Terms of Reference

Consultancy Wetland Inventory Eastern Rift and Mangrove Coast

1. Background

1.1 Context

Wetlands are integral to Eastern Africa's panoramic landscape, from mountain peatlands, to rivers dissecting the deserts and lush mangroves that cushion the coast. They support high levels of biodiversity, play a key role in the water cycle, regulating the regional climate, and global climate, through carbon storage and sequestration.

Wetland biodiversity includes enigmatic species such as the dugong, marine turtles and endemic primates such as the Tana River red colobus monkey. A study coordinated by Wetlands International demonstrated that no less than 82% of freshwater fish and 74% of molluscs are endemic to the region (Darwall et al., 2009). Significantly, they are home to millions of migratory waterbirds, some of which come from as far as Siberia. As connectors between terrestrial, freshwater and marine realms, wetlands support biodiversity far beyond their borders, facilitating the last large-scale mammal migrations in the world and acting as important nursery grounds for the Indian Ocean. Furthermore, Eastern Africa's wetlands are vital to the well-being and livelihoods of people. They provide enormous benefits through climate and flood regulation, coastal protection, recreation and tourism.

Eastern Africa's inland and coastal wetlands are under threat. A major cause of this decline is severe overexploitation of natural resources, including diversion of water for intensive agriculture, wood harvesting from mangrove forests, overgrazing of floodplains and poaching of threatened species. These pressures are heightened by population growth and human displacement, causing sudden migration towards previously pristine areas. Economic growth has stimulated huge investments in large-scale and high-impact infrastructure development. Such developments cause wetland destruction on-site as well as off-site through disturbance of hydrological and sediment flows. Other threats include invasion by alien species, pollution, eutrophication and erosion. Climate change directly affects ecosystem health and biodiversity, and compounds other anthropogenic drivers such as overexploitation of water and natural resources.

However, it is difficult to have a good overview of all present wetlands in the two ecoregions, and similarly to have in-depth knowledge on the target landscapes that we work in, , since there is limited data available, especially at a regional level. Therefore, we propose to work on an Eastern African wetland inventory for the two specific ecoregions and which cover the four targeted landscapes in which we work with more detailed data and information. The wetland inventory will show current location, extent and type of wetland ecosystems within the two ecoregions, as well as information about wetland condition where possible. For the targeted landscapes in which we work more detailed data, information and analysis will be included on specific threats, ecological values, biodiversity, ecosystem services of the landscapes and trends, scenarios and status.

This consultancy will be part of the Source to Sea Initiative (S2S). Source to Sea is an initiative with the vision: 'to ensure that by 2030 high value wetlands in the Rift Valley and along the Eastern Africa Mangrove Coast have an improved conservation status, benefiting freshwater, marine and terrestrial biodiversity, supporting livelihoods and a climate-resilient economy'. Through this initiative, Wetlands International in partnership with the Swedish International Development Cooperation Agency (Sida) will address the drivers to the loss of wetlands and their biodiversity in Eastern Africa by putting in place enabling conditions for integrated wetland management solutions at landscape and ecoregional levels.

1.2 Objective

The objective of this inventory is to identify the location, extent and type of wetlands within the specified two ecoregions (see Scope). Where possible, information about wetland condition is to be added. This inventory will provide important information to be used as baseline for future data collection, and decision making on wetland management, restoration and protection.

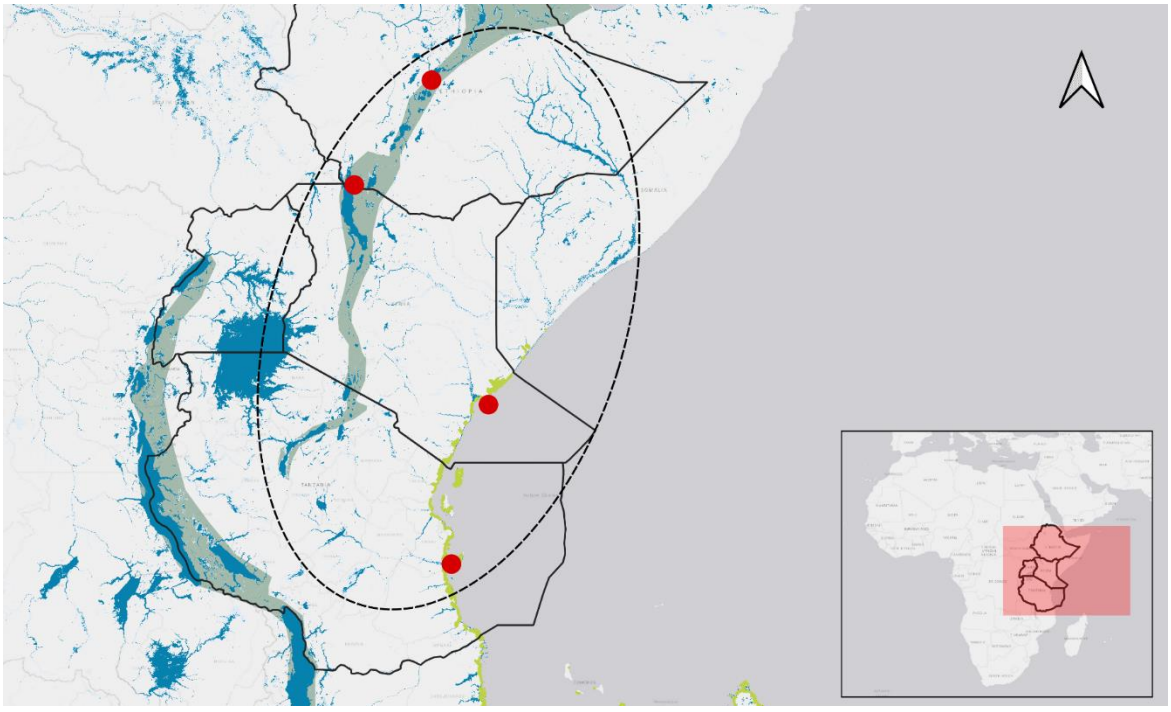
Specific objectives:

I. To develop and share with relevant stakeholders an overview of all wetlands in Rift Valley (Ethiopia and Kenya) and East African Mangroves (Kenya and Tanzania); and
II. As part of the inventory, develop an in-depth analysis of the status, trends, values, and pressures on the wetlands for the 2 ecoregions, and 4 key wetland landscapes and priorities for intervention;
III. Within the final report a subchapter will be dedicated to the ways in which this inventory can be upscaled into a national wetland inventory as per the criteria utilised by the Ramsar convention.

2. Scope of the assignment

Deliverables:

1. **Develop an action plan** to implement this assignment with Wetlands International;
2. **Explore & synthesize relevant wetland inventories that have already been executed within the Eastern African context (e.g. Kenya Wetland Atlas & First Directory of Ethiopian Wetlands Oct 2019, see link:** The Directory of Ethiopian Wetlands: a first inventory - Wetlands International Africa**).** An analysis will be done to explore how the data of these sources could potentially be used within this wetland inventory;
3. **Gaps in information to be filled with existing datasets where possible (e.**g. Global Mangrove Watch)
4. **Participatory process of discussions on draft inventory / findings and incorporation of (government) stakeholders' reflections**: to support ownership at government level of S2S initiative multiple moments to discuss the progress of inventory will be planned. The stakeholders will mostly consists of government institutions within the three countries, which are keen to receive data on wetland extent. WI will support in getting the relevant stakeholders together for these key moments.
5. **Finalize the wetland inventory for the East African ecoregions.**
    a. Within the technical report the consultant will zoom in on the four landscapes and present more detail on threats and ecosystem value.
    b. Inventory will be delivered in a geospatial database
    c. The wetland inventory will use a similar approach and strategy applied for the Wetland Inventory done for Myanmar and Bangladesh (Davidson, unpublished)
6. In addition to the technical report the consultant will submit a final financial report on the consultancy itself.



1: Wetlands in Eastern Africa, including the mangrove ecoregion in the coastal zone and the rift valley ecoregion inland. Wetlands are shown in blue, mangroves in green. The Rift Valley is indicated with Green-grey. The intervention area is located in the in the ellipsoid, with specific implementation landscapes indicated with red bulbs, from North to South: Ziway-Shalla, Omo-Turkana, Lamu Delta, and Rufiji Delta

2.1 Geographic scope

The Wetland Inventory will focus on two larger ecoregions namely:

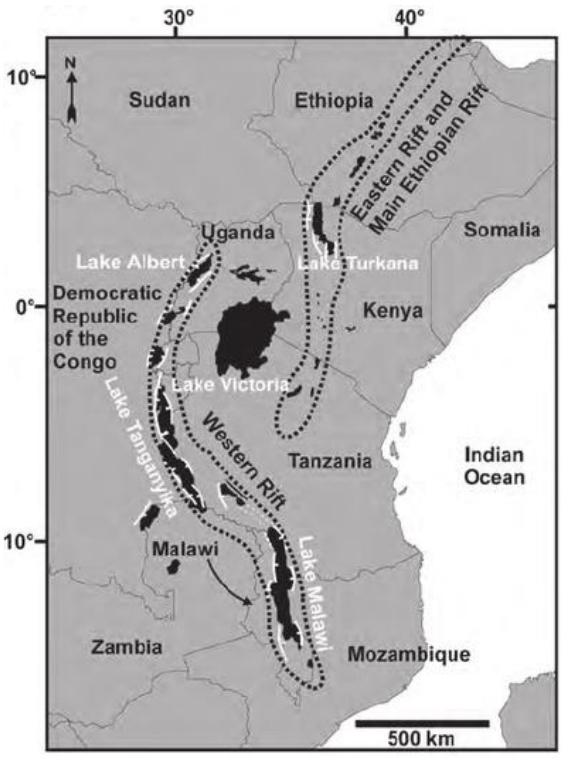
- the Rift Valley
- and the Mangroves in Kenya & Tanzania as they are described below.

In general a basin or landscape approach will be taken to more precisely delineate the scope for these ecoregions. Once a wetland inventory is made for these large ecoregions showing all present wetlands and their extent, the consultant will then zoom in to focus on four specific landscapes that are included in the Source to Sea initiative and are described below. For these four landscapes a more detailed analysis will be done on specific threats, ecological values, biodiversity & ecosystem services.

Eastern Rift Valley ecoregion (Ethiopia, Kenya & Tanzania)

The Great Rift Valley is a series of geological trenches that runs all the way from Lebanon until Mozambique. This term is rarely used in geology as it actually consists of multiple rifts that are merged together as one. Within the S2S Initiative we focus on the Eastern Rift (see figure 1). The scope of this assignment are the basins of all rivers and lakes that fall within the Eastern Rift, namely as described below. Please note the underlined basins have a particular focus within S2S in terms of activities on the ground taking place there:

- Awash basin
- Omo-Gibe basin
- Ethiopian Rift Valley Basin:
    - Ziway-Shalla basin
    - Hawassa basin
    - Abaya-Chamo basin
- Kenya great Rift Valley region, consisting of endorheic lake basins:
    - Turkana
    - Baringo
    - Bogoria
    - Solai
    - Olbolosat
    - Nakuru
    - Elementaita
    - Naivasha
    - Magadi
- Tanzania Internal Drainage Basin, consisting of endorheic lake basins:
    - Natron
    - Manyara
    - Eyasi



2: East Africa with locations of major lakes, the Great Rift Valley and country boundaries (Karp et al., 2012) .

Ziway-Shalla landscape

Ziway-Shalla is a endorheic basin, meaning that the water that enters this system does not eventually drain towards the sea or ocean, but instead stays within. It consists of 4 lakes. Lake Ziway is the only freshwater lake and important for regional economic activity. Together with Lake Langano, they drain their water into Lake Abijata. Lake Shalla is the final lake and not (anymore) directly connected with the other lakes.

Omo-Turkana landscape

Omo-Turkana is a transboundary basin. Lake Turkana lies mostly in Kenya, but the Northern tip falls within Ethiopia. The Omo River is the second largest river in Ethiopia and drains into the endorheic Lake Turkana. Within this ToR we focus on the whole Turkana basin, meaning the basin of the Omo river, but also the other rivers which flow into Turkana.(Ayenew Tenalem & Dagnachew, n.d.)

East African Mangroves Ecoregion (Kenya and Tanzania)

Mangroves in the Western Indian Ocean region stretch from Somalia until Southern Africa, including Madagascar. They cover 745,518 ha in this region. The scope of this work is the mangrove region of Kenya and Tanzania. The Mangrove areas in these 2 countries are:

- Lamu & Tana (Ke) (Figure 3)
- Mombasa (Ke)
- Kwale (Ke)
- Zanzibar (Tz)
- Rufiji Mafia Kilwa seascape (Tz) (Figure 4)
- Ruvuma Estuary (Tz)

Coastal Mangrove ecoregion of Kenya & Tanzania

Lamu & Tana

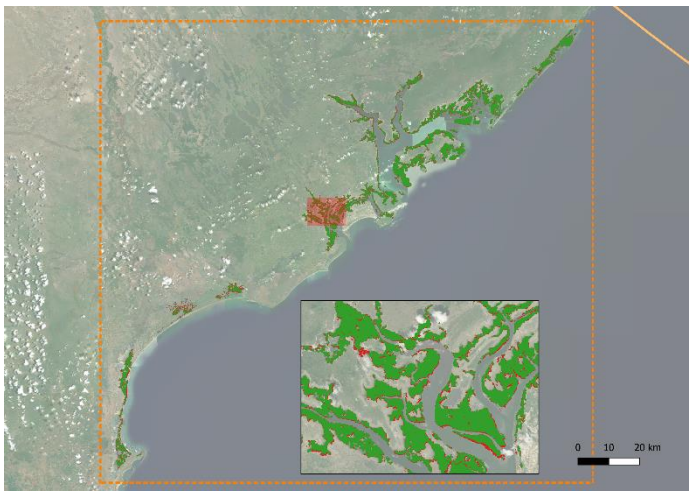


Figure 3: Lamu & Tana mangroves extent and loss (1996-2020)

Mangroves in Kenya are spread around 18 formations along the coastline with about 74% of these forests occurring in Lamu and Tana River, where the protective influence of barrier islands off the coast and a large

estuary has resulted in an abundance of mangroves that cover a combined total of 40,224 ha. Tens of thousands of people depend on the natural resources that are provided by this seascape Among others, they practice fishing, wood logging and small-scale agriculture. Tourism is another important source of income.

Rufiji Delta

In Rufiji Delta, its 54,000 ha of mangroves provide shelter, breeding grounds and food for many iconic species. This ranges from fish, shellfish, migratory water birds, sea turtles nesting on beaches secured by mangrove roots, crabs and shrimp that thrive in mangrove shallows. Recent surveys have found about 20,000 waterbirds in the delta, many of which are northern migrants in the West Asian-East African Flyway. The mangroves, mudflats and sandbanks provide very important habitats for them along the Eastern African coast with concentrations in places like Rufiji. It is estimated that over 49,000 people living around the Rufiji delta are directly engaged in rice farming, mangrove cutting for poles and timber, and fishing activities for both food and income security.

The functioning of the Rufiji delta as a resource for all these people and wildlife species depends on its connectivity with both coastal and marine systems and the health of the river basin it is part of. Limited information about the values and functioning of the system, its biodiversity and connectivity, weak capacity in institutions and with stakeholders and weak governance provide barriers to sound management.

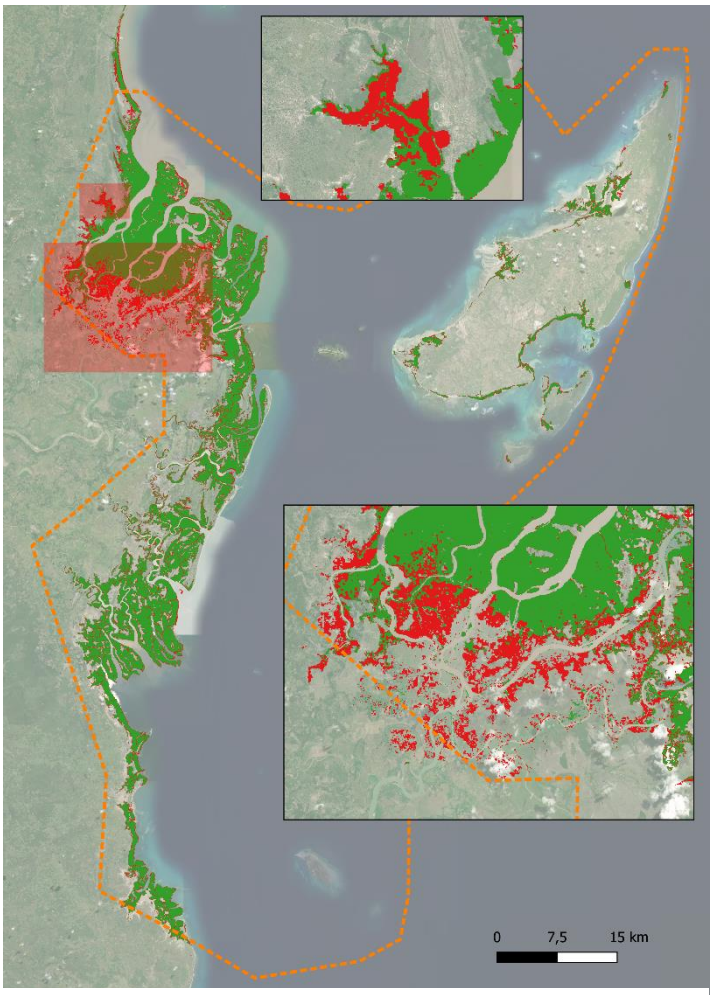


Figure 4: Rufiji-Mafia-Kilwa seascape mangroves extent and loss (1996-2020)

Conclusion of the scope

In conclusion we will work on two different scopes within this assignment:

- For the Wetland Inventory we will focus on the largest scope and do GIS analysis showing current extent of wetland ecosystems within the Eastern Rift Valley and the Kenya and Tanzania Mangrove Coast (including the catchment of the rivers that feed these mangroves).
- Within the wetland inventory we will focus on 4 landscapes as defined above. These landscapes will have more in-depth detail on the status, the trends, the ecological values, biodiversity, ecosystem services and the threats of wetlands, whilst looking at the whole landscape picture.

Guidelines to follow for wetland inventory to support upscaling

Within the wetland inventory we will ensure that the consultant follows the guidelines of two important Ramsar sources, namely:

- Ramsar Convention Secretariat, (2010). Wetland inventory: A Ramsar framework for wetland inventory and ecological character description. Ramsar handbooks for the wise use of wetlands, 4th edition, vol. 15. Ramsar Convention Secretariat, Gland, Switzerland.
- Rebelo, L.-M., Finlayson, C.M., Strauch, A., Rosenqvist, A., Perennou, C., Tøttrup, C., Hilarides, L., Paganini, M., Wielaard, N., Siegert, F., Ballhorn, U., Navratil, P., Franke, J. & Davidson, N. (2018). The use of Earth Observation for wetland inventory, assessment and monitoring: An information source for the Ramsar Convention on Wetlands. Ramsar Technical Report No.10. Gland, Switzerland: Ramsar Convention Secretariat.

By following the guidelines of Ramsar we ensure that our results can potentially be upscaled into national wetland inventories, that can be submitted by the relevant government institution to the Ramsar secretariat if relevant government authorities are interested in this.

3. Profile of the preferred candidate

The consultant will have:

- Expertise in wetland ecosystems
- Expertise in GIS and proven experience in using satellite imagery to monitor wetland extent and health.
- Familiarity with the relevant documents published by Ramsar on wetland inventories.
- Able to capture complex concepts in understandable language (English) and visualisations, and document that for use and application by a range of stakeholders, both in Eastern Africa and within WI more in general.
- Flexible in approach.
- Proven track record of high performance in consultancies
- Embrace principles of diversity and integrity and other important principles in the code of conduct and way of working of WI.
- And other relevant skills needed to perform this consultancy

4. Management and Reporting

During the assignment Michael Nelemans will be the point of contact within WI. He will set up a specific working group with the consultant, our 2 ecoregion leads Lilian Nyaega and Redwan Mouhamed who are based in Kenya and Ethiopia respectively, and our GIS experts Lammert Hilarides and Edmond Kuto. This will make sure the connection between the framework and the needs of the region and its stakeholders gets continuously reflected upon.

Payment structure

Table 1: Payment structure

Deliverables	Payment (%)
On signing agreement	**30**
On delivery of overview of data gaps	**30**
On delivery of the first draft report	**30**
On approval of final products & final financial report	**10**

Timing and duration

The overall proposed time for this task is estimated to be about 60-70 working days during a 5 month period, starting 7th of August. The 5-month period is including part of summer holidays.

Other conditions

Data and information produced under this contract will be made available under a Creative Commons license by Wetlands International, with the exception of data/information where copyright already lies with a third party.

5. Budget

The estimated budget for this consultancy is assumed to be close to 65,000 EURO. This includes potential expenses needed for access to data estimated at a maximum of 5,000 EURO, leaving an indicative budget of 60,000 EURO as budget for the international consultant fees. We welcome proposals of consultants that include travel expenses for potential in-field data collection, validation, consultations and/or discussions, although it is not necessarily needed. The payment will be attached to deliverables as illustrated in table 1.

6. How to apply?

Kindly share with us your CV(s), as well as (short) motivation letter by 10th of July latest to michael.nelemans@wetlands.org and CC: lammert.hilarides@wetlands.org; pbhanderi@wetlands-eafrica.org with 'Wetland Inventory Eastern Africa' in the title of the message. The motivation letter should include a short preliminary work plan, which specifies the estimated number of consultancy days you plan to spend on this assignment, including the corresponding budget figure.