

**Memorandum of Understanding (MoU)**  
**Between**  
**World Bank assisted *Neeranchal* National Watershed Project**  
**And**  
**National Institute of Hydrology (NIH) -Implementing Partner**

1. This Memorandum of Understanding is for leveraging accumulated knowledge, expertise and institutional strengths of the National Institute of Hydrology, Roorkee NIH (the Implementing Partner) for providing support in the areas of Hydrological Assessment, Development of Decision Support Systems (DSS-H) and Capacity Building to the World Bank assisted Neeranchal National Watershed Project is entered into and signed on this day, November the 10<sup>th</sup>, 2016 between the World Bank assisted Neeranchal National Watershed Project of the Department of Land Resources, Ministry of Rural Development, Government of India (herein after referred to as Neeranchal Project), having its office at NBO Building, Nirman Bhavan, New Delhi, represented by its authorized representative, as the First Party

And

National Institute of Hydrology having its office at Roorkee-247667, Uttarakhand, India (herein after referred to as Implementing Partner - IP) represented by its authorized representative, as the Second Party.

2. Whereas the Department of Land Resources (DoLR), Ministry of Rural Development, Government of India will implement the World Bank assisted Neeranchal National Watershed Project for providing technical assistance to the Watershed Component of the Pradhan Mantri Krishi Sinchayi Yojana (WC-PMKSY), erstwhile Integrated Watershed Management Programme (IWMP) in selected states for better delivery of watershed management interventions for intended impacts.

3. Whereas the First Party will enter into strategic partnerships with Government, Semi-government, Civil Society, Public Sector and Private Sector Organizations with an objective to accelerate its progress for achievement of the project objectives.

4. Whereas the IP has gained significant knowledge, expertise and institutional strengths in Hydrological Assessment, Development of Decision Support System (DSS-H) and Capacity Building of related development sector projects.

5. Now the two parties to this Memorandum of Understanding (MoU) with the intention of mutually accepting the agreed terms and conditions, witness as follows:

**A. Objective of the Partnership**

The overall objective of the Partnership is to establish a strategic collaboration with the IP to provide comprehensive support to the First Party with the specific objectives as mentioned below.

- a. Develop and pilot new Decision Support Systems-Hydrology (DSS-H) to implement the WC-PMKSY at landscape, expanded sub-watershed and micro-watershed levels in the selected project areas under the states.
- b. Develop systems to provide improved hydrological information to support landscape level assessment for integrated watershed planning and management
- c. Develop tools and systems to help all the stakeholders, including farmers and local authorities to make better water management decisions during watershed planning and post implementation.
- d. Technical backstopping to States for urban watershed management

- e. Conduct capacity building programmes for the stakeholders to enable them to articulate their needs, prepare plans, implement them, manage the systems and monitor the results based on DSS-H

**(Please refer to the Terms of Reference (TOR) -Annexure-1 for a detailed description of the objectives, scope and deliverables.)**

6. **Deliverables by the Second Party under the Partnership:** The deliverables under the Partnership will be detailed in the Annual Action Plans which will include, but not limited to, the following Hydrological Assessments, Development of Decision Support Systems (DSS-H) and Capacity Building for meeting the current and emerging requirements of Neeranchal and WDC-PMKSY.

- a. Decision Support System- Hydrology (DSS-H) which broadly a combination of following:
  - i) Detailed report based on the hydrological evaluation of existing water conservation/ harvesting structures
  - ii) Hydrological information systems
  - iii) Water management decision systems
  - iv) Scenarios of present and future water availability (with suggested interventions), demand and estimation of potential gap, suggestive measures for addressing the potential gap for each developed scenario as in accordance with the District Irrigation Plan of the PMKSY.
  - v) Mobile application for the use of field staff and other stakeholders.
- b. Report and update (once in 3 months) on the efficiency and the efficacy of the DSS-H experiences with piloting the same - which will be integral part of the Neeranchal progress/ monitoring report.
- c. Handholding support to State Level Nodal Agencies (SLNAs) and Project Implementing Agencies (PIAs)
- d. Technical backstopping to States for urban watershed management
- e. Capacity building programmes for the stakeholders.

**(Please refer to TOR-Annexure-1 for a detailed description on DSS-H development, capabilities, functionalities and customisation, etc.)**

7. **Roles and Responsibilities of the First Party:**

- a. The First Party will advise on the various activities to be performed by the IP. It will also provide feedback on the outputs whenever necessary.
- b. The First Party will designate key-officials to participate in and facilitate all discussions regarding the preparation of Annual Action Plans, Manuals and other administrative activities with the IP to ensure that the Partnership is implemented as per MoU.
- c. The First Party will facilitate access to key information and data available with the DoLR and SLNAs or implementing agencies. The First Party will also coordinate with the SLNAs, relevant departments and other state level agencies to enable the NIH team to access requisite information.
- d. Funds required for performing / completion of the activities as per this MOU or the Amendments thereof, will be provided by First Party on the basis of the receipt and satisfactory report of the various deliverables as mentioned in the attached ToR.

- e. The First Party will provide timely feedback and comments on all reports submitted by the IP for undertaking necessary revisions or corrective actions as necessary.

## 8. **Implementation Arrangements:**

8.1 **Neeranchal Project Hydrological Cell (NPHC):** The IP will constitute a dedicated NPHC comprising professional as required by the project on a full time basis. The job profile, key qualifications and experience of the proposed team are mentioned in the para 6 of the Annexure 1. Engagement of the key personnel of NPHC will be with the prior approval of the First Party. The NPHC would be responsible for approving all contracting and procurement subject to prior clearance by the First Party.

### 8.2 **Annual Action Plans:**

- a. The Partnership will operate through a mechanism of Annual Action Plans (AAPs) prepared by the IP in consultation with the designated PIU Expert and duly approved by Project Director – Neeranchal on a year to year basis, which will become an integral part of the MOU.
- b. The IP will initially prepare Annual Action Plans (with quarterly activities and budget projections) for the first two years and revise/prepare AAPs for every subsequent two years, by clearly listing out in detail all the activities including ongoing/pending activities (if any), implementation strategy, expected outputs/outcomes, delivery timelines and financial projections on reimbursable costs for the financial year and submit to the First Party for appraisal and clearance.
- c. The mutually agreed AAPs will clearly indicate the estimated year-wise costs of all activities including the cost of full and part time staff, payment of honoraria, consultants, travel, etc.

8.3 **Procurement Procedures:** Procurement risk and capacity assessment of the IP shall be carried out by the World Bank. Procurement of goods, works or services, if any, required as per this MOU, shall be included in the Project Procurement Plan to be consolidated by the First Party for Bank prior clearance. Procurement by the Second Party shall be strictly as per the agreed procurement processes and procedures prescribed in the Neeranchal Procurement Manual, which is prepared in accordance with World Bank Procurement Guidelines for Goods, Works and Non consulting services 2011, and Selection and employment of Consultant 2011 for consultancy services. Bidding documents as agreed with the First Party shall be used for carrying out procurement under the project. The IP shall maintain all the procurement related documents in a proper and systematic manner so that they can be easily retrieved and shared with the officials of the Bank or their authorized auditors for their review as and when they request for the same.

8.4 **Financial Procedures:** The IP will abide by all financial regulations as per World Bank Guidelines, General Financial Rules, 2005 and other relevant instructions issued by the Government of India on the subject. In respect of all project transactions, all necessary supporting documents, records and accounts shall be kept by the IP as per the financial procedures laid down in the Financial Manual.

- a. The IP shall:
  - i) Maintain a financial management system and prepare financial statements in accordance with consistently applied accounting standards acceptable to the First Party both in a manner adequate to reflect the operations, resources and expenditures; and (2) at the First Parties request, have such financial statements audited by independent auditors, in accordance with consistently applied auditing standards, and promptly furnish the statements as so audited to the First Party;

- ii) Allow the First Party to inspect the project(s), its operation and any relevant records and documents
- iii) Prepare and furnish monthly/quarterly financial reports [including copies of bank statements] reflecting all receipts and uses of Neeranchal funds and submit the same to the First Party as per agreed reporting schedules to the First Party.
- iv) Provide all such additional information on the financial reports as the First Party shall reasonably request.

9. **Fund Management and Procedure for release of Funds in Installments:**

- a. The IP shall open and maintain a separate account for all receipts received from First Party and expenditures to be incurred for Neeranchal. The funds provided under the Neeranchal in this account should not be used by the IP for any other purpose than the mutually agreed activities as per this MOU. Also, the funds should not be invested in any form of short or medium term deposit schemes.
- b. All direct project related incremental operating expenditures [for example, incremental salaries, travel, office costs, event management, rentals, recurring office costs, office equipment] for which NIH will provide required supporting documentation, will be considered as eligible for reimbursement for the Neeranchal project.
- c. The IP will follow the approved Annual Action Plan and budget of Neeranchal and accordingly develop its quarterly action plans. The funds advanced will be used only for meeting expenditure incurred in the actual conduct of various tasks assigned by Neeranchal. The IP will follow all financial due diligence expected under the Neeranchal implementation framework for making expenditure out of the advanced funds, by adhering to procedures laid down in the Financial Manual.
- d. Release of the first installment – After approval of Annual Action Plan of the first year, the funds required for the initial two-quarters as per the Annual Action Plan (Budget estimate) will be released to the IP, after signing the partnership MoU.
- e. Thereafter, the funds will be released on a six monthly basis, as per the budget estimates, according to the approved AAP by the First Party. While seeking funds for the next six months, the Second Party would submit details of expenditure of previous releases and targets achieved with reference of AAP. On completion of a financial year, the Second Party would also submit a Utilization Certificate (From GFR19-A), Audited Statement of Accounts, etc. in respect of funds released by First Party in the preceding financial year.

10. **Accounts and Audit of Expenditures:** The IP will maintain a financial management system and prepare financial records with consistently applied accounting standards acceptable to the First Party with all relevant records, including invoices and receipts, etc. copies of which will be forwarded to the First Party on a monthly/ quarterly basis. The Books of Accounts and the supporting documentation for the expenditure under the Partnership will be subject to third party internal / external audits by CAG, Chartered Accountant Firms engaged by the First Party, for the purpose. In addition, the physical and financial records will be subject to review by the First Party and representatives of the World Bank as may be required.

11. **Reporting Mechanism:** As per the reporting requirement under the partnership, the IP will submit the following reports which will be reviewed and approved by the First Party:

- (i) Annual Action Plans along with budgets
- (ii) Monthly / Quarterly Progress Reports against the agreed quarterly outputs in AAP.
- (iii) Monthly / Quarterly Financial Reports, including statement of expenditure.

- (iv) Any other report/s as agreed between the partners for certain critical activities in the Annual Action Plan

**Please refer to Appendix-1, Point 7, for Reporting Requirements and Frequency of Reports**

12. **Effective Date / Duration of Partnership / Period of Validity:** It is envisaged that the duration of the project implementation support will be for a period of five years. This Memorandum of Understanding shall enter into force when signed by both Parties and remain valid for the period of the project. In case the period of the project is increased, the MoU will also be extended to the extended period of the project subject to the mutual agreement of both the parties.

13. **Annual review of the partnership:** An annual review of the performance of the partnership shall be carried out for necessary course correction and reinforcement of commitments of either party.

14. **Ownership of physical & intellectual property:** On completion of the project, subject to depreciation, the Second Party shall hand over the assets created under the project in the form of purchase of hardware, software, other equipments etc to the first party. The ownership of intellectual property created through the project shall lie with the first party.

15. **Amendments to the MoU:** The Obligations of the First Party and the IP have been outlined in this MoU. During its operation, this Partnership MoU may be amended through mutual agreement. Any amendment will be without prejudice to any rights or obligations incurred under this MoU or supplementary agreements thereto reached pursuant/ prior to the effective date of such amendments.

16. **Breach of MoU:** The First Party shall have the right to unilaterally terminate the MoU by giving 30 days' notice to the Implementing Partner, in case the latter fails to provide the required services or abide by the terms and conditions agreed upon, and mentioned in the MoU. The second party shall also have the right to terminate the MoU giving 30 days' notice to the First Party if the first party fails to provide funds for implementation of the AAP subject to para 7 of this MoU.

17. **Force Majeure:** For the purpose of this MoU, "Force majeure" means an event which is beyond the reasonable control of the Party, is not foreseeable, is unavoidable and makes a party's performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible under the circumstances and subject to those requirements, includes but is not limited to, war riots, civil disorder, earthquake, fire, explosion, storm, flood, or other adverse weather conditions, strikes, lockouts or other industrial actions, confiscations or any other action by Government Agencies.

Force majeure shall not include

- i) Any event which is caused by the negligence or intentional action of a Party or such Parties' experts, sub-consultants or agents or employee, nor,
- ii) Any event which a diligent Party could reasonably have expected to both take into account at the time of the conclusion of this MOU, and avoid or overcome in the carrying out of its obligations. Force Majeure shall not include insufficient of funds or failure to make any payments required.

18. **Dispute Resolution:** Any dispute between the Parties arising under or related to any aspect of this MoU shall be settled through mutual consultations by both the parties. In case of disagreement, the decision of the Additional Secretary, DoLR shall be final.

19. **Schedules/Appendices: (To be Prepared by the Implementing Partner)**

The following appendices shall form part of the MOU:

- i) Detailed Terms of Reference
- ii) Annual Action Plans for Year 2016-17
- iii) Annual Action Plan for the Year 2017-18

In Witness whereof, both the parties of this MoU, World Bank assisted National Watershed Project named as 'Neeranchal' and the National Institute of Hydrology, Roorkee, (the Implementing Partner) each acting through its representative duly authorized thereto have signed this Memorandum of Understanding on the date first above written, have set their hands together and signed on the day and date aforesaid.

<b>For The First Party</b>		<b>For Implementing Partner</b>	
Signature with Seal:		Signature with Seal:	
Date:		Date:	
Designation:	(Deputy Director General (WM), Department of Land Resources)	Designation:	(Director-NIH Roorkee)

Address: NBO Building, Nirman Bhavan,  
New Delhi - 110011

Address: National Institute of Hydrology  
Roorkee

# Appendix-I to the MOU

## Terms of Reference (NIH) (For Neeranchal Project)

### Background

The Department of Land Resources (DoLR), Government of India is implementing the World Bank supported Neeranchal National Watershed Management Project. Neeranchal is expected to positively influence the outcomes of the ongoing Watershed Development Component of the Pradhan Mantri Krishi Sinchayi Yojana (WDC-PMKSY), the erstwhile Integrated Watershed Management Project (IWMP), 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 main objectives of the WDC-PMKSY are to restore the ecological balance by harnessing, conserving and developing degraded natural resources such as soil, vegetative cover and water. 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.

*Neeranchal* is also expected to provide support to the overall PMKSY in capacity building, convergent planning, communications and monitoring and evaluation. As water including its conservation, distribution and efficient use constitute the core of the PMKSY initiative, it is imperative that any Implementing Partner for *Neeranchal* take into consideration the other components of the PMKSY supported through the Ministries of Agriculture & Farmers Welfare and Ministry of Water Resources, River Development and Ganga Rejuvenation.

Whereas, *Neeranchal* is not expected to invest in field based interventions and is likely to provide technical capacity building support, the achievement of its outcomes will necessitate close alignment with the WC-PMKSY at both national and state levels. By design, *Neeranchal* is proposed to be implemented in 9 Indian states where significant WDC-PMKSY investments are made. It is proposed as a 6-year project with the first being the preparatory year.

### 1. Project Objectives and Structure

The Project Development Objective is to improve the effectiveness of the Watershed Development Component of the PMKSY. Effectiveness is defined by improved incremental conservation outcomes and agricultural yields for communities in project areas and adoption of new processes and technologies into the broader Watershed Development Component of PMKSY in participating project States. Within this context, the key indicators are:

- i. Conservation outcomes in project micro-watersheds
  - Incremental changes in biomass (NDVI values)
  - Incremental reduction in soil loss (t/ha/yr)
- ii. Increased average incremental productivity of arable lands in project micro-watersheds
  - Cereals (t/ha)
  - Pulses (t/ha)
  - Oilseeds (t/ha)
  - Vegetables (t/ha)
  - Milk (l/lactation)
- iii. New approaches developed under the project are integrated into national watershed management programs beyond project sites
  - National watershed guidelines reflect new approaches for watershed planning and monitoring
  - WDC-PMKSY disbursement ratio in participating States increases over baseline

The proposed **Project Components** are:

### ***C-1 - Central Institutional and Human Capacity Building***

- i. Central capacity building
  - support strengthening DoLR for improved watershed planning, support and policy analysis
  - support training development and execution at State level
- ii. Strengthening national M&E for watershed development
  - design and develop an integrated M&E framework that links DoLR and States
- iii. Communications
  - Lead project-wide national communications

### ***C-2 National Innovation Support***

- i. Institutional Applied Research and Development – 2 consolidated focal areas
    - Agricultural performance, rural livelihoods and climate change
    - Decision Support Systems and data bases for hydrology and watershed management
- The component will generate knowledge, tools and new approaches to support improvements in the WC-PMKSY
  - Support piloting at field level to develop a clear body of evidence for innovations
  - Component 3 will scale up successful innovations in the field in project states

### ***C-3 Implementation Support for the Watershed Development Component of the PMKSY in Focal States***

#### **A Core activities across all participating states**

- Support for improved program integration in rainfed areas Institutional Strengthening
- Adoption of R&D and Technology Transfer
- Project Management and Coordination

#### **B – State specific activities**

- State specific innovations and pilots

#### **C – Urban Watersheds**

- Development of Urban Watershed Management

### ***C-4 Project Management Support***

#### **1.2 Target Areas**

The project would predominantly focus on supporting watershed management activities in the following nine states: Andhra Pradesh, Chhattisgarh, Gujarat, Odisha, Jharkhand, Madhya Pradesh, Maharashtra, Rajasthan and Telengana. While primary project engagement would be with the State-level Nodal Agencies (SLNAs) of these States, sub-state engagement is likely in a few cases.

#### **1.3 Institutional Arrangements**

1. The lead implementing agency is the Department of Land Resources, Ministry of Rural Development, Government of India. The project, however, will be implemented on the ground with various State Governments and in all likelihood, at least a few local governments and communities. As such it



requires coordination, collaboration, and information sharing. Overall project coordination will be with the PD-DoLR, and a dedicated PIU is being set up for the purpose. A significant quantum of the project's investments will be implemented by state watershed agencies, as States have primary responsibility for implementation of the WDC-PMKSY to achieve its targeted outcomes. In addition, activities listed under Component 1 of Neeranchal are envisaged on a nation-wide scale and will be implemented directly by DoLR. Neeranchal will enter into strategic partnerships with Government, Semi-government, Civil Society, Public Sector and Private Sector Organizations as required, with an objective to accelerate its progress for achievement of the project objectives.

A systematic sub basin level study of the watersheds along with various activities like mapping the surface water resources, understanding the demand of the water from various users, analysing the gap and developing Hydrological Decision Support System for the present and future water demand for selected sites in the various states under Neeranchal is necessary for better hydrological outcomes and impacts of watershed management interventions. DoLR has identified the National Institute of Hydrology (NIH) as the Implementing Partner which has gained significant knowledge, expertise and institutional strengths in Hydrological Assessment, Development of Hydrological Decision Support Systems (DSS-H) and Capacity Building in the subject area. NIH will collaborate closely with other organisations such as IIT Delhi within the subject area and with other Consultants /agencies/ organisations for related inputs relating to Agricultural Performance, Climate Change, Development of digital databases and DSS-Watersheds within Component 2 and with organisations/agencies contracted for Capacity Building, M&E, MIS and Communications, under Component 1. NIH will also share data/ models/ best practice documentation in agreed format with the Neeranchal Knowledge and Data Centre to be established under Component 1 of the Project.

Significant knowledge sharing and convergence is also foreseen with other World Bank Projects on Hydrology and Groundwater in order to develop synergies and avoid duplication.

NIH will institute national and state/district-level teams to coordinate the effort. NIH shall establish an institutional arrangement for co-ordinating with the SLNAs.

#### **1.4 Objective(s) of the Assignment**

The specific objectives of the current assignment are to:

- a. Develop and pilot new Decision Support Systems-Hydrology (DSS-H) to support DoLR and States to implement WDC-PMKSY at landscape, expanded sub-watershed and micro-watershed levels
- b. Develop systems to provide improved hydrological information to support landscape and project level assessment and integrated watershed planning
- c. Develop systems to help all the stakeholders particularly the Gram Panchayats, Village Watershed Committees, project level communities, farmers and local authorities to make better water management decisions as part of watershed planning,
- d. Develop simple tools including software and mobile apps for use by the communities, local government and project implementing institutions for their water-related information and decision making needs
- e. Provide and build relevant hydrological databases and systems for information flows for DSS-H at all levels
- f. Coordinate closely with Consultant engaged by the Project for Agricultural Performance to provide inputs/models for agricultural water management
- g. Demonstrate community water management models
- h. Work closely with the Consultant for Climate Change-related assessments to integrate climate information and projects into the DSS-H model / else integrate such information when customizing the DSS-H for state or site-specific requirements
- i. Technical backstopping to DoLR and the States for urban watershed management

- j. Strengthen capacities of various stakeholders to enable them articulate their needs, prepare plans, implement them, manage the systems and monitor the results based on DSS-H
- k. Prepare relevant training material and multi media content such as primers, short films, videos, photographs, etc
- l. Undertake impact assessment of the DSS-H initiative
- m. Develop synergies with other projects focusing on hydrology, groundwater or water management to contribute to and generate more robust hydrological databases for the country, especially providing the watershed/ micro-watershed scale and context.

## 2. Scope of Services, Tasks and Expected Deliverables

The deliverables under the Partnership will be detailed in the Annual Action Plans which will include, but not limited to the following Hydrological Assessments, Development of Decision Support Systems (DSS-H), demonstrating the use of hydrological information in agricultural operations, community water management, developing hydrological databases and Capacity Building for meeting the current and emerging requirements of Neeranchal. The assignment is envisaged to be undertaken in two phases . The first phase spanning 2-3 years will consist of developing and piloting the DSS-H. In the second stage, the learnings from the pilot shall be scaled up in which IP shall play a central role. The IP and SLNAs shall start working on upscaling from the time any significant learnings are achieved. The tasks to be performed would be the following:

- a. Development and piloting new Hydrological Decision Support Systems (DSS) to support DoLR and States to implement the Watershed Development Component of PMKSY at landscape, expanded sub-watershed and micro-watershed levels with improved hydrological data and options,
- b. Assessment and estimation of availability of surface and groundwater at present and future water demand for different uses including agriculture, domestic/drinking and industry at sub basin and watershed levels. Each cluster or independent 4 to 5 sub-watersheds would approximately measure 25000 ha.
- c. Estimation of gap in water demand (at both spatial and temporal scales)
- d. Planning for addressing the gap through
  - i. Optimization of water management interventions keeping in view the gap in demand, water availability,
  - ii. Augmentation of supply using appropriate technology-based solutions
  - iii. Reduction in demand
- e. Identification of water bodies, hydrological evaluation of existing water conservation/harvesting structures runoff, stream characteristics and building models to develop potential water resources map for surface water and groundwater at watershed level. This will also support the hydrological information requirement of the District Irrigation Plans for the concerned area
- f. Detailed hydro-geological assessment based on water quality, quantity, aquifer characteristics, groundwater abstraction and recharge to delineate areas for potential groundwater recharge within the watershed, as run-off, recharge and storage zones. This will also support the hydrological information requirement of the District Irrigation Plans
- g. Generating scenarios of future water availability (with suggested interventions) and demand, and estimation of potential gap in water demand including possible(livelihood) opportunities and planning for addressing this potential gap in water demand for each developed scenario
- h. Handholding support for hydrological inputs to DPRs in line with requirements for integration of these with the District Irrigation Plans under PMKSY
- i. Systems including software and mobile apps for information and analysis support for the DSS-H at the project and local levels
- j. Demonstrate agricultural and community water-balance/management models in collaboration with the Consultant for Agricultural Performance
- k. Integrate Climate Change information into hydrological models and DSS-H in collaboration with Partner undertaking climate change assessments.
- l. Preparation of an Operating Manual for the DSS-H
- m. Capacity building of the local stakeholders and institutions through trainings at different levels.

- (i) Conduct capacity building programs for the stakeholders to enable them articulate their water needs, prepare plans, implement them, manage the systems and monitor the results based on DSS-H
- (ii) Conduct capacity building programmes for SLNAs, WCDCs, PIAs & WDTs to enable them to carry out their specific tasks addressing the specific water-related concerns
- (iii) Training and IEC in the subject area, including development of print and multi media content

## **2.1. DSS-H: Scope and activities**

### **Development of DSS-H: Scope and activities**

An obvious starting point in the development of a DSS is to undertake a ‘needs analysis’ to define the nature of the water resource issues to be addressed by the Hydrological DSS. The NIH Team will undertake a preliminary needs analysis by conducting workshops to interact with stakeholders in all participating States. These will help in identifying the nature and importance of water resource issues and outputs for each of the DSS-H components.

An important activity of this (needs assessment) phase of the assignment will be to identify and formulate the specific functional requirements for the DSS-H. Within each State there will be a number of different user profiles of the people who will be using DSS-H as part of their WDC-PMKSY activities. User profiles may include technicians who enter field data into the system and perform data processing and quality analysis tasks; engineers/scientists may use different analysis components and mathematical modelling systems to make predictions and compare different water management scenarios within the DSS-H. The engineers/scientists and water resource planners will also need a suite of DSS-H tools that help them to evaluate, compare alternatives and produce meaningful outputs for decision makers. Managers and decision makers may use the system to extract key water information in predefined reporting formats. Finally, system administrators will need a number of system tools that allows them to maintain, configure and expand the DSS-H. The most important users of the DSS-H would be the local communities in the projects/villages and the individual farmers. The DSS-H should be comprehensible and easy to handle for individual users and the community. The final DSS-H will be used in nine different States.

Mathematical models are designed for highly skilled and trained engineers/scientists, and these models produce a large amount of output data that need filtering, analysis and interpretation. The DSS-H will translate complex and large datasets into simple outputs, designed for decision making. These outputs may often be in the form of standardised simple reports containing graphs, tables and text. The reporting platform may be standard MS-Office products (e.g. as MS-Word, Excel) or HTML for web-publishing. Reports may be created for different requirements. Some reports may be designed for field engineers/scientists and contain raw or processed model outputs while other reports may be designed for decision makers. A report for decision makers may, for instance, contain the result of a water focussed cost-benefit analysis in the form of a ranking of multiple model scenarios.

The main purpose of developing DSS-H is to manage large datasets and information and transform them into simple and meaningful outputs.

A detailed User/Operational Manual for the DSS-H shall be provided by NIH, which will illustrate the procedures of use of DSS-H using different tools. The manual should be simple and also provide useful information regarding the use of tools at various levels for different users with varied capacities.

- a. DSS-H Capability: The DSS to be developed in this Project will have a number of functionalities (capabilities), which can be grouped as follows:
- Management of spatial and time series hydrological data, including facilities for import, presentation, and analysis of the data.
  - Scenario Management to define and execute model simulations and enable further analysis and processing of results
  - Analyses in the form of e.g. benefit-cost analysis or multi-criteria optimization based on potential hydrological outcomes
  - Reporting of selected results and analyses

Some of the relevant platforms/ models/ tools planned to be used in the development of DSS are:

- SWAT
- WEAP
- E-WATER
- ArcView GIS
- Global Mapper

The required DSS-H capabilities will be known after the Needs Assessment process with the stakeholders in the participating States, and the selection of modeling tools for the DSS will be made based on the requisite DSS capabilities.

- b. Hydrological evaluation of existing water conservation/harvesting structures: A variety of water conservation/harvesting structures are likely to be available in the watersheds where WDC-PMKSY is operational. With the capabilities of hydrological models proposed to be used in the Neeranchal Project, hydrological evaluation shall be carried out for these structures. This will provide a basis for improvement in the performance, sustainability of these structures as well scaling up of these activities.
- c. Handholding support for hydrological inputs to DPR and DIPs: The development of DSS-H shall provide hydrological inputs to the DPRs being prepared for various schemes in the project areas. Once the DSS-H is ready, it will be used for the next two years to provide handholding support to the local State departments for preparation of the DPRs. Handholding support during subsequent upscaling throughout the State shall be provided by the IP.
- d. DSS-H Functional Components: The core functionality of the DSS-H may be categorised in 6 groups as follows:
- I. Hydro-meteorological Information System and Databases
  - II. Hydrological Analysis and Modelling
  - III. Scenario Management related to water
  - IV. Decision Support for water-related outcomes
  - V. Presentation and Dissemination
  - VI. System Configuration
- e. DSS-H User Interface: The Graphic User Interface (GUI) of a DSS is used by the user to access various resources through a combination of pop-up windows, pull-down menus and button controls. An interactive, easy-to-use and user-friendly GUI adds values to the DSS functionalities. The main client will be a Windows client that allows users to access data, information and tools embedded in the DSS-H. Each window of the DSS-H User Interface will

be configurable and carefully designed for specific tasks and needs. The precise design will be determined after the needs assessment phase.

- f. Design and Development of DSS-H: The design of the DSS-H will build on the findings of the needs assessment phase. The design will gradually be refined during the development process through a number of workshops where demo versions and prototypes will be presented. The modelling work at the sub- basin level proposed by the NIH shall be reviewed jointly **by the World Bank and DOLR**

The DSS design process will involve a number of different tasks:

- I. Development/adaptation of mathematical models
- II. Integration with existing data sources
- III. Design and development of Generic DSS-H Platform
- IV. Customisation of DSS-H Platform

1. Mathematical Models: Mathematical models will be an important part of the DSS-H. During the needs assessment phase, subject experts will visit the Implementing States (IS) and Implementing Agencies (IA). The purpose of the visit will be to work with IS and IA experts to understand the different water resources issues in depth and to assess the data availability within the IS/IA.

During State visits, the subject experts will hold consultations with State stakeholders. Further, the experts and the IS/IA will jointly assess the data needs and the availability. The findings of the consultations will be consolidated, based on which an appropriate scientific approach and mathematical models will be selected. Subsequently, the models will be built, calibrated and validated and finally implemented in the DSS-H.

It is important for successful project implementation that useful mathematical models are generated and made available for implementation in the DSS-H. Appropriate mathematical models for implementation in the Generic DSS shall be prepared as early as possible so that they can be implemented in the Generic DSS and serve as “test models” for the Generic DSS. In the present application, the mathematical models must be available within 12 months from assignment start.

2. Development of Generic DSS-H: The bulk of the software development activities are related to developing the Generic DSS-H. To a large extent, the Generic DSS-H will build on the existing software components (models) brought together in a flexible DSS framework.

The first step in the development of the Generic DSS is *Concept Design*. A preliminary Concept Design will be developed by the NIH Team and will be discussed and reviewed with the Neeranchal team and other stakeholders at the Interaction Workshop. The Generic DSS-H shall be ready within 14 months after start of the project. Once a generic DSS-H package has been developed, it is to be applied (customized) to identified basins/sub-basins/micro-watersheds in each participating State.

3. Demonstration of DSS-H: At the initial stage (DSS Model Conceptualisation), a non-functional demo DSS will be prepared. The purpose of the demo DSS-H will be to demonstrate the structure and layout of the graphical user interface. It will consist of a number of user dialogues, but the underlying functionality will not be included. The demo DSS-H will be presented to IS/IA experts at Interaction Workshops. The feedback received at the workshops will be used to improve the design of the DSS-H.

4. Iterative Development Process: The development process will progress around the four principal components of the DSS-H (data manager, scenario manager, analysis manager, and report manager). The development process will be iterative. During the development process, in order to get feedback from the IS/IA experts workshops will be organized at various levels. Once the development is complete, the Generic DSS-H will be installed and deployed at the State and district levels.
5. Customisation of DSS-H: During the DSS customisation phase, the Generic DSS-H will be customised to match the needs of each of the States. The Generic DSS-H will be installed at the PIU, each State, and interfaces will be established with the existing data sources. Subsequently, the Generic DSS-H will be configured for each State. This involves incorporating mathematical models and scenarios in the Scenario Manager and specific analysis and scenario evaluations in the Analysis Manager. Tailored outputs will be established using the Report Manager. Finally, the DSS-H will be tested and refined during the next phases (DSS Testing/Refinement DSS Application and Demonstration).
6. Pilot Watersheds: The selection of pilot watersheds and the application of the generic DSS-H software to the pilot watersheds are regarded as essential steps in this Project. These activities, which will be undertaken in conjunction with the States, will provide a firm foundation and understanding of the software and its capabilities and facilitate its application to States during the customisation phase of the Project. The NIH will collaborate in these watersheds with other project partners/consultants to demonstrate community water management and agricultural water management that are undertaken based on inputs provided by the DSS-H. It is proposed to discuss the selection of the pilot watersheds with the Neeranchal Team and specific partner state to identify watersheds for pilot testing purposes.

A detailed User/Operational Manual for the DSS-H shall be prepared providing guidance on the use of the DSS-H, using different tools. The manual would be simple and also provide useful information regarding the use of tools at various levels for different users with different capacities.

After the customisation, DSS-H will help in management decision-making and at planning and operational levels as narrated below:

- a. Provide technological options and solutions for improved water management
- b. Provide alternatives through modelling to mitigate drought and manage disasters
- c. Develop on-the-ground water management strategies taking into account site-specific constraints
- d. Hydrological models for designing and identifying the locations for rainwater harvesting structures in the watersheds
- e. Assess impact of various watershed interventions and rainwater harvesting structures on crop productivity and increased incomes with soil conservation on-site as well as off-site downstream impacts, through reduced runoff and changes in groundwater recharging, etc.
- f. In situ water management
- g. Developing water impact calculator for supplemental irrigation and use of water impact calculator in place of calendar-based irrigation. This experience will also put together integration of various models for developing the integrated decision support system.

## **2.2 Functions of DSS (at different levels):**

### 2.2.1 Hydrological Assessment

- Water demand management
  - Spatial and temporal water availability from different sources
  - Water balance
  - Water demand gap for different uses
  - Water management plan (covering hard and soft options)
- Scenario development
- Hydrological monitoring in pilot micro-watersheds

### 2.2.2 Watershed Management

- Institutional networking and capacity building
- Advise suitable sites, locations & designs for water harvesting and conservation structures
- Preparation of ‘watershed scorecard’ (based on biophysical and socio-economic indicators)
- Convergence with other related operational schemes

## **2.3 Capacity Building and Outreach**

Training will be a key element of dissemination and it should be seen as a tool that can maximize the use and impact of DSS-H dissemination efforts. These will be undertaken in coordination with the Neeranchal CB –Cell n the PIU and the respective SLNA/ State Capacity Building Support Agency. The trainings planned under the sub component/ assignment shall focus on the physical processes involved in the DSS-H development together with application-specific case studies and hand-holding support. A few activities are mentioned below:

- Preparation of training manuals for all the stakeholders in English as well as regional language
- Training of stakeholders
- Interaction workshops
- Field demonstrations and hand-holding support to diverse categories of stakeholders expected to be involved in the process during the upscaling stage.
- Documentation and dissemination activities

These trainings are also considered to be important vehicles of creating awareness among various stakeholders who would take the knowledge forward both in terms of value addition through research inputs and later adoption in preparation of DPR/implementation of DSS-H.

Regular interaction workshops and awareness activities will also be conducted and documentation shall be prepared to ensure that the stakeholders’ views are adequately addressed and the developed concepts and technologies are adopted by the target group and thus the DSS-H software can be put into practice.

The following trainings are a specific component of the assignment:

- On-the-job training to the identified SLNA, PIA (which working in the present framework of WDC-PMKSY), WDT members on DSS-H model, database development, generic DSS-H development, customization of DSS-H, testing and refinement, application and demonstration, evaluation and fine tuning, dissemination etc.
- Programmes for imparting the training to the participants , to be identified by the project IAs during the various stages of scheduled tasks to be carried out for DSS-H. Established

and reputed agencies would assist NIH and provide required infrastructure facility for the organization of the training programs on the DSS-H for the participants of implementing States. Trainings would be coordinated through the PIU and respective SLNAs.

- Training of State line departments on the DSS-H software, providing sample inputs and sample outputs for illustrative examples.
- Training at village/watershed level on the use of tools developed that cater to their specific requirements.

Training programmes, at least in one location per project district shall be conducted by the IP.

## **2.4 Expected Deliverables**

The deliverables under the Partnership will be detailed in the Annual Action Plans which will include, but not limited to the following: Hydrological Assessment, Development of Decision Support Systems (DSS-H) and Capacity Building for meeting the current and emerging requirements of Neeranchal.

- a. Hydrological Decision Support Systems (DSS-H) to support DoLR and States to implement WDC-PMKSY at landscape, expanded sub-watershed and micro-watershed levels. DSS-H will include Hydrological Information System to support landscape level assessment and more integrated watershed planning and Water management decisions systems to help all the stakeholders including farmers and local authorities to make better water management decisions as part of watershed planning,
- b. Provide a report and update (once in 3 months) on the efficiency and the efficacy of the Decision Support System and its pilot experiences - which will be integral part of the Neeranchal progress/ monitoring report.
- c. Scenarios of present and future water availability (with suggested interventions) and demand, and estimation of potential gap in water demand, factoring in climate projections.
- d. Suggestive measures for addressing the potential gap in water demand for each developed scenario
- e. Detailed report based on the Hydrological evaluation of existing water conservation /harvesting structures
- f. Handholding support to SLNAs and PIAs for hydrological inputs to DPR and DIPs
- g. Technical backstopping to States for urban watershed management.
- h. Synergies developed with other Projects on hydrology and water management result in more comprehensive national hydrological databases.
- i. Capacity building programs for the stakeholders enable them to better articulate their water – related needs, prepare plans, implement them, manage the systems and monitor the results based on DSS
  - I. Building Capacities of SLNAs, PIAs & WDTs in the hydrological domain
  - II. Building Capacities of communities in the pilot districts to make informed decisions and prepare a sustainable integrated water management plan including agriculture, drinking water and other uses and (ii) to empower them to undertake implementation, operational and management activities by using DSS-H

## **2.5 Outcomes of the assignment**

Successful implementation of the partnership is expected to result in development and access to tools for hydrological assessment and decision making for water-related interventions in watersheds and



stakeholders at various levels effectively integrate the knowledge and tools developed in the planning and implementation of watershed projects.

## 2.6. Team Composition & Qualification Requirements for Key Experts

### TEAM COMPOSITION

#### Key Experts:

SN	Position	Specialization	Qualifications & Experience	Relevant Experience
1	Project Team Leader	Watershed hydrology, Project Management	Doctorate /PG in Hydrology/Engineering/Sciences having experience of Hydrology with minimum 20 years of R&D experience, particularly of handling watershed projects	Minimum 10 years of R&D experience, particularly of handling watershed Hydrology of the large scale watershed projects
2	Deputy Project Leader	Water Resources Management	Doctorate /PG in Hydrology/Engineering/Sciences having experience of Hydrology with minimum 10 years of R&D experience, particularly of handling watershed projects	Minimum 5 years of R&D experience, particularly of handling watershed Hydrology of the large scale watershed projects
3	Domain Expert (s)	Hydrologic modelling	PG/Doctorate in Hydrology/ Engineering/Sciences; with minimum 10 years of R&D experience in Customization of hydrologic models and interfacing with DSS-H hydrologic modelling	Minimum 5 years of Customization of hydrologic models and interfacing with DSS-H
4	Subject Specialist	Hydro-geology	PG/Doctorate in Hydrogeology/Earth Sciences; with minimum 10 years of experience in watershed projects with Hydrogeological inputs for location of water harvesting and conservation structures and sites	Minimum 5 years experience of Hydrogeological inputs for location of water harvesting and conservation structures and sites in watershed projects
5	Subject Specialist(s)	Soil & Water Conservation Engg.	PG/Doctorate in SWC Engineering; with minimum 10 years of R&D experience in watershed projects	Minimum 05 years of R&D experience in watershed projects

6	Subject Specialist	Soil Physics	PG/Doctorate in Soil Physics/Earth Sciences; with minimum 10 years of R&D experience in Characterization of soil moisture profile for models Watershed projects	Minimum 05 years experience in characterization of soil moisture profile for models
7	Subject Specialist (s)	SWAT/APEX/WEAP/E-Water/Global mapper software modelling	PG/Doctorate in Hydrology/Engineering/Sciences; with minimum 10 years of R&D experience in handling WEAP model design, customization and testing of SWAT/WEAP/APEX/E-Water/GIS models	Minimum 05 years in design, customization and testing of SWAT/WEAP/APEX/E-Water model/GIS model
8	Subject Specialist	GIS/Remote Sensing	PG/Doctorate in Engineering/Sciences; with minimum 10 years of R&D experience in application of RS/GIS in watershed projects	Minimum 05 years in Processing of satellite data and preparation of thematic maps

Non-Key Experts:

9	Subject Specialist(s)	Data Management	PG/Doctorate in Engineering/Sciences; with minimum 10 years of R&D experience in data management projects	Minimum 05 years in Database development, quality assurance, integration with DSS-H
10	Administrative Manager	Admin/HR/Accounts	MBA with experience of 8-10 years in concerned field	Minimum 05 years in Administration/HRM and accounts related issues
11	Subject Specialist	Scenario development	PG/Doctorate in Engineering/Sciences; with minimum 10 years of R&D experience in scenario development projects	Minimum 05 years in Generation of scenarios for use in models
12	Subject Specialist	IT & GUI design	Graduate/PG in IT/ Design with 8-10 years experience in concerned field	Minimum 05 years in Interfacing of models and design of GUI for DSS-H
13	Subject	Dissemination &	MBA/MSW/PG in	Minimum 05 years in

	Specialist (s)	capacity building, Communication	Communication/ Training with experience of 8-10 years in concerned field	Organization of training courses, awareness programs, surveys and documentation
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\* Hiring will be done as per the requirement of specific expertise and time period in the project. The hiring process should be commenced in accordance with the anticipated requirement so that the personnel are in place when required.

Note: The CVs of the key experts will only be evaluated during evaluation of the proposal. However, the CVs of non-key experts shall also be provided along with the proposal.

Apart from the above said full time staff, needs based part time staff as well supporting staff with environmental, engineering, training, and as well field workers would be placed.

## 2.7 Reporting Requirements and Schedule of Deliverables

S.N	Activity	Timing (from start of assignment)	Reports	Frequency of Report
1	Inception Report, Annual Action Plan	01 month	Inception report	Once at inception
2	DSS needs assessment	04 months	i. Needs assessment report	Quarterly
3	DSS model(s) conceptualization	06 months	i. DSS model conceptualization report	Quarterly
4	Database development	12 months	i. Database development report	Every three months
5	Generic DSS development	9 months	i. Report on Generic DSS development status	Every three months
6	DSS customization	14 months	i. Report on State wise DSS-H customization for each pilot watershed	Quarterly
7	DSS testing & refinement	18 months	i. Report on outcomes of Consultation workshops ii. Test report of refined DSS-H model	Half Yearly

8	DSS application and demonstration	20 months	i. Report on State wise case study on application of developed DSS-H outcomes of Consultation workshops	Quarterly
9	DSS pilot runs, evaluation & fine tuning	24-36 months	i. Pilot run report & Operation manual	Half Yearly
10	Hydrological evaluation of water conservation/ harvesting structures	24-36 months	i. Report on hydrological evaluation of selected structures containing observations and improvement	Half Yearly
11	Handholding support for hydrological inputs to DPR and upscaling to the level of States	36-60 months	i. Interaction workshops ii. Report on hydrological inputs to selected DPRs	Half Yearly
12	Capacity building, dissemination and outreach plan	Intermittent during project period	i. Reports on Stakeholders' consultation workshops ii. Report on Training of SLNAs	Quarterly
13	Draft final report	60 months	Draft final report and handing over the final version of DSS-H to SLNAs	Final stage

*Report mentioned as 'Every three month' shall be submitted from the inception of the project for every three months till the completion of the said activity.*

*Report mentioned as 'Quarterly /Half yearly shall be submitted every quarter/ six month from the start of said activity till completion.*

## Appendix II to the MOU

### CW 10– Procurement Plan with Method & Time Schedule for Civil Works by NIH for the period of first 12 months (2016-17)

Contract No.	Contract (Description)	Procurement Agency	Estimated Cost (Rs. In. Lakhs)			Procurement Method	Review by Bank (Prior /Post)	Expected Bid-Opening Date	Expected dates for award	Comments
			No of Contracts	Unit Cost	Cost					
	<b>Establishment of project cell</b>  1. Renovation of hall with provision of cabins, cabin furniture, etc. 2. Procurement & installation of ACs 3. Provision of workstation area				30	Shopping	Post	15 Jun 2016  to 30 Aug 2016	1 Aug 2016  to 15 Nov 2016	Several packages
	Accounting, audit, etc.				3					
	Taxes, bank charges				2					
	Contingencies				5					
	<b>Sub-Total</b>				<b>40</b>					

**GE 10 – Procurement Plan with Method & Time Schedule for Goods & Equipment by NIH for the period of first 12 months (2016-17)**

Contract No.	Contract (Description)	Procurement Agency	Estimated Cost (Rs. In Lakhs)			Procurement Method	Review by Bank (Prior/Post)	Expected Bid-Opening Date	Expected dates for award	Comments
			No of Contracts	Unit Cost	Cost					
<b>NIH/G-1 to G-8</b>	Purchase of: 1. Rugged high-end notebook PCs 2. Large-screen monitors 3. UPS & battery 4. Multi-function printers 5. Computer Software (STELLA, GIS, DBMS) 6. Field instruments (water level sensors, soil moisture sensors, water quality kits, camera, GPS-based smartphones/tablets) 7. Office & training equipment (LCD projectors & screens, audio systems, refrigerators, water coolers, heaters) 8. ICT networking Instruments (WiFi routers, GPRS)	National Institute of Hydrology	8	10	90	Shopping or DGS&D rates	Post	15 Jun 2016 to 30 Jan 2016	1 Aug 2016 to 31 Mar 2017	Several packages
<b>NIH/G-9 to G-14</b>	Purchase of 1. Satellite data 2. Weather data 3. Hydrology data 4. Statistical data 5. Topographic maps 6. Thematic atlases	---,,---	6	10	50	Shopping  OR Direct contracting OR Gol norms	Post	15 Jun 2016 to 30 Jan 2017	1 Aug 2016 to 31 Mar 2017	

Contract No.	Contract (Description)	Procurement Agency	Estimated Cost (Rs. In. Lakhs)			Procurement Method	Review by Bank (Prior /Post)	Expected Bid-Opening Date	Expected dates for award	Comments
			No of Contracts	Unit Cost	Cost					
	<b>Sub-Total</b>				<b>140</b>					

All procurement above the shopping threshold shall be procured following NCB procedures.

All Direct contracting shall be prior approved by Bank.

**CS 10 – Procurement Plan with Method & Time Schedule for Consultancies by NIH for the period of first 12 months (2016-17)**

Contract No.	Description of Assignment	Procurement Agency	Estimated Cost (Rs. In. Lakhs)			Selection Method	Review by Bank (Prior/Post)	Expected Proposals Submission Date	Expected dates for award of Contract	Comments
			No of Contracts	Unit Cost	Cost					
<b>NIH/ C-1 to C-10</b>	Subject Matter Specialists (Annual Contracts on Monthly basis)	National Institute of Hydrology	<b>17</b>		<b>160</b>	Individual Consultant (Based on consultants' qualifications)- to be recruited through open advertisement, as per Guidelines approved by the Ministry of Water Resources (Gol)	Post	15 Jun 2016	1 Aug 2016	
	1. Project Team Leader (NIH)		1	-	-			to	to	
	2. Deputy Project Leader									
	3. Domain Expert		1	21	21			30 Jul 2016	30 Aug 2016	
	4. Modelling specialist									
	5. Subject specialist		2	18	36					
	6. Software specialist		1	18	18					
	7. Support staff (young professionals)		2	15	30					
8. Admn. Manager										
			1	10	10					
			9	04	36					
			1	09	09					
	Water technology consultancy to ICAR-WTC, New Delhi		1		30	SSS	Prior	15 Jun 2016	1 Aug 2016	
								to	to	
								30 Jul 2016	30 Aug 2016	



Contract No.	Description of Assignment	Procurement Agency	Estimated Cost (Rs. In. Lakhs)			Selection Method	Review by Bank (Prior/Post)	Expected Proposals Submission Date	Expected dates for award of Contract	Comments
			No of Contracts	Unit Cost	Cost					
	GIS layers consultancy to IIT Delhi		1		20	SSS	Prior	15 Jun 2016 to 30 Jul 2016	1 Aug 2016 to 30 Aug 2016	
	Capacity building & trainings  1. Stakeholders consultation meetings 2. TOT for SLNA 3. Trainings of other stakeholders 4. Awareness activities		9  9 18	1.5  2 2	70	In-house	Post			
	Travel (other than Trg.) including hiring of vehicles				30	As per Gol norms	Post			
	Consumables (e.g. stationery, chemicals, glasswares, literature & books)				20	Shopping  Or Gol norms	Post			
	<b>Sub-Total</b>				<b>330</b>					

• All Single Source Selection (SSS) subject to Bank prior clearance/review

## Appendix III to the MOU

### Annex CW 10– Procurement Plan with Method & Time Schedule for Civil Works by NIH for the period of 2017-18

Contract No.	Contract (Description)	Procurement Agency	Estimated Cost (Rs. In. Lakhs)			Procurement Method	Review by Bank (Prior /Post)	Expected Bid-Opening Date	Expected dates for award	Comments
			No of Contracts	Unit Cost	Cost					
	<b>Establishment of project cell (recurring expenditure)</b>				20	Shopping	Post	In continuation from 2016-17	In continuation from 2016-17	Several packages
	Accounting, audit, etc.				3					
	Taxes, bank charges				2					
	Contingencies				5					
	<b>Sub-Total</b>				<b>30</b>					

**Annex GE 10 – Procurement Plan with Method & Time Schedule for Goods & Equipment by NIH for the period of 2017-18**

Contract No.	Contract (Description)	Procurement Agency	Estimated Cost (Rs. In Lakhs)			Procurement Method	Review by Bank (Prior/Post)	Expected Bid-Opening Date	Expected dates for award	Comments
			No of Contracts	Unit Cost	Cost					
<b>NIH/G-1 to G-8</b>	Purchase of: 9. Hydrology Software 10. Field instruments (water level sensors, soil moisture sensors, water quality kits) 11. Office & training equipment 12. ICT networking Instruments	National Institute of Hydrology			60	Shopping or DGS&D rates	Post	15 Apr 2017 to 30 Jul 2017	1 Jun 2017 to 31 Oct 2017	Several packages
<b>NIH/G-9 to G-14</b>	Purchase of 7. Satellite data 8. Weather data 9. Hydrology data 10. Statistical data	---,---	4	15	60	Shopping  OR Direct contracting OR Gol norms	Post	15 Apr 2017 to 30 Jul 2017	1 Jun 2017 to 31 Oct 2017	
	<b>Sub-Total</b>				<b>120</b>					

All procurement above the shopping threshold shall be procured following NCB procedures.

All Direct contracting shall be prior approved by Bank.

**Annex CS 10 – Procurement Plan with Method & Time Schedule for Consultancies by NIH for the period of 2017-18**

Contract No.	Description of Assignment	Procurement Agency	Estimated Cost (Rs. In. Lakhs)			Selection Method	Review by Bank (Prior/Post)	Expected Proposals Submission Date	Expected dates for award of Contract	Comments
			No of Contracts	Unit Cost	Cost					
<b>NIH/ C-1 to C-10</b>	Subject Matter Specialists (Annual Contracts on Monthly basis)	National Institute of Hydrology	<b>20</b>		<b>190</b>	Individual Consultant (Based on consultants' qualifications)- to be recruited through open advertisement, as per Guidelines approved by the Ministry of Water Resources (Gol)	Post	In continuation from 2016-17	In continuation from 2016-17	
	9. Project Team Leader (NIH)		1	-	-					
	10. Deputy Project Leader		1	21	21					
	11. Domain Expert		2	18	36					
	12. Modelling specialist		1	18	18					
	13. Subject specialist		4	15	60					
	14. Software specialist		1	10	10					
	15. Support staff (young professionals)		9	04	36					
16. Admn. Manager	1	09	09							
	Water technology consultancy to ICAR-WTC, New Delhi		1		30	SSS	Post	In continuation from 2016-17	In continuation from 2016-17	

Contract No.	Description of Assignment	Procurement Agency	Estimated Cost (Rs. In. Lakhs)			Selection Method	Review by Bank (Prior/Post)	Expected Proposals Submission Date	Expected dates for award of Contract	Comments
			No of Contracts	Unit Cost	Cost					
	GIS layers consultancy to IIT Delhi		1		30	SSS	Post	In continuation from 2016-17	In continuation from 2016-17	
	Capacity building & trainings  5. Stakeholders consultation meetings 6. TOT for SLNA 7. Trainings of other stakeholders 8. Awareness activities		9	1.5	<b>90</b>	In-house	Post			
			9	3						
			18	3						
			LS							
	Travel (other than Trg.) including hiring of vehicles				40	As per Gol norms	Post			
	Consumables (e.g. stationery, chemicals, glasswares, literature & books)				50	Shopping Or Gol norms	Post			
	<b>Sub-Total</b>				<b>430</b>					

• All Single Source Selection (SSS) subject to Bank prior clearance/review