

Implementing the source-to-sea approach in Georgia

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Introduction

The article discusses application of the source-to-sea approach in practice in Georgia, in particular by analyzing practical implementation of the key principles of the approach. The source-to-sea understanding is reviewed from a policy perspective by analyzing the use of the approach within a development process of the draft strategic environmental document – 4th National Environmental Action Programme. The discussion provides examples on how each principle of the source-to-sea thinking was ensured while developing the Programme, how the wider environmental strategy document ensured holistic planning in the marine environment, and which methods were used for the policy development.

Definition of the “source-to-sea” approach

Marine environment is directly impacted by land-based activities and riverine inputs, which usually cause sedimentation problems, nutrient loading, and other forms of pollution resulting from agricultural, urban activities and energy production.¹ For example, unsustainable agricultural practices, such as overuse of fertilizers can cause pollution with nutrients in sea water, insufficient wastewater treatment can cause ammonium concentration in sea water, ineffective solid waste management systems can cause increasing amount of litter in marine environment. Rivers are also main carriers of pollution into seas and oceans. For instance, a recent study estimates that more than 1000 rivers can account for up to 2.7 million metric tons of plastic pollution in the marine environment per year globally.²

Many of the pressures do not account for the challenges caused to the marine environment, neither are different sectors aware of the downstream impacts of their activities. In addition, different aspects of marine environment are governed by various institutions who are siloed, do not coordinated their plans and cause counterproductive outcomes.³ It's been only recently that the attention has been directed towards important connection between land, freshwater and seas/oceans. If before, marine, freshwater and terrestrial specialists worked independently from one another, now the focus is made on more holistic approach⁴ towards planning of marine, terrestrial and freshwater policies and activities, and on the addressing of the continuity from

¹ Singh, G. G., Cottrell, R. S., Eddy, T. D. & Cisneros-Montemayor, A. M., 2021. Governing the Land-Sea Interface to Achieve Sustainable Coastal Development. *Frontiers in Marine Science*, Volume 8, p. 1046.

² Meijer, L. J. J. et al., 2021. More than 1000 rivers account for 80% of global riverine plastic emissions into the ocean. *Science Advances*, 7(18).

³ Singh, G. G., Cottrell, R. S., Eddy, T. D. & Cisneros-Montemayor, A. M., 2021. Governing the Land-Sea Interface to Achieve Sustainable Coastal Development. *Frontiers in Marine Science*, Volume 8, p. 1046.

⁴ Mathews, R. E., Tengberg, A., Sjödin, J., & Liss-Lymer, B. (2019). Implementing the source-to-sea approach: A guide for practitioners. SIWI, Stockholm.

terrestrial and freshwater sources into the marine environment. A source-to-sea approach thus addresses upstream and downstream linkages across issues, sectors.⁵

A source-to-sea system itself is a “*land area that is drained by a river system, its lakes and tributaries (the river basin), connected aquifers and downstream recipients including deltas and estuaries, coastlines and near-shore waters, the adjoining sea and continental shelf as well as the open ocean.*”⁶ And, the source-to-sea approach addresses interlinkages between all these ecosystems and encourages holistic management by considering causal relationships between these systems into policy or project planning and design as well as in the implementation practices. Besides environmental issues, source-to-sea approach also considers economic and social matters through coordination between various sectors.⁷

Key principles of the source-to-sea approach

Mathews and others (2019) in the guide on implementing the source-to-sea approach⁸ identify several essential principles to be considered in the use of the approach in practice. One of the principles is to maintain **holistic** method, meaning that in the design of interventions, the interconnectiveness of issues and sectors need to be considered and desired outcomes need to be coordinated among the key stakeholders. The policies then need to address both upstream and downstream pressures. The following principle is to ensure **collaborative** approach, by embedding source-to-sea thinking into already existing institutions and policies. Another principle is focused on **prioritizing** the key interventions, rather than taking comprehensive assessment of all challenges and addressing all of them at once. However, more complex policy designs are followed afterwards, based on the information and learning derived from the implementation of preliminary activities, programmes, or policies. One of the principles is ensuring **participatory** approach, through encouraging participation and involvement of wide range of stakeholders – those, whose actions have impact, or those, who are affected by source-to-sea system. This way, it is possible to achieve the desired results and ensure everyone’s voices to be heard. The source-to-sea approach must be based on local context, as pressures are different across the different areas. Single policies or programmes cannot be used in all the countries in the same way, as local contexts vary. Thus, one of the principles under the source-to-sea approach is consideration of **context-dependent** circumstances while designing policies and programmes. One of the most essential principles identified in the guide is the source-to-sea approach to be **results oriented**, by making sure that intermediate outcomes have positive impacts on the status of the whole source-to-sea system and address socio-economic implications together with the environmental ones. In the implementation of policies, programmes, it is crucial to monitor and evaluate progress to detect impediments at an early stage and ensure timely intervention to steer the process towards the desired results, if and

⁵ Mathews, R. E., Tengberg, A., Sjödin, J., & Liss-Lymer, B. (2019). Implementing the source-to-sea approach: A guide for practitioners. SIWI, Stockholm.

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⁷ Mathews, R. E., Tengberg, A., Sjödin, J., & Liss-Lymer, B. (2019). Implementing the source-to-sea approach: A guide for practitioners. SIWI, Stockholm.

⁸ Mathews, R. E., Tengberg, A., Sjödin, J., & Liss-Lymer, B. (2019). Implementing the source-to-sea approach: A guide for practitioners. SIWI, Stockholm.

where necessary. Thus, the source-to-sea approach needs to be **adaptive**, by designing flexible policies and programmes and incorporating relevant monitoring and assessment mechanisms into policies.

Application of the source-to-sea approach in Georgia

In order to ensure **holistic** approach in Georgia across all the environmental directions, National Environmental Action Programme (NEAP) is developed within a regular, five-year period, which covers all of the national and sectoral environmental strategic dimensions, including water resources management and marine environment management. The current draft of the 4th National Environmental Action Programme includes 13 sectoral directions, including waste management, climate change, water resources management, marine environment protection, biodiversity and protected areas, protection of land resources. Thus, the goals, objectives, and activities for the 5-year period are coordinated among different institutions and departments within the Ministry of Environmental Protection and Agriculture of Georgia, which is a coordinating institution for the development of NEAP, as well as among the other relevant ministries and public institutions, together with the private sector and academia, working on the various environmental issues. Developing a single framework strategic document in the field of environmental protection, which includes all the key environmental issues, enables the planned activities and their outcomes to be coordinated, synergetic, and ensures prevention of overlaps. For example, in terms of marine litter, relevant activities to prevent and better manage solid waste, is included in the waste management chapter. However, since the chapter was missing marine litter-related particular activities, in coordination with the relevant departments, and considering the activities included under the waste management chapter, appropriate activities have been designed under the Black Sea Marine Environment chapter, related to marine litter. The activities have filled in the gaps to address marine litter. Accordingly, within the draft NEAP 4 document, source-to-sea approach was ensured by, for instance, addressing marine litter challenge more comprehensively, from land-based activities, including closure of illegal landfills and cleaning of ravines from waste, to marine-based activities - such as, including marine litter-related activities in the municipal waste management plans of the coastal municipalities, and conducting a comprehensive study on the marine litter-related challenges in Georgia.

Working on the marine component of the draft 4th National Environmental Action Programme has been a **collaborative** process. The marine environment chapter has been incorporated into an already existing policy document – National Environmental Action Programme and the chapter, as well as the whole document, been developed based on the national Rules of Developing, Monitoring and Evaluating policy documents adopted with the Decree of the Government of Georgia №629. At the same time, initial assessment of Black Sea marine environment, has been conducted in accordance with the EU Marine Strategy Framework Directive (MSFD).

Several key objectives have been **prioritized** to be implemented within a 5-year period under the marine environment chapter of the draft NEAP 4. Even though, the initial assessment included all the key directions, in particular across the 11 descriptors of the MSFD, the strategic goals and objectives have focused on the most feasible, realistic, and effective goals, objectives and activities, to address the challenges identified in the initial assessment.

Participatory approach was undertaken while working on the marine chapter of the draft NEAP 4, as starting from the information gathering stage, to the drafting stage of the objectives and activities, relevant stakeholders were involved. Since different components of the marine environment management, as well as information on various issues is dispersed among the different stakeholders, including academia, NGOs, international organizations, and projects, as well as different public institutions, the coordinating team of the Ministry of Environmental Protection and Agriculture of Georgia consulted with the various stakeholders, through different means of communication. This enabled the team to collect comprehensive information and data and develop realistic activities. For instance, issues related to the port reception facilities were consulted with the LEPL Maritime Transport Agency under the Ministry of Economy and Sustainable Development, issues related to the fishery were consulted with the Environmental Supervision Department of the Ministry of Environmental Protection and Agriculture of Georgia, issues related to endangered species were consulted with experts from academia together with the relevant government agencies/units.

Even though, the marine chapter of the draft NEAP 4 is largely based on the EU MSFD, the strategic goals, objectives, and activities are still related to the **context-dependent** circumstances. Since there is a lack of data and information on the various components of the marine environment, including species, habitats, polluting sources, such as marine litter, the activities are largely focused on the enhancement of the national monitoring capacities. The activities include development of integrated monitoring programme, establishment of ballast water laboratory, research on the endangered species.

Each goal, objective and activity are then **result-oriented**, which is ensured though very specific, measurable, and realistic impact, outcome, and output indicators, at the goal, objective and activity level. For instance, establishment of integrated monitoring programme is measured by the number of publicly available reports including the results of the monitoring programme on all the key marine environment components. Very specific indications on the development of such indicators are provided in the Rules of Developing, Monitoring and Evaluating policy documents. The development of the Rules, in order to harmonize the policy documents and make policy planning more coordinated at the national level, was an important part of the recent public sector reform in Georgia.

Finally, specific timeframe and scheme on the monitoring and evaluation of the implementation of NEAP 4, to ensure effectiveness and flexibility of the policy document, is included in the document as a separate chapter. For instance, with the proper and permanent monitoring of the implementation process of the set objectives and activities, it will be possible to detect any challenges faced in the process and enable timely intervention, while with the effective evaluation of the impacts achieved with the implementation of the NEAP 4, it will be possible to ensure more informed planning process for the next 5-year cycle. Thus, the process of developing the Marine chapter of the NEAP 4, as well as the overall Programme itself, has ensured the **adaptive** nature of the policy document.

Tools that can be used in the policy formulation to ensure holistic source-to-sea approach

Problem tree analysis

In the development of the Marine Chapter as well as the overall NEAP 4 document, Problem Tree analysis method was used. The problem tree is a heuristic method for identifying the challenges, distinguishing causes and effects among them by identifying the deepest causes (roots) of the problems (stem) and their effects (branches).⁹ Such “thinking instrument”¹⁰ enables **holistic** approach as the problem is analyzed more comprehensively, with its causes and effects, and at the end, policy is designed in a way that addresses more integrated interventions, rather than “end-of-pipe” approaches.

For instance, while analyzing the problem of marine litter, its causes, such as illegal landfills, and its effects, such as risks posed on dolphins, were analyzed. Secondly, the problem tree analysis, while it is a comprehensive approach and requires holistic analysis of the problem, enables **participatory** process, with the engagement of relevant stakeholders, to properly identify the causes and effects among the challenges. The problem tree ensures **context-dependent** process, since it enables development of strategic activities based on the challenges identified from the analysis of the local circumstances. While the problems, causes and effects are properly identified in the problem tree analysis, the strategic goals addressing the effects, objectives addressing the problems, and activities addressing the causes are largely **result-oriented**.

Finally, while problem tree analysis ensures effective brainstorming on the identification of the key causes of the problem and the effects, it becomes possible to **prioritize** the key challenges to focus on, with the consideration of the policy or project implementation cycle. It is not always possible and feasible to focus on all the challenges at once; thus having a clear structure of the relationships between the challenges, makes it possible to identify the most urgent, realistic, and effective ways of intervention.

Conclusion

Protection of Black Sea marine environment is one of the chapters of the wider environmental strategic document, 4th National Environmental Action Programme, draft of which currently includes 13 sectoral directions, including waste management, biodiversity management, water resources management, climate change. After the comprehensive situation analysis of the Black Sea marine environment in Georgia, which is an essential part of the policy development, key challenges, their causes, and their effects were identified, with the engagement of relevant stakeholders and with the use of the problem tree analysis. With the familiarization of the set goals and objectives, as well as planned activities in other relevant chapters, including water resources management, biodiversity management, waste management, within the draft 4th National Environmental Action Programme, it was easier to identify the gaps left to be filled in order to ensure positive impacts on the status of the whole source-to-sea system. Thus, the chapters of the draft NEAP 4, while each one of them alone focuses on a particular environmental dimension, in

⁹ Veselý, A., 2008. Problem Tree: A Problem Structuring Heuristic. *Central European Journal of Public Policy*, 2(2), pp. 68-81.

¹⁰ Veselý, A., 2008. Problem Tree: A Problem Structuring Heuristic. *Central European Journal of Public Policy*, 2(2), pp. 68-81.

terms of marine environment, together create a comprehensive strategic framework to improve the overall conditions and protect the Black Sea. As such, improvement of solid waste management practices as well as cleaning of the ravines from waste, which are incorporated as concrete activities in the waste management chapter, will ensure decrease of the amount of litter input into the sea from land-based and riverine sources. Marine chapter then includes additional activities particularly related to marine litter, in order to address marine litter-related problem more comprehensively. Similar approach was taken in addressing other challenges.

To conclude, with the development of a framework environmental strategic document, which involved marine, freshwater and terrestrial specialists from different departments of the Ministry of Environmental Protection and Agriculture of Georgia, which is a coordinating institution for the development of the document, as well as specialists from other public institutions, academic sector, and NGOs, source-to-sea approach was ensured.

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