**Terms of Reference (ToR)**

**Hiring a consultant to Develop a Detailed Assessment Report on Internet of Things (IoT) Based Applications in the Fisheries Sector under RMTP of PKSF**

**1. Background**

The **Rural Microenterprise Transformation Project (RMTP)**, implemented by the **Palli Karma-Sahayak Foundation (PKSF)** with support from **International Fund for Agricultural Development (IFAD)**, aims to enhance the productivity, value addition, and market linkages of rural microenterprises, particularly in the horticulture, livestock and fisheries sectors.

The fisheries sector in Bangladesh holds immense potential to contribute to food security, employment, and export earnings. However, challenges such as low productivity, inefficient feed utilization, poor water quality management, disease outbreaks, and limited traceability hinder the sector’s full potential.

At present, **technology adoption in the fisheries sector at the field level remains limited and fragmented**. While some progressive entrepreneurs and hatcheries use basic water testing kits, aerators, or feed dispensers, the majority still rely on traditional knowledge and manual practices. **Real-time monitoring tools, automated feeding systems, digital record-keeping, and data-driven decision-making are rarely used**. Moreover, local entrepreneurs have very limited exposure to advanced technologies like IoT-based sensors, cloud platforms, or smart farm management solutions. This gap often results in inefficiencies, higher production costs, and increased vulnerability to disease outbreaks and environmental risks.

Recognizing these challenges, PKSF under RMTP seeks to make fisheries micro-entrepreneurs **“technology ready”** by introducing modern, affordable, and context-appropriate IoT solutions. By strengthening the capacity of entrepreneurs and identifying scalable IoT use cases, PKSF and its partner organization **Padakkhep Manobik Unnayan Kendra** aim to build resilience, enhance productivity, and improve competitiveness in the fisheries sector.

To explore these opportunities, PKSF under RMTP will engage a qualified consultant through its **Partner Organization (PO), Padakhep**. The entire consultancy process will be **implemented by Padakhep under the direct supervision of PKSF** to **conduct a detailed assessment of IoT applications in the fisheries sector of Bangladesh**. The assessment will identify existing initiatives, global and local best practices, feasibility, potential use-cases, cost implications, and policy recommendations.

**2. About the organization:**

Padakhep Manabik Unnayan Kendra is a non-governmental leading development and non-bank financial institutions working throughout the country since 1986 contributing to the socio-economic development effort of Bangladesh. During 38 years of journey of change making has served about 12 million beneficiaries with its continuous development journey through **capacity enhancement, market connection-oriented approach and creating appropriate financial choices**. It aims for a world with equity where every potential is empowered to create scalable impact for a sustainable future. At Padakhep, create a synergy of holistic development approach for our beneficiaries through **skills development, entrepreneurship development, capacity building, social inclusion strategy development, SME, women empowerment, job placement, youth engagement,** social development, market linkage and inclusive financial intervention model and contributing to the countries to effort to reach Sustainable Development Goals.

At present, Padakhep is operating its development activities all over the country through 700+ offices, one training institute (Padakhep Institute of Development Management), 85 training centres with having accommodation and logistics facilities. Moreover, Padakhep has **350 Learning Centres (LCs),** **2500 Child Care Centres (CCCs) for Childhood Development**, and **400 Older Peoples’ Club (OPC) supported by the World Bank**, one **Handicrafts Design Development Center**, one **Safe Street Food Market for micro-entrepreneurs supported by the World Bank**, along with required logistics support to conduct skills development training of beneficiaries. Padakhep developed linkages and partnership with more than 300 NGOs/CBOs, universities, etc. and their capacity enhancement in program implementation including **women empowerment, economic development, livelihood development, gender and social development, entrepreneurship development, health and sanitation and hygiene issue, education, climate change and environment, agriculture program, education program,** **skills development and capacity building, youth engagement** and development, etc. Padakhep has made a strong contribution in reducing poverty through different **skills and capacity building training** including capacity building, **women entrepreneurship development focused on women and youth, enterprise development, alternative livelihood and income generating training, supply and sanitation, job placement, life skills development, etc.**

Padakhep was honored with two awards at the **Sustainable Development Goals (SDG) Brand Champion Awards 2024** for Responsible Consumption and Production for Soap Production from Recycle Burn Oil: A Green Prospective and Strengthening Environment-Friendly Micro-Enterprise in Salt Processing and Trade. The awards were presented by Syeda Rizwana Hasan, Adviser to the Ministry of Environment, Forests and Climate Change and the Ministry of Water Resources. The SDG Brand Champion Awards 2024, hosted by Bangladesh Brand Forum, celebrated 39 pioneering initiatives in sustainability. These awards honor organizations excelling in various Sustainable Development Goals (SDGs), including Responsible Consumption and Production, Climate Action, and more.

**3. Objectives of the Assignment**

The main objective of this assignment is to **develop a comprehensive assessment report** on IoT-based applications in the fisheries sector of Bangladesh under RMTP. Specific objectives include:

1. To map existing and emerging IoT technologies relevant to aquaculture and fisheries.
2. To analyze current practices, benefits, opportunities, and gaps in IoT adoption in Bangladesh’s fisheries sector.
3. To identify potential IoT solutions suitable for fisheries sector.
4. To assess the technical, financial, and institutional feasibility of introducing IoT-based interventions under RMTP.
5. To provide recommendations and a roadmap for PKSF/Padakhep to pilot and scale IoT-based solutions in fisheries.

**4. Scope of the Assignment**

The consultant will carry out the following tasks:

1. **Desk Review**
   * Review relevant literature, global case studies, and IoT applications in fisheries and aquaculture.
   * Study national policies and strategies relevant to fisheries and aquaculture.
2. **Stakeholder Consultations**
   * Conduct interviews and focus group discussions with relevant stakeholders (fisheries experts, micro-entrepreneurs, technology providers, government agencies, research institutes, universities, and development partners).
3. **Sectoral Assessment**
   * Map the current status of IoT adoption in fisheries in Bangladesh.
   * Assess the needs, challenges, and readiness of fisheries micro-entrepreneurs for IoT adoption.
4. **Technology Feasibility Analysis**
   * Identify suitable IoT devices, platforms, and solutions for fisheries management (e.g., water quality sensors, feeding automation, disease surveillance, cold chain monitoring, blockchain-based traceability) and develop comparable analysis.
   * Collecting 50 samples from the entrepreneurs (IoT users and non-IoT users).
   * Regions of collecting samples may be Khulna, Satkhira, Bagerhat, Gopalganj, Jashore, Pabna, Sirajganj, Rajshahi, Naogaon and Noakhali.
   * Evaluate cost, scalability, technical requirements, and sustainability.
5. **Recommendations and Roadmap**
   * Develop a set of actionable recommendations for PKSF and relevant stakeholders.
   * Propose a roadmap for piloting and scaling IoT solutions, including-
     1. potential partnerships with technology providers, universities, and private sector actors.
     2. region wise sensor categories/specifications and its effectiveness regarding cost and performance.
     3. sensor requirements based on the area of Pond/Hatchery (How many of which sensors are suitable for how much area of pond/hatchery).

**5. Deliverables**

The consultant is expected to produce the following:

1. **Inception Report** – Within 2 weeks of contract signing, detailing methodology, work plan, and consultation strategy.
2. **Draft Assessment Report** – Covering findings, technology mapping, feasibility analysis, and preliminary recommendations.
3. **Presentation/Validation Workshop** – Present key findings to PKSF, stakeholders, and experts for feedback.
4. **Final Assessment Report** – A comprehensive report (with executive summary, evidence-based analysis, and roadmap for IoT adoption in fisheries), incorporating feedback from PKSF and stakeholders.

**6. Timeline**

**Proposed Timeline of Activities**

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| **Week** | **Key Activities / Milestones** | **Deliverables** |
| Week 1–2 | Desk review, stakeholder mapping, preparation of detailed methodology | Inception Report |
| Week 3–4 | Stakeholder consultations, KIIs, FGDs, and data collection in fisheries clusters | Field notes & preliminary findings |
| Week 5–6 | Analysis of data, technology mapping, feasibility assessment | Draft findings |
| Preparation of Draft Assessment Report | Draft Report submitted |
| Week 7-8 | Presentation at validation workshop with PKSF & stakeholders | Presentation & feedback |
| Revision and finalization based on feedback | Final Assessment Report submitted |

*Total duration: 8 weeks (Timeline of activity will be started from the date of signing the contract).*

**7. Education and Qualifications of the Consultant**

1. Master’s degree (or higher) in **Fisheries, Aquaculture, ICT/Computer Science, IoT/Embedded Systems, Agricultural Engineering, or related disciplines**.
2. At least **6–10 years of professional experience** in fisheries/aquaculture development, ICT applications in agriculture, or related fields.
3. Proven experience in conducting sectoral studies, feasibility assessments, or technology integration projects.
4. Knowledge of IoT applications, smart agriculture, and digital transformation in developing country contexts.
5. Strong analytical, writing, and presentation skills.
6. Prior experience working with PKSF, government agencies, or donor-funded projects will be an added advantage.

**8. Consultant Selection Process**

1. The consultant will be selected following the **Individual Consultant Selection (ICS) method** as per PKSF procurement guidelines and Government of Bangladesh rules.
2. The process will include **shortlisting, evaluation of CVs, and interviews** (if required).

**9. Cost and Mode of Payment**

**Payment Schedule**

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| **Deliverable / Milestone** | **Timeframe** | **Payment (%)** |
| Submission & acceptance of Inception Report | End of Week 2 | 30% |
| Submission & acceptance of Draft Report | End of Week 6 | 30% |
| Submission & acceptance of Final Report (after validation workshop) | End of Week 8 | 40% |
| **Total** | **8 weeks** | **100%** |

* The consultant shall propose a **lump-sum fee** (inclusive of professional fees, travel, accommodation, fieldwork, and applicable taxes).
* Payments will be made by **Padakhep** upon approval of deliverables by **PKSF**.

**10. Reporting and Supervision**

* The consultant will work closely with **Padakhep**, the implementing partner of PKSF for this assignment.
* The consultant’s work will be **supervised and guided by PKSF**, particularly the RMTP- Project Management Unit.
* All key deliverables must receive **final approval from PKSF** before acceptance.