INTEGRATED COASTAL MANAGEMENT PRACTICE CASE STUDIES: DEFICIENCY OF COLLABORATION COMMUNICATION AND SOCIO-ECOLOGICAL SYSTEM APPROACHES

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Abstract. Sustainable coastal governance understanding nowadays still require internationally prescribed integrated coastal management (ICM) approach for both coastal socio-ecological systems studies as well as policies/planning and management practice development. Systems Approach Framework (SAF) as an issue oriented and system analysis based investigation and development planning methodology offers this to be further tested new tool in order not only to study complex coastal systems, but, also complementary, to facilitate participatory problem-solving decision making, what altogether have been correspondingly investigated and tested in the framework of EU BONUS Programme BaltCoast project. The aim of one part of the joint project study was to summarize main findings from retrospective analysis of the best available ICM practice, based on cases from the Baltic Sea Region countries and, particularly, those ones from Latvia coast, as well as to recognize main deficiencies and approaches necessary for further ICM improvement, what are also the main tasks for this paper. Nineteen selected ICM best practise cases were studied accordingly. Obviously, that main known ICM elements, have been recognized in practice cases all around Baltic, but only to different degree as per different contexts and coastal issues studied. However, SAF, or similar coastal system approaching, as well as participatory management requiring applications, have not been regularly and widely used. Latvia ICM case studies also particularly do confirm ongoing requirement for social-ecological system understanding and necessary multi-disciplinary studies, and, related/depending development of collaboration communication approach, based on complementary instruments of coastal information and education, participation and coastal friendly behaviour elaborations.

Key words: integrated coastal management, socio-ecological coastal systems, systems approach framework, best practice cases, collaboration communication.

JEL code: Q55

Introduction

Coastal systems are based on interconnected elements of complex resources systems complementing all sustainability dimensions as natural, socio-economic and also governance resources – coastal territories are to be seen as social-ecological systems (SES). Inadequate use, protection and management of the coastal territories in general are responsible for the instability of the coastal systems (Cooper, J.A.G., Cummins, V. 2009). There is a need for a systemic approach and the instruments that would support our ability to understand and communicate changes in the coastal systems (Waagsaether, K., Ziervogel, G., 2012), and respond adequately through the governance system, including stakeholders and a whole set of governance and, especially also, communication instruments (Ernsteins R., et.al. 2011).

Following question is how to improve the coastal governance process and decision making procedure. The knowledge gained from applied experiments concerns the practical aspects for the development: governance in terms of policy effectiveness; sustainability science in terms of applying trans-disciplinary science to social-ecological problems; simulation analysis in terms of quantifying dysfunctions in complex systems; partnership among research, management, and stakeholders as for a quantitative basis for collaborative decision making (Hopkins, et al., 2012). Further on, there are to be recognized basic pre-conditions for the elaboration of governance options, also based on communication (Ernsteins R., 2010) – balanced sharing of information with stakeholders, creation of space for common dialogue and repeated communication with stakeholders (Mette, 2011).

The paper presents principal results of the first part of the studies carried out within EU BONUS Programme Baltcoast project (Systems Approach Framework for Coastal Research and Management in the Baltic, 2015-2018) having namely two main aims: 1) a retrospective

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analysis of existing integrated coastal management (ICM) best practise case studies and 2) provision of a broad knowledge base for the further development of ICM and for the chosen Systems Approach Framework (SAF) methodology, which was developed by the SPICOSA project (Hopkins et al., 2012).

SAF methodological approach. SAF contribution to ICM is dedicated to understanding and diagnosing the end-user as a partner in the coastal governance options development process (Ostrom, 2009), but the system specific monitoring and compatible multidisciplinary databases are essential precondition (Karpouzoglou, T., et.al. 2016) as well as the need to increase the capacity for governance problems analysis (Conrad, C., Hilchey, K. 2011). SAF methodology approach, has been based not only on “classical” stakeholders’ participation, but combining science-based data investigation and stakeholders’ interactive involvement in ICM development scenarios evaluation, when solving local coastal problem situations. The aim of one particular part of the joint project study was to summarize main findings from retrospective analysis of the best available ICM practice, based on cases from the Baltic Sea Region countries and, particularly, those ones from Latvia coast, as well as to recognize main deficiencies and approaches necessary for further ICM improvement, what are also the main tasks for this paper.

To foster the exchange of experiences and learning from best practice examples, the European Commission maintains the OURCOAST online database (http://ec.europa.eu/ourcoast/), which has about 350 structured case studies on major coastal themes. Initial selection of these cases for the ICM Database were done during execution of the EU granted project OURCOAST (2009 – 2011), being based on national and international ICM expert’s judgements - as their understanding of successfulness of application into practice of the general ICM approach and tools, according to the definition of the eight ICM basic principles (Recommendations of the European Parliament ..., 2002). Also at the selection was requested clear integration principle application in following terms: integrated coastal development aims, vertical cross-level and horizontal cross-sectorial integration, as well as stakeholder participation integration. There were particular types of processes and tools chosen, which have been divided in 6 main key approaches: integration; participation; knowledge-based; ecosystems based approach; socio-economic; technical.

Methods and case studies applications

Re-analysis was done based on the verification of SAF steps/elements application in the ICM local cases studied: 1) issue identification, 2) formulation, 3) appraisal, 4) output, 5) implementation 6) follow up step. The tool used by all project partners to summarize answers, was SAF steps-based designed questionnaire form (Excel format) with predefined choices for standard answers (yes, no, don’t know) and several open-ended questions, and also a specific format for SWOT analysis and summary (10 grades). Comprehensive interview series with local ICM experts familiar with the cases were done, but also document studies and stakeholder interviews took place in the most of studies (Jansen H., Ernsteins R., 2016).

Taking into account local specifics, thematic representation and best available ICM qualities, there were totally 19 cases selected and proposed for analysis by all 7 project partner countries, but covering all 9 Baltic sea region countries (Table 1.) as the Russian and Finnish cases were covered by the Lithuanian partner team involving experts from respective countries. National experts that documented their national ICM best practise cases for the OURCOAST database have been involved for re-analysis as having already full access to all documents and related context (Jansen H., Ernsteins R., 2016).
Coastal issues. Baltic Sea Region cases chosen dealt especially with complex issues related to the ICM, which require the use of system approach. There were clearly dominating issues of following coastal environmental management themes as representing 2/3 of all cases (even often covering several themes by each case): nature protection, management of protected nature sites or specific ecosystems (grasslands, wetlands) (totally 8 cases); coastal/dunes erosion (6 cases); floods, storms (5 cases); sea level rise (3 cases). Also water quality, pollution as well as river mouth, estuary problems (2 cases each group) were present, but just one case each were chosen for following issues - management of natural resources (sand extraction), species (migratory birds) protection, coastal protection, landscape protection, climate change (Lagzdina E., Lontone A., 2016).

Instrumental approach. Four cases were related to the planning instruments: ICM of coastal zone (spatial planning - 2 cases), river basin areas management planning according to the ecosystem or the EU Water framework directive requirement (2 cases). Eight cases were related to technical (infrastructure) instruments (flood defence systems, coastal realignment, wetlands restoration etc.), but two cases suggested environmental communication instruments - establishing monitoring system, improving public environmental education and awareness raising. No other instruments were represented quite obviously.

Sector approach. Also quite understandably there were majority of cases (10 cases) related to use of the coastal area for tourism, resort, and recreational activities as public high interest topics. Seven cases were addressing sea (water) based activities (shipping, fisheries and aquaculture), but four cases - ICM situation in /or near large urban centres and in the harbours/ports. Just two cases address non-traditional topics like coastal resources management in relation to agricultural activities (farming, dairy farming).

The list of cases and countries

<table>
<thead>
<tr>
<th>Country/Author</th>
<th>Case title</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Germany</strong> (Leibniz-Institut für Ostseeforschung Warnemünde, 2015)</td>
<td>Coastal realignment, wetland restoration in Geltinger Birk</td>
</tr>
<tr>
<td><strong>Poland</strong> (Institute of Hydro-Engineering, Polish Academy of Sciences, 2015)</td>
<td>Changing policy to halt beach erosion effects for tourism sustainable management: Hel Peninsula</td>
</tr>
<tr>
<td><strong>Denmark</strong> (Technical University of Denmark - National Institute of Aquatic Resources, 2015)</td>
<td>Integrated management of mussel fishery and aquaculture under changing baselines due to regime shifts in the Limfjord</td>
</tr>
<tr>
<td><strong>Lithuania</strong> (Marine Science and Technology Centre, Klaipeda University, 2015)</td>
<td>Fishery and aggregate extraction in the Sound</td>
</tr>
<tr>
<td><strong>Russia</strong> (Marine Science and Technology Centre, Klaipeda University, 2015)</td>
<td>Russian part of the cross-border Neman River Catchment</td>
</tr>
<tr>
<td><strong>Latvia</strong> (Environmental Science Department, University of Latvia, 2015)</td>
<td>Ventspils voluntary municipal Environmental licensing system</td>
</tr>
<tr>
<td><strong>Estonia</strong> (Institute of Ecology, Tallinn University, 2015)</td>
<td>The Järve - Nasva case-study</td>
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<tr>
<td><strong>Finland</strong> (Marine Science and Technology Centre, Klaipeda University, 2015)</td>
<td>Coastal management strategy for southwest Finland</td>
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Results and discussion

General ICM and SAF in Baltics. Cases selection for BaltCoast SAF based studies were done according to the recognition of both as wide
spread as possible complex and socio-ecological system cases and also participatory decision-making cases hopefully in one coastal problem situation. Not all of the OURCOAST cases selected for BaltCoast studies appears to be best-practice ICM cases as having not gone through known ICM process (Jansen H., Ernsteins R., 2016). During the project studies there were chosen also some non-OURCOAST cases as have been done either after 2011 or representing more SAF type approaches even not fully ICM approach finalized. Selection of cases for SAF analysis by the issue type and, particularly, by management instruments and sectors, do not represent the whole quite systemic ICM elements/approaches selection spectrum, being done for Ourcoast data basis, but are showing us those ICM really functioning components/instruments, which have had both – more public interest/sensitivity and, relatedly, also more SAF type applications.

In most of the analysed case studies the ICM practice has been different from the SAF theory, but in many cases there were recognizable some, mainly most known traditional, ICM items being related to the separate SAF approach elements. Also comprehensive systematic/systemic analyses as for coasts as complex SES were found seldom and they did usually not cover all three pillars of sustainability, incl. national/local culture traditions/approaches. Looks like, in many cases the analytical basis for the ICM type decision-making have not been sufficiently developed (Jansen H., Ernsteins R., 2016).

General problems found are related to the following main/important issues: ICM project/problem team (and/or expert group surrounding) establishment and their working practice as multi-disciplinary and comprehensively; stakeholder full scale and whole problem-solving period participatory appropriate forums/media and communications; limited or formal participation (only legal requirements steps etc.) as such; often only top-down or, rarely, bottom-up approaches used and often lacking even basic collaboration elements etc. (Lagzdina E., Lontone A., 2016). Two partner detailed studies on SAF application finished and related papers are now published - Schernewski G., et al (2017), and Støttrup J. G. et al (2017).

Coastal governance and communication in Latvian cases.

Following is short description of three cases, which could be seen also as complementary ones in terms of main approaches used. Also, there should be initially mentioned, that the main issue related to Latvian ICM situation is: lacking of coastal (and ICM) complexity and SES bases understanding and stakeholder’s collaboration. Subsequently, collaboration communication model (Ernsteins R., 2010) application (Figure 1.) was developed and tested in several environmental and coastal cases, both at local and national level (e.g. National Environmental communication and education Strategy, 2001), relying on four complementary components/instruments: information and education/training, participation and pro-environmental behaviour.

Source: (Ernsteins R., 2010)

Fig. 1. Collaboration communication four instruments model for ICM facilitation.

Important is to be mentioned also necessary role and interaction of four main mediator’s groups into direct implementation of collaborative communication of ICM practice (Figure 2.). Both models, as well as general main eight stakeholders model (Figure 3.) have been
Public self-organized Pavilosta NATURA 2000 site establishing. This case is known as most comprehensive long term public self-organized process in Latvia and was done for Natura2000 site establishment. Since 2007 established, Pavilosta Grey Dune nature reserve, covers 42 ha to protect Latvia’s widest grey dune, that stretches 1.5 km parallel to the seacoast and 812 m inland, and other valuable biotopes and species found. Municipality administer 515 km2 territory with 46 km long seashore border, having population less as 3000.

Extensively locally tested and could be used also during this SAF analysis too (Ernsteins R., 2010).

Fig. 2. Collaboration communication model instruments and main four mediators’ interaction.

Process. Pavilosta case was selected as a specific example of the bottom-up governance initiative. In 1999, responding to the society initiative, the Pavilosta Municipal Council created an institutional coastal governance instrument - Dune Protection Commission (consisting not only of some deputies, but also especially of public/expert representatives). After discovery of semi-illegal construction on the coastal dunes, protested by the public, Commission was dismissed. Shortly after that, few environmental activists, supported by local school students, launched grey dunes protection movement.

SES and decision-making participation. Activists, having had not wide local population support, worked closely with various national-scale organizations, environmental NGOs, culture organizations, churches etc. – a lot was done by the activist group to attract public attention and create political support to the protection of this natural area. This raised interest also from various scientists (mainly bio-science specialists - biologists, botanists, and conservationists), joining activists and professionally supporting.

Communication. In general, it has to be concluded, that this dune protection activity is the best wide targeted public participation process known in Latvia, what was informing, educating and involving all main target groups (Figure 3.) – besides local government, businesses, active part of local society, also nationwide mediators, known scientists and artists, leading politicians and personalities have been participating in different support activities, particularly, in the pro-environmental behaviour ones. There were complementary used the whole set of collaboration communication instruments.

Impact and learning. Currently, there is one competent and active environmental NGO in the municipality and municipal council supports some NGO activities, providing some financial support. However, the conflict between the society and local government is not exhausted – in the relation to the NATURA 2000 site, it could be observed that the local government have not much incentives, but NGOs have not much possibilities to engage with the protected site management issues.
Ventspils municipal voluntary Environmental licensing system (ELS). ELS was operating in Ventspils coastal municipality (around 40,000 inhabitants) in 1994–2009 as steaming from international experience, being approved by the Municipal Council decision as local legal regulation and so applied to 83 enterprises. The main task of Regulation was to establish governance system for coastal/environmental protection and rational use of natural resources, and, to provide municipal specialists and general public with information on impact of economic activities to the Baltic Sea and local environment, as well as to improve public participation in the local decision-making.

Process. ELS was top-down but voluntary coastal/environmental instrument (still the only one in Latvia), being initiated by public growing requirements on environmental security in the harbour town after regaining national independence, what also provided possibility for municipality to work in accordance with EU integrated pollution prevention legislation long before Latvia’s accession to the EU in 2004.

SES and decision-making participation. The Regulation requested, that every existing or newly established business activity, which cause or may cause negative impact on the environment, must obtain environmental license from the municipality, to be issued only after the following: enterprises organize study and prepare SES type overview of their activities to be presented for public discussion to the municipality, placed in libraries etc.

Communication. Municipal Council worked pro-actively to enable its citizen’s role in the local decision-making process. The municipality used mediators: mass media channels (regional newspaper and local television), schools and non-formal education institutions as libraries, NGO’s to disseminate information and participation tools, thus reach local people and acknowledge pro-environmental behaviour. As a result, the local society was provided with comprehensive information about impacts of any entrepreneurial activity on the quality of the environment, public participation and cooperation with all local stakeholders was strengthened, as well as pro-environmentally behaviour was facilitated, what all-in-all was re-affirming ELS as an effective environmental communication tool.

Impact and learning. ELS also created preconditions for the implementation of voluntary environmental management systems (ISO 14001 standard) in the major local/harbour businesses. With the development of the national environmental legislation after Latvia was joining EU, the function of polluting activities control was given to the governmental Regional Environmental Boards, which were issuing integrated permits for polluting activities and using natural resources. After ELS was stopped, municipality have developed legal regulations on public participation.

Liepaja municipal voluntary coastal thematic planning. Besides three mandatory documents at all governance levels (long-term sustainable development strategy, mid-term development programme and spatial plan), there are voluntary ones – particular detailing of planning is possible by either action plan, local spatial plan or thematic plan, what all allow to integrate spatial and development elements under selected thematic issue. Liepaja municipality (around 75,000 inhabitants) is the first municipality in Latvia having prepared coastal zone development thematic plan (2015), what includes elements of the ICM approach.

Process. The thematic plan envisages coastal zone development activities until 2024 and it could be seen as both and complementary – top-down and also bottom-up process. It was elaborated as agreement in the participatory process between all different stakeholder groups about long-term vision of the beach, nearby infrastructure and architectural elements.

SES and decision-making participation. Planning process was started in 2012 and
comprehensive multi-disciplinary environmental studies were commissioned and comprehensive public survey was carried out, later being analysed and discussed by stakeholders. Spatially it is based on several development axes: municipal transport lines; bicycle road and local "sea gates" (providing access to the beach). The main thematic issues for the coastal development were related to how to link beach with the city, security and information in the beach, environmental risks, functionality and improvement of services oriented towards existing natural and cultural (including historical) heritage and values, territorial integrity and dune erosion mitigation tasks.

Communication. Also in Liepaja municipality worked pro-actively to enable its citizen’s role in the local decision-making process. The municipality used all mediators as well, working with coastal information, education and participation tools, also planning and discussing coastal pro-environmental behaviour. As a result, pro-environmentally behaviour was facilitated for all target groups, starting from municipality itself. This was pro-actively planned based on since 2009 existing environmental communication plan, agreed by stakeholders to be as chapter no.1. of municipal Environmental Action Programme (2009-2015).

Impact and learning. In general, the document was agreement between various interests and visions as regards long term development of the coastal territory, as well as their specific perception of infrastructure and architecture elements important for a particular scale of the spatial planning. This agreement is binding for the local politicians and cannot be changed unilaterally without public discussion.

Summary and conclusions
1) Despite all international/national long-term efforts, ICM approach implementation still has been not fully understood and implemented, especially, taking into account local level specifics. Many studied ICM cases are missing both, the SES content to be done by multi-disciplinary studies approach, cross-sectorial and cross-level integration and also real stakeholders participatory decision-making process.

2) General ICM problems solving still do require basic pre-conditions, generic and innovative ones, e.g. initially developing/pro-actively involving cross-disciplinary trained and working project/problem team, designing coastal collaboration process for all main stakeholder’s interests’ formulation and interaction process, creating communication forums/media for initiatives and complementary applying of top-down and bottom-up approaches.

3) Particularly, for avoiding ICM deficiencies mentioned, coastal collaborative communication shall be developed, all main target groups and related coastal topics selectively and multi-thematically oriented, and based on four complementary components/instruments as information and education/training, participation and pro-environmental behaviour.

4) ICM requested coastal nature-social science results interaction needed is to be transformed into local level science-policy-practice chain governance, and that could be done as particular interface process and content development, being based on structural design of to be elaborated/tested local municipal coastal monitoring system (incl. citizen science approach) as part of local municipal development governance. (Kudrenickis, I., Ernstins, R., Kaulins, J., 2016).

The study and the paper have been prepared with the financial support of the EU BONUS programme project “A Systems Approach Framework for Coastal Research and Management in the Baltic” (BaltCoast).

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