

**TOR for engagement of Sr. Water Resources Expert/Embankment Specialist 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 consultant/ specialist 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:-

Senior Water Resources Expert/Embankment specialist:- assistance would be needed for following consultancy works:

- (i) **“Designing, Developing and Deploying Embankment Asset Management System for river basins with structuring of Master Module for Bihar EAMS”.**
- (ii) River Cross section survey for Chandan River.
- (iii) Providing guidance in establishing Water Knowledge Centre like laboratories, model centres etc.
- (iv) 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.

- (v) Consultancy for SW assessment & water balance studies in Mahananda Basin and Kiul-Harohar basin.
- (vi) 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.
- (vii) Hydrographic and Sedimentation Study of reservoirs (Chandan, Badua, Upper Kiul, Kohira, Kharagpur Lake, Phulwaria and Durgawati).
- (viii) Development of Inflow forecast model for seven reservoirs (Chandan, Badua, Phulwaria, Upper Kiul, Kharagpur Lake, Kohira and Durgawati).
- (ix) Dam Break Analysis for Chandan Dam

The consultant would train the officials of WRD Bihar in EAMS/CAMS by conducting in house trainings. The consultant will provide useful suggestions during formulation of Terms of References, Bid Documentation and RFPs related to his domain. The Consultant will also be required to visit sites whenever necessary to provide his meaningful inputs during the implementation of the project activities. The Consultant will review different reports submitted by different Consultants and provide useful inputs for further improvement. Periodical Feedback reports (say 2 monthly) highlighting the progress of works, hindrances if any; suggestions for improvement should be submitted by the Consultant apart from reviewing the reports of different consultants.

Overall, he will be functioning as an advisor for NHP.

3. Remuneration-As specified in annexed Table 1.

4. Contract Duration- As specified in annexed Table 1.

TABLE- 1. Functional responsibility/ eligibility criteria for SWRE/ES 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
Senior Water Resources Expert/ Embankment specialist	<p>-To organize collection of data required for Embankment Asset Management System (EAMS), available with Government of Bihar's Flood Monitoring Circle and respective Water Resources Department offices and other agencies.</p> <p>-To review the quality of office data collected from various sources and liaise with consultants regarding collection process.</p> <p>--To work in close consultation with FMISC under Water Resources Department and the Consultants involved in development of various activities viz. EAMS, Canal Asset Management System, River Cross Sections, Sedimentation studies, Surface water assessment studies etc taken up under Hydrology Project in Bihar.</p> <p>-To examine the different deliverables under this project and recommend modifications if required for better functional water resources management works.</p> <p>- would lead and guide other Consultants engaged in NHP.</p>	<p>- Basic degree in Civil Engineering from a reputed university.</p> <p>Master's degree in Water Resources preferable.</p>	<p>-Minimum 15 years' experience in a State/ Central Water Resources in Govt./Academic/Research Institution/private set up</p> <p>-5 years' experience in planning & construction / monitoring of bank protection, embankment management /Flood management</p> <p>-Minimum 3 years' experience in development of Embankment Asset Management System (EAMS), river bathymetry studies, river behavior studies etc.</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>