

# **TOR for engagement of Hydrologist under National Hydrology Project for Bihar (Surface Water)**

## **1. Introduction :**

National Hydrology Project is being implemented all over India by Ministry of Water Resources, Government of India with the active assistance of World Bank. The project is closely aligned with the GOI's water sector priorities set out in the 12th Five-year Plan (FYP)(2012–17), which calls for a paradigm shift toward integrated management of water resources based on improved systems for water data collection and information management and open access to water information.

This project envisages to support the establishment and up-gradation of *hydro-meteorological monitoring network, water resources data management, water resources information systems, development of decision support tools for flood forecasting, water resources operation and planning* etc. thereby institutional strengthening of related water resources departments of the country. The duration of the project is eight years. Water Resources Department, Government of Bihar is the Implementing Agency for the surface water components in Bihar.

The NHP has following four components:

Component A : Water Resources Data Acquisition System

Component B : Water Resources Information System

Component C : Water Resources Operation and Planning System

Component D : Institutions Capacity Enhancement

Some of the key activities envisaged under NHP for Bihar SW are:

- 1) Installation of Hydro-met Stations in five River Basins (Gandak, Mahananda, Kiul-Harohar, Punpun and Sone) and at eighteen (Chandan, Badua, Phulwaria, Upper Kiul, Durgawati, Kharagpur Lake, Kohira, Nagi, Amrity, Srikhandi, Kolmahadeo, Morway, Kailashghati, Nakti, Belharna, Anjan, Orhni and Bilasi) Dam/Reservoir sites for RTDAS.
- 2) Processing of DEM data received from Central agencies and enhancing existing spatial data base.
- 3) Consultancy Services for Web Application/Developing website.
- 4) Operation and maintenance of e-SWIS.
- 5) Construction of '**Water Knowledge Centre, Bihar**' as Hydrology Project Centre.
- 6) Institutional Modernization Support.
- 7) Development of e-Library.

8) Consultancy Services for :-

- i. Conducting Reservoir Survey including Hydrographic Survey, preparation of DEM of resolution 0.3 m, preparation of Area Elevation Capacity curve of seven dams namely Chandan, Badua, Phulwaria, Upper Kiul, Kharagpur Lake, Kohira and Durgawati.
- ii. Creating State Chapter of WRIS.
- iii. Surface Water Assessment and Water Balance Studies in Mahananda and Kiul-Harohar Basin.
- iv. River Cross section survey for Chandan river.
- v. Development of Inflow forecast model for seven reservoirs (Chandan, Badua, Phulwaria, Upper Kiul, Kharagpur Lake, Kohira and Durgawati).
- vi. Developing DSS for Reservoir regulation, operation manual etc. for Durgawati Dam including data collection & related works.
- vii. Development of Embankment Asset Management System for Gandak river basin with structuring of a Master module.
- viii. Development of Sone Canal Asset Management System for Irrigation Management (using Online Web based Monitoring system and GIS Techniques) and as a Decision Support Tool.
- ix. Sedimentation Study of seven reservoirs (Chandan, Badua, Phulwaria, Upper Kiul, Kharagpur Lake, Kohira and Durgawati) with a view to properly assess Quality, Quantity and rate of annual sedimentation and assessment of present condition of the reservoirs with remedial measures.
- x. Dam Break Analysis for Chandan Dam.
- xi. Data Collection for river cross-sections, other hydrologic, meteorologic data etc. needed for modelling works (as suggested by CWC).
- xii. Consultancy for development of micro level flood forecast and integration with FF model to be developed by CWC.

## 2. Objectives of Consultancy

The objective is to recruit qualified consultants/ specialists as per 'Eligibility Criteria' in annexed Table 1, through "INDIVIDUAL CONSULTANT" selection procedure of World Bank guidelines. These consultants/specialists would provide operational as well as professional support mainly to the consultancies:-

**Hydrologist:** - assistance would be needed for following works:

- (i) Development of Water Resources Information System (WRIS)
- (ii) Providing guidance in HIS, Network Design, establishment of Hydro-met Stations and monitoring.
- (iii) To assist implementation of real-time network in selected basins in Bihar under NHP.
- (iv) Providing guidance in establishing Water Knowledge Centre like laboratories, model centres etc.
- (v) Consultancy for SW assessment & water balance studies in Mahananda Basin and Kiul-Harohar basin.
- (vi) Hydrographic and Sedimentation Study of reservoirs (Chandan, Badua, Upper Kiul, Kohira, Kharagpur Lake, Phulwaria and Durgawati).

- (vii) Development of Inflow forecast model for seven reservoirs (Chandan, Badua, Phulwaria, Upper Kiul, Kharagpur Lake, Kohira and Durgawati).
- (viii) Dam Break Analysis for Chandan Dam

The consultant would train the officials of WRD Bihar in *basic hydrology and hydrologic/hydrodynamic modeling* by conducting in house trainings. He will also have to assist in packaging input data for various models that may be developed by other consultancies. All hydrological aspects under different consultancies will be examined by the consultant and will provide requisite suggestions to all Sub-Implementing agencies for the effective implementation of the project. The consultant will review different reports submitted by different Consultants and provide useful inputs for further improvement.

3. **Remuneration**-As specified in annexed Table 1.
4. **Contract Duration**- As specified in annexed Table 1.

**TABLE- 1. Functional responsibility/ eligibility criteria for Hydrologist (IC) to be positioned in FMISC in connection with implementation of National Hydrology Project**

Consultants/ Specialists	Functional responsibility	Academic Qualification	Professional Experience	Monthly Remuneration	Period of employment
<b>Hydrologist</b>	<p>-To guide development of hydrologic information system, including validation, archival and sharing of both historic data from existing gauge sites and real-time data from new sites in different basins of Bihar.</p> <p>- To conduct analysis of rainfall, stream flow and sediment load pattern; and river morphology, changes</p> <p>-To assist implementation of real-time network in selected basins in Bihar under NHP</p> <p>- To evaluate and analyze data obtained in Hydrology Directorate and other sources with reference to flood management,</p> <p>- Assist in packaging input data for various models that may be developed by other consultancies</p> <p>-Interact with other consultancies in the use of hydrologic information system in the forecasting and other models</p> <p>- other tasks as and when entrusted</p>	<p>- Basic degree in Civil Engineering and ,</p> <p>- Master's in Water Resources Engineering/ Hydrology</p>	<p>- Minimum 15 years experience in any Govt./private organization/academic/research institution including minimum 5 years experience in designing/ developing hydrologic databases and analysis;</p> <p>- experience in development of hydrologic information system</p> <p>- Minimum three years experience in hydrologic/hydrodynamic modeling.</p>	<p>Rs. 60,000 ( There will be 5(five)% annual increment of the basic i.e. Rs. 60,000/- every year )</p>	<p>2 Years (This may be extended depending upon further work requirements and also on satisfactory performance of the expert)</p>