Practical demonstration of how to collaborate in implementation of the source to sea concept -The case of Orange Senqu River Commission (ORASECOM) and Benguela Current Convention

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ABSTRACT

The source-to-sea approach directly addresses the linkages between land, water, delta, estuary, coast, nearshore and ocean ecosystems, leading to holistic natural resources management and economic development. At its core is the idea that to manage development, understand impacts and protect ecosystems in a river system, it is not sufficient to look at separate parts of the system – for example, the coastal zone or upstream rivers or lakes. Instead, it is important to look at the whole system from the source out into the sea that it affects. Two multi-country Commissions oversee two systems that are connected, The Orange Senqu River Commission that works on the freshwater systems; and The Benguela Current Convention that works on the Atlantic Ocean; plan to implement source to sea by collaborating and coordinating their implementation of activities that promote holistic management of the two interconnected systems. This paper seeks to demonstrate this collaboration between ORASECOM and the BCC, through joint field actions that staff from the two Commissions initiated in April 2021. The focus of the joint field excursion was on sampling for water quality parameters as an input into water quality monitoring that each of the two Commissions intend to undertake. The funding was provided by the UNDP GEF funded ORASECOM SAP implementation project and the UNDP GEF funded BCLME III Project. The joint field work is a strong demonstration of how two systems can collaborate and share experiences and approaches that enhance water quality monitoring process, a key element of the implementation of the Source to Sea Concept.

The Source to Sea Concept

“The source-to-sea approach directly addresses the linkages between land, water, delta, estuary, coast, nearshore and ocean ecosystems leading to holistic natural resources management and economic development.”

Unlike traditional water governance frameworks and associated practices, source-to-sea management is concerned with the entire source-to-sea system – considering environmental, social, and economic benefits and impacts in a holistic manner and stimulating coordination across sectors and segments.

At its core is the idea that to manage development, understand impacts and protect ecosystems in a river system, it is not sufficient to look at separate parts of the system – for example, the coastal zone or upstream rivers or lakes. Instead, it is important to look at the whole system from the source out into the sea that it affects. The Source-to-Sea approach includes many flows – of water, flora and fauna, sediment, pollution etc. – that can carry
impacts of activities far downstream. By the same token, management must be able to cross jurisdictions, and national borders.

The intended outcome of applying the source-to-sea approach entails “establishment of governance, operations, practices and finance that increase collaboration and coherence across the source to sea continuum and reduce alteration of key flows, resulting in measurable economic, social and improvements across freshwater, coastal, nearshore and marine environments.”

**Advancing the Source to Sea Approach in the Orange Senqu River Basin and Benguela Current Ecosystem in Southern Africa**

The Benguela Current Convention (BCC) and the Orange-Senqu River Commission (ORASECOM) conducted a joint exercise to understand the causes and extent of pollution in selected pollution hotspots, and associated interactions between the freshwater and marine systems. The result is strengthened coordination between the two institutions and is a significant advancement towards mainstreaming the source-to-sea approach in Southern Africa. Both the BCC and ORASECOM are signatories to the global Source to Sea Approach whose Secretariat is at the Stockholm International Water Institute (SIWI)

**The Benguela Current Convention**

The Benguela Current Convention (BCC) is a multi-sectoral inter-governmental organisation established by the Governments of Angola, Namibia, and South Africa. Its objective is to promote a coordinated regional approach to the long-term conservation, protection, rehabilitation, enhancement, and sustainable use of the Benguela Current Large Marine Ecosystem (BCLME). The Convention was signed by the Parties on March 2013 and came into force in December 2015.

BCC is implementing “Improving Ocean Governance in the BCLME (BCLME III) Project” (2017-2022) which is the third phase of UNDP GEF financing. The BCLME III outcomes are:

i. Improved ocean governance at regional and national level.

ii. Strengthened stakeholder engagement.

iii. BCC capacity strengthened to implement the Strategic Action Programme.

iv. BCC is sustainable institution (beyond project financing).

**The Orange-Senqu River Commission (ORASECOM)**

ORASECOM is an inter-governmental advisory body established by the Governments of Botswana, Lesotho, Namibia, and South Africa. Its objective is to advise the State Parties on the development, utilisation, and conservation of the water resources of the Orange-Senqu River Basin. The agreement to establish the Commission was signed on 3 November 2000
marking the first agreement to establish a river basin institution on a shared River since the Revised Protocol on Shared Watercourse Systems, became an instrument of international water law in the Southern African Development Community (SADC).

ORASECOM is implementing the “Support to the Orange-Senqu River Strategic Action Programme Implementation” (2019-2024) which is the second phase of the UNDP GEF financing. The objective of the project is the strengthening of joint management capacity for implementation of the basin-wide IWRM Plan; and demonstrating environmental and socioeconomic benefits of ecosystem-based approach to water resources management through the implementation of SAP priority actions in the Orange – Senqu River basin.

The project outcomes are:

i. Institutional and policy reform and technical capacity building towards enhanced transboundary basin planning and joint management.


iii. Addressing changes to the hydrological regime through the source-to-sea application.

iv. Addressing land degradation through community-based ecosystem management.

Collaboration between BCC and ORASECOM

ORASECOM and the BCC have a decade-long history of collaboration. The relationship was inspired by the cooperation that existed between the International Commission for the Protection of the Danube River (ICPDR) and the Black Sea Commission.

At an exchange visit to the ICPDR (2008), ORASECOM noted the work to curb pollution in the waters of the Danube Delta resulting from the activities of the shipping, municipal, agricultural, and historic manufacturing industries. This inspired ORASECOM to focus on water quality and curbing pollution, which it now continues in the form of a joint basin survey conducted on the Orange-Senqu River every five years since 2010. ORASECOM also sought a collaborative relationship with the BCC on marine/freshwater system health.

Since then, ORASECOM and BCC have collaborated on various research projects including determining the environmental flow requirements for the ephemeral Fish River and the estuary and coastal ecosystems.

Both organisations have signed on to the source to sea platform which is coordinated by SIWI as a multi-stakeholder initiative to exchange and generate knowledge, and support joint action for improved management of land, water, coastal and marine linkages. They have agreed to collaborate in knowledge sharing on transboundary management through forums and publications.
The joint water quality monitoring exercise conducted in April 2021 is the latest example of collaboration between the two organisations within the framework of the source to sea approach.

The Joint Water Quality Monitoring Exercise

An area of synergy between ORASECOM and BCC is water quality monitoring that each organization is undertaking in its respective water system. The freshwater and marine systems connect in the lower Orange-Senqu, specifically at the Orange-Senqu River Mouth in Oranjemund located in the south-western part of Namibia, and the north-western tip of South Africa. In this regard, teams from the two institutions accompanied by their counterparts from the Namibian Ministry of Agriculture, Water and Land Reform, and the South Africa Department of Water and Sanitation conducted a joint water quality sampling exercise starting at the hotspots around Luderitz Town, Oranjemund Town, the Orange River until the river mouth, as shown below.
The criteria were applied in selecting the sampling sites included among others, identified pollution hotspots, accessibility, and the presence of important ecosystem types that are highly impacted by, or vulnerable to, pollution.

The joint team collected water samples points that included fish processing factories; mining and irrigation areas; municipality waste water treatment works; the estuary and river mouth.

Each site had different parameters measured as indicated in Table xxx below.

Table xxx shows selected types monitoring sites and parameters measured at each site.
<table>
<thead>
<tr>
<th>Land use activity</th>
<th>Type of Effluent/Sample</th>
<th>Associated relevant testing Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish Processing factories (Luderitz)</td>
<td>Industrial (factory effluent)</td>
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</tr>
<tr>
<td></td>
<td>Seawater</td>
<td>Group 3* with Fats, Oils and Grease</td>
</tr>
<tr>
<td>Ports (NamPort Luderitz)</td>
<td>Industrial/ Seawater</td>
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<td></td>
<td></td>
<td>Lead</td>
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<td></td>
<td></td>
<td>Cadmium</td>
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<td>Mercury</td>
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<td>Copper</td>
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<td>Nickel</td>
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<td>Tin</td>
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<td></td>
<td></td>
<td>Coliforms (Bacteria)</td>
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<td></td>
<td></td>
<td>Group 3</td>
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<tr>
<td>Domestic (Luderitz Town and Oranjemund Town;)</td>
<td>Domestic</td>
<td></td>
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<td>Group 3</td>
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<tr>
<td>Irrigation, (Aussenkher); Mining (Sendelingsdrift, Daber as)</td>
<td>Industrial (Heavy metals/Fertilizers)</td>
<td>Tin</td>
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<tr>
<td></td>
<td></td>
<td>Arsenic</td>
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<td></td>
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<td>Selenium</td>
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</tbody>
</table>
### Grouping of analyses

Selected analyses are grouped together to better cover the specific needs of projects:

- **a)** Routine Group 1 (Surface Water): Turbidity, Electric Conductivity, Total dissolved solids (determined), Sediment load; Total phosphates, Total Nitrates, Chlorophyll a;
- **b)** Routine Group 2 (Drinking water): pH, Electric Conductivity, Total Dissolved Solids (determined), Colour, Turbidity, Sodium, Potassium, Calcium, Magnesium, Total Hardness, Iron, Manganese, Chloride, Sulphate, Fluoride, Nitrate, Total and Phenolphthalein Alkalinity, Silica;
- **c)** Routine Group 3 (Effluents): pH, Redox Potential, Electric Conductivity, Total Dissolved Solids (TDS), Turbidity, COD, BOD, Sulphate, Chloride, Sodium, Nitrate, Kjeldahl Nitrogen, Ammonia Nitrogen, Permanganate Value (Absorbed Oxygen), Phosphate, Dissolved Oxygen and Total Suspended Solids (TSS);

### The Results

The collected data from the ocean points is being used to set a baseline for these sampled parameters, which in turn will contribute towards the development of Water Quality Standards for the Atlantic Ocean. Further investigations will be made into any noted anomalies to inform the necessary interventions.

The sampling exercise aligned the teams around a common goal to exchange work approaches and share experiences. It fostered a shared understanding of the challenges and interventions required for the two systems to thrive. In addition, it enabled optimal utilisation of available human skills and material resources. Staff members were oriented on the use of new equipment while being exposed to the source-to-sea management approach in practice.

Overall, the joint exercise provided a valuable opportunity for coordination at various levels. At the transboundary level it set the base for standardised datasets that will support further monitoring and joint action. At the technical level, the teams benefitted from the experience of working outside the silos of their usual work segments. At the community level the exercise laid the foundation for joint stakeholder engagement which will amplify
the efforts of the two organisations to prevent and mitigate pollution. Joint action will also help to alleviate stakeholder participation fatigue.

**Looking to the Future**

The application of the gathered data will inform respective project directions. In addition to being a base for the development of regional pollution databases, the data will feed into existing databases including the ORASECOM Water Information Service (WIS); and inform the monitoring standards used in the third Joint Basin Survey of ORASECOM. Other useful information gathered will direct the maintenance of monitoring stations that were destroyed by floods experienced in the early part of the year.

Should this coordinated approach be maintained in the future, the result, mainstreaming the application of the source to sea approach in Southern Africa, would prove to be worth much more than the sum of the individual joint exercises.
The Joint Monitoring Exercise in Pictures