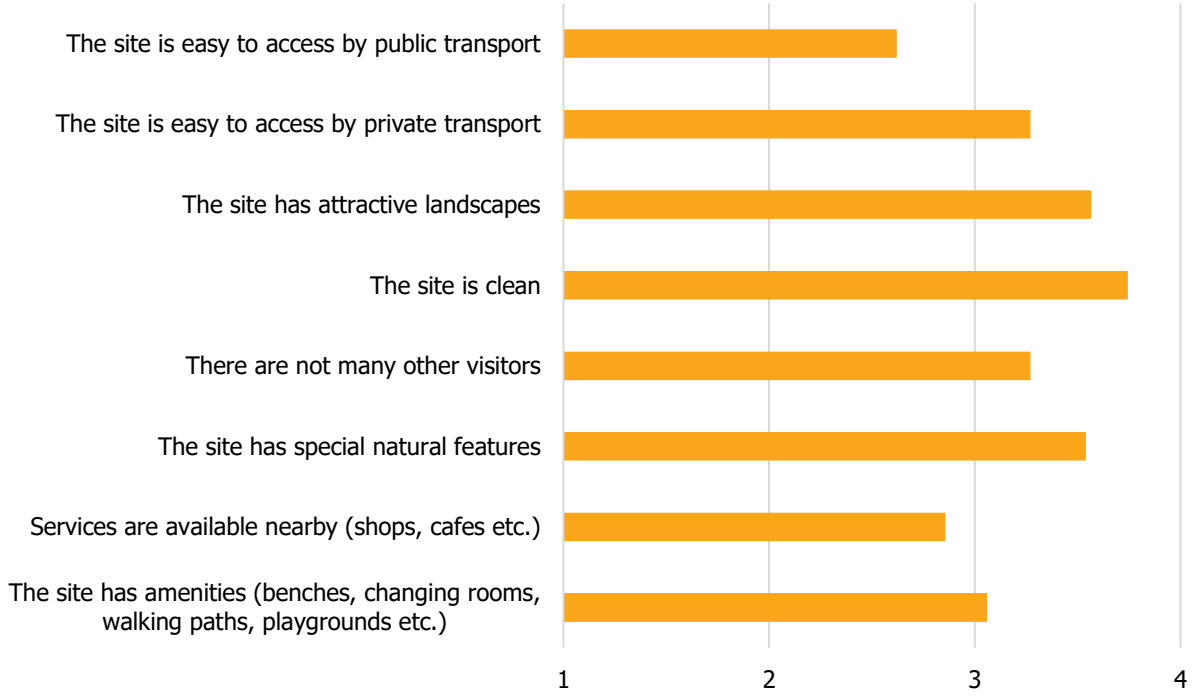
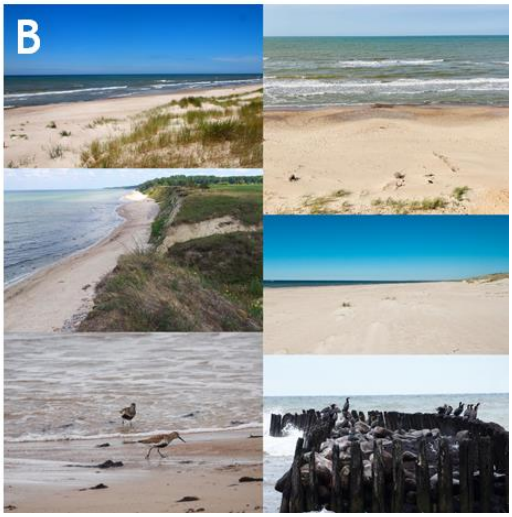
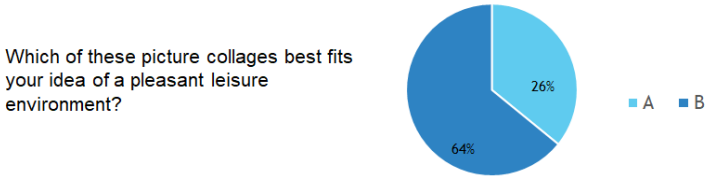


Figure 10. Summary of replies for a survey question: "Which of these picture collages best fits your idea of a pleasant leisure environment?" 64% of the respondents chose collage B that contained pictures of beaches without visible amenities.

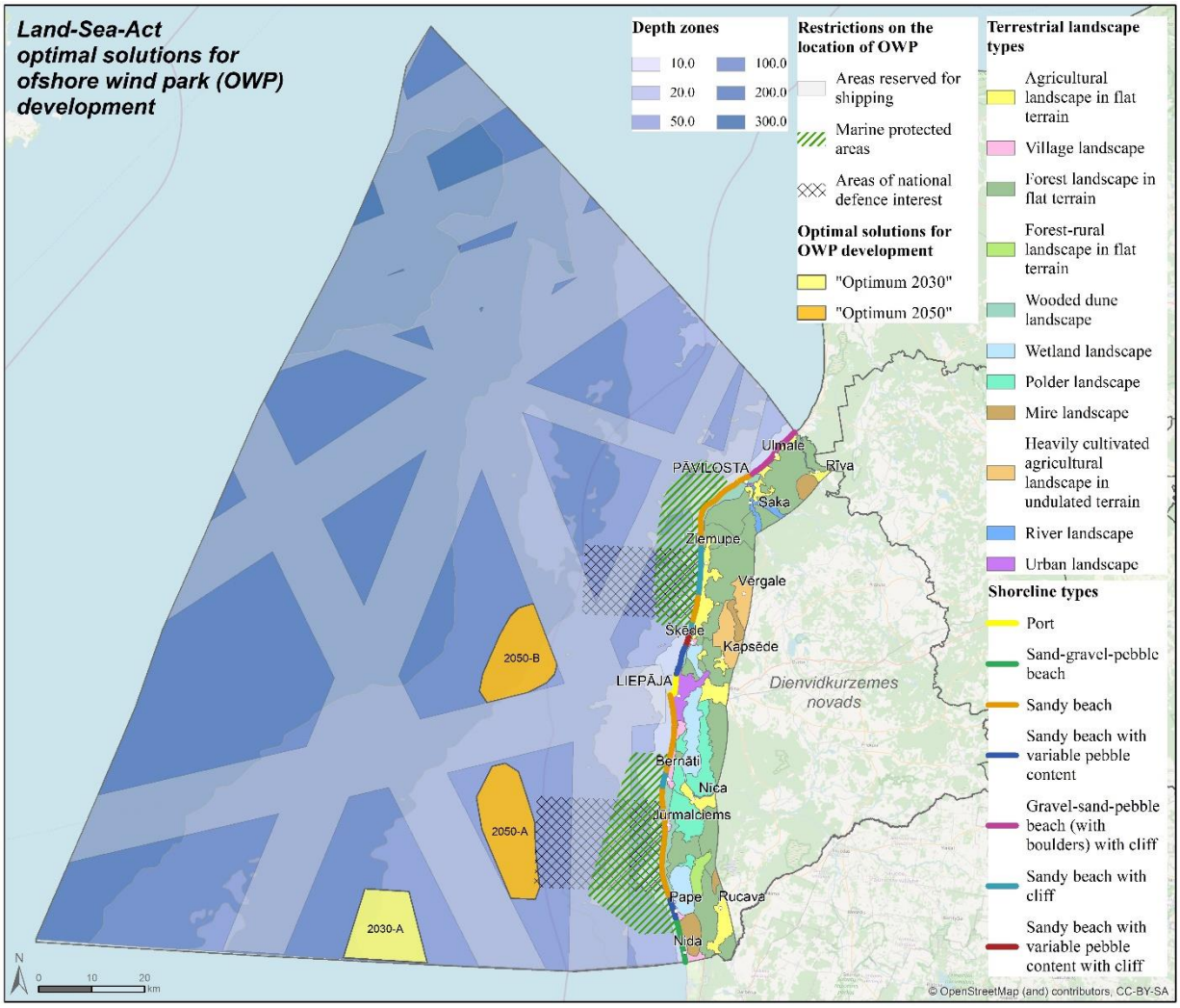


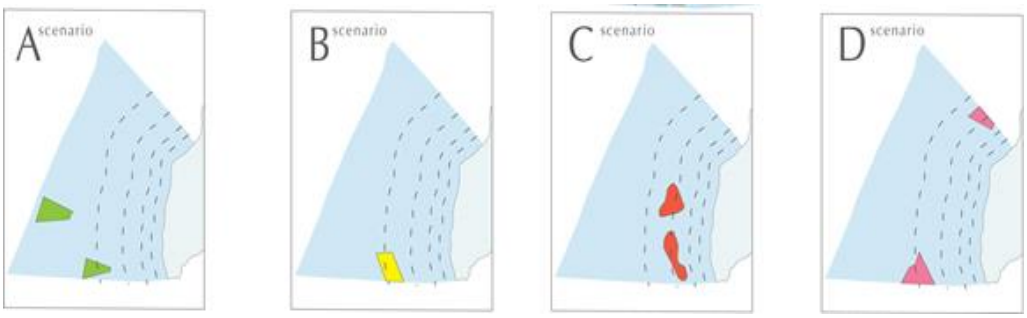


b. The elaborated paths of coastal-marine change, and their multidimensional effects (economic, ecological socio-cultural)

During the scenario building workshop (Liepāja, September 2020) four alternative pathways or scenarios for achieving 2050 targets for offshore wind energy production and sustainable tourism development were elaborated by mixed stakeholder groups (see section 2.c). Taking into account impact assessment of the four scenarios as well as the sea use conditions defined within the national MSP 2030, the project expert group has elaborated optimal solutions for 2030 and for 2050 (see Figure 11).

Figure 11. Visualisations of alternative scenarios – A, B, C, D proposed by stakeholders (four small maps at the bottom of the figure) and the two optimal solutions (Optimum 2030 & Optimum 2050)





The impact of possible OWP development scenarios were analysed on ecosystem structure, ecosystem service and human well-being perspectives. Even though impact was assessed in quantitative units, it was expressed in qualitative categories ranging from "non-significant" to "severe". All but "Scenario A"

had some significant albeit small scale impact on ecosystem structure. Most severe impact on ecosystem structure was observed in "Scenario D" - due to its patch pattern, majority of benthic biotopes (epibenthic bivalves, infaunal bivalves and infaunal polychaetes) were completely disturbed. Both in "Scenario B" and "Scenario C" one of the biotope patches of epibenthic bivalves and sparse epibenthic macrocomunity were severely disturbed, however they were relatively small in size.

Impact on ecosystem services was assessed as the decrease or loss of functions of benthic ecosystems. As the value of individual services rely on multiple functions, the revealed impact in most of the cases were described as "non-significant". However, "Scenario D" should be highlighted as one where significant (i.e., 20-30%) loss of such services as bioremediation, filtration/ accumulation/ storage, regulation of chemical composition of atmosphere and oceans and water environment for recreation could be expected.

Impact of proposed OWP scenarios on seashore landscape qualities and associated cultural ecosystem services was assessed for each seashore landscape area based on distance to OWP scenario polygons and expert opinion (based in literature studies) on possible impact. Specific landscape qualities were differently affected by proximity to OWP, for instance, the strongest impact is on naturalness and scenic-aesthetic qualities, but less on cultural heritage and even less on recreation. "Scenario D" had the strongest impact on naturalness and both "Scenario C" and "Scenario D" had significant impact on scenic-aesthetic quality.

Selection of the optimal placement of OWP was based on criteria described in the section 2.c.6, including envisaged policy target, analysis of impact on benthic habitats, ecosystem services, landscape, zoning of the Latvian MSP 2030 and infrastructural suitability (depth, distance, planned cable connections). The following optimal solutions by 2030 and 2050 were proposed:

Optimal solution 2030: one plot of 160,52 km2 (including overlapping area of three scenarios proposed by the stakeholders) next to the border with Lithuanian EEZ. The size of the plot provides 800 MW energy production capacity, which corresponds to the offshore renewable energy production objectives of Latvia by 2030. The plot is located within one of the research areas for wind park development and connected to the potential electricity transmission corridor as defined in the Latvian MSP 2030. It has comparatively the least negative impact to benthic habitats, ecosystem functions and services and other nature values as well as no negative impact to landscape. Furthermore, it is located nearby envisaged Lithuanian OWP area with possibilities for cable interconnection.

Optimal solution 2050: two plots with total area of 365.71 km2 (proposed by one stakeholder scenario), which together with "Optimum 2030" is providing 2.9 GW energy production capacity corresponding to offshore wind energy estimates for Latvia by 2050 (Wind Europe, 2019). The proposed plots do not have significant impact on biologically valuable benthic habitats and areas important for fish (and related ecosystem services), although partly overlapping with areas important for birds. Since distance from the coast in some parts is only 20 km, OWPs would be visible from the coast. However, because of their location in front of Liepāja (with urban landscape character) and nearby envisaged Lithuanian OWP area, the impact to landscape/seascape character would not be so disturbing.

Solutions for sustainable tourism development were based on cultural ecosystem service assessment results and clustering of the inland landscape units by the dominant landscape qualities (see section 2.c.7). Identified landscape area clusters and recommendations for adjusting tourism development to site specific values/landscape qualities are presented in figure 12.

Figure 12. Landscape quality-based clusters of landscape areas and related recommendations for tourism development

Landscape areas of high aesthetic value:

Characterized by scenic views, open landscape with attractive landscape elements and roads, no visual pollution.

Recommendation: Landscape experts should be involved in identification of valuable landscapes and integration of the landscape qualities in spatial planning/development documents. Access to the attractive landscape sites/scenic views should be improved, including suitable public infrastructure and information for tourism marketing.

Landscape areas of high naturalness value:

Characterized by a high share of protected areas, natural or semi-natural land cover and natural (not modified) streams

Recommendation: nature experts should be involved in assessment of anthropogenic pressure and developing measures for risk prevention as well as ensure appropriate integration of the nature values in the spatial planning/development documents. Suitable public infrastructure should be developed or improved for reducing anthropogenic pressure to vulnerable habitats and species, not contrasting with landscape character, and including nature education elements.

Landscape areas of high cultural heritage value:

Characterized by a high number and diversity of cultural heritage monuments, historic land use features and visually impressive historic objects

Recommendation: Cultural heritage experts should be involved in identification of cultural heritage values and ensuring their appropriate integration in the spatial planning/ development documents. Action plans should be developed for better integration of cultural heritage in tourism offer. Connection between nature and cultural heritage should be highlighted (e.g., coastal meadows, grey dunes etc.). Public infrastructure should be harmonic with the cultural historic identity of the site.

5. Obstacles and synergies towards sustainability transitions of coastal areas

a. Synergy effects, examples of co-using and co-planning coastal-marine spaces

The case study has developed an ecosystem-based assessment framework for addressing LSI, which allows considering coastal landscape and ecosystem service trade-offs in planning the use of marine space as well as in development planning of the terrestrial part of the coastal area. Thereby, the proposed assessment framework can support co-planning of coastal-marine spaces and achieving more balanced land and sea planning solutions. The described stakeholder involvement approach and tools demonstrates a way forward to co-planning and integration of multi-level and multi-sector interests in development of spatial and/or strategic solutions for sustainable development of coastal areas.

The case study results can support national planning authority (Ministry of the Environmental Protection and Regional Development) in the implementation of the MSP as it is foreseen that impacts on landscape as well as nature assets due to OWP shall be assessed when issuing licences for the wind park developments.

b. Capacities of the main stakeholders and caps to be improved (on different governance levels) in sustainable development

The stakeholder meetings organised by the Land-Sea-Act project revealed good understanding and knowledge about the LSI related issues. Though, the lack of (or insufficient) cooperation and coordination among municipalities, state authorities and entrepreneurs was noted as one of the main obstacles for sustainable development of the coastal areas. Therefore, different stakeholder engagement techniques as well as collaborative and interactive planning should be promoted to support cooperation, use of local knowledge and better acceptance of the planning decisions.

6. Main lessons learned and recommendations

a. Comparative reflections with similar tendencies and/or cases in BSR and elsewhere

Identification of suitable sites for OWP development is a topical issue in the Baltic Sea Region, considering growing demand for renewable energy sources. Suitability of sites are assessed using various modelling tools (e.g., MARXAN). Several studies have been carried out to assess the impacts of OWP on coastal landscapes by mapping and assessing viewpoints (e.g., recent study within MSP to determine visual impacts of potential OWPs near Saaremaa, Estonia[1]). The attitudes of local residents and tourists regarding a potential OWP and its impact on landscape and willingness of tourists to use such coastal areas for recreation were studied also in Latvia (Veidemane and Nikodemus, 2015). New approaches and tools for assessing impacts of the new sea uses (including OWP) to marine ecosystem structure and service supply are being developed and tested in the BSP and beyond (e.g., Bergström et al., 2020; Kotta et al., 2020) as well as applied in MSP and strategic environmental assessment (e.g. Veidemane et al., 2017).

The Land-Sea-Act case study in Southwestern Kurzeme has tested the application of the ecosystem service cascade model (including ecosystem structure, functions, services, and human well-being) in assessment of impacts of OWPs. The case study also developed a novel approach to using assessment of cultural ecosystem services and landscape qualities for targeting sustainable tourism development to site specific values, which could be up taken during elaboration of the municipality thematic plans or development programmes. Ecosystem service assessment enables an integrated approach in planning of LSI by establishing connections among all components of the cascade model - from ecosystem structure to human well-being.

b. Potentials and limits of replicating (also upscaling) the applied approaches and planning solutions towards sustainable coastal-marine futures

Ecosystem service and landscape approaches as all integrated planning approaches are problem oriented and case sensitive, as all steps of planning processes (from problem definition and definition of criteria to implementation of solutions) shall be carried out in close collaboration with stakeholders, thus emphasizing case specific problems and contingencies. Nevertheless, ecosystem service assessment and scenario building are acknowledged as useful tools to support policy and decision making. Ecosystem service concept provides a holistic view on interactions between nature and humans and helps to address conflicts and synergies between environmental and socio-economic goals. It can be also used as a comprehensive framework for trade-off analysis between competing land uses and help to facilitate planning and development decisions across sectors, scales, and administrative boundaries (Fürst et al. 2017).
Ecosystem service maps can be used to communicate complex spatial information and raise awareness about areas important for ecosystem service supply and human dependence of functioning nature. Participatory approaches (e.g., workshops, surveys, PGIS) are used to support ecosystem service mapping by incorporating people's experiences, perceptions, and local knowledge.
Participatory scenario building methods allow to explore different development alternatives and spatial options considering stakeholders views and local knowledge. Combining scenario building methods with assessing impacts to ecosystem structures and services enables integration of ecological and socio-economic aspects in comparing the future scenarios, and thus supporting more informed and balanced decisions making.

[1] https://mereala.hendrikson.ee/dokumendid/Eskiis/Estonian_MSP_Impact_assessment_ENG.pdf

Stakeholder engagement is a key tool that can be further supported via new digital techniques such as online GIS platforms which provide interactive collaboration between planners and stakeholders. Some national MSPs have been created using online and digital products. Digitalisation and online tools are very much welcome, particularly in data collection; however, there is also a need for face-to face meetings when solutions and compromises shall be achieved. Stakeholder engagement within the Land-Sea-Act case studies was partially limited by pandemic restrictions, lessening the extent of possible synergies produced in live interactions with interested parties.
The approaches and methods tested and developed within the Land-Sea-Act case study in the Southwestern Kurzeme can be replicated in other parts of the country at regional or potentially at national level as well as at the scale of the Baltic Sea Region. For example, the approach for assessment of ecosystem services and landscape qualities can be applied in other coastal areas to support tourism development and spatial planning. In Latvia such information can be integrated in thematic planning documents of different levels as well as used in development plans of regions or municipalities. Methods employed to assess impact of OWP on marine ecosystem structures and services (as well as the proposed solutions) can be used in maritime spatial planning or strategic environmental assessment of the sea use plans. The approach tested by the Latvian case study is potentially replicable at the Baltic Sea Region, where harmonised data sets on marine ecosystem components are compiled by the HELCOM Map and Data Service.

Furthermore, the approaches applied in the case study for balancing OWP development interests with local interests in preserving coastal landscape and tourism development can be also applied in addressing other land-sea interaction issues, particularly for addressing various socio-ecological land-sea interactions, including impacts of new sea uses (like aquaculture farms, cables, ports etc.) on coastal ecosystems, fish resources, cultural heritage, tourism and well-being of coastal communities.

The main limitations of the approaches tested by the Latvian case study are related to scarcity of data and knowledge on structures and functions of marine ecosystems. In Latvia detailed mapping of benthic habitats have been performed so far only in the coastal waters for designation of marine protected areas (MPAs). Recently a new LIFE REEF project has started, which aims to investigate more distant sites in EEZ for designation of offshore MPAs. The new data provided by the LIFE REEF project will enable more accurate assessment of the impacts of potential OWP areas. Another important limitation is shortage of knowledge of cumulative impacts of different pressures caused by construction of OWP. Accumulation of evidence-based knowledge on adaptation of marine ecosystems to OWP infrastructure could produce contrasting results with regard to analysed ecosystem functions (i.e., underwater constructions of OWPs can serve as artificial reef providing habitat for algae or mussels) thus also changing provision of ecosystem services and its contribution to human well-being. Also, the assessment of the coastal inland landscapes and ecosystem services at the scale of landscape units is rather data and labour intensive (e.g., some of landscape qualities can be assessed only by experts at the site, thus requiring systematic field surveys).

c. Key contribution to the existing knowledge on LSI in coastal governance

- The Latvian case study has developed a novel landscape quality mapping approach as a proxy for cultural ecosystem service assessment, which can serve as a support tool for land and sea use planning. The applied approach is based on expert knowledge and experience in terrestrial landscape assessments, adjusting it to the coastal/land-sea interaction context.
- The case study has applied the well-established ecosystem service concept to highlight trade-offs of land-sea interactions and seek solutions for balancing of different (land and sea use/ national and local) interests. It demonstrated that ecosystem service assessment is a suitable method to integrate multiple economic, social, and ecological values that need to be taken into account in complex multi-level decision-making situations such as planning coastal areas.
- The case study has tried to link the ecosystems with human well-being in the context of integrated planning. Connections between ecosystem structures, services and human well-being were established based on knowledge provided by previous projects (e.g., BONUS BASMATI), expert knowledge and results from the social survey on contribution of the coastal ecosystems to human well-being.

7. References

Armoškaitė A., Puriņa I., Aigars J., Strāķe S., Pakalniete K., Frederiksen P., Schrøder L. and Hansen H.S., 2020. Establishing the links between marine ecosystem components, functions and services: An ecosystem service assessment tool. *Ocean & Coastal Management*, *193*, p.105229. https://doi.org/10.1016/j.ocecoaman.2020.105229

Bergström L. et al., 2019. Cumulative Impact Assessment for Maritime Spatial Planning in the Baltic Sea Region. Pan Baltic Scope. http://www.panbalticscope.eu/wp-content/uploads/2019/11/PBS_Cumulative_Impacts_report.pdf

Brown G. and Hausner V.H., 2017. An empirical analysis of cultural ecosystem values in coastal Landscapes. Ocean & Coastal Management 142: 49-60. https://doi.org/10.1016/j.ocecoaman.2017.03.019

Bryce R., Irvine K.N., Church A., Fish R., Ranger S., Kenter J.O., 2016. Subjective wellbeing indicators for large-scale assessment of cultural ecosystem services. Ecosystem Services 21: 258-269. https://doi.org/10.1016/j.ecoser.2016.07.015

Cabinet of Ministers, 2019. National Energy and Climate Plan of Latvia 2021-2030

Domon G., 2011. Landscape as resource: Consequences, challenges and opportunities for rural development. Landscape and Urban Planning, 100(4): 338-340. https://doi.org/10.1016/j.landurbplan.2011.02.014

Fish R., Church A., Winter M., 2016. Conceptualising cultural ecosystem services: a novel framework for research and critical engagement. Ecosystem Services 21: 208-217. https://doi.org/10.1016/j.ecoser.2016.09.002

Fürst C., Luque S., Geneletti D. 2017. Nexus thinking – how ecosystem services can contribute to enhancing the cross-scale and cross-sectoral coherence between land use, spatial planning and policy-making. International Journal of Biodiversity Science, Ecosystem Services & Management, 13(1): 412-421 https://doi.org/10.1080/21513732.2017.1396257

Hazeu G.W., Metzger M.J., Mücher C.A., Perez-Soba M., Renetzeder C.H., & Andersen E. (2011). European environmental stratifications and typologies: an overview. Agriculture, ecosystems & environment, 142(1-2), 29-39. https://doi.org/10.1016/j.agee.2010.01.009

Haines-Young R. and Potschin M., 2010. The links between biodiversity, ecosystem services and human well-being. In: Raffaelli, D.G & C.L.J. Frid (eds.): Ecosystem Ecology: A New Synthesis. Cambridge University Press, British Ecological Society, pp. 110-139. https://doi.org/10.1017/CBO9780511750458.007

IPBES, 2016. The methodological assessment report on scenarios and models of biodiversity and ecosystem services. S. Ferrier, K. N. Ninan, P. Leadley, R. Alkemade, L. A. Acosta, H. R. Akçakaya, L. Brotons, W. W. L. Cheung, V. Christensen, K. A. Harhash, J. Kabubo-Mariara, C. Lundquist, M. Obersteiner, H. M. Pereira, G. Peterson, R. Pichs-Madruga, N. Ravindranath, C. Rondinini and B. A. Wintle (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 348 pages. https://ipbes.net/assessment-reports/scenarios

Kotta J., Fetissov M., Szava-Kovats R., Aps R., Martin G., 2020. Online tool to integrate evidence-based knowledge into cumulative effects assessments: Linking human pressures to multiple nature assets. Environmental Advances, 2: 100026. https://doi.org/10.1016/j.envadv.2020.100026

Liu J. and Opdam P.F.M. 2014. Valuing ecosystem services in community-based landscape planning: introducing a wellbeing-based approach. *Landscape Ecology 29.* https://doi.org/10.1007/s10980-014-0045-8

Martínez-Harms M.J. and Balvanera P., 2012. Methods for mapping ecosystem service supply: a review. International Journal of Biodiversity Science, Ecosystem Services & Management 8: 17-25.

https://doi.org/10.1080/21513732.2012.663792

Millenium Ecosystem Assessment, 2005. Ecosystems and Human Well-being. Available at: https://www.millenniumassessment.org/documents/document.356.aspx.pdf

Ministry of Environmental Protection and Regional Development, 2016. The National Long Term Thematic Plan for Development of the Coastal Public Infrastructure.

Ministry of Environmental Protection and Regional Development, 2019. The Maritime Spatial Plan for the Marine Inland Waters, Territorial Sea and Exclusive Economic Zone Waters of the Republic of Latvia. National level long-term spatial development planning document. https://www.varam.gov.lv/en/maritime-spatial-planning

Ministry of Environmental Protection and Regional development, 2020. Overall study of the visitors at the Baltic sea coast and their impact on environment and public infrastructure. [In Latvian: Baltijas jūras piekrastes apmeklētība, tās radītās slodzes uz vidi un infrastruktūras vispārīgs izvērtējums] Available at: https://www.varam.gov.lv/lv/piekrastes-novertejums-piekrastes-apmekletaju-ietekmes-uz-vidi-un-publiskas-infrastrukturas-novertejums

Müller F., de Groot R., & Willemen L. (2010). Ecosystem services at the landscape scale: the need for integrative approaches. Landscape Online, 23, 1-11. https://doi.org/10.3097/LO.201023

Raudsepp-Hearne C., Peterson G.D., Bennett E.M., 2010. Ecosystem service bundles for analyzing tradeoffs in diverse landscapes. Proceedings of the National Academy of Sciences 107 (11): 5242-5247. https://doi.org/10.1073/pnas.0907284107

Rogers D.S., Duraiappah A.K., Antons D.C., Munoz P., Bai X., Fragkias M., Gutscher H., 2012. A vision for human well-being: transition to social sustainability. *Current Opinion in Environmental Sustainability: Volume 4, Issue 1*. https://doi.org/10.1016/j.cosust.2012.01.013

Scholte S.S., Daams M., Farjon H., Sijtsma F.J., Teeffelen A.J., Verburg P.H., 2018. Mapping recreation as an ecosystem service: considering scale, interregional differences and the influence of physical attributes. Landscape and Urban Planning 175: 149-160. https://doi.org/10.1016/j.landurbplan.2018.03.011

Sowińska-Świerkosz B.N. and Chmielewski T.J., 2016. A new approach to the identification of Landscape Quality Objectives (LQOs) as a set of indicators. Journal of environmental management, 184, 596-608. https://doi.org/10.1016/j.jenvman.2016.10.016

Veidemane K. and Nikodemus O., 2015. Coherence between marine and land use planning: public attitudes to landscapes in the context of siting a wind park along the Latvian coast of the Baltic Sea. Journal of Environmental Planning and management. 58: 949-975. https://doi.org/10.1080/09640568.2014.903167

Veidemane K., Ruskule A., Sprukta S. 2017. Development of a maritime spatial plan: the Latvian recipe. http://www.balticscope.eu/events/final-reports/

Veidemane K., Ruskule A., Strake S., Purina I., Aigars J., Sprukta S., Ustups D., Putnis I., Klepers A., 2017. Application of the marine ecosystem services approach in the development of the maritime spatial plan of Latvia, International Journal of Biodiversity Science, Ecosystem Services & Management, 13:1, 398-411. https://doi.org/10.1080/21513732.2017.1398185

Wind Europe, 2019. Our energy, our future: How offshore wind will help Europe go carbon-neutral. Available at: https://windeurope.org/wp-content/uploads/files/about-wind/reports/WindEurope-Our-Energy-Our-Future.pdf

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

LAND SEA ACT

Interreg Baltic Sea Region

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EUROPEAN REGIONAL DEVELOPMENT FUND

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