TERMS OF REFERENCE

Feasibility Study for Sustainable Aquaculture in the Mekong Delta

1. Background

The coastal areas of Soc Trang and Bac Lieu provinces are also becoming increasingly vulnerable to the impacts of sea level rise and extreme weather events. The clearance of mangrove forests has exposed the coast to accelerated erosion as trees no longer attenuate waves and bind the soil. In addition, mangrove loss in the Mekong Delta (which is home to 75% of Viet Nam's mangroves) is driven by sediment supply reduction, sea level rise (SLR), and other human interventions such as the building of sea dikes, shrimp farming, and groundwater pumping that led to subsidence. Flat and low-lying, Soc Trang and Bac Lieu are the provinces that are suffering the fastest shoreline mangrove loss with the greatest consequences to communities and enterprises. Here, mangroves are being squeezed between dirt dikes on one side and rising sea level on the other, a phenomenon known as the coastal squeeze. Any new mangroves planted outside the sea dike are quickly eroded away by the combination of declining sediment supply, SLR and subsidence. Restoring mangroves along these highly vulnerable mangroves requires a new approach that makes business as well as environmental sense.

However, among relatively poor communities with limited and insecure livelihood options, the shrimp industry is one of the few employment options in the area, especially in coastal areas where the water is too saline for crops. The sustainability of the shrimp sector and the conservation of mangroves are therefore both national priorities. A new model of Recirculation Aquaculture System and Integrated Multi-Trophic Aquaculture (RAS - IMTA) is needed in the area if the industry is to remain environmentally, socially and economically sustainable. With TCCF's fund, IUCN proposes to pilot different RAS models in both Soc Trang and Bac Lieu provinces. The project will be implemented in three years (2024–2026).

The project aims to expand the area of mangroves inside the sea dike in coastal communes in Soc Trang and Bac Lieu by testing and then scaling up a hybrid nature-based solution (NbS) that combines mangrove restoration (through natural and assisted regeneration) and the conversion of shrimp production from large, open-air ponds to hyper-intensive RAS, which produces 20-time more shrimp per unit area with much lower disease risk. This conversion will eliminate or greatly reduce the need to pump groundwater to dilute pond water, thereby reducing land subsidence, which at 2.5 cm/year is five times greater than global SLR.

Knowledge on RAS and its integration with mangroves will be shared with businesses to inspire them to adopt the technology.

IUCN conducted the feasibility study for this project and submitted to Bac Lieu PPC in April 2024. As a result, the project documents were approved by Bac Lieu PPC by 05/06/2024. Accordingly, the first provincial kick off workshop was held in Bac Lieu by Sub-Department of Forestry Protection on 05/07/2024. The second provincial kick off workshop was held in Soc Trang by Sub-Department of Aquaculture on 16/01/2025.

In this context, the project seeks to contract an eligible consultant with the appropriate experience and expertise to perform the assignment of Tasks mentioned above.

2. Objectives

The overall objectives of the tasks are to improve water and environmental quality in aquaculture using innovative water management technologies by RAS - IMTA model and rehabilitate the mangrove trees in the shrimp farms.

Specific Objectives:

- Design and implement RAS models for 17 shrimp farms in Soc Trang and Bac Lieu provinces.
- Monitor environmental and water quality indicators over at least one production cycle for medium-scale shrimp farms.
- Restore an average of 4,000m² of mangrove forest per farm.
- Train at least 85 individuals in the use of RAS technology.

3. Scope of Work and Methodology

Key Tasks:

1. **Field Survey:** Conduct surveys at 17 selected farms to collect data for designing integrated mangrove–RAS models.
2. **System Design:** Develop technical layouts, cost estimates, operational guidelines, and data sheets for monitoring RAS implementation.
3. **On-Site Support and Training:** Set up RAS models, train operators, monitor water quality, and provide technical advice for water management and risk mitigation.

4. **Reporting:** Prepare a comprehensive final report and present findings at a consultancy workshop.
5. **Capacity Building:** Develop training materials and conduct Training of Trainers (TOT) sessions for local staff and stakeholders.
6. **Final Survey and Data Validation:** Conduct follow-up surveys to validate data and assess the impact of implemented solutions.

4. Expected Results

Outputs:

- Technical layouts and cost estimates for 17 RAS models.
- Operational guidelines and monitoring tools for RAS application.
- Final report including data analysis, water quality assessment, and system efficiency evaluation.
- Training materials and results from TOT sessions.

Timeline:

- February 3, 2025 – June 30, 2025

5. Timeline and Deliverables

Activity	**Deadline**	**Deliverables**
Field surveys	February 2025	Preliminary designs for RAS models
RAS model design	March 2025	Technical layouts, cost estimates, operational guides
RAS testing and training	April–June 2025	TOT sessions, monitoring results
Final report and presentation	June 2025	Comprehensive report and operational guidelines

6. Travel and Meeting Organization

The consultant will work with the IUCN office in HCMC to arrange travel, meetings, and stakeholder workshops. Travel cost, including transportation, hotel and DSA are arranged and paid directly by IUCN.

7. Consultant Qualifications

- **Education:** Master's degree or higher in aquaculture, biology, or a related field.
- **Experience:** At least 5 years of professional experience in designing and operating integrated aquaculture systems. Familiarity with RAS-IMTA models is an advantage.
- **Skills:** Strong research, communication, and training abilities.
- **Travel:** Willingness to travel frequently to the Mekong Delta.

8. Reporting

The consultants/firm will report directly to IUCN Vietnam Mekong Delta Program Manager, Nguyen Thanh Phong.

9. Application Submission

Interested consultants/firm and consulting firms must submit:

- Comprehensive CVs
- Detailed proposal outlining the proposed approach
- Submission deadline: 10 February 2025

10. Evaluation Criteria

Consultants/firm will be assessed based on:

- Professional qualifications
- Relevant professional experience
- Proposed methodological approach
- Competitive and reasonable budget

11. For inquiries and application submissions, please contact:

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