

# Rejuvenating Watershed for Agriculture Resilience through Innovative Development (REWARD)

## TERMS OF REFERENCE

### FOR

### HYDROLOGIST / WATER RESOURCES EXPERT

#### BACKGROUND OF THE PROJECT

The Department of Land Resources, Government of India has initiated a World Bank supported multi-State project namely *Rejuvenating Watershed for Agricultural Resilience through Innovative Development* (REWARD). It is expected to positively influence by promoting resource efficient growth in selected watersheds, investing in human capital at State and National levels, and developing networks of scientific and technical partners. The project will enhance productivity and net income of farmers and contribute significantly to Lighthouse India by implementing new science and data-driven approaches for climate resilient watershed management, land resource inventory, land use planning, and precision farming in a range of agro-ecological conditions in participating states. The project will directly address key strategic actions around agricultural and rural development, including doubling farmers' incomes, more crop per drop, water to every plot, soil health, and promotion of entrepreneurship through technical and financial support for better delivery and impacts through improved planning approaches, capacity building, coordination and convergence, and supportive research and development. The outcomes are prevention of soil run-off, regeneration of natural vegetation, rain water harvesting and recharging of the ground water table. This enables multi-cropping and the introduction of diverse agro-based activities, which help to provide sustainable livelihoods to the people residing in the watershed area.

REWARD is being implemented in three to four Indian States. It is proposed as a 6 years Project. The total allocation for the Project is approximately USD250 million of which USD178.5 million is International Bank for Reconstruction and Development (IBRD) loan from the World Bank and the balance is funded by the Government of India/ State Governments.

#### PROJECT OBJECTIVES AND RESULTS

The Project Development Objective (PDO) is to: improve land and water conservation and climate resilience in selected watersheds, and strengthen capacities of national and state institutions to deliver more effective science-based watershed development programs.

#### KEY RESULTS

<b>PDO Element</b>	<b>Potential PDO Indicator(s)</b>
Improved land conservation outcomes in demonstration sites	Percentage of targeted watershed area showing an increase in Normalized Difference Vegetation Index (NDVI) correcting for climate effects;
Improved agricultural outcomes in demonstration sites	Incremental change in agriculture/horticulture productivity and income for selected crops;
Improved water outcomes in demonstration sites	Percentage of targeted landscape area showing an increase in Land Surface Water Index (LSWI) correcting for climate effects;
Improved climate resiliency outcomes in demonstration sites	Changes in resilience index composed of a set of variables covering exposure, sensitivity to climate events and adaptive capacity;
Strengthened capacities of watershed development institutions	Functional networks of scientific partners in project states;
Revised policies for watershed programs	Revised National Watershed Guidelines informed by project experiences and lessons learned that will guide new national

## **PROJECT COMPONENTS:**

The project will deploy institutional and technical solutions to address the PDO across four components, and over six years, as follows:

### **Component 1.Improved National Watershed Governance and Institutional Capacity Building**

This component will strengthen capacities and systems primarily in DoLR, for delivering national watershed programs. The component will be delivered through two sub-components:

**1.1 Institutional strengthening and capacity building.** The sub-component will strengthen human resource and institutional capacities in DoLR to plan, coordinate, deliver, evaluate and report on more effective, science-based national watershed programs. It would support overall project monitoring and reporting based on coordinated status and monitoring reports from states.

**1.2 Technology transfer.** The sub-component will support DoLR to coordinate the improved transfer of knowledge and experiences across Indian states and globally through national and international workshops and conferences, and international and national study tours/exposure visits.

### **Component 2: Improved State Watershed Governance and Institutional Capacity Building.**

This component will strengthen capacities and systems primarily at state levels for planning methodology, technology development, decision-support tools, and delivery models. The component would ensure climate change considerations are integrated into all activities. The component will be delivered through four sub-components:

**2.1 Institutional strengthening and capacity building.** The sub-component will strengthen human resource and institutional capacities in relevant line departments at state, district and field levels to implement more effective and science-based programs in watersheds. The sub-component would provide resources to build capacities for state and field level safeguards oversight.

**2.2 Technical support to states.** Following a lighthouse approach, the sub-component will finance the participation of the Karnataka Watershed Development Department, their experienced scientific and technical network of top caliber scientific partners, and other institutions as needed to help new project states and DoLR prepare the project and establish and train their own partners.

**2.3 Research and development.** The sub-component will finance existing scientific and technical partners from Karnataka, and new state, national and international partners as needed, to undertake applied research and development for improved watershed development, including creating and piloting the projects.

**2.4 Monitoring and Evaluation.** The sub-component would finance 3<sup>rd</sup> party M&E directly tied to project activities, including baseline surveys, input and output monitoring, process monitoring, impact assessments, acquisition of necessary remote sensing images, and case studies to guide project implementation.

### **Component 3: High Impact Demonstration Watersheds in Rainfed Agricultural Areas.**

This component will support the development of model watersheds in rainfed areas in each of the participating states. Component 3 would be delivered through three main sub-components:

### **3.1 Improved integrated watershed plans using science-based data and tools.**

### **3.2 Establish Model Watersheds.**

**3.3 State specific innovations and pilots, urban watersheds, etc.** The sub-component will support piloting of small-scale innovations to address land, agriculture, water, and climate change issues unique to each participating state, for example urban/peri-urban watershed management planning and investments, managing landscapes in arid regions, biodiversity management, major gully rehabilitation, solar pumps for small-scale irrigation, etc. The sub-component will also institutionalize knowledge and lessons learned from these pilots for future upscaling in government programs.

## **Component 4: Project Management and Coordination.**

Project management and coordination will be supported at central and state levels. The sub-component would support incremental administration costs and specialists, travel, meetings, financial management, internal/external audit and procurement, and equipment.

## **PROJECT AREA**

3. A flexible approach will be adopted in participating states to select watersheds for developing improved data bases and watershed plans, as well as a sub-set of sites to establish model watersheds. Participating states would be committed to establishing an agreed number of model watersheds. Each site will be approximately 5,000 ha. An average target of 10-15 model watersheds per state would be taken up. It is expected that the model watersheds would be spread variably across the states, with some states being able to establish more sites than others. As was the case in Karnataka, the broader LRI work and watershed planning process would be scaled far beyond the model watersheds in the states. It is anticipated that each of the states could complete LRI work, LRI and hydrology atlases, water security plans, and integrated watershed plans on an additional 1,500 to 2,000 watersheds.

4. **Technical design:** States are familiar with implementing national watershed schemes. However, REWARD will be different from “business as usual” watershed programs because the new states will be expected to adopt modern technologies and data-focused land resource inventorization for watershed planning and implementation, work with technical partners, and expanding the application of data bases and DSS tools to help farmers improve productivity and climate resiliency.

## **Project Management support**

The Project would predominantly focus on supporting watershed management activities in the partner States viz. Andhra Pradesh, Karnataka and Odisha. However, certain activities of the Project would have nation-wide application. While primary Project engagement would be with the State-level Nodal Agencies (SLNAs) of these States, engagement at the district and watershed level is foreseen in certain cases.

## **OBJECTIVE OF THE ASSIGNMENT**

Hydrological information and modeling is an essential input for watershed assessment and planning. A water-focused planning approach based on sound hydrological principles is a key

component for REWARD and gains further importance in the context of National Watershed Programme with its focus on the principles of conserving, provisioning, using and managing water for increased agricultural production. In this context, the DoLR proposes to engage the services of a Hydrologist/Water Resources Expert in the DoLR REWARD Project Implementation Unit.

## **DUTIES AND RESPONSIBILITIES**

- Coordinate with key partners at central and state levels in the application of hydrological and other tools for catchment planning, monitoring of surface and groundwater availability and use
- Ensure that Hydrological data /models are routinely applied in the planning for watershed Projects and are reflected in the DPRs
- Responsible for managing the partnership with National level institutions and state level institutions working on hydrological and water management issues under REWARD project.
- Assess state-level requirements for strengthening capacity of teams in using GIS and RS applications in watershed management and use of GIS based Decision Support Systems (DSS)
- Assess and recommend techniques for water use efficiency and water reuse at the community level and pilot these at the appropriate levels.
- Liaise with research and academic institutions and partner states as necessary to Main stream hydrological concerns within the watershed management approach.
- Identify suitable hydrological models for piloting and upscaling.
- Ensure that efficient water use based crop planning practices are demonstrated within the REWARD pilot watersheds.
- Take a lead with the urban watershed management concept and pilot applications under Component 3 to ensure that appropriate frameworks/models for urban watershed management are developed for diverse scenarios/ requirements.
- Assist with capacity building of Project stakeholders at different levels in hydrology/ water management in coordination with the Capacity Building (CB) team within the PIU.
- Conceptualize Project activities for the introduction of meteorological and hydrological gauging and stream flow measurement at watershed level.
- Pilot systems for monitoring stream flow in watershed Projects.
- Plan measures for improving small watershed level hydrological and sedimentation data collection and analysis in the planning process and by the M&E team. Ensure that monitoring parameters for hydrological outcomes are integrated into the overall M&E for the Project.
- Identify procedures for hydrological modeling of small watersheds to evaluate impacts of watershed structures on surface flow, groundwater recharge and crop planning.
- Contribute to documentation and knowledge sharing in the thematic area and facilitate data availability on the subject at the PIU level.

## **EXPERIENCE AND QUALIFICATIONS**

### **ESSENTIAL QUALIFICATIONS**

- 1) Masters degree or equivalent in Hydrology or Water Resources Management from a recognized University.
- 2) 10 years of relevant work experience in India.

### **DESIRABLE QUALIFICATIONS**

- 1) Sound knowledge of latest hydrological gauging tools and modeling techniques applicable in the watershed management context.
- 2) Experience of working with government and research institutions.
- 3) Applied research or applications at scale pertaining to the areas indicated.
- 4) Publications pertaining to areas of interest for the Project.
- 5) Experience of having worked in World Bank or other donor funded Projects.

Serving Officers belonging to the Central Govt. or Govt. of States or Union Territories or Central / State Govt. Public Sector Undertakings / Autonomous Bodies holding the post equivalent to Deputy Secretary / Director level at the Govt. of India having requisite qualification and work experience as stated above are also eligible to apply. In such case of selection the relevant Government rules regarding deputation will apply for regulating the terms and conditions of service during deputation to this position.

#### **AGE - LIMIT:**

The maximum age limit for applying the position shall be not exceeding 65 years as on date of advertisement of the post.

#### **FEE AND ALLOWANCES**

For selected candidates other than the candidates selected on deputation, the compensation package will be paid within Rs. 1.50 lakh to Rs. 2.00 lakh per month, as decided by the Departmental Consultancy Evaluation Committee (CEC) based on the candidate's qualification, experience and suitability to the post.

#### **REPORTING**

The position directly reports to the Project Director – REWARD or his / her designate.

#### **LOCATION**

The position is based in the REWARD, PIU Office in New Delhi.

#### **TERMS AND CONDITIONS OF THE CONTRACT**

The position is contractual and coterminous and with the duration of the REWARD Project. The initial contract is for a period of 1 year with provision of extension on an annual basis on satisfactory performance of duties. There will be a probationary period of 4 months during which period the contract can be terminated with immediate effect. Beyond this period, the contract can be terminated after a notice period of one month by either party. The expert shall be transferred to the rolls of the Project Management Consultant Agency (PMCA) once the same is appointed under REWARD Project. The terms of conditions of the contract will remain the same in case of such transfer.

#### **APPLICATION PROCEDURE AND DEADLINE**

Applications are expected to submit a CV detailing their qualifications and experience that match the eligibility criteria. A covering letter highlighting why the applicant feels she /he would be good choice for the indicated position should accompany the CV.

All applications must be submitted electronically (signed /scanned/PDF) via email to the following id. **recruit.reward-dolr@gov.in**. The position applied for should be clearly stated in the subject line. The deadline for submission of application is 15<sup>th</sup> day from the date of publication in news papers.

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