



**Government of West Bengal
Irrigation & Waterways Department**

NATIONAL COMPETITIVE BIDDING

Request for Expression of Interest (REOI)

For

**BENCHMARKING STUDY OF THE
KANGSABATI RESERVOIR PROJECT**

Under

National Hydrology Project

March- 2020

*Executive Engineer
Burdwan Investigation & Planning Division
Irrigation & Waterways Directorate*

Consultancy services for
“Benchmarking study of the Kangsabati Reservoir Project”

Memo No: 112/NHP-02/02

Date: 25.03.2020

Request for Expression of Interest (REOI)

EOI No: WBIW/NHP/NIQ-06/2019-20
Ref No: NHP-2019-2020-WBSW-279410

1. Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India is implementing the National Hydrology Project (**NHP**) in almost entire India with the active technical and financial support of World Bank.
2. Irrigation & Waterways Department, Government of West Bengal is the Implementing Agency responsible for development of *Surface Water components* in the state. The State Project Management Unit (SPMU) of I&W Department implementing the NHP project as Implementing Agency –Bengal(SW) is the agency requiring the benchmarking study for which the proposed work under Eoi is necessitated.
3. This is a 100% Central Sector Scheme. I&WD, Govt of West Bengal has been allocated INR 100 Crore as Grant-in-aid for this project. The project duration is for eight years (2016-17 to 2023-24).
4. World Bank Guidelines including procurement, financial management and safeguard have to be followed.
5. The project development objective (PDO) is to improve the extent, quality, and accessibility of water resources information and to strengthen the capacity of targeted water resources management institutions in India.
6. The project has following four major components to implement :
 - A. Water Resources Data Acquisition System
 - B. Water Resources Information Systems
 - C. Water Resources Operations and Planning Systems
 - D. Institutional Capacity Enhancement
7. The consultancy services for “Benchmarking study of the Kangsabati Reservoir Project” broadly consist of the following:
 - a. Carrying out reconnaissance survey of the project area including distribution system and reservoir
 - b. Collecting and compiling data
 - c. Data validation, processing and analysis
 - d. Carrying out water auditing
 - e. Computation and evaluation of performance indicators at the smallest possible outlet level for
 - i. System delivery performance including irrigation efficiency
 - ii. Production performance
 - iii. Financial performance

- f. Identifying the gaps between the current and designed parameters
- g. Suggesting remedial measures for improving the performance.

The use of remote sensing for estimation of parameters like crop evapotranspiration and crop yield is envisaged.

A Terms of Reference (ToR) is attached with this EoI.

8. The Executive Engineer Burdwan Investigation & Planning Division I&W Deptt Govt. of West Bengal invite Consultants / firms to indicate their interest in providing the Consultancy services for Benchmarking study of the Kangsabati Reservoir Project under National Hydrology Project.
9. The duration of the consultancy period will be for a period of **2 years**.
10. The criteria for short listing of the Consulting firms shall be as follows:

(A)

- The firm should have been in consulting business for at least 5 years.
- The firm shall be financially sound with an average annual turnover of more than **INR 100.00 Lakhs** during any two years in the last five years i.e. 2014-15, 2015-16, 2016-17, 2017-18 and 2018-19.
- The firm should have experience of substantially completed at least one similar assignment of benchmark study (*preferably in water resource sector*) in India/abroad.
- Availability of skilled personnel. having relevant advanced academic degree and experience in
 - ✓ Agriculture engineering and,
 - ✓ Water resource Engineering,

EOI submitted by the consultant must include introductory letter on letter head explaining how the firm is best to deliver the task, Organization Profile, Annual Audited Financial Statement for the last five years, short note on similar projects implemented by the firm as required for qualifying criteria along with contract details of past clients as evidence of previous experience in similar works. Thus, the EOI should contain sufficient supporting documents to substantiate the claim of the consultant towards their qualification as per the short listing criteria.

(B) After short listing as per criteria (A) The short listed Consulting firms will be finally evaluated based on their **Concept Plan for the work**. The shortlisted Consulting Firms would have to **present** their **Concept Plan** before an **Evaluation Committee** of the department constituted for this work. The Committee will select the best Consulting Firm for the work to whom *Request for Proposal (RFP)* will be issued.

11. Consultants may associate with other firms in the form of a joint venture or a sub-consultancy to enhance their qualifications. This should be clearly stated in the submission.
12. A consultant will be selected in accordance with the **CQS (Consultant's Qualification based selection)** procedures set out in the World Bank's "*Guidelines: Selection and Employment of Consultants Under IBRD Loans and IDA Credits & Grants by World Bank Borrowers- Jan 2011*". The Guidelines are available at www.worldbank.org/procure.
13. Interested Consultants may obtain further information at the address given below from 10.00 – 17.00 hours (IST) on all working days.

Superintending Engineer,
Investigation and Planning circle II
Irrigation & Waterways Directorate, Govt of West Bengal
Jalasampad Bhavan 5th Floor, Salt lake,
Kolkata 91, West Bengal, India

This notice for Expression of Interest (EOI) has also been posted on websites-
<http://wbtenders.gov.in> and in <http://wbiwd.gov.in>

Pre-bid Meeting: A pre-bid meeting will be held on 29.04.2020 at 11:00 hrs (IST) at the Office of the Office of the Superintending Engineer, Investigation and Planning Circle II, Irrigation & Waterways Directorate, Govt of West Bengal, Jalasampad Bhavan 5th Floor, Salt lake, Kolkata 91, West Bengal, India, to clarify the issues and to answer questions on any matter that may be raised at that stage:

14. Expression of Interest with all relevant information and documents must be submitted online in the website www.wbtenders.gov.in by not later than **15:00 hours (IST) on 12.05.2020.** **The Expression of Interests received till the appointed time and date shall be opened same day at 15:30 hrs. System Server time.** The electronic bidding system will not allow any late submission of the REOIs after due date and time as per server time. Physical, Email, Telex, cable or facsimile submission of REOIs will be rejected as non-responsive.

Sd/-
Executive Engineer
Burdwan Investigation & Planning Division
Irrigation & Waterways Directorate
Purta Bhawan, 3rd Floor
Purba Burdwan-713103, West Bengal



Government of West Bengal

Terms of Reference (ToR) for Consultancy Services

For

Benchmarking study of the Kangsabati Reservoir Project

Ref No: NHP-2019-2020-WBSW-279410

for

Irrigation & Waterways Department

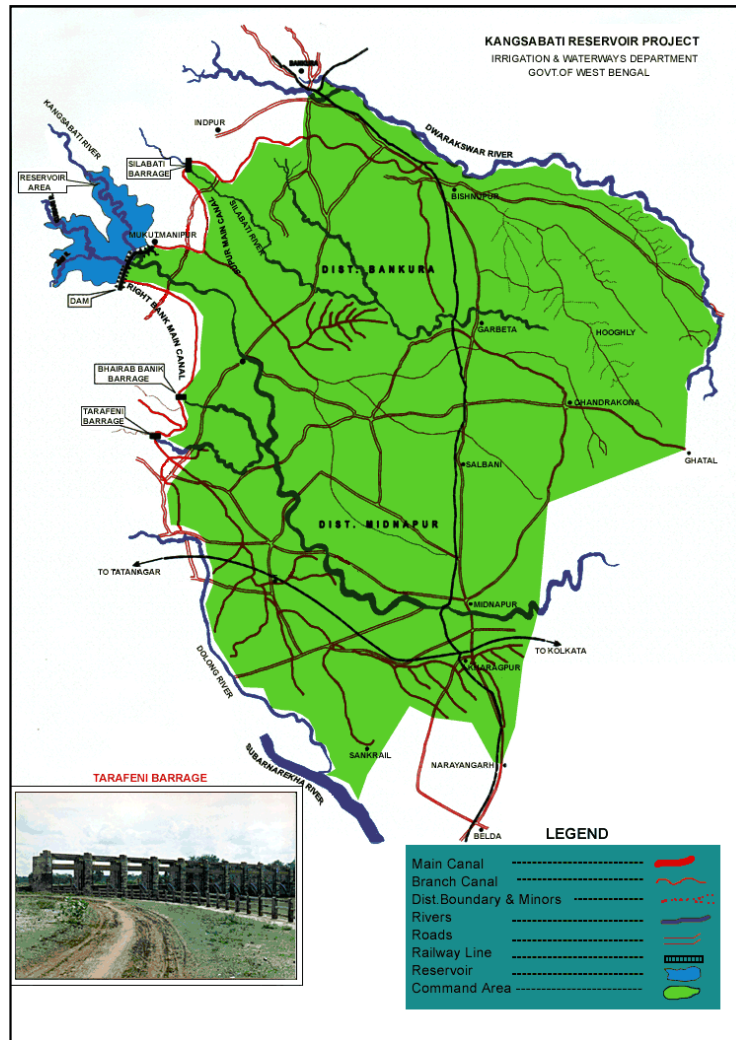
March- 2020

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1. Background

The Kangsabati Reservoir Project consisting of a dam located at Mukutmanipur in the Bankura District in West Bengal on the rivers Kangsabati and Kumari was started in the year 1956-57. Till date an irrigation potential of 3,99,100 ha has been created in the districts of Bankura, East Midnapore, West Midnapore and Hooghly through this Project. With a total length of canal system of about 3218 Km (Main and Branch - 804.50 km. and Distributaries and Minors - 2413.50 km.) it is one of the most important irrigation project in the state of West Bengal



With the development of such a huge irrigation infrastructure, efficient management of the system is a primary responsibility of the Irrigation Department so as to ensure a sustainable food production. The assessment of the irrigation infrastructure created, its utilization, diagnostic evaluation is important to measure the efficiency. A modern tool of Benchmarking (BM) of irrigation projects is in practice the world over in order to analyse and evaluate the performance of irrigation projects. Benchmarking process is an important management tool used to improve water use efficiency. It also helps in identifying grey areas in the system and provides direction for improvement, with adoption of best management practices. Benchmarking also helps to develop a better understanding and knowledge of the system leading to improvement in policy making in Water Resources Development and Management. The performance evaluation is done based on various components namely Irrigation Infrastructure, Agricultural System, and Water Delivery Dynamics.

The main performance indicators for benchmarking has been described in the Guidelines for Benchmarking of Irrigation Systems in India, Indian National Committee on Irrigation and drainage, New Delhi, 2002 wherein the indicators for benchmarking of irrigation projects have been broadly classified under the following groups:

- A. System Performance
- B. Agricultural Productivity
- C. Financial Aspects
- D. Environmental Aspects
- E. Social Aspects
- F. Additional Indicator

Programs for benchmarking the performance of projects have started in several countries however benchmarking in the irrigation sector is a comparatively recent activity and several states in India are taking it up. It has already become an important and effective tool to improve irrigation performance. Irrigation benchmarking undertaken in several projects the world over has already helped towards:

- Development of strategic plans for future improvement.
- Commitment to excellence in service provision.
- Effective user participation in the management and operation of the system.
- Effective policies for water resources and environmental management.

Irrigation benchmarking has been found to be an effective tool to help achieve these performance objectives. It is however important to understand the adoption of benchmarking implies an on-going process of measuring, comparing and internalising best management practices identified in the process. Benchmarking is a circular process rather than a linear process with a starting point and an end point. To become fully effective the irrigation authorities need to adopt a standardized set of scheme descriptors and performance indicators, such as currently defined by the INCID guidelines.

Since the construction and commissioning of the Kangsabati Reservoir Project, no such benchmarking study has been undertaken for this project. It is felt that by undertaking this process, the Irrigation and Waterways Department will make a great leap towards better commitment to provide a better service to the community of farmers and other stakeholders who are very much dependent on this important Irrigation scheme of the State.

2. Objectives of the consultancy

The consultant shall carry out the process of irrigation benchmarking for the Kangsabati Reservoir Project with a view to enable achievement of optimisation with respect to the following objectives:

- Appropriate use of water
- Appropriate use of agricultural inputs
- Betterment of farmers' welfare

The performance indicators selected for benchmarking are as follows:

Domain	Performance Indicator
System Performance	<ol style="list-style-type: none"> 1. Irrigation Potential created and utilised. 2. Total annual volume of irrigation water supplied/delivered (m³/year) 3. Conveyance efficiency

	<p>4. Annual irrigation water supply per unit command area (Cum/ha)</p> <p>5. Annual irrigation water supply per unit irrigated area (Cum/ha)</p>
Agricultural Productivity	<p>6. Output per unit irrigated area – Tons/ha crop wise, Rs/ha</p> <p>7. Output per unit of irrigation water supplied (tonnes/m³)</p>
Financial Aspects	<p>8. Cost recovery ratio</p> <p>9. Total O&M cost per unit area (Rs/ha)</p> <p>10. Revenue collection performance</p> <p>11. Revenue per unit volume of irrigation water supplied (Rs/cum)</p> <p>12. Maintenance cost to revenue ratio</p> <p>13. Total O&M cost per unit of water supplied (Rs./cum)</p>
Social Aspects	<p>14. Equity Performance</p>

Broad objectives of the consultancy are:

- (a) To set the goal for the selected project in comparison to the standards set for the project (e.g. the Detailed Project Report for the project or any other project performing ideally, if available)
- (b) To identify the key processes and indicators which have the potential to improve performance of the project (specific to project type, may involve additional processes and indicators than considered commonly) in such a way that they are easy to estimate/measure with available infrastructure and facilities
- (c) To collect data in a way that is as simple as possible so that the personnel engaged/employed do not face problems in data collection
- (d) To carry out the analysis for benchmarking of the projects under consideration
- (e) To identify /quantify the gap in terms of performance indicators for the project.
- (f) To identify the means and methods for bridging up the gap for better management of the project.
- (g) To prepare a report that describes in detail the data, methods, analysis, gaps and way forward for the project.
- (h) To train a selected group of officers from the Department for carrying out independent operations of benchmarking irrigation projects in the future

The process of project evaluation may include the following steps:

- Carrying out reconnaissance survey of the project area including distribution system and reservoir
- Collecting and compiling data
- Data validation, processing and analysis

- Carrying out water auditing
- Computation and evaluation of performance indicators for
 - System delivery performance including irrigation efficiency
 - Production performance
 - Financial performance
- Identifying the gaps between the current and designed parameters
- Suggesting remedial measures for improving the performance

3. Scope of the Consultancy

The scope of the consultancy is broadly divided into two phases as follows:

Phase-I: Data collection and analysis phase

- i. Collection and evaluation of the available historic hydro-meteorological data, water availability and water use data, data on system performance parameters and financial aspects, data on agricultural productivity and environmental aspects for all relevant locations in the command area for all the years for which sufficient data exists. The use of remote sensing for estimation of parameters like crop evapotranspiration and crop yield is envisaged.
- ii. Carrying out data validation to ensure removal of anomalies
- iii. Estimation of benchmarking indicators.

Time: T + 12 months

Phase-II: Report writing phase

- i. Finding gaps that contributed to reduce the project performance as compared to the best in the country/ climatic region
- ii. Suggesting recommendations for improvement of the project performance
- iii. Preparation of the draft report and the final report after incorporation of the suggestions. The report should bring out how implementation of the suggestions indicated would benefit the local farmers and the society as a whole.
- iv. Providing training to the designated officers of the department, enabling them to carry out irrigation benchmarking for similar projects in the future.

Time: T + 24 months

Note:

1. The activities of training and capacity building are to be conducted throughout the second phase.
2. T is the time in month from signing of the contract

3.1 The key tasks in Phase I: Data collection and analysis phase

- **Collection and compilation of data.** Some of the data may be available at different locations/ in hardcopy format. It may also be required to rearrange data into the format suitable for analysis. A list of the key descriptors may include the following:

- Salient project features
 - Irrigable area
 - Annual irrigated area
 - Water source
 - Method of water abstraction
 - Water delivery infrastructure
 - Type of water distribution
 - Volume of water supplied (at all critical measurement locations, up to the smallest possible)
 - Cycle of irrigation
 - Availability of water through canal irrigation across the command area (upper to lower reach) in terms of adequacy of volume and timeliness of supply
 - Predominant on-farm irrigation practice
 - Climate
 - Average annual rainfall
 - Average annual reference crop evapo-transpiration (may be carried out through remote sensing with ground truthing)
 - Major crops (with percentages of total irrigated area)
 - Average farm size
 - Type of management
 - System performance
 - Financial indicators
 - Agricultural productivity (may be estimated using remote sensing with field verification)
 - Environmental aspects
- **Validation of data.** Before carrying out the benchmarking analysis it is necessary to do the auditing of collected data to remove inconsistencies. It may be done with the help of secondary information from other sources.
 - **Carrying out water auditing analysis and estimation of performance indicators.** It involves estimation of ratios to produce the value of the required performance indicators.

3.2 The key tasks in Phase-II: Report writing phase

- Identification of gaps- as obtained by comparison with the best projects of its class in the country/ climatic zone
- Suggestion of remedial/ improvement measures/ strategic directions to upgrade the system performance
- Preparation and submission of the draft irrigation benchmarking report for the specified project
- Preparation and submission of the final irrigation benchmarking report after incorporation of the comments received on the draft report
- Organisation and conduction of training sessions to make the nominated officers of the department capable to carry out irrigation benchmarking studies of similar other projects on their own in the future.

4. Deliverables

The deliverables will include but will not be limited to:

- Inception report
- Data collection and compilation report
- Draft final report of benchmarking
- Final report of benchmarking

5. Responsibility of the Consultant

The responsibility of the consultant will include the following tasks:

- Conduct and complete the consultancy as per the agreed TOR and scope of the consultancy subject to the full satisfaction of the Technical Advisory and Review Committee (TARC) within the stipulated time period.
- Collect data and information required from concerned agencies. The consultants may have to acquire real time data which is not available from different state agencies and/or others if so required. The costs will be reimbursable following the prior approval by the client.
- Conduct field visits as required for data collection or to verify results of analysis
- Train a selected group of officers from the Department, enabling them to carry out independent operations of benchmarking irrigation projects
- Hand over all software, hardware, data, and source code of all applications that were in public domain or that were developed as part of this project after the completion of the consultancy to the client.

6. Schedule for completion of tasks

The time schedule for the proposed deliverables are given below:

Deliverables	Description	Timing
1. Inception Report	Review of data availability and data quality, methodology for the exercise, with selected benchmarking indicators, and fortnightly schedule of implementation work plan.	T + 1month
2. Data collection and compilation Report	Collection, validation and compilation of all the data required for carrying out the task (hydro-meteorological, water availability and demand, agricultural and economic data, any other relevant data/information).	T + 12 months
3. Draft Final report of benchmarking	The draft final reports should provide complete details such as data analysis, outcome and results, recommendations, etc.	T+23 months
4. Final Report	Covering all the tasks described in the ToR and addressing all the observations of the client on draft final reports	T + 24 months
* T is the time in month from signing of the contract		

7. Handling Restricted Data

The Consultant shall not, either during the term or even after the expiration of this contract, disclose any proprietary or confidential information related to the Project, the services, this contact, or the Client's business or operations without the prior written consent of the Client.

8. Data Services and Facilities to be Provided by the client

The following amenities will be provided by the Client:

- Facilitation of the data collection by way of recommendation letters, as required. In case it is required by the consultant to purchase data, the actual cost of data shall be reimbursed to the consultant. It should be decided jointly by the client and the consultant with prior approval from the client before the procurement is made.
- Designated staff of the Department for training

9. Administration

For the purposes of this assignment, the Consultant will periodically report to a Technical Advisory and Review Committee (TARC) comprising of officers from the Department for guidance and review of works/ reports. The Consultant will work closely with the Client throughout this assignment – especially to discuss interim results and on methodology.

10. Desirable Experience of Consulting Firm and their Key Team Members

The lead organization for the project shall meet the following criteria

- Minimum five years of experience in providing consultancy services in the water sector, with particular emphasis and a track record of successfully delivering major analytical projects that directly interface with water resources policy or management.
- Demonstrated experience in carrying out similar benchmarking studies, and experience of working with governments/ state owned enterprises.
- The firm(s) / research institutes bidding on this project, including the JV partners and sub-consultants, should have at least 40% of the key professionals, including the Team Leader as permanent employees.
- Experience in technical assignments in developing countries; preferably India.
- Track record of providing solutions to water sector problems, with specific reference to the last five years.
- Ability to quickly deploy a team (professionals with relevant experience and qualifications) either from the lead organization or through sub-contracting arrangements.

Consultant Team

Sl. No.	Designation	Nos	Minimum Qualifications and Experience	Suggested Man Months
1.	Team Leader/ Senior Benchmarking Expert	1	<ol style="list-style-type: none">1. Master's in Agricultural Engineering / Water Resources Engineering or equivalent2. At least 15 years working experience in water resources.3. Having sound knowledge and experience of benchmarking irrigation projects in India/ abroad. Experience in India preferred.4. Should have handled at least two projects as a Team Leader/Dy. Team leader in projects,	1×24= 24
2.	Water resource/ Agriculture Specialist	1	<ol style="list-style-type: none">1. Degree in Water Resources engineering/ Agriculture.2. At least 10 years working experience in agriculture sector/ water resources sector3. Preferably having sound knowledge and experience of irrigation benchmarking.	1×18= 18
3.	Technical Support Staff	1	<ol style="list-style-type: none">1. Engineering Graduation in any discipline with minimum 3 years of working experience2. Preferably having working experience in assignments of similar type	1×24=24
4	Other support staff	2	<ol style="list-style-type: none">3. Graduation in any discipline	2×24=48
			TOTAL	114

11. Duration of Consultancy

The duration of consultancy will be **24 months**.

Annexure I: Main Performance Indicators for Benchmarking (INCID, 2002)

Domain	Performance indicator
(I) System performance	<ol style="list-style-type: none"> 1. Water delivery capacity Index 2. Total annual volume of irrigation water supplied/delivered (m³/year) 3. Field application efficiency 4. Annual Relative Irrigation Supply Index 5. Annual irrigation water supply per unit command area (m³/ha) 6. Annual irrigation water supply per unit irrigated area (m³/ha)
(ii) Agricultural Productivity	<ol style="list-style-type: none"> 7. Output per unit command area (Rs/ha) 8. Output per unit irrigated Area-Tons/ha crop wise, (Tonne/ha) 9. Output per unit crop water supply(tonne/m³) 10. Output per unit crop water demand(Rs/m³)
(iii) Financial Aspects	<ol style="list-style-type: none"> 11. Cost recovery ratio 12. Total O&M works cost per unit area(Rs/ha) 13. Total cost per person employed on O&M works (Rs/person) 14. Revenue collection performance 15. Revenue per unit volume of irrigation water supplied (Rs/m³) 16. Maintenance cost to revenue ratio 17. Staff numbers of O&M per unit area (person/ha) 18. Total O&M cost per unit of water supplied (Rs/m³)
(iv) Environmental Aspects	<ol style="list-style-type: none"> 19. (a)Average depth to water table(m) 20. (b)Land Damage Index 21. (a)Water quality: Ph./Salinity /Alkalinity Index 22. (b)Salt balance (tones)

Annexure II: Data Requirements Pertaining to the System/Sub-system (INCID, 2002)

1. Current canal capacity of the system/sub-system at the diversion point
2. Designed Peak irrigation water demand for a month/fortnight
3. Total daily measured water at the intake of the system /sub-system
4. Total daily measured water delivery to the field head
5. Total daily measured water used by evapo-transpiration (for different crops if available)
6. Total daily measured rainfall over irrigated area
7. Total command area serviced by the irrigation system/sub-system
8. Total annual irrigated crop area
9. Total annual tonnage of each crop
10. Market price/Minimum support Price (MSP) for the crops
11. Total volume of water consumed by the crops(Etc.). for rice crop, percolation losses need to be included
12. Total revenue collected from water users
13. Total management, operation and maintenance (MOM) cost excluding capital expenditure and depreciation/renewals
14. Total cost of MOM personnel
15. Total number of MOM personnel employed
16. Total revenue due during the year
17. Periodic measurements of depth to water table
18. Waterlogged area in the command area after introduction of irrigation
19. Salinity /alkalinity affected area in the command area after introduction of irrigation
20. Electrical conductivity of periodically collected irrigation water sample in mmhos/m³
21. Electrical conductivity of periodically collected drainage water samples in mmhos/m³
22. Total daily measured drainage water outflow from the irrigation system
23. Periodic measurement of salt content of irrigation water
24. Periodic measurement of salt content of drainage water