Terms of reference (ToRs) for the hydro-ecological assessment for integrated management of Bhitarkanika Ramsar site, Odisha

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Hydro-ecological assessment for integrated management of Bhitarkanika Ramsar site, Odisha	**Project number/ cost centre: 16.9020.5.001.00**

List of abbreviations

AVB	General Terms and Conditions of Contract (AVB) for supplying services and work 2018
ToRs	Terms of reference(s)
MoEFCC	Ministry of Environment, Forest and Climate Change
CDA	Chilika Development Authority
WISA	Wetlands International South Asia
NPCA	National Plan for Conservation of Aquatic Ecosystems
CV	Curriculum Vitae

1. Context

1.1. Project Background

The MoEFCC, in partnership with the GIZ, is implementing a Technical Cooperation project "Wetlands management for biodiversity and climate protection" with funding support from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) under the International Climate Initiative (IKI). The goal of the project is to strengthen the institutional framework and capacities for an ecosystem-based integrated management of wetlands of international importance (Ramsar sites) in India. The project is implemented in close cooperation with the NPCA of the MoEFCC.

The objective of this Project is that Wetlands of International Importance (3-4 Ramsar sites) in India are managed according to an ecosystem-based integrated management approach. Three main output areas define the implementation approach of the project:

1. Integrated management planning for 3-4 pilot Ramsar sites based on biodiversity, ecosystem services and climate change risks.
2. Capacity development of national, state and site level stakeholders for integrated wetland management.
3. Development of a wetland monitoring system, including an instrument to track management effectiveness.

Four Ramsar sites have been selected as pilot sites under the project: Pong and Renuka in Himachal Pradesh, Bhitarkanika in Odisha, and the Point Calimere in Tamil Nadu. In addition, the Wetland Research and Training Centre, Chilika Development Authority (CDA) has been identified as a resource centre for the project. The project is being implemented at these sites in partnership with the respective State Wetlands Authorities and site level management institutions. Wetlands International South Asia (WISA) is a technical partner in project implementation.

1.2. Context of Assignment

The status and movement of water in the wetland provides the physical template on which the wetland evolves and functions. Catchment of the wetland is the source of water, nutrients and sediments. Ecosystem-based management of wetlands requires understanding of the catchment, hydrology, ecology, ecosystem services, climate, topography and their inter-relationship. Equally important is the understanding of natural processes that govern the functioning of a wetland. Other important aspects are the socio-economic setting around the wetland, institutional framework and governance.

Bhitarkanika is located in the deltaic region of Brahmani and Baitarani rivers on the north eastern coast of India in Odisha. It represents one of the largest and most diverse mangrove ecosystems in the entire Indian coast. Bhitarkanika is a wildlife sanctuary of area 672 sq.km; includes a national park of area 145 sq. km, and shares the coast along with the Gahirmatha

marine sanctuary. It is a mosaic of tidal rivers, creeks, riverine islands, coastal wetlands and inter-tidal zones. Unique biodiversity values of this wetland include the largest Olive Ridley turtle mass nesting beach in world; one of the largest heronry in Asia and contains the highest density of saltwater crocodile in India. In terms of ecosystem services, the wetland supports a population of around 2,50,000 people in 410 villages; provides livelihoods in the form of agriculture, fishing and brackish water aquaculture; and mangroves protect the area from devastating cyclones and tidal surges.

Gradual reduction in freshwater inflow in the feeding rivers has been identified as one of the major threats in the Management Plan of Bhitarkanika Wildlife Sanctuary and National Park. Abstraction of water by agriculture, industries and other development activities is taking place in the catchment of Bhitarkanika wetland. Change in the species composition/mangrove community is being observed due to change in salinity regime. Current management of the wetland does not effectively integrate community interactions and dependence on the wetlands. Water requirements for mangrove ecosystem functioning is not factored in within the operation regimes of upstream hydraulic structures. The impact of reduced fresh water flow and increase in salinity on the wetland, especially on the mangrove community needs to be studied.

1.3. Objectives and Scope of Assignment

The objective of this assignment is to conduct hydro-ecological assessment of Bhitarkanika Ramsar site and recommend management measures for maintaining hydrological and ecological characteristics and functioning of the wetland. The assessment should analyse the hydrological changes within the wetland and the direct catchment that have both short and long-term impacts on the ecological character of the Bhitarkanika Ramsar site, identify drivers of these changes, recommend management measures and monitoring indicators and protocol for ecosystem-based management of the Ramsar site.

2. Tasks to be performed by the contractor

The contractor is responsible for providing the following services:

2.1. Hydrological characterisation of Bhitarkanika

- Demarcate and map zones of direct, indirect catchment and zone of influence of Bhitarkanika Ramsar site
- Document climatic settings in terms of precipitation, temperature and their inter-annual variability
- Map topography, drainage pattern and land use land cover (LULC) in the direct catchment
- Identify and map major hydraulic structures in the wetland, in direct inflows, outflows and in direct catchment including their type and location
- Identify and map the perennial and non-perennial inlets, document their relative contribution and types and water quality

- Estimate the volume and seasonality of freshwater inflow through the major rivers and streams based on data collected from state agencies (e.g. water resources department).
- Analyse the quality of freshwater inflow (including nutrients) from major rivers and streams in pre and post monsoon season based on data collected from state agencies (Pollution control board, water resources department, etc.).
- Document water quality within Bhitarkanika wetland with a focus on salinity.
- Identify and map major point and non-point sources of pollution within the wetland boundaries. This should be done through field surveys and consultations.
- Analyse water abstraction in direct catchment – quantity and seasonality (purpose)
- Analyse the hydrological connectivity (rivers, coasts, wetlands)
- Estimate/ document the amount and seasonality of sediment inflow through major rivers.
- Estimate the amount of nutrients inflow through major rivers and their seasonality.

2.2. Status and trends (changes in the hydrological character over last 3 decades)

Analyse, primarily within the wetland boundary and in the immediate catchment, the temporal changes (for the past 25 - 30 years) and provide a status and trend for the aspects - water quantity, water quality with focus on salinity, sediment and nutrient flow.

2.3. Assessment of impact of changes on wetland ecology (ecosystem character and functions) and identification of drivers of change

Assess the short and long-term impacts of the following changes on Bhitarkanika:

- Land use land cover changes in direct catchment
- Developmental activities, river course, hydraulic structures and cropping pattern in direct catchment
- Changes in freshwater flow
- Sediment and nutrient flow
- Surface water abstraction in the direct catchment
- Coastal infrastructure
- Coastal processes including longshore sediment transport, tidal variation, erosion/ accretion.
- Identify drivers of changes and prioritize them based on their degree of impact(s).

2.4. Recommendation for management measures and monitoring

- Based on hydrological characterisation, hydrological changes and their impacts, and drivers of change, recommend hydrological management measures for maintaining the ecological characters of the wetland.
    - Water levels, water quality, hydrological connectivity with rivers and coastal rivers, groundwater table, inflow and outflow, sources of pollution
    - Identify parameters for wetland monitoring and suggest their periodicity;
    - Suggest parameters for preparation of wetland health report cards.

- Recommend strategies to address unfavourable hydrological changes within the wetland, focussing on salinity profile.

- Make practical recommendation for hydrological monitoring parameters and protocols

Certain milestones, as laid out in the table below, are to be achieved by certain dates during the contract term, and at particular locations:

Milestone	**Deadline/place/person responsible (Tentative) – from signing of contract**
Submission of inception report and presentation (methodology, work plan, literature review, collation of existing data/ information)	3 weeks
Submission of primary field results	6 weeks
Submission of interim report (including assessments, preliminary results)	14 weeks
Stakeholder consultation workshop presenting results and recommendations	20 weeks
Submission and presentation of draft report incorporating suggestions from stakeholders and experts	23 weeks
Submission of final report incorporating recommendations	26 weeks

The following report structure is proposed for the assignment.

i. Executive summary highlighting the important findings of the assessment and key recommendations
ii. Introduction including a brief review of existing literature describing the hydro-ecology of Bhitarkanika Ramsar site
iii. Methodology followed for carrying out the assessment
iv. Results and Discussion
    - Hydrological characterisation of Bhitarkanika Ramsar site and its catchment
    - Status and trends analysis - changes in hydrological character of Bhitarkanika Ramsar site
    - Drivers of change - assessment of impact of changes in the Bhitarkanika Ramsar site on its ecological character
    - Recommendations for management measures and monitoring for maintaining hydro - ecological functioning of the wetland
v. Conclusions
vi. References
vii. Annexures, including field assessment reports

Period of assignment: From 1st December 2019 until 31st May 2020.

3. Concept

In the bid, the bidder is required to show how the objectives defined in Chapter 2 are to be achieved, if applicable under consideration of further specific method-related requirements (technical-methodological concept). In addition, the bidder must describe the project management system for service provision.

Technical-methodological concept

Strategy: The bidder is required to consider the tasks to be performed with reference to the objectives of the services put out to tender (see Chapter 1). Following this, the bidder presents and justifies the strategy with which it intends to provide the services for which it is responsible (see Chapter 2).
The bidder is required to present the actors relevant for the services for which it is responsible and describe the **cooperation** with them.

The bidder is required to present and explain its approach to **steering** the measures with the project partners and its contribution to the results-based monitoring system.

The bidder is required to describe the key **processes** for the services for which it is responsible and create a schedule that describes how the services according to Chapter 2 are to be provided. In particular, the bidder is required to describe the necessary work steps and, if applicable, take account of the milestones and contributions of other actors in accordance with Chapter 2.

The bidder is required to describe its contribution to knowledge management for the partner and GIZ and promote scaling-up effects (**learning and innovation**).

Other specific requirements

- The assignment should be carried out in close cooperation with the site manager of Bhitarkanika Ramsar site. The assignment execution should follow the feedback adaptation mechanism with continuous discussion and engagement of the contractor with GIZ and Odisha Forest Department to review and provide suggestions. For this purpose, the contractor would be available for discussions and meetings in Delhi/Odisha or over skype as and when required.
- Developing a methodology and identifying suitable tools for hydrological assessment of Bhitarkanika wetland.
- Preparation of methodology; assessments and recommendations should include field surveys, stakeholder interviews, and review of secondary data and literature.
- Present the draft results at an expert workshop to get feedback on the proposed strategy
- Incorporate the experts' feedback into the final result

Project management of the contractor
The bidder is required to explain its approach for coordination with the GIZ project.

- The contractor is responsible for selecting, preparing, training and steering the experts (international and national, short and long term) assigned to perform the advisory tasks.
- The contractor makes available equipment and supplies (consumables) and assumes the associated operating and administrative costs.
- The contractor manages costs and expenditures, accounting processes and invoicing in line with the requirements of GIZ.
  The contractor reports regularly to GIZ in accordance with the AVB of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH from 2019

In derogation from GIZ AVB, the contractor makes contributions to reports to GIZ's commissioning party instead of submitting its own reports.

The bidder is required to draw up a **personnel assignment plan** with explanatory notes that lists all the experts proposed in the bid; the plan includes information on assignment dates (duration and expert days) and locations of the individual members of the team complete with the allocation of work steps as set out in the schedule.

Technical Backstopping
The bidder is required to describe its backstopping concept. The following services are part of the standard backstopping package, which (like ancillary personnel costs) must be factored into the fee schedules of the staff listed in the bid in accordance with section 5.4 of the AVB:

- Service-delivery control
- Managing adaptations to changing conditions
- Ensuring the flow of information between GIZ and field staff
- Contractor's responsibility for seconded personnel
- Process-oriented technical-conceptual steering of the consultancy inputs
- Securing the administrative conclusion of the project
- Ensuring compliance with reporting requirements
- Providing specialist support for the on-site team by staff at company headquarters
- Sharing the lessons learned by the contractor and leveraging the value of lessons learned on site

Eligibility Criteria for firms

The qualifying criteria for the firms/institutions/organisations applying for this is given as follows:

- Should be registered in India;
- Should have annual turnover of at least Euro 50,000;
- Should have present staff strength of at least 5 persons;
- Should have implemented reference project with a minimum value commission of Euro 5,000;
- Should have implemented at least two reference projects in the field of hydrological assessment in India;

- Should have implemented at least one reference project in Odisha in the last three years
- At least 5 years of experience in conducting hydro-ecological assessment of coastal wetlands
- Should have experience of implementing assignments on water resource management
- Should have a wetland ecologist;
- Experience of implementing assignments with multi-disciplinary teams of experts
- Should have 5 years of experience in implementing assignments in east coast of India, especially Odisha
- Should have experience in implementing development projects
- Sub-contracting the assignment or its parts to other agencies is not permitted.

4. Personnel concept

The bidder is required to provide personnel who are suited to filling the positions described, on the basis of their CVs (see Chapter 7), the range of tasks involved and the required qualifications.
The below specified qualifications represent the requirements to reach the maximum number of points.

Team leader – Technical expert 1

Tasks of the team leader

- Development of methodology for the hydrological assessment of Bhitarkanika
- Overall responsibility for the advisory packages of the contractor (quality and deadlines)
- Coordinating and ensuring communication with GIZ, partners and others involved in the project
- Personnel management, in particular identifying the need for short-term assignments within the available budget, as well as planning and steering assignments and supporting local and international short-term experts
- Regular reporting in accordance with deadlines

Qualifications of the team leader

- Education/training (2.1.1): University qualification (PhD or Master's) in Hydrology from a reputed institute.
- Language (2.1.2): Good business language skills in English
- General professional experience (2.1.3): 10 - 15 years of professional experience in conducting hydrological assessments and water resources management
- Specific professional experience (2.1.4): 5 years in topics of wetland hydrology
- Leadership/management experience (2.1.5): 6 years of management/leadership experience as project team leader or manager in a company
- Regional experience (2.1.6): 5 years of experience in projects in coastal areas of India, of which 2 years in projects in Odisha

Technical Expert 2 (Wetland Ecologist)

Tasks of expert 2

- Assist the team leader in the following tasks:
  - Developing methodology for hydrological assessment
  - Assessment of land use land cover, water inflow, water quantity and quality, sediment and nutrients; and mapping of hydraulic structures.
  - Oversee field studies for hydrological assessments
  - Formulation of recommendations; identification of parameters for wetland health report cards
  - Preparation of report on 'Hydrological assessment of Bhitarkanika wetland'

Qualifications of expert 2

- Education/training (2.2.1): Master's degree in ecology or water resources management or any other related field
- Language (2.2.2): English and Odiya (necessary for field work)
- General professional experience (2.2.3): 5 years of experience in working in hydrological assessments, water resource management, watershed management or any other related field
- Specific professional experience (2.2.4): 3 years of experience in conducting hydrological assessments, hydraulic assessments and monitoring
- Regional experience (2.2.6): 3 – 5 years of working experience in Odisha or any other part of the east coast
- Other (2.2.8): Well-versed with GIS based water resources management

Technical Expert 3 (Remote sensing/ GIS expert)

Tasks of expert 3

- Assist the team leader in the following tasks:
- Develop suitable methodology for the assignment
- Conduct and oversee field assessments including hydrological assessments, use of RS-GIS in hydrological assessment and modelling, etc.
- Data collection and analysis
- Report Preparation

Qualifications of expert 3

- Education/training (2.2.1): Master's degree in remote sensing/ GIS
- Language (2.2.2): English and Odiya
- General professional experience (2.2.3): 5 years of experience in RS/ GIS - based assessments
- Specific professional experience (2.2.4): 3 years of experience in GIS based hydrological assessments/ hydraulic modelling/ water resources management
- Regional experience (2.2.6): 3 years of experience of working in Odisha or any other part of the east coast of India
- Other (2.2.8): Well-versed with wetland hydrology

Soft skills of team members

In addition to their specialist qualifications, the following qualifications are required of team members:

- Team skills
- Initiative
- Communication skills
- Sociocultural competence
- Efficient, partner- and client-focused working methods
- Interdisciplinary thinking

Short-term expert pool with minimum 3, maximum 5 members

Tasks of the short-term expert pool

Assist the team leader and technical expert in the following tasks:

- Data collation and preliminary analyses
- Field studies, data compilation and analysis
- Formulation of recommendations

Qualifications of the short-term expert pool

- Education/training (2.6.1): Experts with Master's in Hydrology/Water resources management; experts with Bachelor's/ Master's in Environmental Science
- Language (2.6.2): Good language skills in English and at least 1 expert with good language skills in Odiya
- General professional experience (2.6.3): technical experts with at least 3 years of experience in hydrological assessments
- Specific professional experience (2.6.4): hydrological and hydraulic modelling and remote sensing data based hydrological parameters assimilation and ecologically sustainable water management.
- Regional experience (2.6.5): 2 experts with at least 3 years of experience in Odisha

The bidder must provide a clear overview of all proposed short-term experts and their individual qualifications.

5. Costing requirements

Assignment of personnel

Team leader: Up to 45 expert days

Technical Expert 2 and 3: Up to 90 expert days

Expert Pool including field investigators: Up to 150 days

Travel

The bidder is required to calculate the travel by the specified experts and the experts it has proposed based on the places of performance stipulated in Chapter 2 and list the expenses

separately by daily allowance, accommodation expenses, flight costs and other travel expenses.

Workshops, training
The contractor implements the stakeholder workshops at Odisha.

6. Inputs of GIZ or other actors

GIZ and Odisha forest department are expected to make the following available:

- Necessary communication to government department to facilitate the tasks outlined in the project
- Conceptual inputs and information related to hydrology of Bhitarkanika region as and when required
- Workshop logistics

7. Requirements on the format of the bid

The structure of the bid must correspond to the structure of the ToRs. In particular, the detailed structure of the concept (Chapter 3) is to be organised in accordance with the positively weighted criteria in the assessment grid (not with zero). It must be legible (font size 11 or larger) and clearly formulated. The bid is drawn up in English (language).

The core proposal/bid shall not exceed 30 pages (excluding CVs, Annexures and details of reference projects).

The CVs of the personnel proposed in accordance with Chapter 4 of the ToRs must be submitted using the format specified in the terms and conditions for application. The individual CV of each expert shall not exceed 3 pages. The CVs must clearly show the position and job the proposed person held in the reference project and for how long. The CVs shall be submitted in English (language).

If one of the maximum page lengths is exceeded, the content appearing after the cut-off point will not be included in the assessment.

As the contract to be concluded is a contract for works, please offer a fixed lump sum price that covers all applicable costs (fees, travel expenses etc.). The price bid will be evaluated based on the specified lump sum price. For our internal costing and any further commissions, please also provide the daily rate which the prices are based on. A breakdown of days is not required.