TERM OF REFERENCE

Hydrology Expert to Support Mangrove Restoration Works

Background

Indonesia boasts the world's largest mangrove ecosystem, covering an area of 3.44 million hectares (KLHK, 2023). This vast expanse represents 20% of the world's total mangroves and can store carbon equivalent to a third of all carbon stored in coastal ecosystems globally. Mangrove forests constitute an important ecosystem that provides coastal protection to vital assets (e.g., airports, seaports, highways, residential, commercial, industrial, and other infrastructures), nursery and spawning ground for marine biota, habitat for migratory birds, and community livelihoods.

However, Indonesia's mangrove forests continue to decline, with an annual degradation rate between 6,000 and 12,000 ha (Arifanti et al. 2022). An alarming 30 percent of Indonesia's mangroves have been lost in the last four decades (FAO 2020). The loss of this ecosystem significantly impacts Indonesia's coasts (where 60 percent of the population lives), which are increasingly vulnerable to extreme weather events associated with climate change.

Yayasan Konservasi Alam Nusantara (YKAN) through its Oceans Program supports sustainable management of coastal and marine resources. By 2030 YKAN through the Coastal Resilience Strategy aims to improve the management of 300,000 ha of mangroves defined as ecological improvement from Nature-Based interventions (mangrove protection, restoration, and better brackish water aquaculture practices). To achieve the target, several stages need to be carried out, including restoring of 500 ha degraded mangrove ecosystem.

YKAN implements science-based integrated ecosystem restoration using a Natural Climate Solution (NCS) approach to restore mangrove ecosystem functions in different settings, namely degraded area, abrasion area, as well as the SECURE (Shrimp-Carbon Aquaculture) model that implements mangrove restoration plot the adjacent to aquaculture plot (the restoration plot is also used for natural shrimp cultivation). The main concept is to restore underlying hydrology and consider adjustments to a disturbed area's topography, so that mangroves may regenerate naturally, resulting in true ecosystem restoration with a richer biodiversity. In this regard, the coastal resilience strategy requires a hydrology expert to support the development of mangrove restoration design.

Objective

The Hydrology Expert is responsible for collecting data and developing a hydrological improvement design (model) for mangrove ecosystem restoration.

Scope of Work

The scope of work includes:
1. Preparing a work plan for hydrological data collection in YKAN's mangrove sites in Berau, Ogan Komering Ilir, and Bengkalis.
2. Collecting and coordinating field data related to hydrological aspects in the three sites.
3. Analyzing and developing the design of hydrological improvement for mangrove ecosystem restoration:
   a. Bengkalis, Riau: 120 ha
   b. Berau, East Kalimantan: 3 SECURE ponds (15 ha)
   c. Ogan Komering Ilir, South Sumatera: 51 ha
4. Developing a protocol or guideline for mangrove hydrological restoration.
5. Developing a protocol or guideline for monitoring the implementation of hydrological aspects.
6. Develop budget development recommendations for mangrove ecosystem restoration.
7. Supporting the implementation and monitoring of hydrological improvement design/plan.

Deliverables

Based on the scope of work above, the expert is expected to produce:
1. Work plan of hydrological data collection and analysis.
2. Design of mangrove hydrological restoration in Bengkalis (120 ha), Berau (3 ponds – 15 ha), and Ogan Komering Ilir (51 ha).
3. Guideline for mangrove hydrological restoration implementation.
4. Guideline for monitoring hydrological aspects of restoration implementation.

Budget and Period of Work

We expect that the work duration to be from November 2024 to March 2025. The total proposed budget for the assignment should cover the entire work duration including the deliverables requested and proposed. Payment arrangements will be confirmed once the consultant is selected.

Competency of the Consultant

The consultant competencies required include:
1. Individuals with experience in collecting data and developing hydrological modeling.
2. Knowledge of ecological (hydrological) mangrove restoration concept.
3. Experience with GIS software, drone applications, and hydrological model software.
4. Experienced in working in a result-oriented environment.

Application Procedure

Individuals interested in this work are invited to send their CV, technical proposal (work plan), and budget plan to syidik.fami@ykan.or.id, no later than November 20, 2024. Only selected candidates will be contacted further.

Deliverable and Timeline

Submission Date	Deliverable	Payment	Late submission Penalty
25 November 2024	Deliverable Report 1: - Contract signed. - Workplan developed.	1st payment (50%)	N/A
27 January 2025	Deliverable Report 2: - Field data collection results on hydrological aspects in Bengkalis, Berau, and Ogan Komering Ilir. - Review (input) on existing or planned design of mangrove ecosystem restoration in Bengkalis, Berau, and Ogan Komering Ilir. - Guideline for mangrove hydrological restoration implementation.	2nd payment (30%)	N/A
18 March 2025	- Design of mangrove hydrological restoration in Bengkalis, Berau, and Ogan Komering Ilir. - Data from monitoring hydrological performance in restored areas. - Report on assessment of hydrological restoration implementation in Bengkalis, Berau, and Ogan Komering Ilir. - Guideline for monitoring hydrological aspects of restoration implementation.	3rd payment (20%)	N/A