ECOSYSTEM SERVICE APPROACH: AN EXAMPLE[1]

Ecosystem service approach in assessment of land-sea interactions: 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 & 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 ES values (Martin et al. 2016, Scholte et al. 2018).

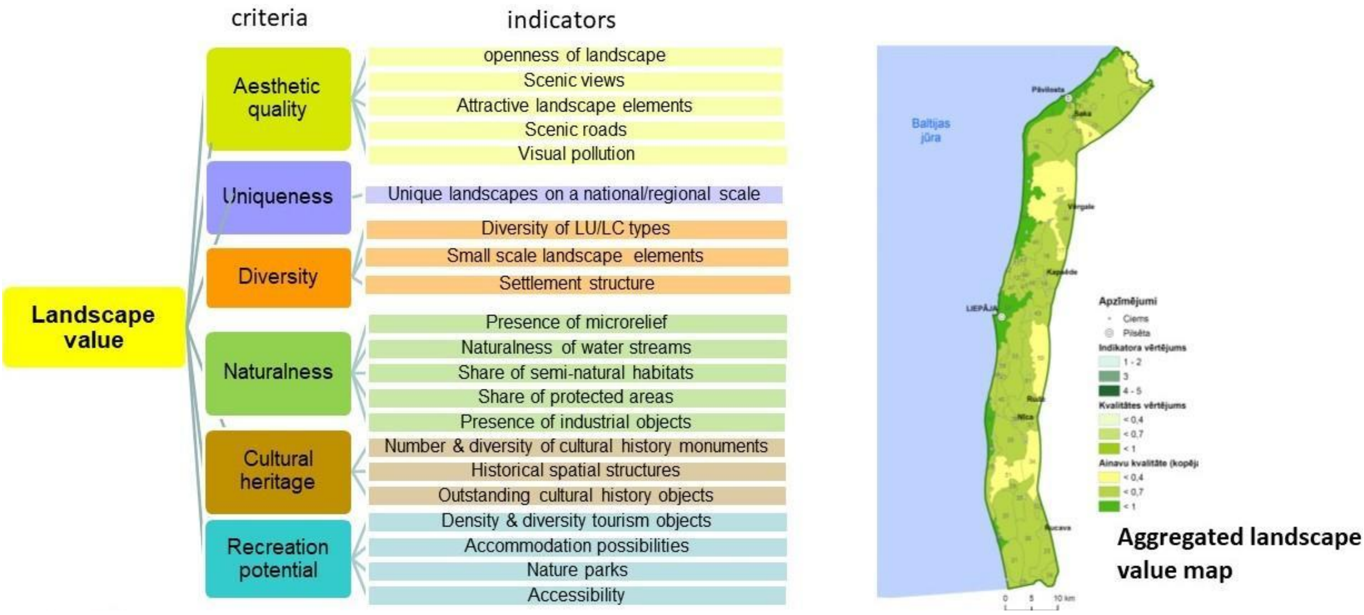
Implementation of the method in the case study

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 exclusive economic zone. 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, although the provisioning and regulating services were also assessed.

[1] Originally published as a part of: Ruskule, A., Veidemane, K., Pikner, T., Printsmann, A., Palang, H., Arikas, D., Siegel, P., Costa, L., Burow, B., Piwowarczyk, J., Zielinski, T., Romancewicz, K., Koroza, A. 2021: Compendium of methodologies on how to address land-sea interactions and development trade-offs in coastal areas. Interreg Baltic Sea Region Programme funded project "Land-sea interactions advancing Blue Growth in Baltic Sea coastal areas" (R098 Land-Sea-Act).

The production of Valuable practice was supported by the Interreg Baltic Sea Region Programme 2021–2027 – through the Subsidy contract for the project #C018 Baltic Sea2Land of Interreg Baltic Sea Region. The content of this document represents only the views of the author and is his/her sole responsibility. The document does not reflect the views of the Interreg Baltic Sea Region Programme, the Interreg Baltic Sea Region Programme and its representatives do not accept any responsibility for the further use of this document and its contents.

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 BASMATI project (Armoškaitė et al. 2020). The assessment results are available at the Land-Sea-Act map explorer.

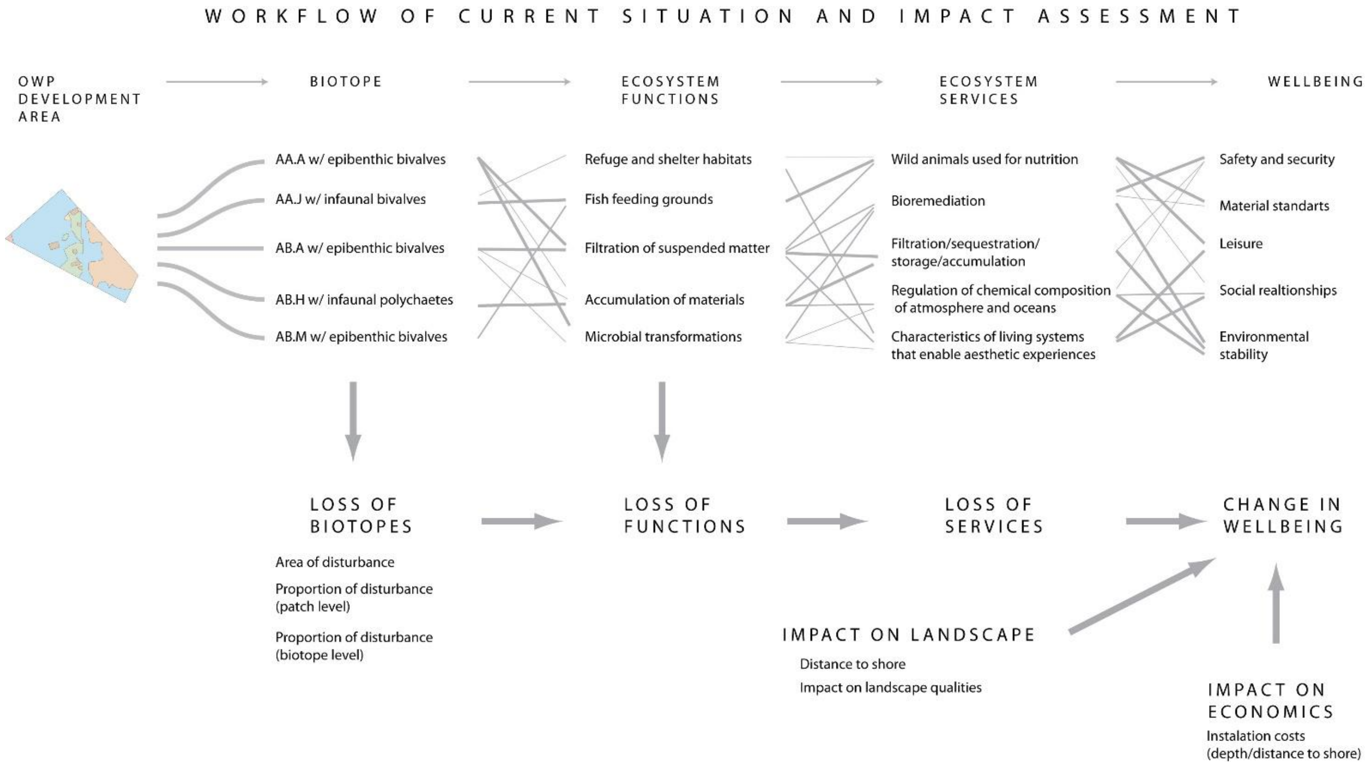


Assessment scheme of landscape qualities in terrestrial part of the Southwest Kurzeme case study

Biophysical ES 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 ecosystem service 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. The estimated loss of ES and related human welling aspects were considered in selection of an optimum solution with least negative impacts.



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:

- areas of high aesthetic value,
- areas of high natural value,
- areas of high cultural heritage value

(some landscape areas can belong simultaneously to all clusters). Recommendations for tourism development were developed addressing the potentials and limitations of each cluster.

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