The World Bank
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July 2, 2018

Mr. U.P. Singh
Secretary
Ministry of Water Resources, River Development and Ganga Rejuvenation
Government of India
Shram Shakti Bhawan
Rafi Marg
New Delhi - 110 001

Dear Mr. Singh:

INDIA: National Hydrology Project (IBRD Loan No. 8725-IN)
Second Implementation Support and Review Mission (April 25-June 6, 2018)

We would like to thank the Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD&GR) and all concerned agencies for the support extended to the Implementation Support Mission for the National Hydrology Project, held from April 25-June 6, 2018. The mission's findings and the key actions agreed are provided in the attached Aide Memoire for your information and follow up as needed.

As you know, the National Hydrology Project aims to provide a national platform to support India's Flood Mitigation and Water Resources Management efforts. The major outcomes of the project include a web-based national water information system, flood forecasting and reservoir operation systems and river basin plans, which will support the states in preparing evidence based plans and investments.

The project has just completed one year and most of the critical elements required to expedite the implementation are in place. Majority of implementing agencies have overcome their administrative issues and have commenced implementation. The dynamic team at National Project Management Unit (NPMU) has been providing excellent support to the PMUs of the 48 central and state agencies. In particular, NPMU has supported the IAs in preparing the tenders for more than INR 400 crores (US$ 60 million). Although disbursement is at 3%, the project has committed INR 140 crores (US$ 21.5 Million) and for almost INR 200 crore (US$ 30 Million), tenders are in process.

Out of 48 agencies, 20 agencies are either performing satisfactorily or have a system in place to work towards the project objective. Almost eight agencies have already established information system and river basin models for various purposes including: Andhra Pradesh & Telangana Groundwater; Gujarat, Maharashtra & Karnataka Surface Water agencies. Some agencies including Kerala Surface Water, Telangana Groundwater, Uttarakhand, Mizoram and Nagaland have shown drastic improvement since the last mission. Among central agencies, Survey of India has made excellent progress and about to process major tenders.

There are almost 10 agencies who are on the other side of the spectrum with respect to performance. They are still struggling with their administration systems pertaining to clearances etc. including: Odisha, Bihar Groundwater, Chhattisgarh, Assam, Tripura and Manipur. Some of these agencies are yet to delegate any powers to nodal officers and to allow project management units to perform as required. We would like to seek your support in bringing these issues to the attention of the senior management of these respective states, so that the critical bottlenecks could be addressed.

As you would agree, the most important activity under this project is strengthening of National Water Resources Information. In this context, we are pleased to note that several states have fulfilled their commitment to the Memorandum of Agreement by joining the national water database platform (e-SWIS) and by updating their data policies in line with the National Data Dissemination Policy. Once the dataflow arrangements from the centre materialize, the country will leap forward towards management of water resources. If not resolved immediately, it is likely that the state agencies might have no other option but to develop systems which are duplicate in nature. Based on this status of project, the implementation progress is being rated as Moderately Satisfactory while the achievement of the project Development Objective is maintained at Satisfactory. In order to fulfil the vision towards a river basin approach and to ensure timely completion of the project activities, the following critical actions need to be taken on priority:

(i) Strengthening of the National Water Informatics Center (NWIC) including the staff, IT experts & infrastructure;
(ii) Finalizing data exchange protocol with the states; and
(iii) Simplification of approval processes both at central and state levels.

We look forward to working with you on this important project. For further information, please do not hesitate to contact the Task Team Leaders, Ms. Anju Gaur (email: agaur@worldbank.org) and Mr. C.R. Singh (email: csingh5@worldbank.org).

With regards,

Yours sincerely,

John D. Blomquist
Acting Country Director, India

Enclosure

cc:
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Mr. Shakil Alam (MI), DEA, Ministry of Finance

Mr. Akhil Kumar, Joint Secretary (IC), MoWR, RD&GR
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Secretary, Irrigation & CAD Department, Government of Andhra Pradesh
Additional Chief Secretary, Water Resources Department, Government of Assam
Secretary, Minor Water Resources Department, Government of Bihar
Secretary, Water Resources Department, Government of Bihar
Secretary, Water Resources Department, Govt. of Chhattisgarh
Principal Secretary, Water Resources, Government of Goa
Secretary, Water Resources, Narmada, Water Resources, Water Supply and Kalpsar Department, Government of Gujarat
Additional Chief Secretary, Irrigation and Water Resources Department, Government of Haryana
Principal Secretary, Irrigation & Public Health Department, Govt. of Himachal Pradesh
Principal Secretary, Water Resources Department, Govt. of Jharkhand
Secretary, Major Water Resources Department, Government of Karnataka
Additional Chief Secretary, Water Resources Department, Govt. of Kerala
Principal Secretary, Water Resources Department, Govt. of Madhya Pradesh
Principal Secretary, Water Supply & Sanitation Department, Government of Maharashtra
Principal Secretary, Water Resources Department, Government of Maharashtra
Additional Chief Secretary, Irrigation and Flood Control Department, Government of Manipur
Principal Secretary, Water Resources Department, Government of Meghalaya
Secretary, Minor Irrigation Department, Government of Mizoram
Secretary, Irrigation & Flood Control Department, Govt. of Nagaland
Principal Secretary, Water Resources Department, Government of Odisha
Principal Secretary (Irrigation), Water Resources Management and Development Corporation, Government of Punjab
Secretary, Water Resources Department, Government of Rajasthan
Secretary, Irrigation and Flood Control Department, Government of Sikkim
Principal Secretary, Public Works Department, Government of Tamil Nadu
Principal Secretary, I & CAD Department, Government of Telangana
Principal Secretary, PWD (Water Resource), Government of Tripura
Principal Secretary, GWD, Government of Uttar Pradesh
Principal Secretary, IRD & Minor Irrigation, Government of Uttar Pradesh
Principal Secretary, Irrigation Department, Govt. of Uttarakhand
Principal Secretary, DWRI & Irrigation and Waterways, Government of West Bengal
Chief Secretary and Chairman, Water Resources Organization, Government of Puducherry

Chairman, Central Water Commission (CWC) Government of India
Chairman, Central Ground Water Board (CGWB) Government of India
Director, National Institute of Hydrology (NIH), Government of India
Director, Central Water & Power Research Station (CWPRS), Government of India
Member Secretary, Central Pollution Control Board (CPCB), Government of India
Surveyor General, Survey of India (SOI), Government of India
Director, National Remote Sensing Centre (NRSC), Government of India

Chairman, Bhakra-Beas Management Board (BBMB), Government of India

Chairman, Damodar Valley Corporation (DVC), Government of India

Director, Ground Water Department, Government of Andhra Pradesh
Chief Engineer, Water Resources Department. Govt. of Andhra Pradesh
Chief Engineer, Quality Control, Water Resources Department, Government of Assam
Chief Engineer, Planning and Monitoring and Ground Water, MWRD, Government of Bihar
Chief Engineer, Planning and Monitoring, Department of Water Resources, Government of Bihar
Engineer-in-Chief, Water Resources Department, Government of Chhattisgarh
Chief Engineer, Water Resources Department, Govt. of Goa
Managing Director, Water Resources Development Corporation, Government of Gujarat
Chief Engineer (CG), Water Resources Department, Government of Gujarat
Chief Engineer (Coordination), Irrigation and Water Resources Department, Government of Haryana
Engineer-in-Chief, Irrigation & Public Health Department, Govt. of Himachal Pradesh
Chief Engineer, Water Resources Department, Govt. of Jharkhand
Chief Engineer, Water Resources Development Organization, Government of Karnataka
Chief Engineer, Project II & Hydrology Project Government of Kerala
Director, Ground Water Department, Government of Kerala
Chief Engineer (BODHI), Water Resources Department, Government of Madhya Pradesh
Director, Groundwater Surveys and Development Agency, Government of Maharashtra
Chief Engineer, Planning and Hydrology, Water Resources Department, Government of Maharashtra
Chief Engineer, Irrigation and Flood Control Department, Government of Manipur
Chief Engineer, Water Resources Department, Government of Meghalaya
Chief Engineer, Minor Irrigation Department, Government of Mizoram
Chief Engineer, Irrigation & Flood Control Department, Govt. of Nagaland
Chief Engineer & Director, Directorate of Ground Water Survey & Investigation, Government of Odisha
Chief Engineer, Hydrology, Water Resources Department, Government of Odisha
Chief Engineer, Water Resources Management and Development Corporation, Government of Punjab
Chief Engineer, Water Resources Department, Government of Rajasthan
Chief Engineer, Irrigation and Flood Control Department, Government of Sikkim
Chief Engineer, SG&SWRDC, Government of Tamil Nadu
Director, Ground Water Department, Government of Telangana
Chief Engineer, Hydrology and Investigation, I & CAD Department, Government of Telangana
Chief Engineer, PWD (Water Resources), Government of Tripura
Director, Ground Water Department, Government of Uttar Pradesh
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Chief Engineer, Irrigation & Waterways Department, Government of West Bengal
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NATIONAL HYDROLOGY PROJECT

Second Implementation Status Review Mission

Congrats Kerala SW and Telangana GW for boosting the performance

List of Abbreviations

AP	Andhra Pradesh	**MP**	**Madhya Pradesh**
AS	Assam	**MZ**	Mizoram
BBMB	Bhakra Beas Management Board	**NHP**	National Hydrology Project
BH	Bihar	**NIC**	National Informatics Centre
CGWB	Central Ground Water Board	**NIH**	National Institute of Hydrology
CH	Chhattisgarh	**NL**	Nagaland
CORS	Continuous Operating Reference Station	**NPMU**	National Project Management Unit
CPCB	Central Pollution Control Board	**NRSC**	National Remote Sensing Centre
CWC	Central Water Commission	**NWIC**	National Water Informatics Centre
CWPRS	Central Water and Power Research Station	**OD**	Odisha
DVC	Damodar Valley Corporation	**PB**	Punjab
e-SWIS	Electronic Surface Water Information System	**PDO**	Project Development Objectives
FY	Fiscal Year	**PFMS**	Public Finance Management System
GA	Goa	**PIP**	Project Implementation Plan
GeM	Government e-Marketplace	**PP**	Procurement Plan
GJ	Gujarat	**PY**	Puducherry
GW	Ground Water	**RFQ**	Request for Quotations
HP	Himachal Pradesh	**RJ**	Rajasthan
HR	Haryana	**S**	Satisfactory
IA	Implementing Agency	**SK**	Sikkim
IBRD	International Bureau for Reconstruction and Development	**SOI**	Survey of India
ISRO	Indian Space Research Organization	**SoR**	Schedule of Rates
IT	Information Technology	**STEP**	Systematic Tracking of Exchanges in Procurement
IUFR	Internal Unaudited Financial Report	**SW**	Surface Water
IWRM	Integrated Water Resources Management	**SWRIS**	State Water Resources Information System
JH	Jharkhand	**TAMC**	Technical and Management Consultancy
KL	Kerala	**TG**	Telangana
KT	Karnataka	**TN**	Tamil Nadu
ME	Meghalaya	**TR**	Tripura
MH	Maharashtra	**UK**	Uttarakhand
MIS	Management Information System	**UP**	Uttar Pradesh
MN	Manipur	**USD**	United States Dollars
MoA	Memorandum of Agreement	**WB**	West Bengal
MOWRD, RD&GR	Ministry of Water Resources, River Development & Ganga Rejuvenation	**WRIS**	Water Resources Information System

NATIONAL HYDROLOGY PROJECT
Second Implementation Status Review Mission, April-June, 2018

I. Introduction

1. The second World Bank Implementation Status Review Mission[1] for the National Hydrology Project (NHP) was conducted from April 25 to June 6, 2018 in collaboration with the National Project Management unit (NPMU, Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD*GR). The mission's objectives were to review the agency-wise project implementation progress as envisaged in the annual work plans and the project implementation plan (PIP); to identify implementation bottlenecks and to provide recommendations in agreement with senior officials of central/state implementation agencies for the smooth implementation of the project. The Aide Memoire summarizes mission findings and the status of project implementation.

2. The mission was held in three different zones where regional states/IAs signed up based on their zonal preferences. These three zones were North: Gangtok, Sikkim (April 25-27); South: Munnar, Kerala (May 23-25) and Central: New Delhi (June 4-6, 2018). A total of 47 agencies (excepting Tripura and Delhi) were represented by more than 200 participants who attended the review. The final briefing of the mission was done to the Joint Secretary (MoWR, RD&GR).

II. Key Project Data

Table 1: Key Project Data and Ratings

Project Data		USD (millions)		
Original Project Amount		IBRD= 175	Total = USD 350 Million	
Total Disbursement		5.25	3%	
Disbursement in FY		5.25	3%	
Board date		March 15, 2018		
Closing Date		March 31, 2025		
Project Age		1 Year		
Project Ratings			**Previous**	**Current**
Project Development Objective			S	S
Implementation progress			S	S
Component				
A	Water Resources Monitoring Systems		S	S
B	Water Resources Information Systems		S	S
C	Water Resources Operations and Planning Systems		S	S
D	Institutional Capacity Enhancement		S	S
Project Management			S	S
Procurement			S	S

[1] Mission Members Mmes/Messrs: Anju Gaur (Senior Water Resources Specialist and Task Team Leader); Chabungbam Rajagopal Singh (Senior Water Resources Specialist and TTL); Ankan De (Operations Analyst); Sreenivas Devarakonda (Procurement Specialist); S. Krishnamurthy (Senior Financial Management Specialist); Pamela Patrick (Procurement Program Assistant); Jai Mansukhani (Sr. Program Assistant); World Bank Consultants: Anish Kumar (Hydromet and Water Resources Modelling); Hitesh Thakur (M&E Consultant); and Pradeep Dadlani (Environmental Safeguards Consultant).

III. Implementation progress and Key findings

3. The National Hydrology Project, the third phase of the Hydrology Project, aims to extend the innovative practices in flood mitigation and IWRM developed under the prior two phases of Hydrology project to the Ganga and Brahmaputra River basins. **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.** This is a central sector scheme with 100% grant in aid to the states. The project is designed to minimize duplication and streamline information generation and database management (pertaining to water related data), which will in turn reduce the financial burden on states and ensure the sustainability of interventions beyond the planned lifecycle of the project. The MoWR is working on establishing data integration and accessibility protocols for IndiaWRIS[2]. The ministry will also implement centralized database management which would then enable real-time data exchange among river basin entities, with control systems available at central and state servers.

4. The National Water Informatics Center (NWIC) will play a pivotal role in integrating the National WRIS and will also provide support to the states for developing respective state level WRIS. The aim would be to strengthen spatio-temporal information for preparing river basin plans and assess water availability. The major products from the project include: Flood forecasting and reservoir operation systems; mapping of water availability and accounting from watershed to basin scales; drought management plans and IWRM plans for selected rivers basins. The states will be using and updating their river basin information systems in a dynamic fashion.

5. **The project has had a robust start.** The project has just completed one year **and all the critical elements to expedite the implementation are already in place**. The NPMU, with a very dynamic team in place, has been playing a key role in supporting the PMUs of 48 central and state agencies. NPMU is being supported by Technical and management consultancy (TAMC) which was mobilized on October 23, 2017. Although disbursement is only 3%, the project has committed a total amount of INR 140 crores (USD 21.5 Million) and tenders for INR 400 Crore (USD 60 Million) have been reviewed by NPMU and are all ready for processing.

6. **The performance of implementing agencies has improved since last mission.** Majority of IAs have overcome their administrative issues and have commenced implementation. Out of 48 agencies, almost 20 agencies are performing satisfactorily or have picked up their momentum. The well performing agencies in analytics and modelling include: Andhra Pradesh & Telangana GW, SW agencies of Maharashtra, Karnataka and Gujarat; and in terms of procurement progress: Survey of India, Damodar Valley Corporation, Himachal Pradesh, Kerala, Uttarakhand and Maharashtra. The agencies on other side of spectrum include: Bihar GW, Orissa SW and GW, Tamil Nadu, Chhattisgarh, Assam, Tripura and Manipur states. Gujarat, Himachal Pradesh, Kerala, Rajasthan and Punjab have been one of the major contributors to the national database i.e. eSWIS out of 16 agencies who have joined eSWIS so far.

7. **Central agencies** who are required to "facilitate/serve" have also initiated some of the major activities. CWC/NPMU (with support from the TAMC) are in process of strengthening the national

[2] IndiaWRIS is a web enabled portal with geo-spatial and temporal information system. It is maintained by CWC (MOWR, RD&GR) with non-classified data available to public.

water database system (e-SWIS). SoI has progressed very well with the preparation of large procurement packages for generation of DEM required for modelling and have also progressed in other critical activities for referencing including development of geoid model to define zero elevation and establishment of Continuous operating referencing station (CORS) for precision positioning. NRSC had started preparing national remote sensing based products including real time Evapotranspiration estimates, surface water availability; and some project specific applications such as flood forecasting for Godavari basin and an Irrigation Scheduling system for Narayanpur irrigation project, however they need serious attention to comply with bank procurement procedures. CWC needs to expedite various procurements and the establishment of the national database and information system including increased support to states for e-SWIS. CGWB, CWPRS and CPCB are yet to commence their activities. NIH needs to focus on designing demand based training programs with the inputs and support of other agencies.

Table 2: Summary of performance of implementing agencies

Sustained performance		**Improved since last mission**	
GW: AP; SW: MH, KA, GJ, DVC	NPMU	SW: AP, BH, KL, TG, UP; GW: GJ; TG, WB; *CH, HP, PB, NL, MZ, RJ, UK*	SoI, NRSC
Progressing but slow		**Not active**	
SW:BH, OD; GW: CH, KL, MH, UP; BBMB, MP, AS, GA, JH, ME, SK	CWC, NIH, CGWB	GW: BH, OD *HR, MN, PY, TN, TR*	CPCB, CWPRS

8. Based on the overall assessment of project, the project ratings for Development Objective is being maintained as **Satisfactory** and for implementation progress as "**Moderately Satisfactory.** In order to ensure that the implementation arrangements are in line with project strategy, following critical activities need immediate attention:

a. **NWIC needs to be strengthened:** A significant development since the first mission was that the official government order to establish the NWIC was issued in the 1st week of April (2018) (exactly after two years of cabinet approval). The director for NWIC has been nominated but the required staff is yet to be assigned particularly IT personnel for ongoing development and updation. Similarly, the hardware and software needs to be upgraded as IndiaWRIS has been operating on a non-permanent infrastructure (currently provided by ISRO/NRSC).

b. **The modalities for Data exchange need to be operationalized:** The integrated database is the foundation for supporting river basin planning and this was envisaged in the MoA. Almost Sixteen agencies have fulfilled their commitment and have joined the national database system (eSWIS). Many agencies were issued the user credentials during the mission and they have demanded more trainings for field staff. The success of this system can only be achieved if the exchange of data is a two-way system and central agencies

also need to be sharing data with states. In order to streamline this process, particularly for flood management, MoWR, RD&GR needs to make the data available online to IAs. Once it is operationalized, this will be a major breakthrough towards flood and water management potentially affecting 60% of the country's population.

c. **Finalize the procurement of consultancy for IWRM based river basin planning of three basins (Krishna, Godavari and Mahanadi).** The procurement of the consultancies for two packages has taken quite long and now it is at the evaluation stage. Evaluation may be expedited so as to award the contract within the validity period.

d. **Water accounting and planning:** Simultaneously, several states have already started setting up the models and are seeking guidance for advance development. This includes support in the form of international trainings and procurement of relevant modelling software.

e. **Trainings need to be demand based:** The project has given a great emphasis on training and knowledge exchange. Till date a total of 101 trainings have been held and 1676 persons have been trained. This includes 6 international trainings. There was a general consensus that trainings, especially international advanced training should be clearly linked with the development of products and only relevant candidates linked with the development activity should be nominated for such trainings. As a pre-requisite, the officials may attend basic training at home or undertake online courses before being nominated for such international training. The personnel attending these trainings should also be available to work on the product even after the completion of such advanced trainings.

f. **Trainings are meant for entire department of IAs:** The agencies are encouraged to nominate deserving participants and they need not be only from SPMU. As entire department represents for executing the project, the candidates can be nominated from any division as long as they plan to work on similar aspects. Particularly Jharkhand, Odisha, Tripura, Bihar GW, Tamilnadu, Puducherry and UP need to participate more actively.

g. **Schedule of Rates for Hydromet need to be updated:** One of the major challenges in the preparation of Hydromet procurement packages has been the preparation of cost estimates. There was distinct need for having the schedule of rates for various range of sensors and systems which was felt. The NPMU was advised to explore the possibility of preparation of such a SoR. As an intermediate solution, the NPMU is planning to prepare it based on budgetary estimates.

h. **Real time data acquisition software**: The centralized software for Real time data acquisition and transmission to the states is needed so that data from automatic stations can be retrieved and duplicity of efforts pertaining to data acquisition at state and central levels is minimized.

i. **Strengthening capacities of IAs in procurement:** Many Implementing Agencies encounter difficulties in complying with the World Bank procedures and managing the procurement process. This is generally slowing down progress. To address this issue, more specific support and training related to procurement and instrumentation is required

9. **Finance Management:** GoI has provided a budget of INR 250 crores for the FY 18-19 and during last year also provided adequate budget and ensured that funds are timely transferred to the states. Project has incurred a total expenditure of INR 63.98 crores from inception till date. The Internal Unaudited financial report (IUFR) for disbursed funds has been submitted till March 2018. The expenditure incurred in comparison to the release of funds is on the lower side and this could lead to non-fulfillment of conditions for next tranche release. The onus is on the states to carry out the activities in a timely manner and ensure that the funds are used. Accounting and fund transfer is handled through the Public Financial Management system (PFMS). Expenditure Advance & Transfer (EAT) module needs to be operationalized in all the agencies. From FY 18-19, expenditures recorded in PFMS would be considered as the eligible expenditure at the time of processing of IUFRs. Audit reports for both the retroactive period as well as for FY 17-18 needs to be submitted by the project within the agreed timeline. An internal auditor should be appointed by September 2018. Keeping in mind the progress made so far and the agreed actions for future, the rating is maintained as **Satisfactory** (S).

10. **Procurement:** The update on STEP is streamlined under the project. The World Bank team has conducted multiple training programs for the officials of IAs on STEP and has been providing constant hand holding support to the IAs. The *STEP help Desk has also been introduced that can be reached via a toll-free number 1-800-208-9987 or e-mail (stepitsupport@worldbankgroup.org) from 9 am to 6 pm.* The project has further worked out to link their own MIS with STEP and they are now able to upload excel sheet from MIS into STEP. All implementing agencies should start the procurement process only after entering the procurement activity in the procurement plan through STEP and its NOL from the Bank. Review of the E-procurement system of Andhra Pradesh and Telangana is under progress. NRSC is firmly advised to follow the Bank procurement guidelines and procedures including update of PP in STEP. The World Bank has assessed that the e-procurement system of NRSC and noted some non-compliances. Till the non-compliances are addressed by NRSC, they may follow the NIC e-procurement system which is already cleared by the Bank or carry out manual procurement. Use of GeM will now be allowed in lieu of shopping up to US$ 100,000, provided there are at least 3 suppliers for the item on GeM and the Purchaser uses the RFQ (mini competition or bidding among suppliers) feature on GeM to discover the final price.

11. The project has six ongoing prior review packages and large number of post review packages. The NPMU has been providing excellent guidance to the IAs in preparing various tenders. Based on the assessment of progress in procurement, the performance is being maintained as '**Satisfactory**'.

12. The key actions agreed to be undertaken in Implementation Status Review Mission are summarized in the following table.

Table 2a: Summary of key Actions- Central Agencies

S.No.	Key Actions	Lead Agency	By when	Status
1.	Expedite clearances of AWP and budget release	MoWR, RD&GR	Ongoing	Process need to be simplified for timely approval and clearances
2.	NWIC: strengthened with approved staff	MoWR, RD&GR	Oct 15, 2018	Delayed. Government notification issued but yet to be staffed
3.	Protocol for online exchange of data through NWIC with all the IAs	MoWR, RD&GR	Nov, 2018	Delayed. The arrangements for classified data to be finalized
4.	Tender for NE Hydromet	CWC	July 31, 2018	Almost ready but delayed substantially.
5.	Develop module in e-SWIS for hydromet system for real time data acquisition and transmission exchange with IAs.	CWC / NPMU	June, 2018	In progress, expected by Aug 2018
6.	Support states in development of State WRIS	CWC	Dec 30, 2018	Online system for editing and update is required from central. GIS expert at states may be trained to populate spatial information
7.	Procurement of consultancy for three River basins finalized	CWC	Sep 30, 2018	Delayed, technical evaluation is in progress
8.	Consultancy for streamflow forecasting including flood dashboard	CWC	Oct 15, 2018	TOR in progress
9.	TOR for urban hydro-geology modelling shared with States	CGWB	Jul 15, 2018	
10.	Update Schedule of Rates for Hydromet	CWC	Aug, 2018	Needed urgently as states are facing difficulties in design and clearances for cost estimates.
11.	Finalize two major procurement for DEM	SoI	Sep15, 2018	Bids are ready to be floated
12.	Provide the list of and access to satellite-based products developed for states	NRSC	30 Jun 2018	Also develop training courses, online modules and brochures
13.	Engage the firm for Internal auditing	NPMU	Sep 2018	Share TOR
14.	Organize training for safeguard specialist	NPMU	Sep 2018	

Table 1b: Key Actions- State Agencies

	Key Actions	Agency	By when	Status
15	Nominate safeguard specialist in SPMU	All IA	Immediately	Several have already nominated
16	Simplify procedures	IA	Immediately	Orissa, Chhattisgarh, NE States, Tamil Nadu, Goa
17	Maintain dedicated core team for SPMU and delegation of powers to Nodal officer	All IA	Ongoing	
18	Use of PFMS for financial transactions	All IAs	Immediately	8 agencies have started using PFMS
19	Mapping of Procurement Activities between STEP and MIS.	State IAs	Immediately	
20	Nomination in training need to be improved	All IAs	Ongoing	Puducherry, Odisha SW and GW, Bihar SW, Chhattisgarh, Manipur, Tripura, UP SW and GW
21	Integrate with e-SWIS or CGWB database	All IA	Ongoing	16 IAs have already joined). GW agencies need to share data with CGWB, may be in excel format
22	Update state Data policy in line with National Data dissemination policy (already agreed in MOA)	State IAs	Immediately	Several states have already updated and some have data online; remaining states need to remove pricing policy
23	Initiate development of state level Water resources information systems	State IAs	Immediately	6 Agencies already have WRIS, some were advised to engage GIS expert which can be trained by TAMC to populate the data
24	Input all procurement activities into MIS and STEP	State IAs	Immediately	In progress

List of Annexures

S. No.	Annexure	Description
1.	Result Framework	Targets and baseline were set during appraisal.
2.	Performance Ranking of agencies	2 A: state agencies 2 B: Central agencies
3.	Status Summary of agencies	Summary of findings with the change in ranking since last mission 3.A State agencies 3. B Central agencies
4.	Overall status of project: component wise	Sharing status about components and project management
4.1- 4.41 & 5.1 – 5.8	Agency wise summary report and key actions	Short summary for each IA

Annexure 1: Results Framework

S. No.	Indicator Name	Baseline	Target 2018	Actual (June 2018)	End Target
1	Water resources monitoring stations operated by implementing agencies providing validated data online (Number)	4,370	4700	4,370	12,000
1.a	Surface water stations (Number)	909	1000	909	2,500
1.b	Groundwater stations (Number)	2,310	2500	2,310	7,000
1.c	Meteorology stations (Number)	1,140	1200	1,140	2,500
2	Information products produced under the project made available to the relevant stakeholders (Number)	5	5	5	50
3	Water resources institutions achieving benchmark performance levels (Number)	10	10	10	25
3.a	Institutions upgraded to next performance level (Number - Supplemental)	0	0	0	25
1	WRIS users satisfied with the services (Percentage)	0	10	-	50
2	Water data centers functioning satisfactorily (Number)	10	10	10	30
3	Page views to access the information at WRIS (Number, thousands)	400	420	400	900
4	Water availability report for river sub-basins published regularly (Number)	3	5	3	30
5	Streamflow forecasting stations with improved lead time (Number)	200	200	200	325
6	Targeted professionals trained (Number)	0	100	81	2,000

Annexure 2A: Performance of agencies: States, UTs and RBOs (total Agencies =41)

S. No.	Agency Name	Rank	Procurement	Finance	SPMU	Training	Modelling	Data Center	Data integration	WRIS	Follow up	Total
	Maximum	41	32	20	5	10	10	5	5	8	5	100
1	Andhra Pradesh (GW)	2	10.40	13.33	5.00	5.00	10.00	5.00	5.00	8.00	4.00	65.73
2	Andhra Pradesh (SW)	15	9.12	10.33	5.00	5.00	0.00	5.00	1.00	4.00	4.00	43.46
3	Assam	21	8.65	11.00	3.00	4.50	3.00	2.00	0.00	2.00	3.00	37.15
4	BBMB	10	3.26	12.00	5.00	3.75	7.00	5.00	0.00	8.00	2.00	46.01
5	Bihar (GW)	40	1.29	8.00	1.50	0.50	0.00	3.00	0.00	0.00	2.00	16.29
6	Bihar (SW)	17	3.03	10.33	2.00	4.25	10.00	5.00	0.00	2.00	4.00	40.62
7	Chattishgarh (GW)	30	6.24	8.33	2.00	3.25	0.00	5.00	0.00	1.00	4.00	29.82
8	Chattishgarh (SW)	20	6.84	10.33	2.50	3.00	0.00	5.00	5.00	1.00	4.00	37.67
9	Delhi	41	0.00	0.00	1.00	0.75	0.00	0.00	0.00	0.00	1.00	2.75
10	DVC	3	18.80	11.33	5.00	7.00	7.00	3.00	1.00	4.00	4.00	61.13
11	Goa	28	4.25	9.92	3.00	1.50	0.00	5.00	0.00	4.00	4.00	31.67
12	Gujarat (GW)	12	12.80	9.33	5.00	3.75	0.00	5.00	2.00	2.00	4.00	43.88
13	Gujarat (SW)	7	7.06	10.00	5.00	8.00	10.00	5.00	5.00	1.00	4.00	55.06
14	Haryana (SW)	35	8.00	9.00	2.00	2.50	0.00	2.00	0.00	0.00	2.00	25.50
15	Himachal Pradesh	8	6.27	16.33	3.00	7.00	4.00	5.00	5.00	1.00	4.00	51.60
16	Jharkhand	27	7.71	10.00	5.00	4.00	0.00	3.00	0.00	0.00	2.00	31.71
17	Karnataka (SW)	5	9.17	12.00	5.00	5.00	10.00	5.00	3.00	6.00	4.00	59.17
18	Kerala (GW)	34	0.42	8.33	3.00	5.00	0.00	5.00	2.00	0.00	2.00	25.76
19	Kerala (SW)	4	17.00	13.33	3.50	5.50	7.00	5.00	3.00	0.00	5.00	59.33
20	Madhya Pradesh	9	4.87	9.67	5.00	6.00	7.00	5.00	1.00	6.00	3.00	47.54
21	Maharashtra (GW)	26	0.00	8.00	2.50	7.00	2.00	5.00	0.00	5.00	3.00	32.50
22	Maharashtra (SW)	6	12.00	10.00	5.00	6.00	10.00	5.00	1.00	6.00	4.00	59.00
23	Manipur	36	7.80	8.67	1.00	2.25	0.00	2.00	0.00	0.00	2.00	23.72
24	Meghalaya	25	2.25	12.00	2.50	7.00	0.00	0.00	1.50	4.00	4.00	33.25
25	Mizoram	19	4.10	16.67	4.00	7.00	0.00	0.00	1.00	0.00	5.00	37.77

S. No.	Agency Name	Rank	Procurement	Finance	SPMU	Training	Modelling	Data Center	Data integration	WRIS	Follow up	Total
	Maximum	41	32	20	5	10	10	5	5	8	5	100
26	Nagaland	18	3.97	13.00	5.00	6.75	0.00	3.00	0.00	3.00	4.00	38.72
27	Odisha (GW)	38	4.23	6.58	2.50	1.50	0.00	3.00	0.00	1.00	2.00	20.81
28	Odisha (SW)	29	1.60	8.33	2.50	3.75	7.00	0.00	0.00	5.00	3.00	31.18
29	Puducherry	37	5.25	7.33	3.00	0.00	0.00	5.00	0.00	0.00	3.00	23.58
30	Punjab	23	2.76	9.67	5.00	4.50	4.00	5.00	4.00	0.00	2.00	36.92
31	Rajasthan	16	1.32	10.67	5.00	10.00	4.00	4.00	5.00	0.00	3.00	42.98
32	Sikkim	22	7.65	13.92	3.50	5.00	0.00	2.00	0.00	0.00	5.00	37.07
33	Tamil Nadu	33	5.34	0.00	3.00	5.00	4.00	5.00	1.00	3.00	1.00	27.34
34	Telangana (GW)	1	16.80	11.33	5.00	8.00	9.00	5.00	5.00	4.50	4.00	68.63
35	Telangana (SW)	13	10.00	6.67	5.00	6.00	4.00	5.00	2.00	1.00	4.00	43.67
36	Tripura	39	0.00	8.33	4.00	4.75	0.00	0.00	0.00	0.00	2.00	19.08
37	Uttar Pradesh (SW)	24	10.54	8.33	0.50	4.25	0.00	3.00	2.00	4.00	4.00	36.62
38	Uttar Pradesh(GW)	31	3.00	8.00	3.00	2.25	0.00	5.00	0.00	5.00	2.00	28.25
39	Uttarkhand	32	2.80	13.00	4.50	4.50	0.00	0.00	0.00	0.00	3.00	27.80
40	West Bengal (GW)	11	9.73	10.33	2.50	5.25	3.00	5.00	2.00	5.00	2.00	44.81
41	West Bengal (SW)	14	7.80	9.33	4.00	5.50	7.00	5.00	0.00	2.00	3.00	43.63

Annexure 2 B: Performance of Central Agencies

S. No.	Agency Name	Rank	Procurement	Finance	SPMU	Training	Follow up	Total
	Maximum	8	32	20	5	10	5	72
1	CGWB	4	4.54	11.43	5.00	9.50	4.00	34.47
2	CPCB	8	0.00	10.33	4.00	0.50	3.00	17.83
3	CWC	2	9.57	11.00	4.00	9.25	5.00	38.82
4	CWPRS	6	4.08	9.95	4.00	8.00	4.00	30.03
5	MoWR	1	26.50	18.53	5.00	9.50	5.00	64.53
6	NIH	5	6.39	11.33	4.00	8.75	3.00	33.48
7	NRSC	7	0.00	11.33	3.00	7.00	3.00	24.33
8	SOI	3	13.87	9.00	5.00	5.50	4.00	37.37

Annexure 3A Status Summary of State agencies:

Sr. No	Agency Name	Old Rank	New Rank	Change	Summary
1	Andhra Pradesh (GW)	1	2	▼ 1	Andhra Pradesh GW is and has been a well performing implementing agency since last two years. An informative dashboard, real time water data repository and water budgeting information up to the village level are appreciable and often act as a reference for planning and building respective State WRIS for other agencies. The procurement of geo-physical equipment, generation of database and its application for analytics are appreciable steps. Considering the availability of modeling team and potential, the models needs to be strengthened further. The efforts towards international publications and presentations in international conferences are highly appreciated. Andhra GW needs to focus on procurement and hosting in-house training programs, and generate web based reports for dissemination to stay at top.
2	Andhra Pradesh (SW)	28	15	▲ 13	The agency has shown considerable improvement since last mission. The availability of digitized data, APWRIS and open data policy are some of positive starts. However, negligible progress has been made in utilization of this data in modelling activities and development of basin assessment. Moreover integration with eSWIS should also be taken on priority.
3	Assam	10	21	▼ 11	The performance of Assam has gone down compared to previous mission. The major bottleneck identified was weak SPMU, slow administrative approval process and nomination for training events. The agency needs to work on streamlining the approval process by empowering nodal officer and strengthening SPMU.
4	BBMB	5	10	▼ 5	BBMB had been leading agency in HP2 and developed Real-time forecasting system. Recent progress by calibrating with hydropower SCADA for real time data updation were appreciated by mission. However, the developed system needs to be taken further by incorporating meteorological bias correction, model re-calibration and enhancing canal monitoring. The progress in procurement has been slow and needs to be taken on priority.
5	Bihar (GW)	40	40	■ 0	No active participation, They have commissioned almost 300 DWLRs from state funds.
6	Bihar (SW)	15	17	▼ 2	The performance of Bihar SW has improved, mainly in procurement activities including EAMS and construction of building. Considering the availability of MMC under Koshi project, the agency may initiate activities for analytics, improving models and sub-basin assessment. Apart from that, agency should focus on integrating data with eSWIS.
7	Chhattisgarh (GW)	33	30	▲ 3	The agency has made slow progress in NHP activities mainly due to weak SPMU. The SPMU needs to be strengthened on priority and focus on developing bid documents for DWLRs. The participation in training events needs to be improved
8	Chhattisgarh (SW)	23	20	▲ 3	The implementing agency has started picking up in performing NHP activities and made considerable progress in data integration through eSWIS. The RTDAS bid should be finalized on priority basis.

Sr. No	Agency Name	Old Rank	New Rank	Change	Summary
9	Delhi	41	41	■ 0	No participation.
10	DVC	2	3	▼ 1	The implementing agency is among top 3 best performing agencies and progressing very well in procurements. The agency should focus on analytics and strengthen reservoir operation system for flood as well irrigation management. The TOR for inflow forecasting including reservoir optimization, updated model for climate change, bias correction and display system with dashboard was discussed.
11	Goa	36	28	▲ 8	The agency has initiated some activities like consultancy for coastal study and bid document for RTDAS. However, the progress is slow mainly due to administrative and approval processes. The agency is advised to streamline project implementation by delegating some powers to nodal officer and SPMU. The activities for developing state WRIS should be initiated on priority.
12	Gujarat (GW)	19	12	▲ 7	Gujarat GW is one of good performing agency when compared against analysis, data sharing, reporting and participation in knowledge exchange events. However, the progress is slow in procurement and expenditure, which should be expedited on priority
13	Gujarat (SW)	6	7	▼ 1	The implementing agency has shown drastically good performance in analytics but procurement yet to pick up. The web based analytics need to be introduced in the state. Worked with NIC to set spatial information of reservoirs. E-SWIS is updated with historical data and for rest it is in process.
14	Haryana (SW)	33	35	▼ 2	Although SPMU has now some active team members, both progress and performance are yet to pick up. The bid documents for SCADA and RTDAS should be floated on priority basis.
15	Himachal Pradesh	10	8	▲ 2	Himachal Pradesh has made considerable progress towards procurement and now needs to focus on analytics and data use application**.** For Shahnahar, the monitoring system and water accounting using Remote Sensing technology may be strengthened with help from NIH. The mission team welcomed the proposal for collaborating with a local institute and support for degree program. The agency need to focus on for AMC of old DWLR. The core SPMU is in place and it was further advised that they can seek inputs from Karnataka on how to holistically move forward.
16	Jharkhand	29	27	▲ 2	The state of Jharkhand is picking up and has initiated some procurement pertaining to piezometers and also progressing with the consultancy for State data center. Tender for ADCP need to be finalized immediately. The participation in training events needs to be improved, by nominating relevant staff. The nomination can be for anyone from the entire department, not just SPMU.
17	Karnataka (SW)	3	5	▼ 2	Extensive training plan with training of 120 engineers, river basin modelling activities and IWRM plans for Tungabhadra under ADB places Karnataka under one of best performing agencies. The KWRIS has already been developed but the architecture needs to be made compatible with National WRIS under development. The agency is advised to strengthen the groundwater modelling and analytics portion. E-SWIS and PFMS trainings should be planned on priority basis.

Sr. No	Agency Name	Old Rank	New Rank	Change	Summary
18	Kerala (GW)	33	34	▼ 1	The overall performance of the implementing agency is not satisfactory and they need to work on all aspects in order to upgrade their performance ratings. SPMU is yet to be strengthened, dedicated staff have been transferred and nodal officer is not empowered. The agency is advised to strengthen SPMU and streamline administrative approval process, empower nodal officer and participate in training activities. The works for digitization of data should be completed on priority.
19	Kerala (SW)	26	4	▲ 22	Kerala SW has shown considerable progress by initiating major procurements, several studies and need based consultancies which will facilitate production of bankable/actionable reports. The team has a dedicated modelling team and can focus on further development of DSS initiated under HP2.The mission team noted with appreciation that for training, the CE has been empowered to nominate staff for training. However, air travel for junior staff is still needs to be sorted out. Further, the Equipment purchase for PDS should be clubbed with RTDAS bid if it falls in similar category.
20	Madhya Pradesh	4	9	▼ 5	The implementing agency has made good performance in uploading data in eSWIS and with some additional training historical data may also be uploaded. Considering the availability of modellers and experience of DSS, the analytics part needs to be strengthened. The agency need to update RTDAS with gate sensor and canals monitoring instead of focusing on SCADA.
21	Maharashtra (GW)	17	26	▼ 9	The agency has made negligible progress in procurement and expenditure. However, their plans for monitoring the drought and mapping all irrigation wells were appreciated, which needs to be executed on priority basis. They need to develop more workable solution for monitoring the open wells as DWLR may not be the most suitable sensor.
22	Maharashtra (SW)	10	6	▲ 4	Maharashtra SW is among top performing agencies and preparation and clearance of bid documents worth 50 Crores for RTDAS were appreciated. However, the participation in Training events by relevant staff has reduced drastically during last few months. Moreover, the state need to focus on updating data policy in line with national policy. Considering E-Water activities for DSS for upper Godavari, the agency needs to put DSS for reservoir in operational use. The PDS topics proposed like Assessment of Irrigation potential gap, water quality management (reservoir to outlet), post monsoon flow in Godavri, integrated state water plan etc. may be carried out under component C1.
23	Manipur	32	36	▼ 4	SPMU has some team and initially their participation was ok. but there is no progress due pending approvals.
24	Meghalaya	13	25	▼ 12	The mission appreciated the Meghalaya implementing agency for coordination with regional CWC office and progress in bid document for construction of data centre building. However, the progress is slow mainly due to inadequate SPMU strength. The agency is suggested to hire contractual manpower to strengthen SPMU till the time permanent staff is allocated.

Sr. No	Agency Name	Old Rank	New Rank	Change	Summary
25	Mizoram	23	19	▲ 4	The state of Mizoram has shown considerable progress in streamlining the project implementation, procurement, renovation of data centre buildings and strengthening IT infrastructure. Now they need to focus on development of state WRIS and may engage GIS manpower for that.
26	Nagaland	14	18	▼ 4	The organizational support by state government for NHP activities has improved and team has been participating in training events. However, the progress has slowed down due to change in SPMU team and new members are yet to pick up on various requirements like GeM, PFMS, eSWIS and procurement.
27	Odisha (GW)	38	38	■ 0	No progress
28	Odisha (SW)	16	29	▼ 13	Odisha SW has initiated some procurements like ADCPs in recent past. However, the progress is negligible and no efforts are visible towards developing analytical products. The utilization of data generated during HP2 and development of state WRIS should be taken on priority. The agency also needs to improve participation in training and other knowledge exchange activities.
29	Puducherry	38	37	▲ 1	Puducherry has upgraded their quality lab. They could now focus on urban hydro-geology while CGWB is already focusing on it. If required they can do LiDAR for improved planning.
30	Punjab	26	23	▲ 3	Punjab has improved the performance compared to last mission by initiating some major procurements and setting up initial model for Ravi Basin. However, due to changes in SPMU officials, new team needs to pick up and coordinate with divisional implementing units. RTDAS bid should be floated on priority basis
31	Rajasthan	19	16	▲ 3	The performance of Rajasthan has improved since last mission, and Rajasthan tops the list in integration with eSWIS and participation / hosting of training events. Utilization of GeM and advertisement of RTDAS bid has contributed to progress in procurement. Now the agency needs to focus on development of State WRIS and may collaborate with SRSAC for same.
32	Sikkim	9	22	▼ 13	Sikkim has put considerable efforts in streamlining the approval processes and initial procurements. However, the progress has slowed down compared to last mission, which is primarily due to change in staff in SPMU. The new team has yet to pick up in project implementation and efforts are required to strengthen the capacity of new team. Pending procurements like data centre construction bid needs to be expedited. The hosting of mission and overall arrangements were strongly acknowledged by participants.
33	Tamil Nadu	19	33	▼ 14	The implementing agency has not shown any progress under the project. Although the SPMU seems to be strengthened but no real activities have started under NHP. The agency is advised to initiate activities as per project implementation plan and start procurement process. The bids for RTDAS and groundwater monitoring should be taken on priority.

Sr. No	Agency Name	Old Rank	New Rank	Change	Summary
34	Telangana (GW)	23	1	▲ 22	The performance of the implementing agency has improved drastically since last mission. The SPMU has been strengthened and the entire departmental data has been digitized. Development of a dashboard and a decision tool; a web based conjunctive use plan for one basin and the plan to extend the same for other basins were appreciated by mission. The agency should focus on developing bid documents for DWLR, initially for existing 40 locations and later for all other 450 locations.
35	Telangana (SW)	19	13	▲ 6	Strengthening of SPMU and development of mobile app for data exchange were appreciated by mission team. The Agency needs to work on developing ToRs for basin assessment and procurement of RTDAS on priority.
36	Tripura	29	39	▼ 10	Last year the agency became active but it has again become passive is unable to participat and travel.
37	Uttar Pradesh (SW)	37	24	▲ 13	The performance of the implementing agency has improved since last mission. It is expected that the expenditures will pick up once the bid documents are tendered. The IA now needs to focus on developing analytical skills. Under UPWSRP2, flood forecasting for Rapti has been developed. The IA can take up the extension/development of similar models for all the remaining basins. The agency has a good vision for setting up monitoring system for dams and barrages. However, mission was concerned that entire team was going to change and it may take time for new team to adapt to the project activities.
38	Uttar Pradesh(GW)	6	31	▼ 25	The performance of UP groundwater has gone down drastically since last mission. The major bottleneck is shortage of SPMU staff and negligible participation in training and knowledge exchange activities. The activities for monitoring of groundwater including water extraction and water budgeting should be initiated on priority. The state need to develop holistic plan for both quality and quantity rather than just focusing on exploited blocks. The deep aquifer need to be monitored for entire alluvium region and CGWB has been requited to work with the states.
39	Uttarkhand	29	32	▼ 3	The implementing agency has shown considerable progress in procurement and activities related to construction of buildings. However, the progress in component C of the project is completely missing, the agency is advised to initiate ToRs for analytical work, flood forecasting and development of state WRIS,
40	West Bengal (GW)	18	11	▲ 7	The performance of the Agency has been slow considering the institutional capacity and skilled manpower available for analysis. Any gap in analytical skll may be filled by collaboration with academic institutions. The agency should also focus on finalizing RTDAS bids for DWLRs and surface monitoring in consultation with NPMU.
41	West Bengal (SW)	8	14	▼ 6	The performance of West Bengal SW has slowed compared to previous mission. The major bottleneck identified was administrative approval process and nomination for training events. The agency needs to work on streamlining the approval process by empowering nodal officer and SPMU.

Annexure 3B Status Summary of Central agencies:

Sr. No.	Agency Name	Old Rank	New Rank	Change	Summary
1	CGWB	3	4	▼ 1	Procurement slow, GW database management to be strengthened for integration of state data, support in GW modelling.
2	CPCB	7	8	▼ 1	Not active and have been even struggling to continue the applications introduced during HP2
3	CWC	4	2	▲ 2	CWC has several important applications to be developed for database management and IndiaWRIS and river basin planning. IndiaWRIS yet to be made accessible for states, major procurements are to be expedited, support for e-SWIS need to be strengthened with two way exchange with the states.
4	CWPRS	2	6	▼ 4	The implementing agency has no dedicated staff for the NHP project. CWPRS needs to customize its training for the project and is also required to provide support to the implementing agencies at no cost. The procurement through NIC is an issue, and there can be greater improvement however only minor increases has been recorded between the years. The mission team was informed that an instrumentation laboratory is being prepared for supporting the IAs in the project. The Hydrological information facility may be first developed for testing only and in stages for various instruments. First they can see things in action in national firms and then in international firms/organizations.
5	MoWR	1	1	▲ 0	NPMU is providing excellent support, however data policy and NWIC are yet to be resolved and the approval process to be streamlined; trainings need to purpose oriented with the development of outcome.
6	NIH	6	5	▲ 1	The mission team noted the change in the ranking of the Implementing Agency since the last mission. The PMU has been setup and is functional. It is expected that progress will be made in the DSS front however the progress in the PDS has been slow as there have been delays in the R&D process because of which expenditure has also been slow. It is expected that expenditure for the IA will be picking up this financial year. NIH has a crucial role to play with respect to promoting modeling. There is a need for advanced modeling and NIH can play the role of reaching out to all the implementing agencies and checking in with them with respect to their modeling needs. Also given the lack of human resources with respect to modeling, it was suggested that pooling in resources for now might make more sense. It was appreciated that NIH has engaged modellers and they are being made available to other State IAs as technical resource persons for providing inputs on modeling

Sr. No.	Agency Name	Old Rank	New Rank	Change	Summary
7	NRSC	8	7	▲ 1	The implementing agency has made considerable progress in hiring manpower; strengthening CPMU; acquiring high resolution ALTM DEM for Tapi and Godavari; organization of trainings on RS and GIS applications; snow hydrology and GLOF risk assessment. The agency is requested to work in collaboration with NWA to develop online courses, share metadata and develop brochures on standard satellite-based products (DEM, ET estimate etc.) available for states. Apart from that, NRSC needs to follow World Bank procurement procedures for all procurements and introduce PFMS for all transactions.
8	SOI	5	3	▲ 2	Survey of India has made commendable progress under NHP since last one year. The initiation of activities like CORS and Goid Model were highly appreciated by the Mission. Good progress is made in procurement including construction of Data Centre, 3-5 m & 0.5 m DEM, bidding for Gravimeters, purchase of satellite imageries etc. Survey of India is requested to develop customized training programs and online courses to meet the demands of NHP agencies.

Annexure 4: Detailed review of progress and Status

IV. Introduction

13. The second World Bank Implementation Status Review Mission[3] was conducted from April 25 to June 6, 2018 for the National Hydrology Project (NHP) with National Project Management unit (NPMU). The mission's objectives were to review agency-wise project implementation progress as envisaged in the annual work plan and PIP; and identify implementation bottlenecks and provide recommendations in agreement with senior officials of states and central implementation agencies for the smooth implementation of the project.

14. The mission was held in three different zones where regional states/IAs signed up for review, based on their zonal preferences. These three zones were North: Gangtok, Sikkim (April 25-27); South: Munnar, Kerala (May 23-25) and New Delhi (June 4-6, 2018). A total of 47 agencies (excepting Tripura and Delhi) represented by more than 200 participants attended the review. The final briefing of mission was made to the Joint Secretary (MoWR, RD&GR). This note is summarizing the detailed status of project implementation.

V. Project management

Central Agencies

15. **Project Management:** One of the most significant developments since the last mission was the engagement of Technical Assistance and Management Consultancy (TAMC) firm. The TAMC team came on board on October 23, 2017 and are now working very closely with the NPMU in supporting the NHP state and central implementing agencies. The TAMC has four regional centers at: Guwahati, Kolkata, Ahmedabad and Hyderabad.

16. Several agencies have started strengthening their team with contractual and other staff however there are still 23 agencies which are yet to be appropriately strengthened. Since the last mission Haryana, Kerala SW, Uttarakhand and Bihar SW have improved. West Bengal GW needs to interact more with the state in order to be active part of project. Meghalaya on the other hand has gotten weaker. The agencies with weak PMU and not much action include: UPGW, CPCB, CGWB, CWPRS and Bihar GW. In some states, for each approval, the file goes through the entire hierarchy and the process gets delayed. Particularly this still continues in Assam, Manipur, Odisha and Tamil Nadu.

17. NPMU is supported by CWC, CGWB, NIH and CWPRS for technical support to the agencies. During mission, it was clearly felt that more involved guidance and support would be necessary from these agencies. Both CWC and CGWB committees have worked with the agencies to finalize hydromet monitoring network. It may be noted that role of CWPRS is to provide guidance for the design and implementation of hydromet apart from providing verification support for the specifications. CWPRS experts are funded directly through the project for their services.

[3] Mission Members Mmes/Messrs: Anju Gaur (Senior Water Resources Specialist and Task Team Leader); Chabungbam Rajagopal Singh (Senior Water Resources Specialist and co-TTL); Ankan De (Operations Analyst); Sreenivas Devarakonda (Procurement Specialist); S. Krishnamurthy (Senior Financial Management Specialist); Pamela Patrick (Procurement Program Assistant); Jai Mansukhani (Sr. Program Assistant); World Bank Consultants: Anish Kumar (Hydromet and Water Resources Modelling); Hitesh Thakur (M&E Consultant); and Pradeep Dadlani (Environmental Safeguards Consultant).

18. CWPRS plans to develop a Hydrological Information Center for testing, calibration and certification. They should first focus on testing facilities and furnish the lab in stages. Getting a consultancy for all the expertise in one would be difficult (considering the small scope of work) and very expensive. Instead, they can map the testing of each parameters with various firms, national and international, and seek their guidance. For instance, rain-gauge, DWLR and some other sensors are manufactured nationally. It means they can visit their testing lab and seek their guidance in setting up the lab. For some other sensors, the CWPRS may visit international lab/s and learn from them.

19. NIH has been providing their required support in terms of organizing trainings and reviewing Purpose Driver support (PDS). The first and second phase of PDS reviews has been completed. The states need to be made aware that this activity is also meant to serve the preparation of various DPRs for investments. Kerala SW has already understood the potential of this activity.

National Water Informatics Center

20. The NWIC is expected to play a pivotal role in integrating the National WRIS and to provide support to states for developing respective state level WRIS. The center however is yet to be strengthened with required expertise and regular staff resources need to be assigned. The government notification has been issued recently but the staffing situation is yet to be addressed. The system is also in need of updated software and servers. At present the India WRIS hosting is provided by ISRO on a provisional basis. Activities are in process to provide a permanent hosting arrangement for e-SWIS and India WRIS.

States/Regional Agencies

21. The states are also expected to have SPMUs to coordinate with various executing agencies in the department. The role of the SPMUs is to coordinate with the field agencies, NPMU and the World Bank. Therefore, a dedicated team of around 3-5 key members with assigned roles of nodal officer, procurement officer, Finance, MIS & M&E; technical (Hydromet expert and/or water resources modelling expert), safeguards and communication experts is required. It may also be noted that in some states, the project implementation arrangement is not clear. As stated earlier, the SPMU is expected to be a coordinating agency while actual execution of the works, procurement and supervision should be undertaken by respective divisions / field offices.

22. In several states, Nodal officers have been empowered to process the procurement, nominate personnel for training and to attend meetings, while in other states the teams are struggling to process various implementation arrangements and technical sanctions.

23. Out of 49 agencies, 75% are well staffed while the remaining 25% state agencies are yet to be strengthened with dedicated staff. The states which need to strengthen their SPMUs are Tamil Nadu, Kerala (SW, GW), Odisha, and UP (both SW and GW). In terms of fiduciary performance, DVC and Uttarakhand have been the lead performing agencies. The State of Gujarat continues to be a leading performer with respect to institution capacity, database management and river basin modelling setups, which is the ultimate vision of NHP, but has been very slow in its procurements.

24. The mission was impressed with the holistic approach being adopted by State of Karnataka where ACIWRM is taking the lead in consolidating various schemes, and also integrating multi-disciplinary data with various departments using the State WRIS.

25. Key actions required to expedite the implementation are:

a. Simplify approval procedures in the states particularly with the empowerment of agencies and establishing a onetime approval system.
b. Empower Nodal officers for implementation including procurement, nominations for trainings etc.
c. Prepare an internal training plan and profile for staff of the implementing agencies and nominate relevant persons for different type of trainings like Hydromet, procurement, modeling, remote Sensing and GIS etc.

National and State Level Steering committee

26. A National level steering committee has been formed and have commenced guiding the project. A total of 21 state agencies have already formed state level steering committees (SLSC) while the remaining 8 are yet to be formed. It may be noted that these committees are expected to be formed with members from inter-disciplinary departments, so that they may play an important role in the establishment of State WRIS, data policy and avoid duplicity of data creation in various departments. Some of the proposed inter-disciplinary departments may include disaster management, drinking water, agriculture, revenue, rural development, environment and forests and waterways.

VI. Project Components

27. The project has four components and their status is summarized below.

Component A. Water Resources Monitoring System (USD 150 million)

28. This component is designed to focus on improving the extent, timely availability, and reliability of water resources data. It is financing the establishment of new or upgradation of existing hydromet data systems including meteorology, streamflow, groundwater, water quality and water storage measurements, together with the construction of data centers that capture data about both water resources and its uses. There are three main subcomponents: (A1) Hydromet observation networks; (A2) Supervisory control and data acquisition systems for water infrastructure; and (A3) Establishment of state hydro-informatics centers.

Table 1: Status of Number of Hydromet stations

Sl. No.	Type	No. of Real Time Stations proposed in Project	No. of Stations Finalized considering existing stations	No. of Stations to be installed during 2018-19	No. Of stations for which bids have been cleared
1	Rain Gauges	2388	1363	185	609
2	Weather Stations	520	303	17	51
3	River Gauging/discharge	2716	1614	189	575
4	Reservoir monitoring				
5	Canal Monitoring				
6	DWLRs (Groundwater)	7898	6249	357	1360

29. Major contracts worth INR 140 crore have been awarded by the agencies MoWR, Uttarakhand, Puducherry, SOI, Goa and DVC. Tenders with a total value of INR 105 crore (covering 15 states) have been cleared and tenders worth INR 80 crores covering DVC, UP(SW), DVC, Bihar(SW), Jharkhand, Punjab, Odisha(SW), Kerala(SW) and Himachal Pradesh have already been floated. In addition, the tender for a SCADA system for Okhla barrage in UP is already in process. Further, hydromet bids covering 14 states with a value of INR 93 crores are in progress at the moment.

30. To facilitate streamlined technical evaluation, initially it was thought that it was best to have a framework agreement. However, in order to have more flexibility and empower states to procure systems with the latest technology, the ministry opted to guide the states with make and models rather than binding them. Now, instead of the framework agreement, a database of make and models has been shared with the agencies by the NPMU. This can be used as a guideline during technical evaluation. This database will be maintained in association with the states. The agencies have been given standard specifications to finalize the Hydromet procurement. To avoid duplication, the central agencies have worked with states to optimize the chosen sites for the Hydromet network. Now agencies have proceeded with the preparation of tenders. However, it was felt that the following immediate actions from the MoWR, RD&GR are needed:

a. Standardized cost estimate: It was noted that agencies are struggling with the cost estimates of systems in the absence of a Schedule of Rates. It means that the SOR of CWC needs to be updated immediately, incorporating all the components and range of Hydromet. As an intermediate solution, the NPMU is planning to have budgetary estimates soon.
b. Centralized software for RTDAS: The e-SWIS is yet to be updated with the provision of reception and transmission of real-time data, to and from states. The TAMC is currently working on the required IT development.

c. Capacity of IAs: During preparation a large number of trainings were conducted on Hydromet and this needs to be continued both at central level as well as the state levels. A standardized training along with the trainers from states (who already have experience) need to be developed. NWA and CWPRS need to run those courses. The courses should cover not only the technical instrumentation part but also cover items such as site selection, tender evaluation, installation supervision and steps to ensure service level agreement derived in the tender.

d. Telemetry: It is noted that INSAT telemetry is being proposed for all the stations. As it involves a large investment, it may be done optimally considering various aspect of security and capacity of agency. It was informed that the NDMA has advised to opt for satellite based telemetry. While the mission team fully concurs, the first aim should be to have the "right" data and system in place. The satellite based telemetry has several exposed components such as solar and antenna and involves large investments. It puts the entire system at high security risk so priority has to be set whether to have data first with basic system or high-end system which may be at higher risk of theft and damage.

e. GW monitoring system: We continue to note that GW agencies are demanding construction of new piezometers including the HP2 states. The NPMU and GW committee needs to ensure that proposal for deep aquifer monitoring is designed in a comprehensive way, particularly in Alluvium aquifer where monitoring of only dark blocks as well as areas where future development is envisaged and planned. Further some solutions to maintain the piezometers need to be thought through. It was understood earlier that they were equipped with the hand pump. Now some other arrangements such as solar based small pumping systems in secured premises may be considered.

f. SCADA in GW: In West Bengal, the SCADA in GW systems has been introduced and agencies are welcome to see the performance at: < analytics.kisanraja.com>. Some demonstrations are also planned in Punjab. The system basically includes a mobile based controller, a water level recorder and a flow meter. Such systems are helping to understand the pattern of yield with respect to water level and actual usage which is rarely available in the country. This of course would additionally provide pumping well characteristics with drawdown-discharge-yield relationships.

g. For north eastern region, the CWC is collectively processing the bid for the Hydromet network, while each state agency will be responsible for execution and payment of their respective packages. It was also interesting to note that the CWC regional office has conducted hydromet trainings for the states.

h. **SCADA and integrated reservoir monitoring:** All the agencies are encouraged to have integrated reservoir monitoring with the provisions for the monitoring of water level/storage in reservoir and outflows through canal releases and spillways, with the installation of additional sensors for water level in canal outlets and spillways. If required, the gate sensors may be installed. It is to be noted that SCADA will only be funded for selected systems where electrically operated gates are already available and would enable gate operation from central room. The agency may also like to have sound alert systems at dams so that accidents can be avoided as a result of opening of gates.

i. **Inclusion of Display screens at key locations:** The agencies should be encouraged to include LED based ticker displays at key hydromet sites like reservoirs, toll bridges, schools, Panchayat houses etc. to create another avenue of engagement with local communities and appraise them about key data being monitored. These types of screens may be included in the hydromet bids for selected key locations where security threats are not an issue.

31. **Data center:** Provision for Data Centres have been allowed only for the New HP states while legacy states (HP1 & HP2 era) have been advised not to carry out any more civil works and have instead been advised to use the NHP funding for strengthening/supporting river basin assessments and planning exercises for new investments in the state. There have been several proposals for water quality labs but agencies are encouraged to invest in labs only if they have the expert staff to support the activity. If staffing provisions are immediately not available, agencies are advised to consider PPP modes (as in Maharashtra) or to use other accredited laboratories for analyses.

32. Out of the 39 state / UT IAs, 31 (Table 2) have already established hydrological monitoring; the six northeastern states (excepting Nagaland) are yet to establish hydrology divisions. The 21 HP2 IAs have appropriate institutional arrangements established but are yet to improve upon their irrigation/reservoir management.

Table 2: Assessment of implementing agencies

Type of Agencies	**Number**	**Agencies with existing Hydrological monitoring divisions***	**Modelling center**	**Modelling team (>=2)**	**State WRIS**
States	37	31	14	17	14
UT	2	1	0	0	N/A
Central agencies	8	5	4	4	4
RBO	2	2	2	2	2
Total	49	39	20	23	20
Percent of total		**83* [34/41]**	**41* [17/41]**	**41* [17/41]**	

*Percent represent with respect to total state/UT/RBO agencies

Component B. Water Resources Information systems (USD 50 million)

33. Component B is designed to support the strengthening of the NWIC and the sub-national water information centers through the standardization of information-sharing platforms and synchronization protocols enabling the integration of databases and products from various data sources/departments. This will that comprehensive, timely, and integrated water resources information is available to decision makers for effective planning, decision making, and operations. The emphasis here is on improving quality of data, accessibility to water information and on expanding public access beyond data to analytical results (trends, water balance, and so on) as well as to contribute to developing evidence-based operational and investment plans.

34. India-WRIS is currently undergoing a major revision by the TAMC team which is scheduled to be completed by April 2020. However, before that, improvements in India-WRIS will gradually be implemented. The strengthening of NWIC is critical to ensure the smooth operation of India WRIS. The previous contract with ISRO (NRSC) had concluded in December 2017. At present the operation of India WRIS is done through a small team of outsourced staff. Hosting is provisionally provided by ISRO, however, discussion are going on for migrating to a Cloud storage/server solution. In order to advance with content building, India-WRIS has shared basic layers with states on the basis of which the states can

start digitizing and building up their own data/information. The bid for hiring staff is being finalized and shall be floated soon.

35. **E-SWIS status of IA:** The CWC has a web-based data management system that allows data entry, validation and some basic assessment. The mission team was pleased to note that 16 agencies have already joined e-SWIS. Gujarat, Himachal Pradesh, Kerala, Madhya Pradesh and Rajasthan are the major contributors. Several states have demanded training for field staff to help them take part in the system data entry process. Now CWC needs to make the exchange a two-way process and should share their data with the agencies as well.

36. With the help of the TAMC, the aim is to strengthen e-SWIS with the following interventions:

a. Development of a real-time data acquisition system and validation module.
b. It was advised that the digitization of old data may be done directly through e-SWIS as it facilitates some primary quality control right away i.e. right from the data entry stage.

37. **Groundwater data:** Currently there is no functional centralized web-based database management system and it was noted that each state was following their own respective systems. Some were still trying to maintain old GWDES while state of Karnataka informed that they had developed online version of GWIS. During HP2, a web-based data base management system was developed but due to contractual issues it has not been possible to operationalize the same. The TAMC is now developing the GW-module for the e-SWIS. The basic forms for data entry of GW data will be available starting September 2018.

38. **E-WQIS**. During HP2, the web-based water quality system was developed with CPCB. They have been requested to investigate whether the system can be integrated with IndiaWRIS. CPCB has also agreed to integrate their data with IndiaWRIS.

39. **High Resolution Digital elevation model (DEM)**: The project will support the development of a DEMs particularly for flood prone areas. It was noted that some state agencies have procured high resolution DEM through LiDAR survey under different projects like Disaster management, ICZM, Water Sector restructuring. Survey of India is in the advanced stage of procurement for the development of a 3-5-meter DEM for an area of 835,742 square km and another bid for generating DEM at 0.5-meter resolution for 58,460 square km along the flood zones of Ganges and its tributaries. Both Survey of India and NRSC are in the process of planning to develop a DEM for the selected areas.

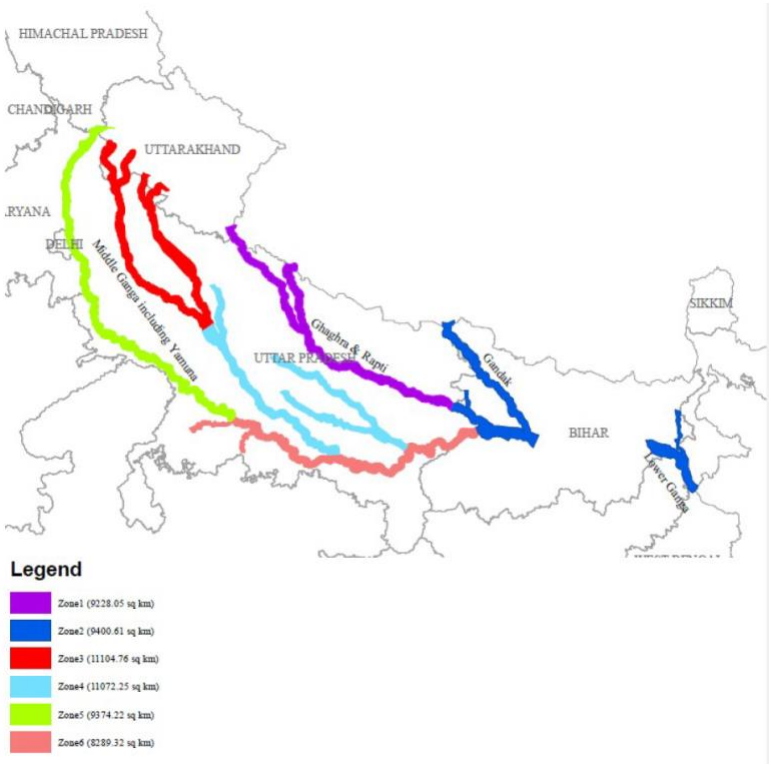


Figure 1. The areas covered to be proposed under 0.5 by SoI

40. SOI has already commenced the following major activities:

a. CORS system for UP for providing corrections to satellite based GPS location accuracy.
b. Geoid modelling for the country is finalised and version 1.0 of INDGEOID was launched in April 2018.

41. NRSC has also initiated for following and will customize the products for IndiaWRIS. They need to interact more the IAs and make them acquainted with the system.

a. Development of real time ET while also planning to install lysimeters for calibration.
b. VIC model with real time estimate for stream flow.
c. Surface water body mapping and can be used to estimate water availability
d. Flood forecasting system for Godavari basin
e. Irrigation scheduling for Narayanpur irrigation project

StateWRIS

42. The development of SWRIS is taking place in various modes while many need guidance from IndiaWRIS team. The following options were thought through, to better support the development process:

a. TAMC will open up the layers of India-WRIS through WMS, WFS and versioning services. Thereafter, the state can utilize these layers through web browser and can develop

their own applications and fill up the micro-level details. This work will be completed in next 4-5 month time-period.

b. As decided in the 1st NLSC meeting held on 23-11-2017, the NPMU is planning to engage an agency to develop some basic generic modules for state-WRIS such as water auditing and water budgeting.
c. Interestingly some states have introduced state level GIS portals for all the disciplines and NHP agencies team has also joined for their water chapters. Now the next effort would be to link the same with IndiaWRIS.
d. Some states are taking help of state remote sensing application center which also has repository of other layers and would automatically ensure the compliance with IndiaWRIS.
e. Other states may engage GIS specialists and NPMU experts may impart training to them to populate the information.

43. In order to ensure integration for SW and GW agencies, both the agencies may like to have the same developer so that integration of various layers is easy. The states have been advised to look for the partner agencies in the state that can help them in long-term and think beyond the project lifecycle.

44. **Updated State Data Policy:** The development of StateWRIS would be successful only after the data dissemination policy is in line with National data dissemination policy and provide free access to state departments. Although states in principle have already agreed through a MoA with MoWR for integrating the data in line with the policy of IndiaWRIS. South Indian states (HP2) in particular need to update their pricing policy in line with National data policy at the earliest. The states also need to introduce their own policy so that all the sectors have access to data and they need not duplicate. Particularly, the costly information such as LiDAR maps would require arrangements for accessibility so that it could be used in planning and designing cost effective systems.

45. Some noteworthy efforts to strengthen at state level are:

a. Andhra Pradesh C.M.'s dashboard with real time water auditing
b. WRIS at Karnataka integrating interdisciplinary data.
c. Telangana SW chapter is ready with the help of NRSC Bhuvan
d. MP geo portal
e. Tamil Nadu used to have one but now the status is not clear

46. The mission was pleased to note that the process of integrating the data has already commenced. The MoWR is in the process of making the data accessible online to government agencies for Ganga and Brahmaputra basins on real time basis, for improved flood and river basin management. Sixteen IAs have already joined the web-based data management system (e-SWIS) while others are in process. Some agencies have requested for additional training for their field staff and CWC has been advised to plan this immediately in their respective centers.

47. The mission was pleased to note that some agencies have already adopted the vision of NHP through their own funding or through other external Assistance and have established integrated information systems, centers for river basin planning and management and flood forecasting centers.

Component C. Water Resources Operations and Planning Systems (USD 84 million)

48. The objective of Component C is to deploy an interactive decision support platform for flood forecasting, reservoir operation systems, river basin planning and management, irrigation benchmarking and support in preparation of investment plans through the support of purpose driven studies. The interactive platform would integrate information systems, forecasts and modeling tools to generate water information knowledge products and support in decision making for improved water resources operations and planning. In case, additional monitoring systems are required to improve this assessment or strengthen the calibration, they should be supplemented through Component A. The component also undertakes a series of 'Purpose-Driven Support' activities to fill water resource development and management knowledge gaps and develop analytical tools to support hydrologic analyses.

49. Models at basin scale will be developed and applied by the CWC and the CGWB in collaboration with states and river basin IAs, leveraging resources/inputs from the international consultancies and other high-level technical support. Models will be designed so that they can be adapted for use by other agencies as well and, in particular, will support the 'nesting' of models so that state agencies or basin organizations can develop sub-models to improve the representation of local catchments within a river basin modeling system. A centralized modeling framework will be integrated into India-WRIS (or NWIC, once established) to provide an open access modeling. An 'adapter module' will allow linking of legacy models.

50. Component C has three subcomponents: (C1) Development of Analytical Tools and Decision-support Platforms, (C2) Purpose-Driven Support, and (C3) Piloting Innovative Knowledge Products.

51. **C1.1: Streamflow forecasting system:** CWC has setup a flood forecasting system based on climate forecasts for entire India. During HP2, the World Bank supported the development of stream flow forecasting based on climate forecasts for Krishna-Bhima basins and the Bhakra system. Some states or agencies who already have models in operation or are in the process of developing are: Maharashtra for Upper Krishna - Bhima; BBMB for Bhakra Beas; Bihar for Bhagmati and Kosi (also in the process of developing 2-D inundation model); UP for Rapti; West Bengal and DVC for Damodar; Odisha for Mahanadi; NESAC for Brahmaputra. A more comprehensive list is available in Table 6. The World Bank has also supported the development of flood risk assessment and flood forecasting system for Ganga and Brahmaputra river basins (refer first mission AM Annexure 3 B).

52. There is a plan to develop a dashboard for streamflow (flood) forecasting at the National level and to also support reservoir operation systems that will basically guide the states with respect to the operation of reservoirs. CWC also needs to plan how streamflow forecasts and reservoir operation systems would operate in integrated manner without duplicating the efforts for the states or the centre. Moreover, the integrated reservoir operation system needs to be linked with flood forecasting system to make the forecast at locations downstream of reservoirs more relevant and accurate. There is also a plan for long lead flood forecasting in selected basins. The details are yet to be worked out by CWC for i) developing the dashboard for streamflow forecasting; ii) Long lead flood forecasting. All these forecasting systems need to incorporate reservoir operation systems so that accurate forecasts for operation may also be provided.

53. C1.2: **River basin planning system:** This sub-component aims at developing a River basin modelling platform for planning, operation and management. The objective is to develop river basin plans

and operate reservoir coupled with seasonal forecast and be ready to meet multiple demands and climate extremes. The ultimate aim is to have dynamic water accounting and availability at various scales.

a. Some states have already started setup for their respective basin using other resources. The efforts known to the mission include: UP for Basin assessment and planning system for its 8 basins; Ganga: Strategic plan funded by the World Bank; Damodar Basin: Using Riverware software and supported by the World Bank; and Tungabhadra: ADB funded through ACIWRM.

b. Under NHP, the immediate plan is to develop IWRM based river basin plan for the three river basins (Krishna, Godavari and Mahanadi). The procurement had been initiated and is in evaluation stage. This procurement has been packaged in such a way that all the riparian states will lead the development of their respective micro-river basins while for Macro-level, CWC will develop and coordinate in partnership with the riparian states. The technical proposal is under review for both the packages.

c. Some states have also proposed to develop river basin plans for intrastate basins. During HP2, the DSS was developed for nine sub-basins using MIKE Hydro system. NIH has been requested to provide the status of those systems and also provide future plan for upscaling in respective states. The proposal is in initial stage for reviving the DSS and including some bug-fixes and trainings to participating basin states.

d. In addition, some states have started setting up river basins plans for their respective small basins in Riverware software following basic training of a week. The efforts of those modelers are highly appreciated and a modelling group has been established. Some of the River basins for which this model has been developed are: Gujarat- Bhadar Basin, Maharashtra-Upper Bhima Basin, Punjab- Ravi Basin; DVC- Damodar Basin; and BBMB-Satluj and Beas Basins.

54. **Water accounting: UNESCO-IHE:** A five month training was given on Water Accounting Plus involving 12 participants from NRSC, CWC, CGWB and NIH. The aim of the training was to equip the participants with tools and knowledge of setting up basin models for dynamic water resource assessment using remote sensing data. The expected outcome of the training is setting up the models for Cauvery basins by the training participants. The participants were selected based on training in India. They have already been in Netherlands and now plan to have finale leg of training at NWA. The trainees need to be focused on linking the model with the applications. Also first batch belongs to only central agencies, they need to consult with the states in order to develop required scenarios. Also the team should try to use observed data to the extent possible so that the model can be validated with maximum confidence.

55. **Water Accounting and Integrated Reservoir Operation:** Narmada basin has a cascade system of dams and barrages and is having a system of management of its resources as per a master plan. The TAMC has taken up the work of developing a framework for water accounting and integrated reservoir operation in collaboration with Narmada Command Authority (NCA).

56. **C1.3 Irrigation management and benchmarking:** The project will support in the improved assessment of irrigation system and states are encouraged to modernize benchmarking of their system.

Some states have demanded to improve their operation system using the technology. NRSC has proposed irrigation scheduling for Narayanpur project using remote sensing technology. Similarly, the Haryana state plans to have SCADA integrated with the operation system. The remote sensing based ET or other indicators may be used to prepare roster of irrigation system. Further this activity may be used to map the performance of irrigation projects.

57. **C2: Purpose Driven Support:** NIH is the coordinating agency for PDS review. Recently 27 PDS have been cleared and 7 PDS are under review. The aim of this activity is to support the states in evidence based planning for their investments. Many of PDS proposed by states were either fitting in component A or C1. The technical support to state may be continued.

Component D: Institutional Capacity Enhancement (USD 83.56)

58. Component D is designed to build capacity and capability for the technical and planning dimensions of water resources management. Component D has four subcomponents: (D1) Water Resources Knowledge Centers; (D2) Professional Development; (D3) Project Management; and (D4) Operational Support.

59. D1. **Water Resources Knowledge Centers:** There have been proposal by states to upgrade their water resources knowledge centers. But the majority of proposals are centered around "construction" of building with no clarity about the arrangements for "excellent" experts. The agencies are encouraged to collaborate with the expert institutes and work on developing a system while providing the platform for their staff for on the job training. Some agencies have been developing these arrangements with local institutes while international collaborations are also welcomed. In some states, knowledge centers have been created through other means and NHP will help to fill the gaps and develop activities. For instance, Karnataka has ACIWRM funded by ADB for Tungabhadra. This center will be strengthened to develop river basin plans for other basins in the state. Bihar is also advised to follow a similar model. Bihar has a mathematical modelling center for the Koshi river; the same center could be used for other basins using resources from NHP.

60. NIH has opened its center of excellence for river basin modelling. NIH has indicated a pool of resource persons covering each aspect of water resource management. Further, NIH has shown their keenness to support the activities of river basin modelling under NHP and to guide the states in development of these systems. The team has been very supportive of the idea but requires dedicated teams from NIH in various river basin models and guiding the states in the development of these systems. So far, their proposals have been limited to only some PDS and specific studies while the project requires continuous support in setting up the river basin models and to test the performance on various fronts. This is a long-term process and requires intensive support from expert agencies like NIH through formal, and on the job trainings and help centers in various models available internationally.

61. **D2. Professional development:** This subcomponent aims at organizing and attending various training and also developing various modules. NIH/TAMC had conducted needs assessment and based on that a training calendar has been developed. However, the training calendar may be treated as dynamic exercise considering the changing/dynamic needs of various agencies. All the IAs are also encouraged to invite other states whenever they are organizing any course. Considering the specific needs of

implementing agencies, the trainings should be customized to be "demand based" instead of "supply based". TAMC will support to:

i. Identify specific institutes mapped with regional requirements;

ii. Coordinate and facilitate the collaboration among IAs and expert institutes;

iii. Standardize various courses;

iv. Develop media based courses and online learning tools.

62. The project has already setup an excellent foundation with number of trainings organized during preparation and with continued momentum during implementation. Right up May 2018, 118 training events have been organized, with more than 2,177 participants. Details on training events and participation are on the project website and are summarized in Table 3. Since the launch of project, MoWR, RD&GR has continued with the organization of national and international trainings. Now there is need to work on standardizing some regular trainings and also introduce e-modules and develop the trainers.

63. The project will target to have trainings linked to specific purposes and ensure that those trainings are applied. One of the models that could be adopted is that basic level training can be organized in the country and then be followed up with more advance level training at the international level for the participants who have already developed the basic setup in the state/country. For instance, the basic training of HEC and Riverware has already been conducted in the country. Based on that some participants have already setup the model, the deserving candidates were further nominated for advanced training so that they could setup the system under the guidance of international experts.

64. Considering the specific needs of implementing agencies, the trainings need be customized to be "demand based" instead of "supply based". Currently the trainings have been a mix and some institutes continue to offer through their routine training program. However, the training calendar may be treated as dynamic exercise considering the dynamic needs of various agencies. All the IAs are also encouraged to invite other states whenever they are organizing various courses.

Table 3: Type of training and number of participants

S No.	Training Type	Number of trainings		Number of participants
		National	International	
1	**Contract Management and Others**	2		50
2	**Finance & PFMS**	3	1	33
3	**GeoPhysics**	3		54
4	**GW Hydrology**	4	1	82
5	**GW Modelling**	2	1	52
6	**GW Resource Estimation**	3	1	107
7	**Hydromet Instrument**	13		346
8	**Irrigation Bench Marking**	1		33
9	**Procurement**	12	1	339
10	**Remote Sensing and GIS**	9		172
11	**River Basin Planning & Management**	11	2	301
12	**Software: e-SWIS; e-Gems; Other**	13	2	192
13	**Surveying & Mapping**	3		12
14	**SW Hydrology**	12		196
15	**SW Modelling**	7	2	152
16	**Water Quality-Transport Modelling**	3	1	29
17	**WRM-IWRM**	1	4	27
Grand Total		**102**	**16**	**2177**

65. The implementing agencies are continuing to exchange amongst each other through various modes: (Facebook, WhatsApp and email). New project states have been linked with prior HP states to provide project preparation advice, to provide 'peer to peer' technical assistance and support exchange meetings. The modelling groups also continue to exchange regarding the development of models. The mission encourages IAs to continue these exchanges.

66. **D3: Project management:** many agencies have started to furnish the office space for operation of PMU. The procurement and hiring of vehicles, computers, furniture etc. have been picking up mainly in new states. The major issues faced by the states is the inability to hire incremental staff (like data entry operators, IT support, accountant, etc.) on temporary basis.

67. **D4: Operational support:** Many agencies have started using operational support. Some agencies have been asking to use this support for AMCs for various systems. It may be noted that the limits have been set for various categories of expenditures under this category and therefore they should balance all the needs under this component. Several agencies desiring to use for support staff however have been struggling to engage the contract and competent staff.

VII. MIS and Monitoring & Evaluation

68. **MIS:** The MIS is fully functional in the project and several modules are already in practice. The project has an online approval system and agencies are not required to submit any paper documents. There are number of enhancements on going or completed with reference to last mission. The existing MIS modules are as follows:

a. Preparation and approval process for of PIP, AWP and PP
b. Submission and review of bid and PDS documents
c. Financial management for itemized reporting and automated preparation of IUFR.
d. Online document system
e. Training module: registration and monitoring of participants
f. Project Progress Module: Auto ranking and percentage progress with reference to procurement and finance.

69. The MIS needs to be further developed. The development of the following modules are already in progress: i) Selection process for make and models of Hydromet. ii) Tracking of trained personnel-utilization of training and outcomes to support as indicators including training profiles of individual participants iii) Internal communication, data sharing & email provision between national and state agencies iv) integration with Monitoring & evaluation component and to develop Web Application User interface from other resources like e-SWIS; v) Development of Mid Term Review Module to reshuffle PIP vi) Development of Reporting section to generate various financial , budgeting, annual planning and day to functioning reports vii) Query builder to have data from MIS based on Project requirements as and when required

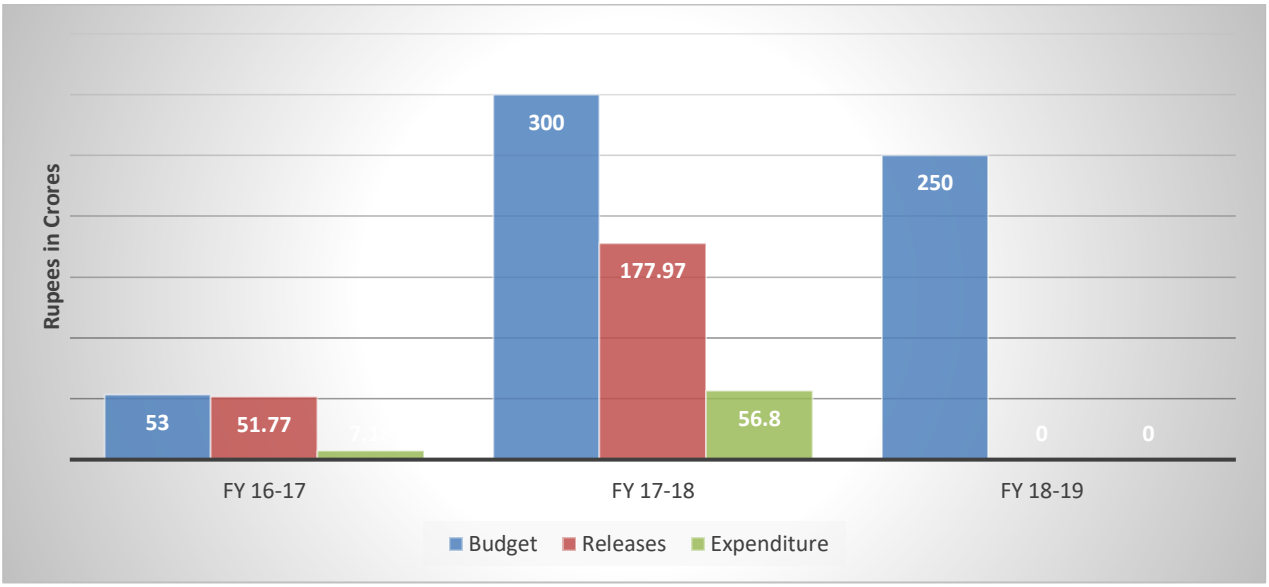
70. **M&E:** The result framework is attached in Annexure 1 and performance of IAs in Annexure 2. The performance of States is being monitored for the following parameters: SPMU capacity, progress in procurement and disbursement, Institutional setup (data center and modelling center), data integration and policy to enable improved access, financial management (for details, refer to the project website http://nhp.mowr.gov.in /Performance.aspx. APGW, Karnataka and Gujarat have been found performing well in Institutional capacity aspects while DVC, APGW and MoWR have been performing on procurement and disbursement. Majority of states are yet to pick on procurement while new states are yet to strengthen their Institutional setup.

VIII. Financial management

71. **Budget:** The MOWR has provided a budget of Rs.250 crores for the FY 18-19. The Centre had **provided** adequate budget for the last two years and released grants in aid to the states on a timely basis. During last FY Rs.178 crores was transferred to the states and the central agencies for carrying out project expenditure. Project funds have reached the states and now the onus is on the states to carry out the activities in a timely manner and ensure that the funds are used. Fund flow during this year could be an issue as the expenditure at the state level are not meeting the guidelines for tranche release. The states should ensure that UCs and audit reports are submitted at the earliest to ensure funds release.

Table 4: Budget and fund transferred (INR in Crores)

Particulars	FY2016-17	FY 2017-18	FY 2018-19	Total
Budget allocation	53.14	300.00	250.00	603.14
Opening balance		45.03	169.94	
Amount released to states/agencies	47.84	154.14	0	201.98
Fund utilized by central agencies	3.93	23.83	0	27.76
Total Expenditure for the project (both states and Centre)	7.19	56.80	0	63.98



72. **Project Expenditure:** As evident from the above Table 4, the project has incurred a total expenditure of Rs.64.40 crores from inception till date. IUFR has been submitted till March 2018 which is under process. The expenditure incurred in comparison to the release of funds is on the lower side and this could lead to non-fulfillment of conditions for the next tranche release and MoWR may have difficulties in releasing the amounts. The mission requested the states to ramp up the operations and ensure all the conditions are met for the next tranche release.

73. **Accounting systems:** PFMS has been mandated by the GOI and Expenditure Advance Transfer (EAT) module has been made compulsory for all states. In case of PFMS system, all agencies have registered their respective bank accounts and amounts from the Central level is being transferred through this system. 23 agencies have started using the EAT module for making payments which will capture the expenditure online. In case of central agencies 7 agencies are using PFMS. The ministry should enforce all payments should be done through PFMS systems, cash book and utilization certificates, should be generated from PFMS to make full utilization of the system. The EAT module of PFMS should be implemented by all the state agencies and all payments should be done through electronic mode of PFMS. PFMS should be rolled out across all states at the earliest as prescribed in the office memorandum issued by MoWR. From FY 18-19, expenditures recorded in PFMS would be considered as the eligible expenditure at the time of processing of IUFRs. The Bank will review the progress made in this area in

the next couple of months. The mission requested the project to ensure that TMAC financial consultants visit states on a regular basis and review the accounting process followed in the agencies.

74. Online MIS system has been developed and implemented by the project which is working well. The MIS systems currently records financial progress component wise and all financial reports are being generated from this system. MIS can continue as it records the total payments and provide physical and financial progress.

75. **External Audit:** The audit reports of some of the agencies for retroactive period has been submitted to the NPMU. The **mission** reiterated that the audit reports for both the retroactive period as well as for FY 17-18 needs to be submitted by the project within the agreed timeline. The audit arrangements have been confirmed with the CAG office by NPMU and instruction have been sent from CAG head office to the states. The project should share the format of audit reports with the state so that audit reports are received in the agreed format.

76. **Internal audit:** In the first year of operation the overall expenditure has been on the lower side. it was agreed that the project would appoint internal auditor by September 2018 to undertake internal audit of FY 18-19.

Keeping in mind the progress made so far and the agreed actions for future, the rating is pegged **as Satisfactory *(S)***.

Table 5: Implementing agency wise releases and expenditure (INR in lakhs)

Implementing Agency	Releases			Expenditure			Utilization
	2016-17	2017-18	Total	2016-17	2017-18	Total	
AP GW	221.90	381.00	602.90	0.00	266.12	266.12	44%
AP SW	83.05	355.00	438.05	0.00	55.55	55.55	13%
Assam	93.87	204.00	297.87	1.27	60.69	61.96	21%
Bihar GW	16.05	80.00	96.05	0.00	0.00	0.00	0%
Bihar SW	28.60	250.00	278.60	0.00	7.60	7.60	3%
Chhattisgarh (GW)	10.85	92.00	102.85	0.00	3.95	3.95	4%
Chhattisgarh (SW)	20.80	105.00	125.80	0.00	29.45	29.45	23%
Delhi	0.00	0.00	0.00	0.00	0.00	0.00	0%
Goa	0.00	50.00	50.00	0.00	3.43	3.43	7%
Gujarat GW	80.82	150.00	230.82	0.00	10.20	10.20	4%
Gujarat SW	48.60	371.00	419.60	0.00	45.28	45.28	11%
Haryana SW	149.50	222.00	371.50	2.17	1.08	3.25	1%
HP	100.00	200.00	300.00	16.67	203.28	219.95	73%
Jharkhand	100.00	266.00	366.00	0.00	3.53	3.53	1%
Karnataka SW	204.36	450.00	654.36	11.05	181.21	192.26	29%

Implementing Agency	Releases			Expenditure			Utilization
	2016-17	2017-18	Total	2016-17	2017-18	Total	
Kerala GW	120.00	106.00	226.00	0.00	6.10	6.10	3%
Kerala SW	92.83	209.00	301.83	0.00	135.36	135.36	45%
MP	60.60	300.00	360.60	0.00	18.57	18.57	5%
Maharashtra GW	38.50	177.00	215.50	0.00	0.40	0.40	0%
Maharashtra SW	368.45	733.00	1101.45	0.00	121.06	121.06	11%
Manipur	32.50	159.00	191.50	3.12	28.94	32.06	17%
Meghalaya	36.00	162.00	198.00	3.00	35.47	38.47	19%
Mizoram	93.00	177.00	270.00	76.70	110.21	186.91	69%
Nagaland	84.00	137.00	221.00	58.51	52.87	111.38	50%
Odisha GW	17.74	117.00	134.74	0.00	5.26	5.26	4%
Odisha SW	67.00	324.00	391.00	0.00	6.89	6.89	2%
Punjab	222.00	322.00	544.00	0.00	42.93	42.93	8%
Rajasthan	95.75	631.00	726.75	0.00	42.71	42.71	6%
Sikkim	25.90	159.00	184.90	0.00	108.21	108.21	59%
Tamil Nadu	100.00	400.00	500.00	0.00	5.84	5.84	1%
Telangana GW	195.00	324.00	519.00	0.00	129.82	129.82	25%
Telangana SW	50.74	517.00	567.74	0.00	36.60	36.60	6%
Tripura	18.28	101.00	119.28	1.70	3.27	4.97	4%
UP GW	150.00	120.00	270.00	0.00	0.11	0.11	0%
UP SW	202.75	350.00	552.75	0.00	11.31	11.31	2%
Uttarakhand	52.60	260.00	312.60	0.00	97.55	97.55	31%
West Bengal GW	72.90	264.00	336.90	0.00	80.90	80.90	24%
West Bengal SW	73.25	300.00	373.25	0.00	17.63	17.63	5%
Puducherry	60.00	79.00	139.00	31.74	92.35	124.09	89%
DVC	30.87	209.00	239.87	6.08	77.44	83.52	35%
BBMB	22.50	149.00	171.50	16.14	35.93	52.07	30%
NIH	235.80	314.00	549.80	67.03	118.77	185.80	34%
CPCB	78.00	70.00	148.00	30.11	11.71	41.82	28%
NRSC	28.67	816.05	844.72	0.00	449.60	449.60	53%
SOI	900.00	4252.00	5152.00	0.00	542.16	542.16	11%
CWC	22.00	128.82	150.82	22.00	128.82	150.82	100%
CWPRS	25.19	120.73	145.92	25.19	120.73	145.92	100%
CGWB	16.62	102.81	119.43	16.62	102.81	119.43	100%
NPMU	329.60	2030.70	2360.30	329.60	2030.70	2360.30	100%
Total	***5177.44***	***17797.11***	***22974.55***	***718.70***	***5680.39***	***6399.09***	**28%**

IX. Procurement

77. The procurement performance during the review period is rated as '**Satisfactory**', taking into consideration that (a) Critical procurement activity of Technical and Management consultancy has been successfully awarded; (b) Contracts worth 22 Million USD have been awarded, (c) Bidding process is on-going for contracts worth 12 Million USD, (d) Implementing agencies are ready to float bids for contracts worth 48 Million USD.

78. **E-procurement system**: The e-procurement system assessment was carried out by the World Bank team for Central Water Commission (CWC), Chhattisgarh, Andhra Pradesh, Telangana and NRSC. Review of E-procurement systems of Andhra Pradesh and Telangana is under progress. Some observations/suggestions were made on the e-procurement systems of NRSC, CWC and Chhattisgarh which were communicated to the respective implementing agencies. The replies from these agencies are awaited. All the agencies should ensure that the e-procurement system they intend to use for carrying out procurement under NHP is assessed and accepted for use by the World Bank.

79. **Procurement Plan**: The procurement plans are being approved through STEP. It is a mandatory system for clearance of procurement plans and processing the clearances at various stages. Several agencies have already started using STEP for filling roadmap for procurement activities. To streamline the use of STEP, the Bank has conducted multiple training programs for the officials of IAs on STEP and has been providing constant hand holding support to the IAs. *STEP help Desk has also been introduced that can be reached via a toll-free number 1-800-208-9987 or e-mail (stepitsupport@worldbankgroup.org) from 9 am to 6 pm.* All implementing agencies should start the procurement process only after entering the procurement activity in procurement plan through STEP and its NOL from the Bank.

80. The Bank team reiterated that the procurement manual provides for use of Government e-market place (GeM) in lieu of shopping up to USD 30,000 in catalog mode. Use of GeM will now be allowed in lieu of shopping up to US$ 100,000, provided there are at least 3 suppliers for the item on GeM and the Purchaser uses RFQ (mini competition or bidding among suppliers) feature on GeM to discover the final price. In both above cases Implementing agencies will record their assessment on reasonableness of price. GeM is not to be used in lieu of NCB.

81. NPMU may like to consider introducing rate contracts or get included in GeM for some common items such as ADCP, water quality equipment and survey equipment. Similarly, centralized contract arrangement for VC equipment may be organized so that all agencies have the same platform and could make group / family in VC system. The mission was pleased to know that a rate contract with ESRI for procurement of Arc GIS software has already been signed.

X. Social (including Safeguards)

82. The Operation Policies related to Involuntary Resettlement and Indigenous People has not been triggered, as neither the project requires acquiring land involuntarily nor is it impacting tribal/indigenous people. However, the project will be vigilant and document all aspects related to "land" secured for the installation of any facility. At the end of the first year, "land" would be revisited and reviewed. Based on the results of the review, further needful action would be taken. Therefore, the SPMU has been assigned to nominate one of the team members to monitor the same.

XI. Environment (including Safeguards)

83. The project triggers OP/BP 4.01 as it might cause minor potential environmental impacts arising from implementation of Components A and C. Component A, which will set up monitoring stations, data centers, and associated facilities and infrastructure, may have minor construction-related environmental impacts.

84. The borrower has prepared an Environmental Assessment (EA) which identifies multiple enhancement opportunities in the project and proposes ways of mitigating small negative impacts. Construction-related impacts will be managed by application of National Building Codes in designing and construction of the small buildings and careful in situ disposal of all construction wastes.

85. **Environmental Management**: The States plan to undertake infrastructure development activities ranging from setting up of Hydromet stations to construction of Data Centers and water quality monitoring laboratories. To ensure compliance of State & National laws and to avoid delays in execution of works, necessary permits and clearances from various departments like Forest Department, Public Works Department, etc., are obtained and documented before execution of works start. Any cost incurred due to non-compliance of environmental rules and regulations shall be borne by the respective State and not through the Project.

86. National Building Code shall be followed for design of buildings. It is recommended that new and existing buildings proposed to be rehabilitated under the project, with plan area more than 5000 square feet, conform with Green Rating for Integrated Habitat Assessment (GRIHA) standards. Respective states need to ensure that the scope of work/terms of reference of the design consultancy and bid documents adequately address these requirements. It is the discretion of the states to follow GRIHA standards for buildings with plan area less than 5000 square feet.

87. The States also need to ensure that necessary information regarding environmental management is incorporated in the design and bid documents including potential environmental impacts of activities proposed, mitigation measures, responsible agency for ensuring compliance, and responsible agency for supervision along with monitoring schedule for various mitigation measures. Applicable rules and regulations related to, but not limited to, Environmental Social Health and Safety, fire safety in laboratories and buildings, disposal of construction waste, disposal of batteries, monitoring of air and noise quality, etc., need to be addressed in the design and bid documents. If required, the details of cost towards mitigating potential impacts may be included in the cost estimate.

88. The World Bank Group's General Guidelines on Environmental, Health and Safety (EHS) can be accessed at: http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES. Due to health impacts of asbestos, use of asbestos containing material (ACM) in construction activities shall be avoided. Practices regarding use of asbestos that are normally considered acceptable by the World Bank Group in projects supported through its lending are addressed in the EHS guidelines as well (page 71, 91 and 94). Also, any asbestos containing material dismantled during construction activities need to be disposed in accordance with these guidelines. A General Guidance Note on issues relating to asbestos is available at: https://siteresources.worldbank.org/EXTPOPS/Resources/AsbestosGuidanceNoteFinal.pdf.

89. The project involves installation of hydromet stations powered by batteries. The disposal of lead acid batteries shall be in accordance with Batteries (Management and Handling) Rules, 2001, and of other batteries with Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2016 of GoI.

90. **Purpose driven support (PDS)**: It needs to be ensured by the respective states and NIH that environmental management aspects are adequately included in the scope of the proposed PDS and thereafter in the Terms of Reference of the consultancies undertaking the studies.

91. **Institutional Arrangement**: A dedicated Environmental Specialist needs to be designated by National and all State PMUs to ensure environmental management. Several PMUs have assigned the staff while some still need to ensure that environmental management aspects are adequately addressed in the design and bid documents being prepared and submitted by the States to NPMU.

92. During the mission it was agreed that the monitoring systems of dams shall be integrated with Emergency Response Systems, especially for barrages. The mission noted that generic environmental safeguards aspects drafted by NPMU for IAs to be included in bid documents for infrastructure works needs to be further strengthened with (i) National Building Code and GRIHA standards for buildings larger than 5000 sq ft for construction and rehabilitation of buildings; (ii) GoI's Construction & Demolition Waste management rules (Gazette notification dated 29th March, 2016)[4]; (iii) World Bank's Operational Health & Safety (OHS) Guidelines[5]; (iv) Bank's guideline on handling of asbestos containing material[6]; and (v) Batteries (Management & Handling) Rules 2001 and Hazardous Waste Management Rules, 2016 for battery powered hydromet stations.

93. **Institutional Capacity and Trainings**: NPMU has directed all IAs to designate Health, Safety and Environment safeguards specialist to address environmental safeguards works for the project. For all individuals nominated by the Implementing Agencies as Environment Safeguards Specialists, specific training and capacity building exercises can be undertaken to familiarize all stakeholders with respect to the World Bank project compliance requirements. The NPMU has proposed to conduct training programs on environmental safeguards for IAs.

94. In view of the above, environmental safeguards performance was found to be Satisfactory.

[4] http://www.moef.gov.in/sites/default/files/C%20&D%20rules%202016.pdf and http://cpcb.nic.in/c-d-waste-rules/
[5] http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES
[6] https://siteresources.worldbank.org/EXTPOPS/Resources/AsbestosGuidanceNoteFinal.pdf

Table 6: Summary of River Basin Activities

S. No.	Basin	Area (Km^2)	RTDAS/ SCADA	WRIS	Flood model/ Reservoir operation system	River basin model
	Northern River Basin		**Trans-boundary; developed, perennial with snow melt; data scarce basins**			
1	**Ganga Basin** (Bihar, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Uttar Pradesh, West Bengal)	808,328			CWC stream flow forecasting system	River basin planning framework IWRM strategy plan
	Uttarakhand		Meteorology: Rain gauges: 20 proposed	No		
	Uttar Pradesh		Rapti basin 5 SCADA for dam and barrages 20 proposed 2 SCADA	Partial under UPWSRP	Flood model including 2D inundation developed for Rapti	IWRM for 8 basins in UP is under progress through UPWSRP-2
	Haryana		SCADA proposed for Hathini-kund barrage RTDAS proposed for canal monitoring	No		GW security plans will be developed under the NGMIP
	Jharkhand					
	Madhya Pradesh		SCADA exists in some systems; During HP2, RTDAS for Vanganga is in operations; Tendering for			UNESCO: two sub-basin plans were prepared.
	Rajasthan		RTDAS Bid floated for 247 stations	No		Aquifer mapping is done, water resources plans were prepared a decade ago. GW

S. No.	Basin	Area (Km^2)	RTDAS/ SCADA	WRIS	Flood model/ Reservoir operation system	River basin model
						security plans will be developed under the NGMIP
	Bihar			Disaster and FMIS: Flood forecasting and morphological studies in Kosi are under progress. Matehematical modelling center established.	• Inflow forecasting and DEM for flood inundated area for Chandan River • Improve GW monitoring and assessment system	
	West Bengal		• Upgrade RTDAS including Dam/Barrage monitoring systems • SCADA for selected Barrage/reservoirs	ADMI project: Selected monitoring system and data centers are being upgraded under ADMI project for minor irrigation department.	• Reservoir operation system	• GW quality assessment and modelling for potential GW development • Framework for overall irrigation development
2	Brahmaputra and Barak (Assam, Meghalaya, Nagaland, Sikkim, West Bengal, Manipur, Mizoram, Tripura)	152,553	• Combined RTDAS for NE States • New and upgraded (Assam) hydromet system by state	Brahmaputra sedimentation study. Inflow forecasting for three small sub-basins in Assam is developed. NESAC has also setup FF system for Assam.	• Sediment monitoring, sediment transport modelling for mapping erodibility • GLOF • Northeast center of excellence • Establishment of hydrology cell in states • Cloud burst studies and forecast	• Planning for drinking water supply • Remotes sensing applications for ungauged basins
3	Indus (up to border) Basin (Chandigarh, Haryana, Himachal Pradesh, Punjab, Rajasthan)	261,596	• RTDAS installed on 100 sites • Upgrade partial hydromet system	Real-time flood forecasting and reservoir operation system exist for major catchment (lower Sutlej and Beas) in the Bhakra system.	• Extend reservoir operation system for Ravi Basin • SCADA on barrage system,	• irrigation benchmarking

S. No.	Basin	Area (Km^2)	RTDAS/ SCADA	WRIS	Flood model/ Reservoir operation system	River basin model
			• Irrigation canal monitoring system	Now focus will on upgrading ROS for states and canal systems.		
	Southern Basins					
4	**Godavari Basin** (Andhra Pradesh, Chhattisgarh, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Telangana)	302,021	RTDAS under bidding stage for 182 stations	NRSC and Maharashtra are setting up for IWRM and river basin plan for some tributaries/sub-basins.	• NRSC: Flood forecasting system including DEM	• CWC: Macro- and micro-level planning by the CWC and riparian states. Procurement of consultancy under evaluation.
5	Krishna Basin (Andhra Pradesh, Karnataka, Maharashtra, Telangana)	254,750	RTDAS installed for 250 sites	• Real-time flood forecasting and DSS for river basin planning has been developed for sub-basins of Maharashtra.	• Macro- and micro-level planning by the CWC and riparian states, consultancy in evaluation stage	• For IWRM plan for Tungabhadra is under preparation. • The NIH is setting up for Krishna Basin.
6	Cauvery Basin (Karnataka, Kerala, Pududherry, Tamilnadu)	85,626		Tamilnadu had developed TNWRIS	Reservoir operation system.	UNESCO: Remote sensing based water accounting by WA+ trainees
7	Pennar Basin (Andhra Pradesh, Karnataka)	54,223				River basin planning tool for both macro-and micro-level will be developed.
	Western rivers with limited water resources					
8	Mahi Basin (Gujarat, Madhya Pradesh, Rajasthan)	37,984				• Conjunctive use of SW-GW study was carried out during HP-II. • River basin planning tool for both macro- and micro-level will be developed.

S. No.	Basin	Area (Km^2)	RTDAS/ SCADA	WRIS	Flood model/ Reservoir operation system	River basin model
9	Narmada Basin (Chhattisgarh, Gujarat, Madhya Pradesh, Maharashtra)	93,467				River basin planning tool for both macro- and micro-level will be developed. NPMU is supporting through TAMC. The process initiated through stakeholder consultation.
10	Sabarmati Basin (Gujarat, Rajasthan)	30,679				River basin planning tool for both macro- and micro-level will be developed.
11	Tapi Basin (Gujarat, Madhya Pradesh, Maharashtra)	63,428				River basin planning tool for both macro- and micro-level will be developed.
	Eastern rivers with limited water resources					
12	Mahanadi Basin (Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha)	139,617	RTDAS is set up in Odisha during HP2			Macro- and micro-level planning by the CWC and riparian states, Consultancy in evaluation stage.
13	Subernarekha Basin (Jharkhand, Odisha, West Bengal)	25,792				River basin planning tool for both macro- and micro-level will be developed.
14	Brahmani and Baitarni Basin (Chhattisgarh, Jharkhand, Odisha)	51,897			Options would be explored to upscale the developed system.	CWC.CSIRO: IWRM modelling setup is developed for Brahmani and Baitarni.

Note: NMCG = National Mission for Clean Ganga; GW =Ground water; SW = Surface water; FF = Flood forecasting; UPWSRP2 = Uttar Pradesh Restructuring Project; ADMI = Accelerated Development of minor irrigation; NESAC = North East Space Application Center; GLOF = Glacial lake outburst flood; ROS = Reservoir Operation system.

Red color text indicates activities under other projects / HP2 and blue color indicates activities

Annexure 4.1 – 4.48 Agency wise summary report and key actions

Annexure 4.1: Andhra – Ground Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
1	50%	2	66%

Performance

Summary

Andhra Pradesh GW is and has been a well performing implementing agency since last two years. An informative dashboard, real time water data repository and water budgeting information up to the village level are appreciable and often act as a reference for planning and building respective State WRIS for other agencies. The procurement of geo-physical equipment, generation of database and its application for analytics are appreciable steps. Considering the availability of modelling team and potential, the models needs to be strengthened further. The efforts towards international publications and presentations in international conferences are highly appreciated. Andhra GW needs to focus on procurement and hosting in-house training programs, and generate web based reports for dissemination to stay at top.

Identified Actions

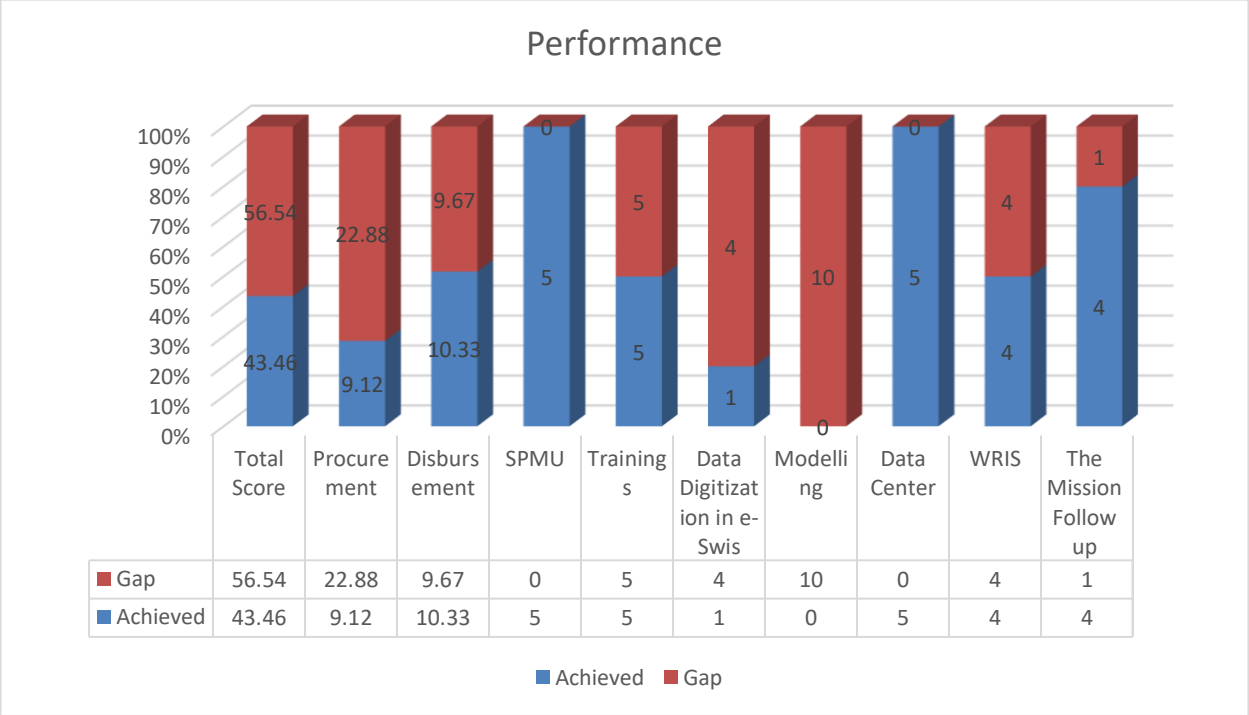
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1.	Personnel	Designate one engineer as safeguard specialist	Immediate	
2.	Finance	Audit report due	Immediate	
3.	Finance	PFMS yet to be put in practice	Immediate	

Annexure 4.2: Andhra – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
28	22%	15	44%

Performance



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	56.54	22.88	9.67	0	5	4	10	0	4	1
Achieved	43.46	9.12	10.33	5	5	1	0	5	4	4

Summary

The agency has shown considerable improvement since last mission. The availability of digitized data, APWRIS and open data policy are some of positive starts. However, negligible progress has been made in utilization of this data in modelling activities and development of basin assessment. Moreover integration with eSWIS should also be taken on priority.

Identified Actions

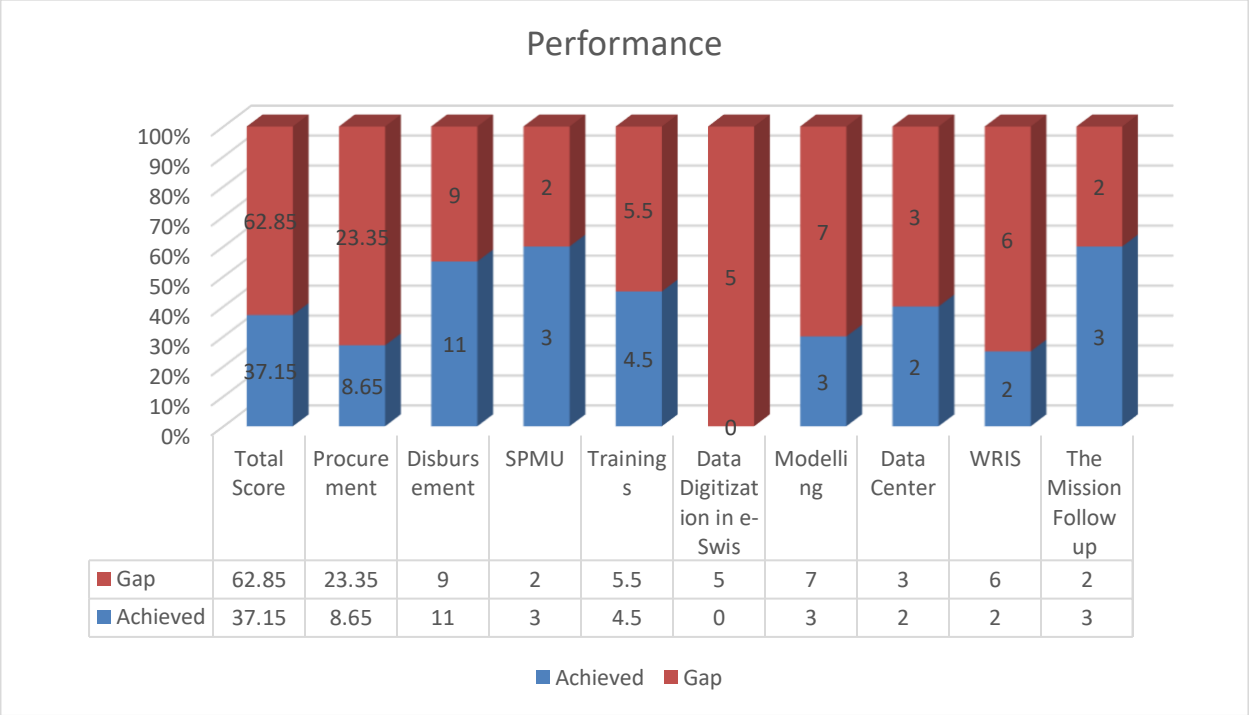
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Modelling team to be strengthened	September 30, 2018	
2	Human Resource	Designate one engineer as safeguard specialist	Immediate	
3	Procurement	Advertise the Bid document for RTDAS	June 10, 2018	Network Optimization has done by CWC and The bid documents has been approved by NPMU
4	Date	Upload Data in e-SWIS	Immediate	
5	Data Policy	Share the revised data policy with NPMU	Immediate	
6	Capacity Building	Send personnel for e-SWIS training	Immediate	

Annexure 4.3: Assam

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
10	31%	21	38%

Performance



Summary

The performance of Assam has gone down compared to previous mission. The major bottleneck identified was weak SPMU, slow administrative approval process and nomination for training events. The agency needs to work on streamlining the approval process by empowering nodal officer and strengthening SPMU.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Designate one engineer as safeguard specialist. Strengthen the SPMU.	Immediate	
2	Procurement	Consultancy for divisional data center	September 30, 2018	
3	Policy	Harmonization with the National data dissemination policy	Immediate	Drafted and working on it.
4	Technical	Initiate planning for modelling the tributaries in a phase wise manner instead of trying to model the entire Brahmaputra as a whole	Immediate	

Annexure 4.4: Bhakra Beas Management board (BBMB)

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
5	38%	10	46%

Performance

	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	53.99	28.74	8	0	6.25	5	3	0	0	3
Achieved	46.01	3.26	12	5	3.75	0	7	5	8	2

Summary

BBMB had been leading agency in HP2 and developed Real time forecasting system. Recent progress by calibrating with hydropower SCADA for real time data updation were appreciated by mission. However, the developed system needs to be taken further by incorporating meteorological bias correction, model re-calibration and enhancing canal monitoring. The progress in procurement has been slow and needs to be taken on priority.

Identified Actions

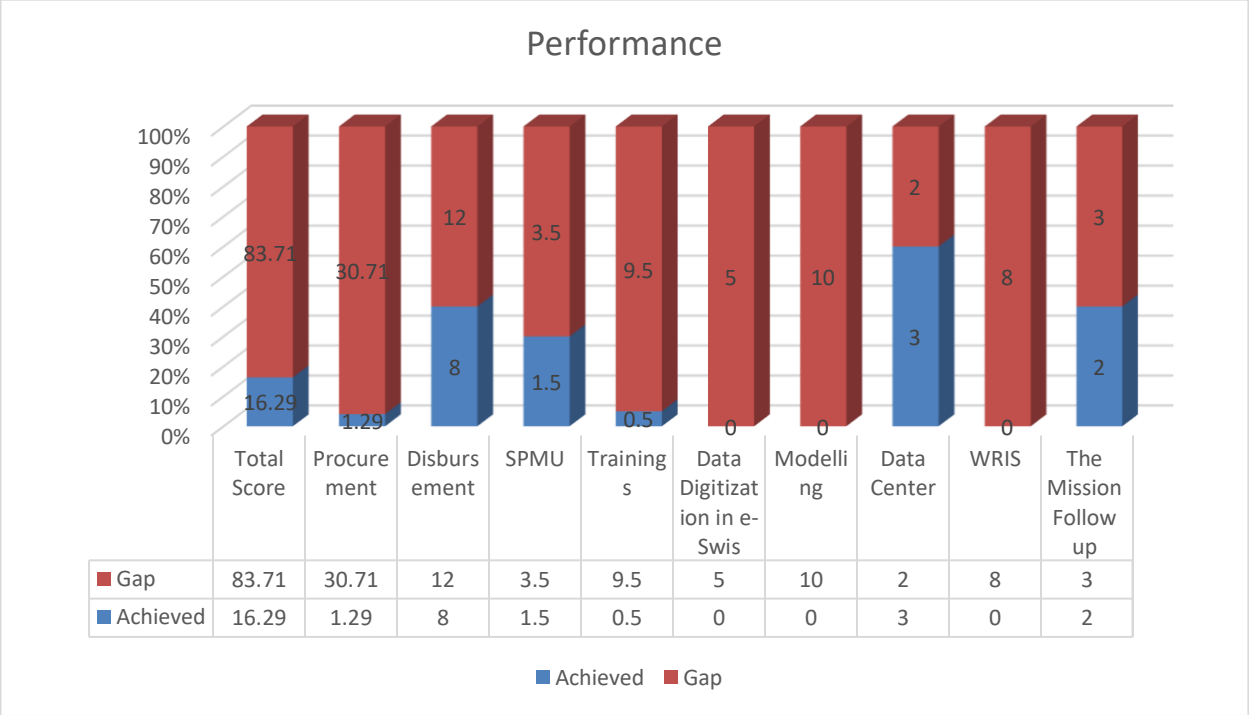
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Technical	Check level discharge rating curves for sites proposed for velocity RADAR and then justify	May 30, 2018	Hold demonstrations to compare Velocity Radar discharge readings with those obtained through ADCPs.
2	Procurement	Share RTDAS Tender	May 30, 2018	
3	Procurement	Prepare Canal Monitoring Bid Document.	May 25, 2018	
4	Procurement	Prepare TOR for climate change/Ensemble forecast	Immediately	

Annexure 4.5: Bihar – GROUND Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
40	6%	40	17%

Performance:



Summary:

No active participation, they have commissioned almost 300 DWLRs from state funds.

Identified Actions

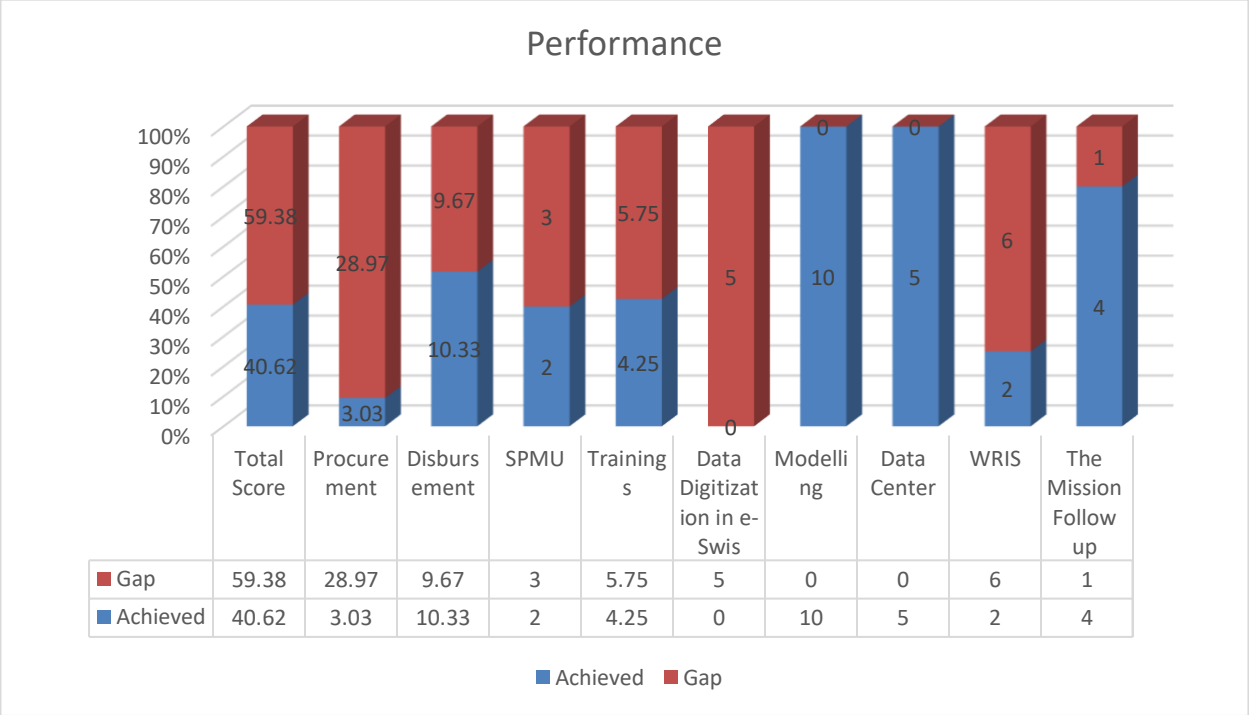
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	Appropriate bid documents to be shared with IA	Immediate	NPMU support is required
2	Procurement	Hire relevant consultancies – manpower, architecture	immediate	
3	Others	Share problem points with NPMU for necessary support/follow	Immediate	

Annexure 4.6: Bihar – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
15	29%	17	41%

Performance:



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	59.38	28.97	9.67	3	5.75	5	0	0	6	1
Achieved	40.62	3.03	10.33	2	4.25	0	10	5	2	4

Summary:

The performance of Bihar SW has improved, mainly in procurement activities including EAMS and construction of building. Considering the availability of MMC under Koshi project, the agency may initiate activities for analytics, improving models and sub-basin assessment. Apart from that, agency should focus on integrating data with eSWIS.

Identified Actions

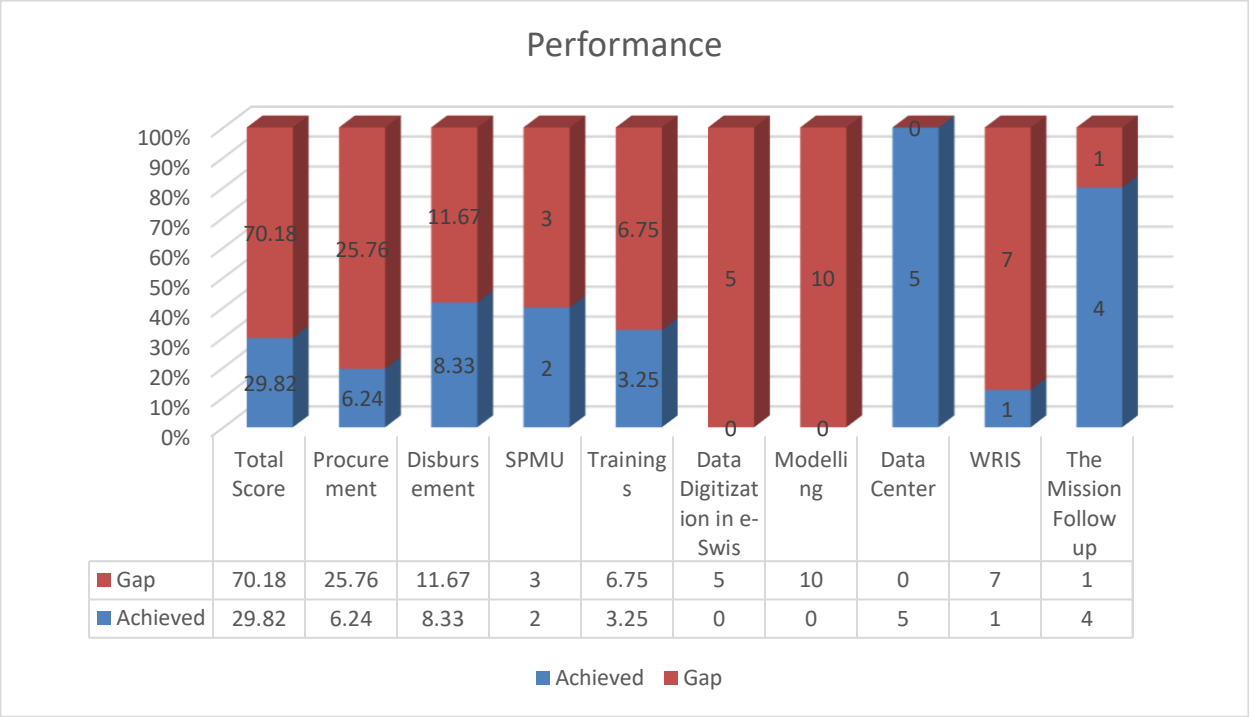
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	Sedimentation ToR and Bid Document to be ready	May 30, 2018	
2	Data	Information to be obtained for Spillway rating curve as assessed by the DRIP team	Immediate	
3	Data	Data to be entered into e-SWIS	Immediate	

Annexure 4.7: Chhattisgarh – Ground Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 49)	Score	Rank (Out of 41)	Score
33	18%	30	30%

Performance



Summary

The agency has made slow progress in NHP activities mainly due to weak SPMU. The SPMU needs to be strengthened on priority and focus on developing bid documents for DWLRs. The participation in training events needs to be improved.

Identified Actions

Sr. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Strength the SPMU. Designate one engineer as safeguard specialist	Immediately	SPMU staff may be assigned additional responsibility
2	Procurement	Prepare draft tender document for DWLR	Immediately	
3	Data	Identify the GIS Center Platform for state WARIS	September, 2018	State remote sensing center

Annexure 4.8: **Chhattisgarh** – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
23	25%	20	38%

Performance

Summary

The implementing agency has started picking up in performing NHP activities and made considerable progress in data integration through eSWIS. The RTDAS bid should be finalized on priority basis.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1.	Human Resource	Strength the SPMU. Designate one engineer as safeguard specialist	Immediately	SPMU staff may be assigned additional responsibility
2.	Data policy	Match with National data dissemination policy	Sep 2018	
3.	Procurement	Finalize the RTDAS Bid	Immediately	Network is being finalized by NPMU and will share within June 30, 2018

Annexure 4.10: DVC (Damodar vally corporation)

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
2	45%	3	61.13%

Performance

Summary:

The implementing agency is among top 3 best performing agencies and progressing very well in procurements. The agency should focus on analytics and strengthen reservoir operation system for flood as well irrigation management. The TOR for inflow forecasting including reservoir optimization, updated model for climate change, bias correction and display system with dashboard was discussed.

Identified Actions

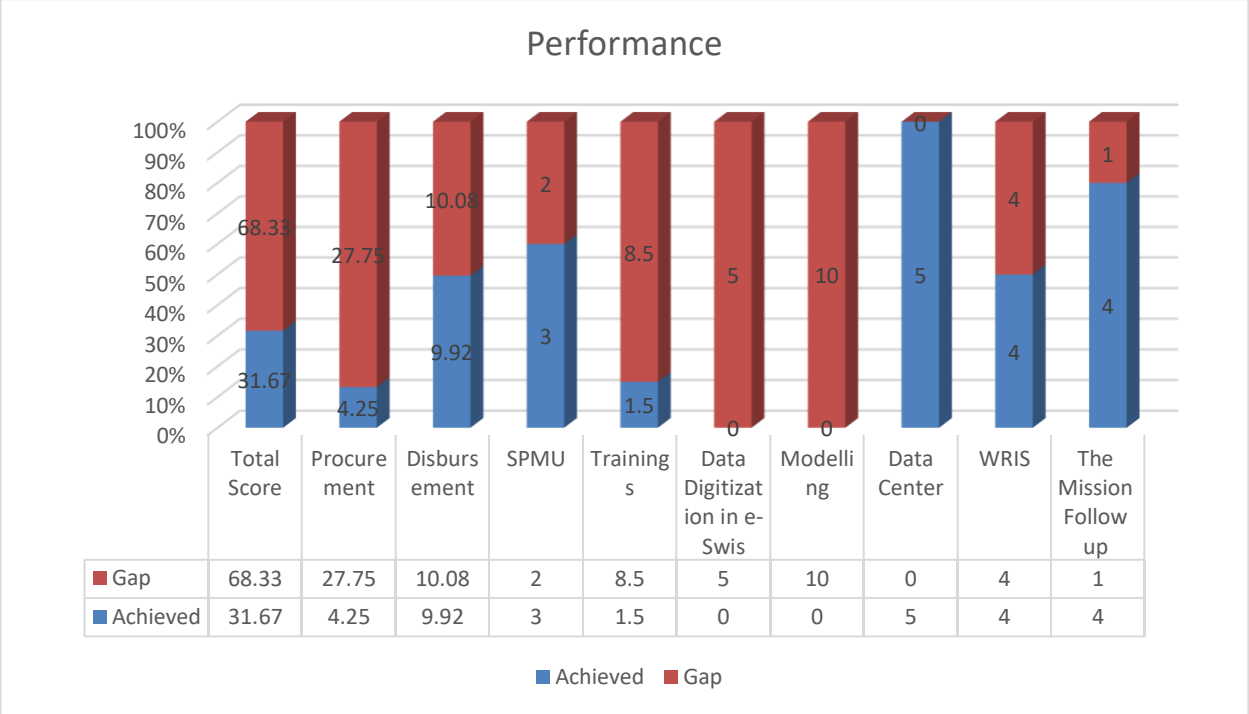
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human resources	Designate one engineer as safeguard specialist	Immediate	
2.	Implementation	Conduct Reservoir Management Optimization study through consultancy	July 30, 2018	Update TOR to include reservoir optimization, updated model for climate change and bias correction and display system with dashboard.
3	Procurement	Tendering for survey works for Hydraulic structures.	June 30, 2018	
4	Procurement	Tendering for survey works for cross-sections.	June 30, 2018	

Annexure 4.11: GOA

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
36	17%	28	32%

Performance



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	68.33	27.75	10.08	2	8.5	5	10	0	4	1
Achieved	31.67	4.25	9.92	3	1.5	0	0	5	4	4

Summary

The agency has initiated some activities like consultancy for coastal study and bid document for RTDAS. However, the progress is slow mainly due to administrative and approval processes. The agency is advised to streamline project implementation by delegating some powers to nodal officer and SPMU. The activities for developing state WRIS should be initiated on priority.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Capacity Building	GIS and MIS experts to start lesioning with NPMU immediately. NPMU expert may visit IA if permission to travel to New Delhi cannot be obtained by SPMU members.	Immediate	
2	Technical	For sediment analysis, consult the DVC document and revise AWP accordingly.	Immediately	
3	Procurement	Float the RTDAS Document	May 15, 2018	
4	Human Resource	Designate one engineer as safeguard specialist.	Immediately	NBC guidelines for buildings to followed strictly.

Annexure 4.12: Gujarat – GROUND Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
19	26%	12	44%

Performance:

Summary:

Gujarat GW is one of good performing agency when compared against analysis, data sharing, reporting and participation in knowledge exchange events. However, the progress is slow in procurement and expenditure, which should be expedited on priority.

Identified Actions

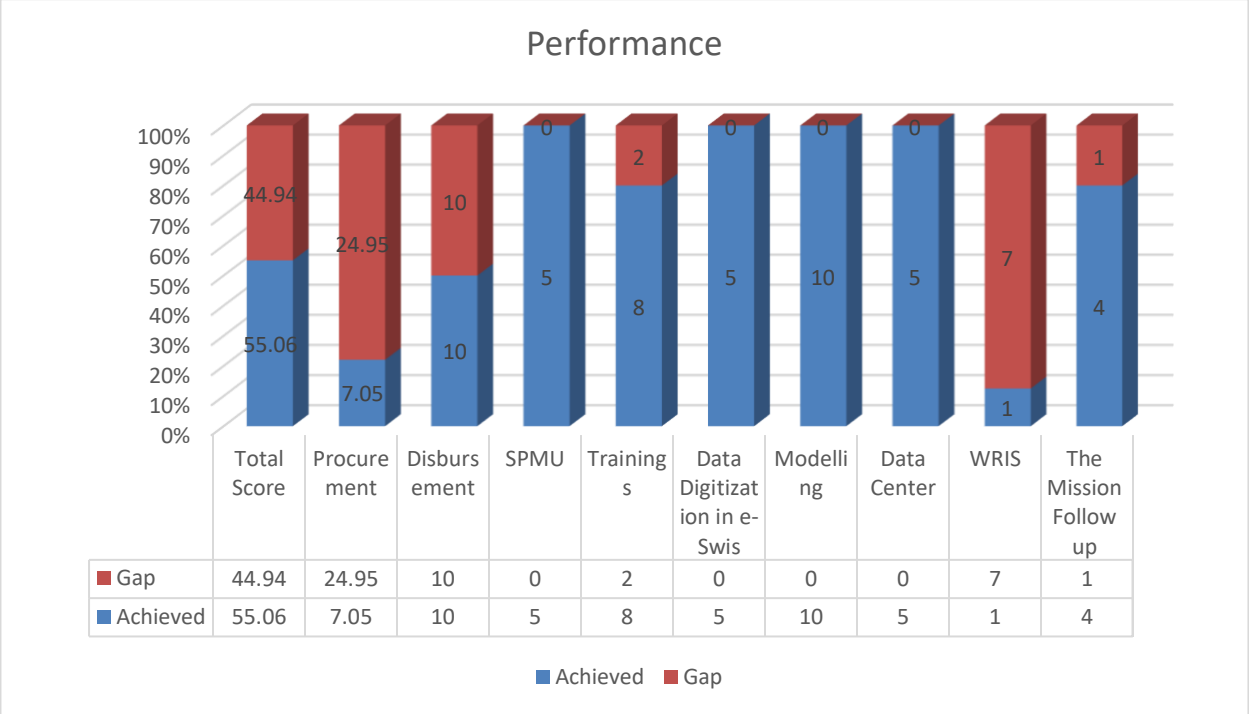
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Capacity Building	Identify capacity building/training needs of the IA	Immediate	
2	Technical	Perform data audit and functional status of field deployed sensors deployed in the field	Immediate	

Annexure 4.13: Gujarat – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
6	34%	7	56%

Performance



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	44.94	24.95	10	0	2	0	0	0	7	1
Achieved	55.06	7.05	10	5	8	5	10	5	1	4

Summary

The implementing agency has shown drastically good performance in analytics but procurement yet to pick up. The web based analytics need to be introduced in the state. Worked with NIC to set spatial information of reservoirs. E-SWIS is updated with historical data and for rest it is in process.

Identified Actions

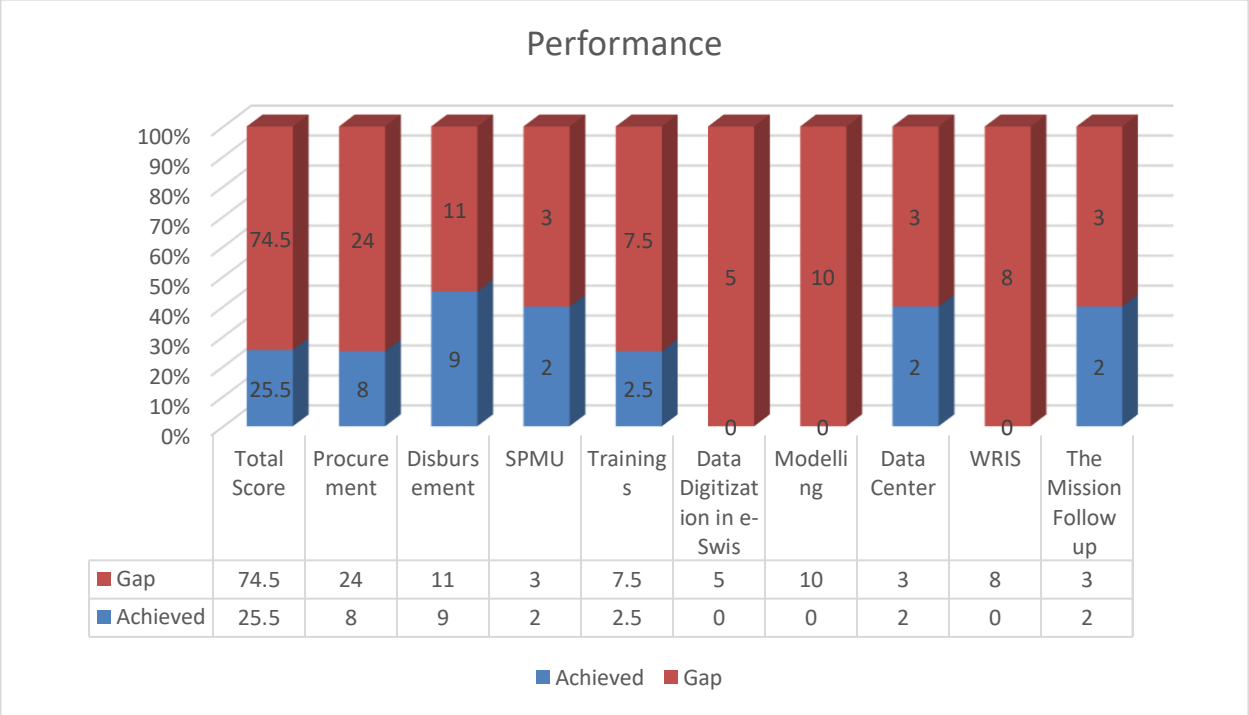
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	AWS	Immediately	

Annexure 4.14: Haryana

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
33	18%	35	26%

Performance



Summary

Although SPMU has now some active team members, both progress and performance are yet to pick up. The bid documents for SCADA and RTDAS should be floated on priority basis.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Strengthen the SPMU and designate one engineer as safeguard specialist	Immediate	
2	Procurement	Finalize procurement for SCADA for Hathnikund barrage	July 31, 2018	
3	Procurement	Design for RTDAS need be developed	July 31, 2018	Initiative to invite instrument vendors to discuss the solutions on installation of equipment in vandalism areas
4	Data	Join and Upload Data in e-SWIS	Immediate	
5	Others	Overall Planning missing the areas like water availability, groundwater, water quality, and water logging and institutional	December 30, 2018	
6	Human Resource	Engage people for digitizing data	Immediate	

Annexure 4.15: Himachal Pradesh

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
10	31%	8	52%

Performance

Summary

Himachal Pradesh has made considerable progress towards procurement and now needs to focus on analytics and data use application. For Shahnahar, the monitoring system and water accounting using Remote Sensing technology may be strengthened with help from NIH. The mission team welcomed the proposal for collaborating with a local institute and support for degree program. The agency need to focus on for AMC of old DWLR. The core SPMU is in place and it was further advised that they can seek inputs from Karnataka on how to holistically move forward.

Identified Actions

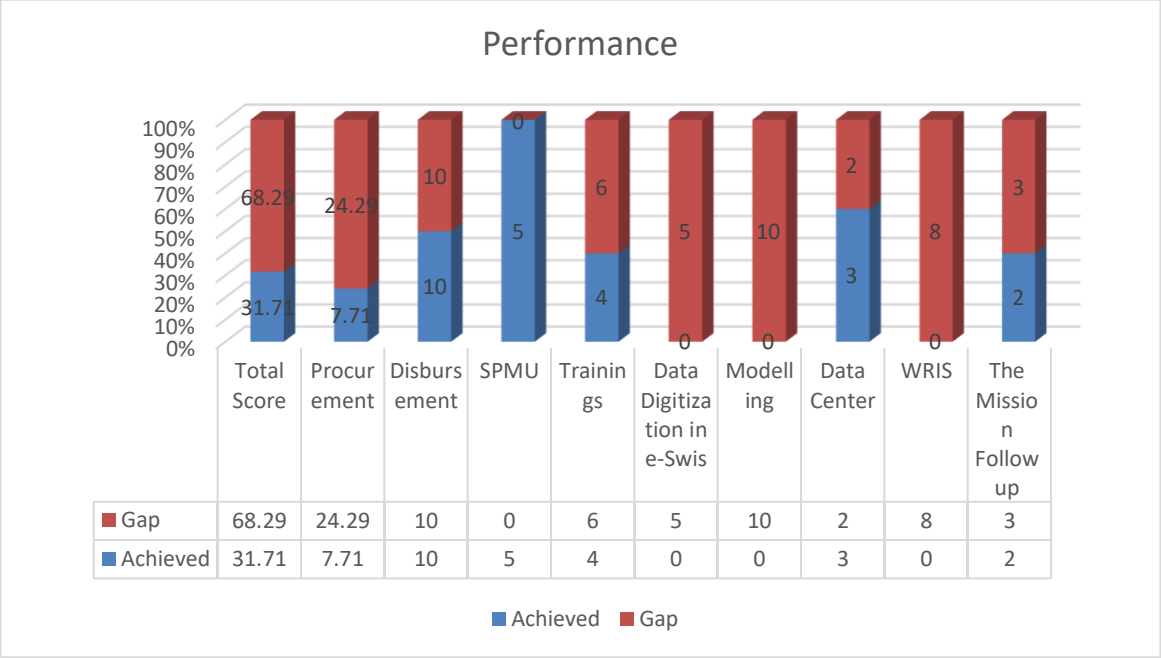
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Designate one engineer as safeguard specialist	Immediate	
2	Procurement	Real time monitoring system for Shahnahar canal system	July 15, 2018	
3	Procurement	SCADA for tube well system	Immediate	
4	Technical	Develop irrigation management plan for Shahnahar system with the help of NIH		For Water budgeting and conjunctive use for the command area
5	Data	Need collaboration with CGWB for Modelling	Immediate	
6	Technical	Arrangement for AMC of old DWLR need to be worked out	September 15, 2018	

Annexure 4.16: Jharkhand

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
29	20%	27	32%

Performance



Overview

The state of Jharkhand is picking up and has initiated some procurement pertaining to piezometers and also progressing with the consultancy for State data center. Tender for ADCP need to be finalized immediately. The participation in training events needs to be improved, by nominating relevant staff. The nomination can be for anyone from the entire department, not just SPMU.

Identified Actions

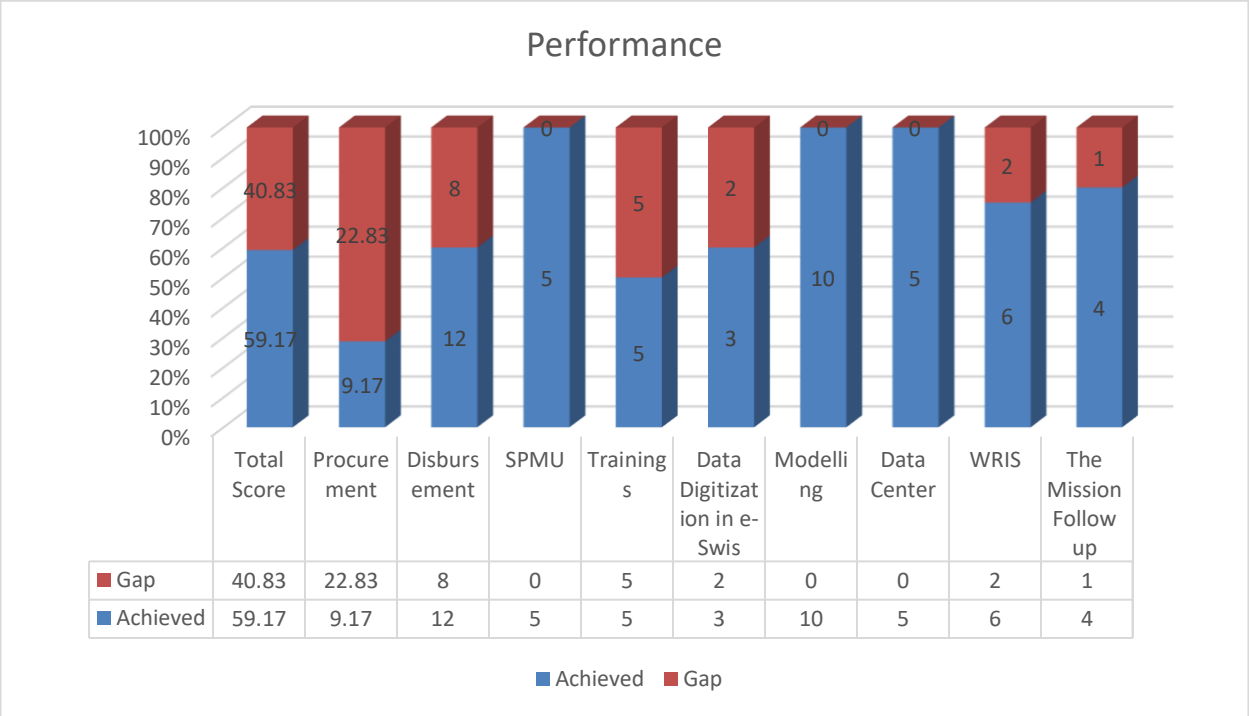
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1.	Human Resource	Designate one engineer as safeguard specialist.	Immediate	
2.	Procurement	Finalize RTDAS tender	May 30, 2018	
3.	Procurement	Tenders for ADCP to be finalized.	May 30, 2018	
4.	Technical	Integrate Groundwater wells for monitoring with existing wells	Immediate	
5.	Compliance	For the construction of the Data Centre Social Screening forms would have to be filled- (available at NHP website).	Immediate	

Annexure 4.17: Karnataka

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
3	42%	5	60%

Performance



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	40.83	22.83	8	0	5	2	0	0	2	1
Achieved	59.17	9.17	12	5	5	3	10	5	6	4

Summary

Extensive training plan with training of 120 engineers, river basin modelling activities and IWRM plans for Tungabhadra under ADB places Karnataka under one of best performing agencies. The KWRIS has already been developed but the architecture needs to be made compatible with National WRIS under development. The agency is advised to strengthen the groundwater modelling and analytics portion. E-SWIS and PFMS trainings should be planned on priority basis.

Identified Actions

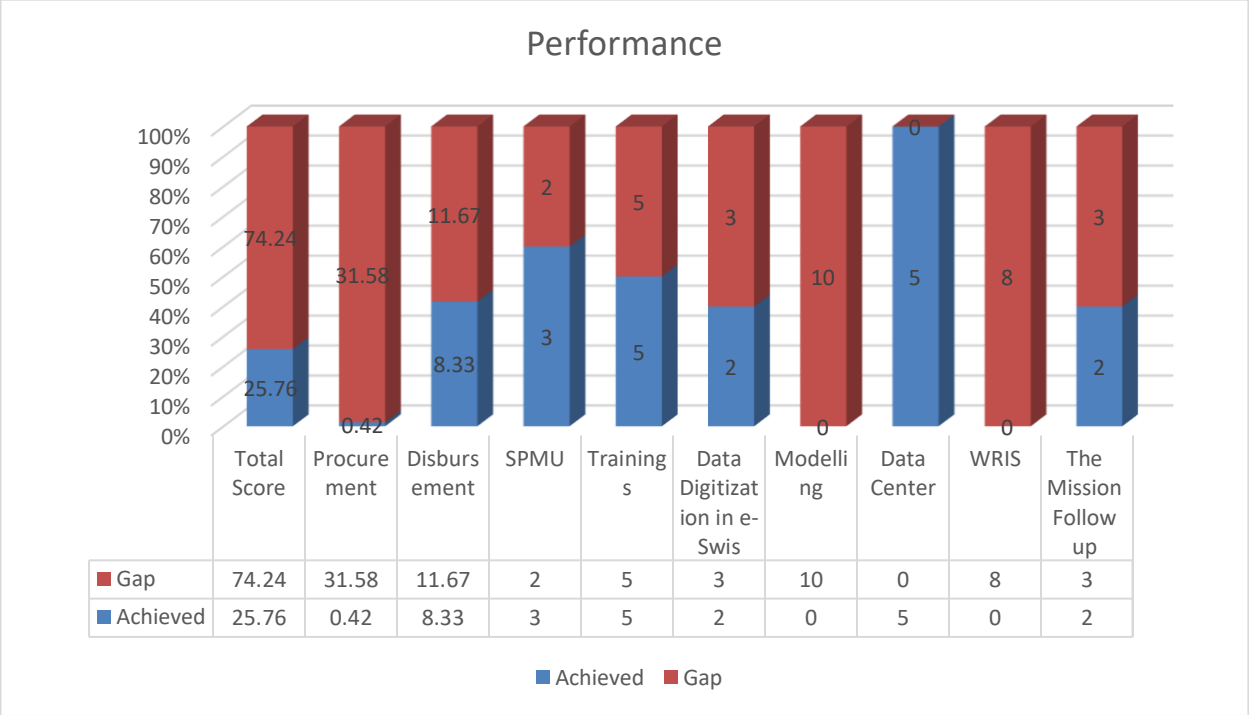
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1.	Human Resource	SPMU need to actively work on work	Immediate	Dedicated team is needed
2.	Procurement	All procurements are delayed and response time is slow.		
3.	Data	Upload KWRIS and SWDES data in to e-SWIS	Immediate	

Annexure 4.18: Kerala – Ground Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
33	18%	34	26%

Performance



Summary

The overall performance of the implementing agency is not satisfactory and they need to work on all aspects in order to upgrade their performance ratings. SPMU is yet to be strengthened, dedicated staff have been transferred and nodal officer is not empowered. The agency is advised to strengthen SPMU and streamline administrative approval process, empower nodal officer and participate in training activities. The works for digitization of data should be completed on priority.

Identified Actions

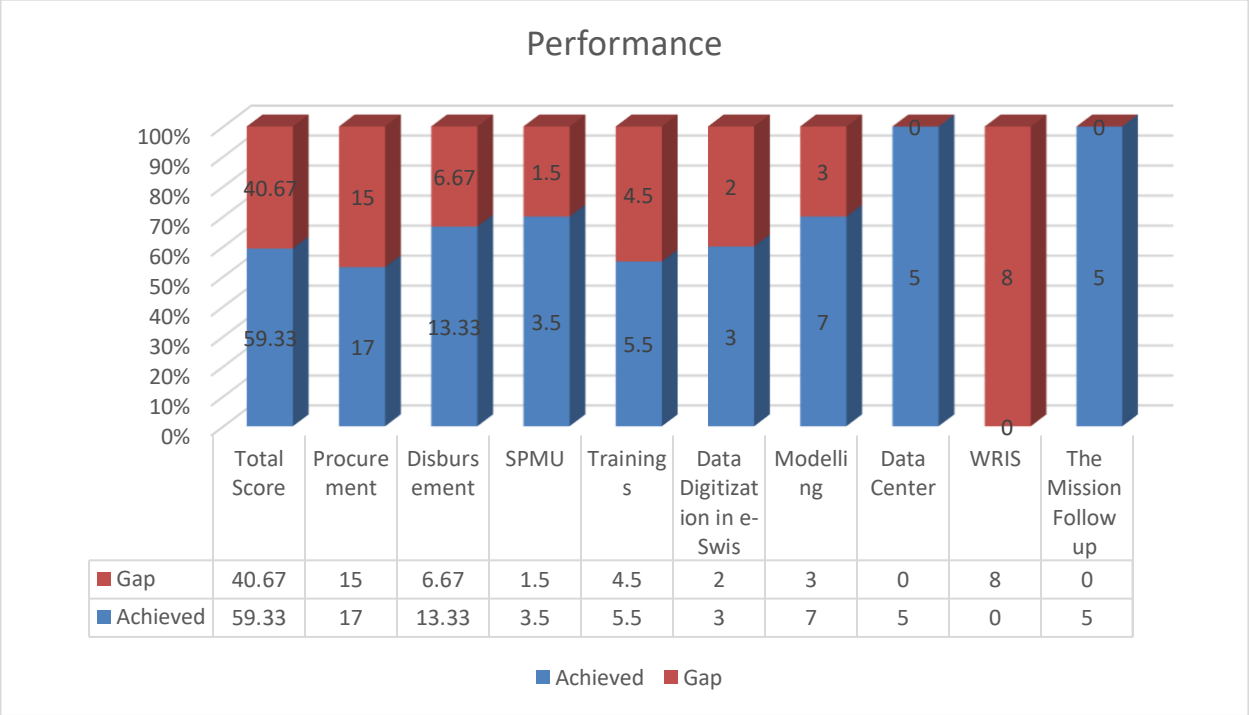
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Strengthen SPMU	Immediate	Majority of staff are part time or vacant
2	Procurement	Procurement of DWLR	Sep 2018	
3	Procurement	Prepare TOR for managed aquifer recharge program	Immediate	In consultation with NPMU & CGWB
4	Procurement	Pending approval Procurement activities in STEP	Immediate	
5	Data	Digitalization of data in e-Swis	Immediate	Data in hard copy format, met data is shared with SW.
6	Others	State level specific training to be reviewed with Central level training programs	Jul 2018	Involve other neighbor states for training

Annexure 4.19: Kerala – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
26	23%	4	60%

Performance



Summary

Kerala SW has shown considerable progress by initiating major procurements, several studies and need based consultancies which will facilitate production of bankable/actionable reports. The team has a dedicated modelling team and can focus on further development of DSS initiated under HP2.The mission team noted with appreciation that for training, the CE has been empowered to nominate staff for training. However, air travel for junior staff is still needs to be sorted out. Further, the Equipment purchase for PDS should be clubbed with RTDAS bid if it falls in similar category.

Identified Actions

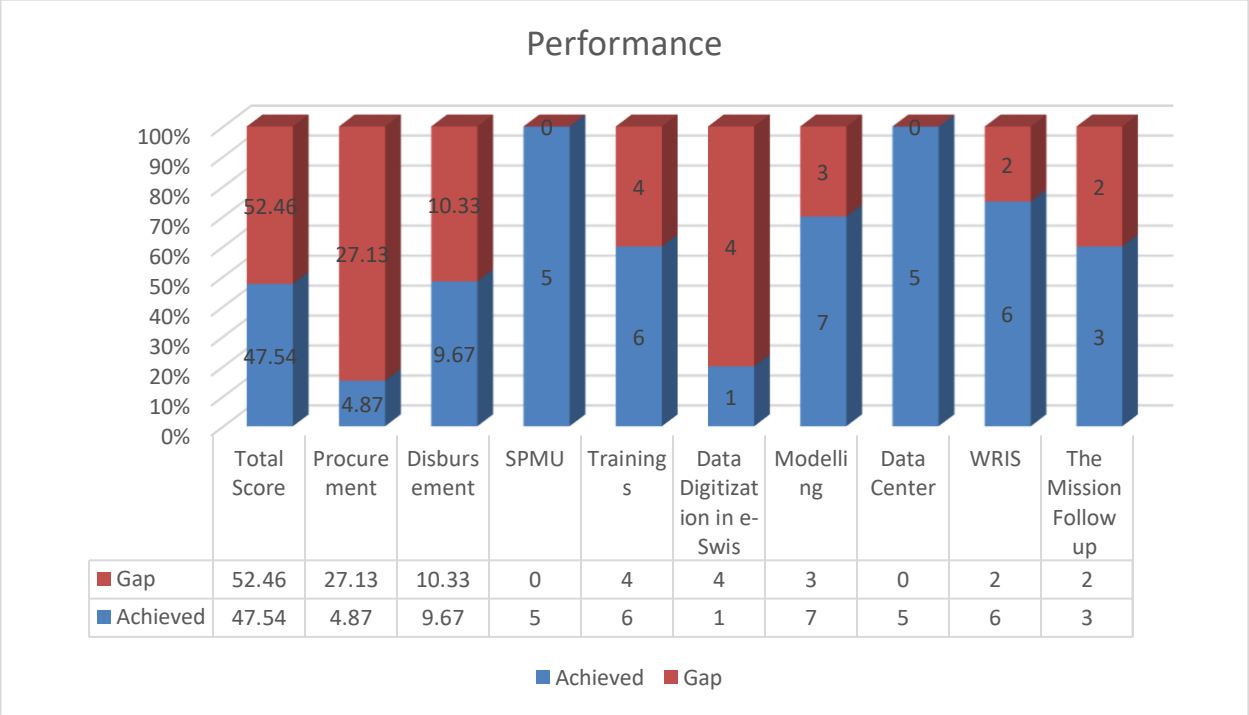
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
4.	Human Resource	Designate one engineer as safeguard specialist	Immediately	SPMU staff may be assigned additional responsibility
5.	Policy	State data policy to be aligned	Sep 2018	Accepted and in process
6.	Procurement	Tender for RTDAS	October 2018	Meteorological network is yet to be finalized by IMD.
7.	Procurement	Tender for stream discharge measurement devices	Immediate	
8.	Procurement	Survey equipment	Immediate	
9.	Procurement	Procurement for consultancy for revitalization for selected basins.	August, 2018	EOI issued.
10.	Technical	Revival of DSS planning model	July 2018	Seeking guidance of NIH and NPMU
11.	Data	Integration with e-SWIS	July 2018	Met Data in CD has shared with CWC. For other data CWC can initiate training program to support in secondary validation process
12.	WRIS	State WRIS		Visited AP. NPMU will guide

Annexure 4.20: Madhya Pradesh

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
4	39%	9	48%

Performance:



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	52.46	27.13	10.33	0	4	4	3	0	2	2
Achieved	47.54	4.87	9.67	5	6	1	7	5	6	3

Summary

The implementing agency has made good performance in uploading data in eSWIS and with some additional training historical data may also be uploaded. Considering the availability of modellers and experience of DSS, the analytics part needs to be strengthened. The agency need to update RTDAS with gate sensor and canals monitoring instead of focusing on SCADA.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	Float tender for RTDAS bid	July 15, 2018	
2	Procurement	Replace Canal SCADA proposal with RTDAS based canal monitoring proposal	June 30, 2018	
3	Technical	Re-activate modeling team	Immediate	
4	Data	Reach out to NPMU for Historic data input to e-SWIS	Immediate	
5	Technical	Seek inputs from NPMU on operationalize MIKE Hydro for Basin setup	Immediate	

Annexure 4.21: Maharashtra – Ground Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
17	27%	26	33%

Performance

Summary

The agency has made negligible progress in procurement and expenditure. However, their plans for monitoring the drought and mapping all irrigation wells were appreciated, which needs to be executed on priority basis. They need to develop more workable solution for monitoring the open wells as DWLR may not be the most suitable sensor.

Identified Actions

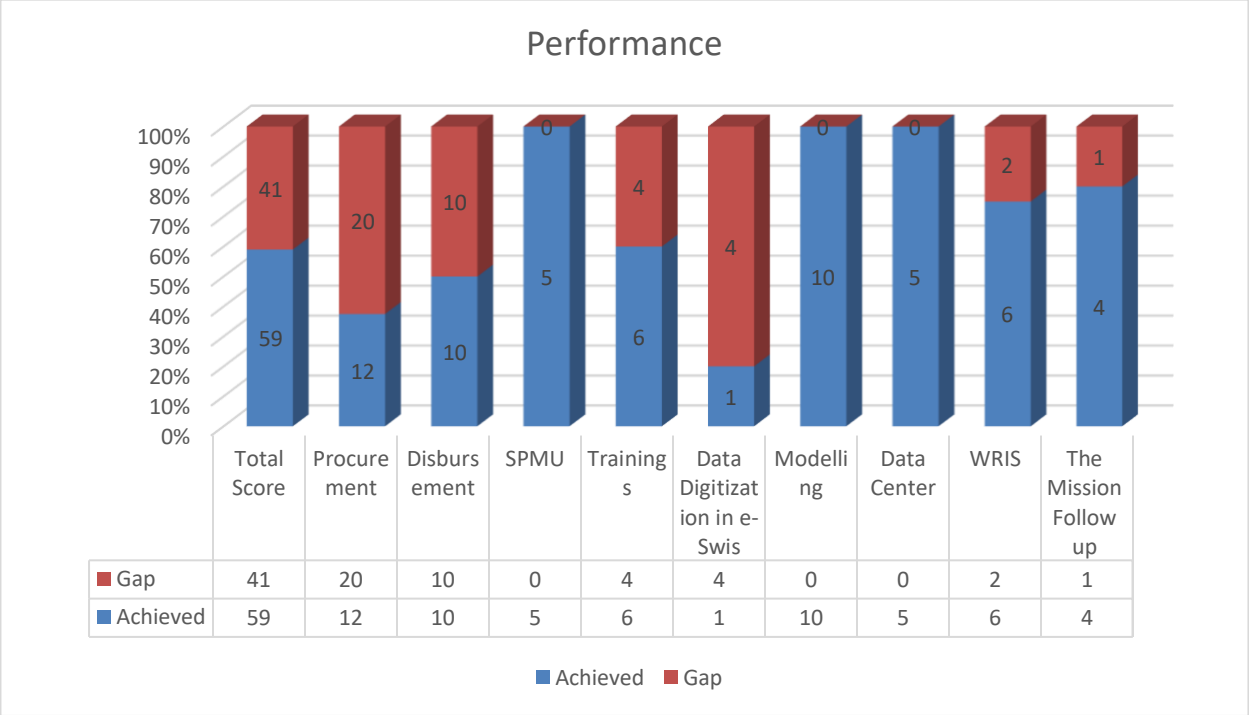
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Data policy	Match with National data dissemination policy	Sep 2018	No pricing policy
2	Procurement	Submit tender for 20 DWLRs	June 2018	

Annexure 4.22: Maharashtra – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
10	31%	6	59%

Performance



Summary

Maharashtra SW is among top performing agencies and preparation and clearance of bid documents worth 50 Crores for RTDAS were appreciated. However, the participation in Training events by relevant staff has reduced drastically during last few months. Moreover, the state need to focus on updating data policy in line with national policy. Considering E-Water activities for DSS for upper Godavari, the agency needs to put DSS for reservoir in operational use. The PDS topics proposed like Assessment of Irrigation potential gap, water quality management (reservoir to outlet), post monsoon flow in Godavari, integrated state water plan etc. may be carried out under component C1.

Identified Actions

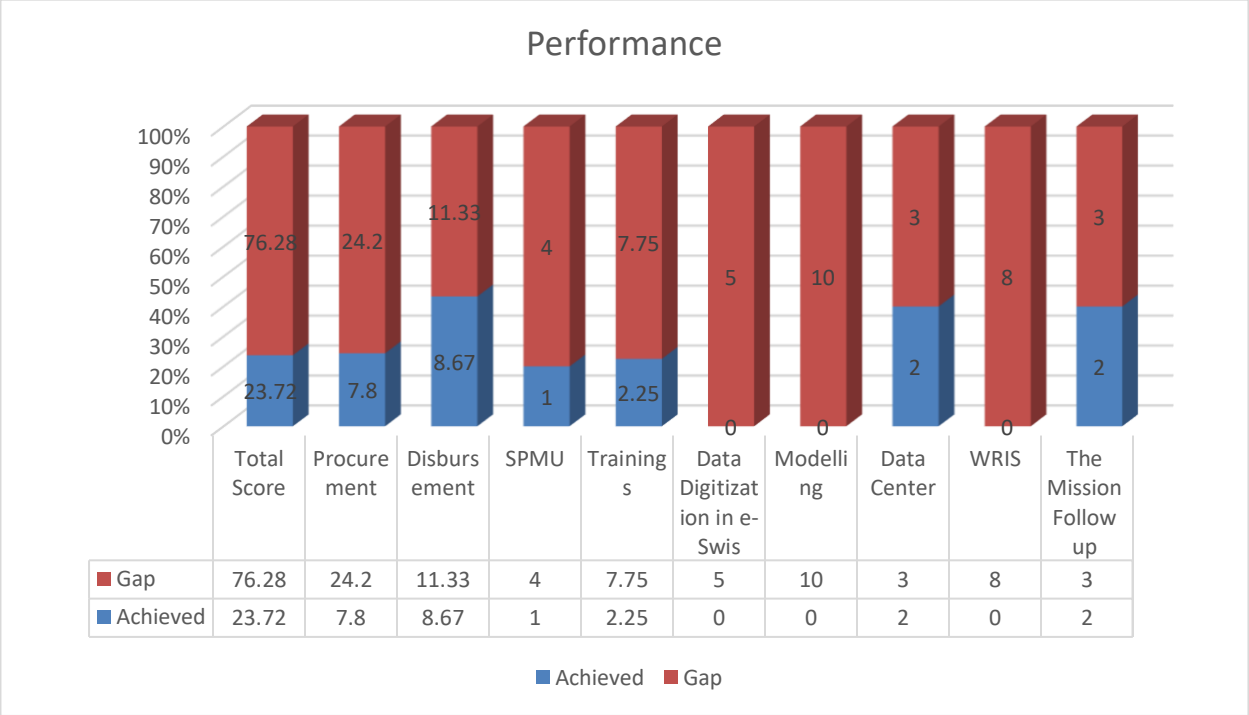
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Data policy	Match with National data dissemination policy	September, 2018	
2	Procurement	Float the tenders for RTDAS Bids	June 30, 2018	
3	Procurement	Plan for reservoir operation system for all the basins	Immediate	
4	Procurement	To take up Irrigation efficiency/evaporation studies under the component C	September , 2018	Instead of PDS
5	Technical	Initiate studies and analytical tools	Immediate	
6	Data	Historical data to be integrate with e-Swis	Immediate	Agency has agreed to share historical data in CD to CWC
7	Data	Upper Godavari Basin IWRM model	June 2018	Share the model developed by e-Water Australia with CWC

Annexure 4.23: Manipur

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
32	19%	36	24%

Performance:



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	76.28	24.2	11.33	4	7.75	5	10	3	8	3
Achieved	23.72	7.8	8.67	1	2.25	0	0	2	0	2

Summary

SPMU has some team and initially their participation was ok. But there is no progress due pending approvals.

Identified Actions

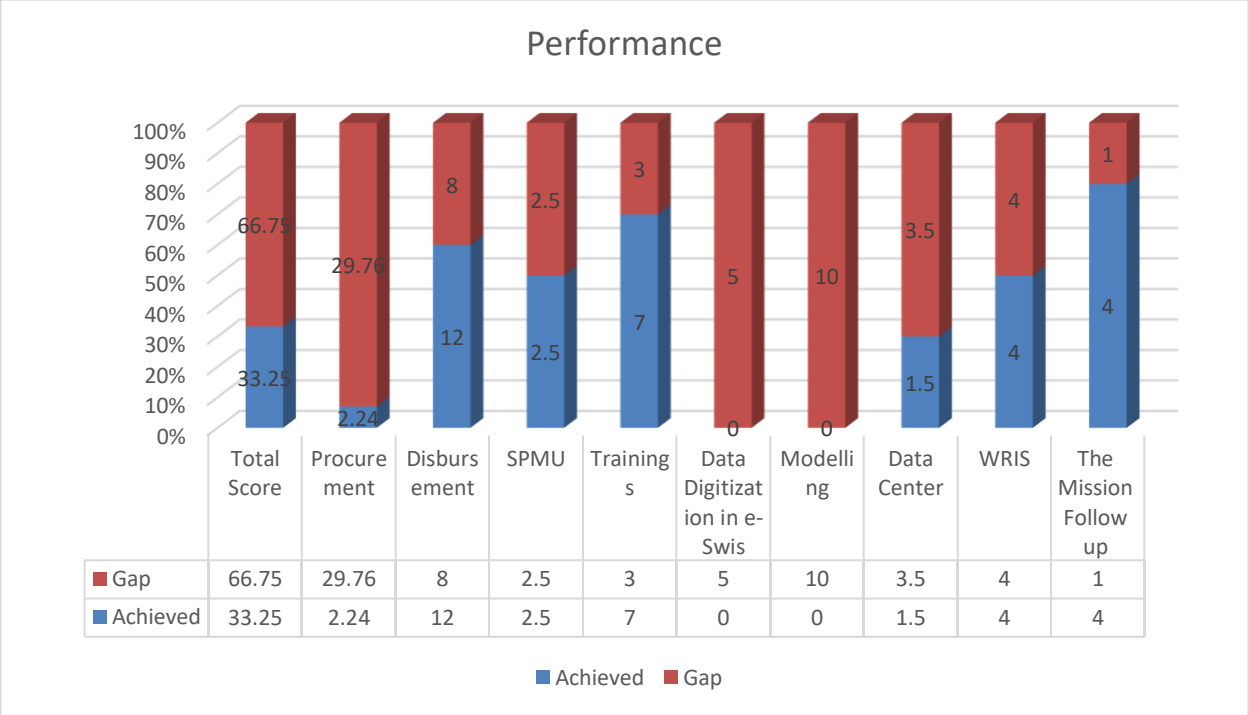
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	SPMU need to be strength	Immediate	
2	Procurement	Identify Technical Institute for Signing MoU for Data Generation Support	July 30, 2018	
3	Procurement	Procure Computers for Modeling	Immediate	
4	Training	Send modelers for e-SWIS training	Immediate	
5	Data	Upload data in e-SWIS	Immediate	

Annexure 4.24: Meghalaya

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
13	30%	25	34%

Performance



Overview

The mission appreciated the Meghalaya implementing agency for coordination with regional CWC office and progress in bid document for construction of data centre building. However, the progress is slow mainly due to inadequate SPMU strength. The agency is suggested to hire contractual manpower to strengthen SPMU till the time permanent staff is allocated.

Identified Actions

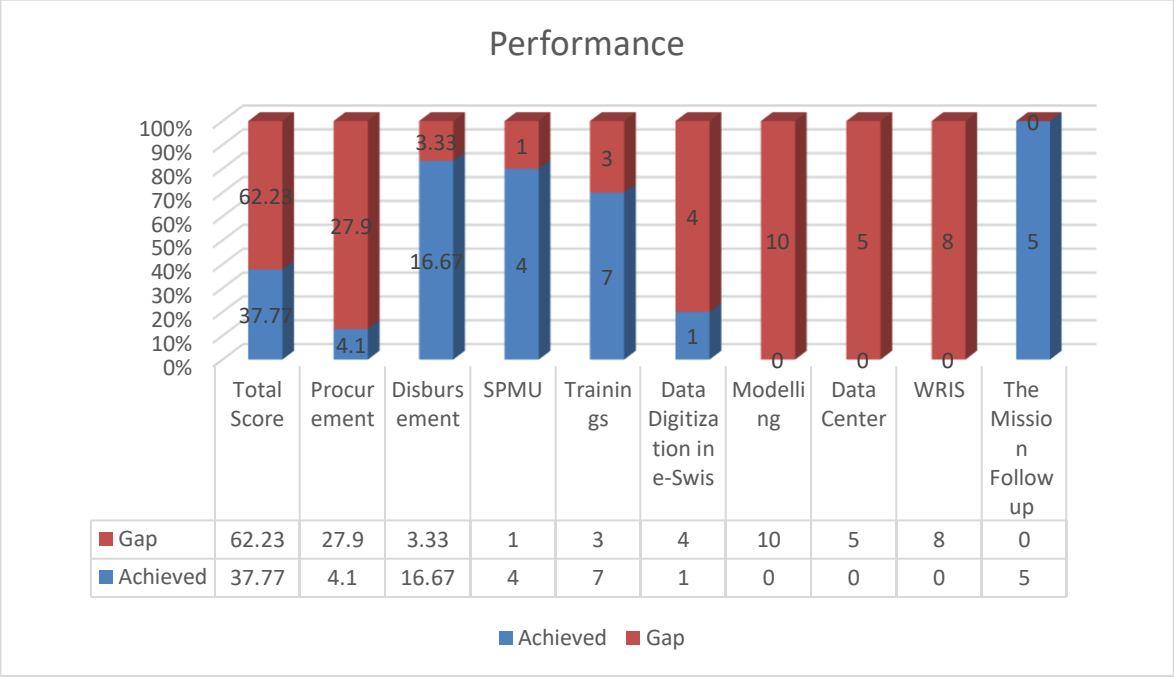
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1.	Human Resource	Engage Contractual staff	June 30, 2018	Allocation required to be declared in AWP of 2018-2019
2.	Human Resource	Designate one engineer as safeguard specialist	Immediate	
3.	Procurement	Prepare Tenders for current meters or equivalent device.	May 30, 2018	
4.	Procurement	Float the tender for construction of state data center.	May 30, 2018	DPR is ready

Annexure 4.25: Mizoram

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
23	25%	19	38%

Performance



Overview

The state of Mizoram has shown considerable progress in streamlining the project implementation, procurement, renovation of data centre buildings and strengthening IT infrastructure. Now they need to focus on development of state WRIS and may engage GIS manpower for that.

Identified Actions

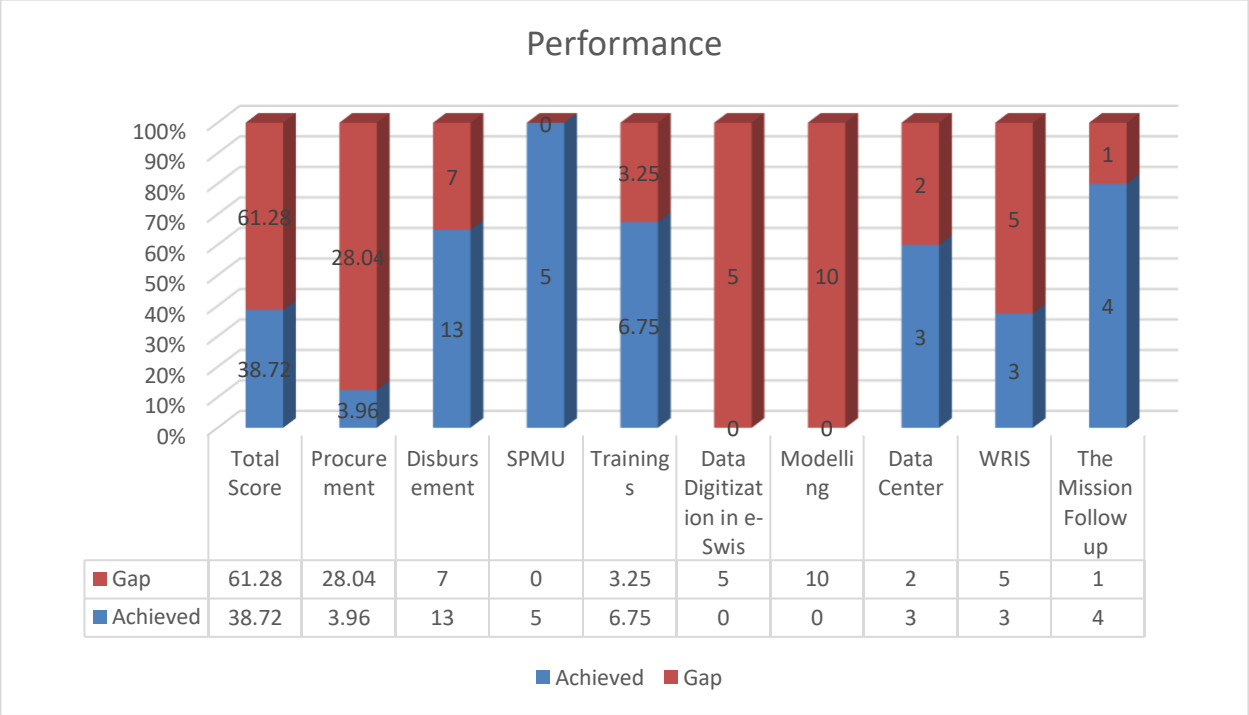
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Share the "Engagement of contractual staff", contract Document with NPMU for inputs	Immediate	
2	Procurement	Prepare the Bid documents for vertical extension of the building	May 15, 2018	
3	Procurement	Prepare the bid documents for Southern Division Centre.	May 15, 2018	
4	Procurement/ Technical	To create Geo-database for SWRIS and identification of firm which can support this activity.	June 30, 2018	NPMU may also support through their GIS expert.
5	Financial Management	Audit report is due in AG's office	Immediate	

Annexure 4.26: Nagaland

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
14	30%	18	39%

Performance



Overview

The organizational support by state government for NHP activities has improved and team has been participating in training events. However, the progress has slowed down due to change in SPMU team and new members are yet to pick up on various requirements like GeM, PFMS, eSWIS and procurement.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Prepare and Submit Terms of reference for 2 GIS personnel- one middle level and one Junior level.	May 30, 2018	
2	Technical	TBM or DGPS Benchmark would suffice if it's difficult to establish benchmark		
3	Technical	Background Materials and Topics for PDS can be shared so that decisions can eventually made.		
4	Capacity Building	GIS training from NPMU for handling GIS data for populating SWRIS- Will also tie up with GIS state GIS cell for support and training of Engineers		
5	Financial Management	Join and Start PFMS	15 May 2018	
6	Data	Upload Data in e-Swis	Immediate	

Annexure 4.27: Odisha Ground Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
38	14%	38	21%

Performance:

Summary

No progress

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	SPMU need to be strength	Immediate	
2	Training	Nominate and register staff for training	Immediate	Facilitate Letter from MoWR side to government for smoothening training nomination

Annexure 4.28: Odisha Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
16	28%	29	32%

Performance:

Summary

Odisha SW has initiated some procurements like ADCPs in recent past. However, the progress is negligible and no efforts are visible towards developing analytical products. The utilization of data generated during HP2 and development of state WRIS should be taken on priority. The agency also needs to improve participation in training and other knowledge exchange activities.

Annexure 4.29: Puducherry

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
38	14%	37	24%

Performance

Summary

Puducherry has upgraded their quality lab. They could now focus on urban hydro-geology while CGWB is already focusing on it. If required they can do LiDAR for improved planning.

Identified Actions

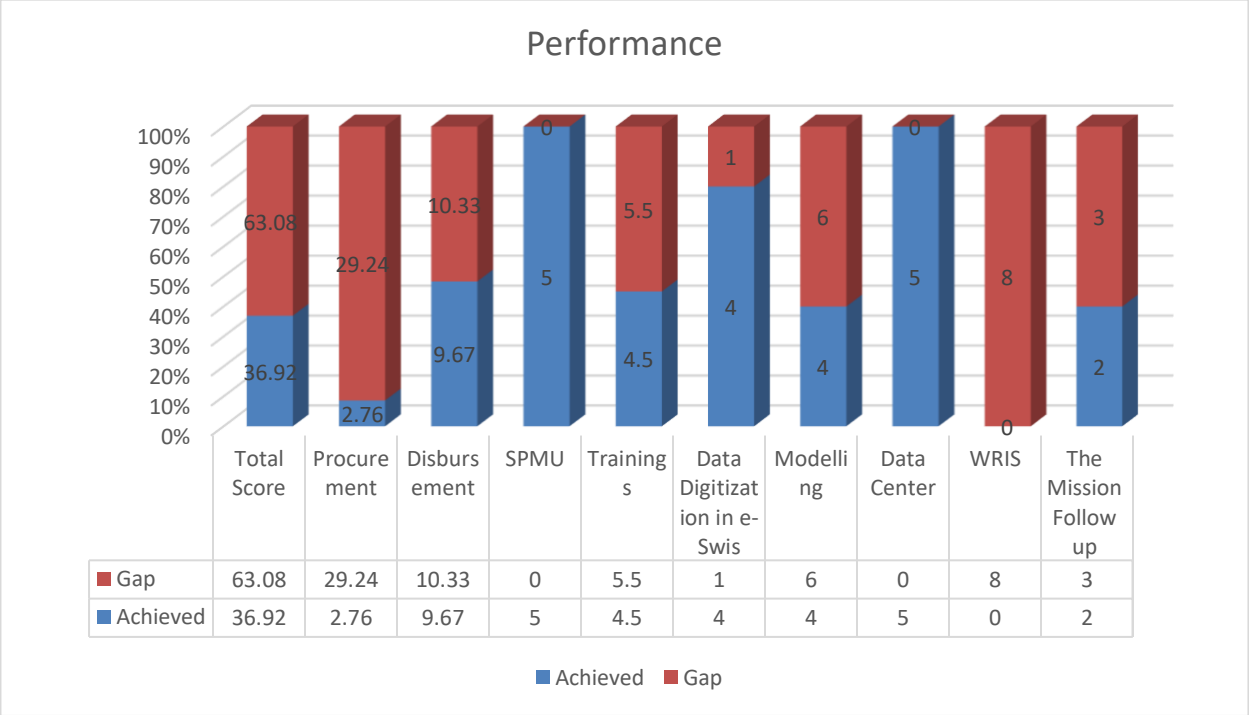
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Strengthen SPMU	July 15, 2018	
2	Procurement	Prepare Plan for Analytics with focus on Urban Hydrology	July 30, 2018	
3	Procurement	Submit and get approved Procurement plan in STEP	Immediate	

Annexure 4.30: Punjab

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
26	23%	23	37%

Performance



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	63.08	29.24	10.33	0	5.5	1	6	0	8	3
Achieved	36.92	2.76	9.67	5	4.5	4	4	5	0	2

Summary

Punjab has improved the performance compared to last mission by initiating some major procurements and setting up initial model for Ravi Basin. However, due to changes in SPMU officials, new team needs to pick up and coordinate with divisional implementing units. RTDAS bid should be floated on priority basis

Identified Actions

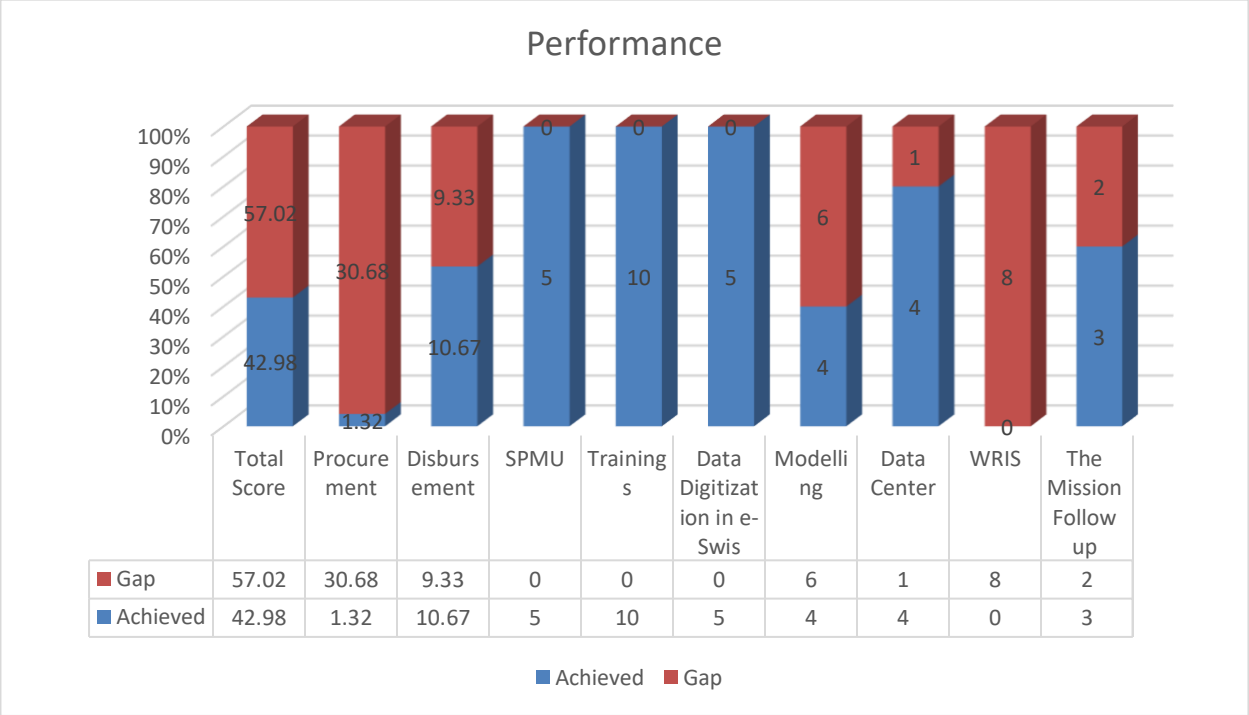
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Strengthen SPMU	May 15, 2018	All the communication should come through PMU
2	Procurement	Review and finalize the Bid documents for AV	May 30, 2018	
3	Procurement	Float the Solar System Tenders.	Immediate	
4	Capacity Building	Advanced training for River Ware to be carried out.	June 30, 2018	
5	Capacity Building	River Basin Planning Training to be carried out.	June 30, 2018	

Annexure 4.31: Rajasthan

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
19	26%	16	42%

Performance



	Total Score	Procurement	Disbursement	SPMU	Trainings	Data Digitization in e-Swis	Modelling	Data Center	WRIS	The Mission Follow up
Gap	57.02	30.68	9.33	0	0	0	6	1	8	2
Achieved	42.98	1.32	10.67	5	10	5	4	4	0	3

Summary

The performance of Rajasthan has improved since last mission, and Rajasthan tops the list in integration with eSWIS and participation / hosting of training events. Utilization of GeM and advertisement of RTDAS bid has contributed to progress in procurement. Now the agency needs to focus on development of State WRIS and may collaborate with SRSAC for same.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	To float the RTDAS bid	June 30, 2018	
2	Technical	To take up the PDS studies Component A with Institutional tie ups.	June 30, 2018	
3	Technical	To install the DWLRs for existing piezometers	June 30, 2018	Reassess the necessity before taking up any new piezometers
4	Data	E-SWIS 30 additional years of data to be entered into the system.		import function issue in e-SWIS need to resolved

Annexure 4.32: Sikkim

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
9	33%	22	38%

Performance

Summary

Sikkim has put considerable efforts in streamlining the approval processes and initial procurements. However, the progress has slowed down compared to last mission, which is primarily due to change in staff in SPMU. The new team has yet to pick up in project implementation and efforts are required to strengthen the capacity of new team. Pending procurements like data centre construction bid needs to be expedited. The hosting of mission and overall arrangements were strongly acknowledged by participants.

Identified Actions

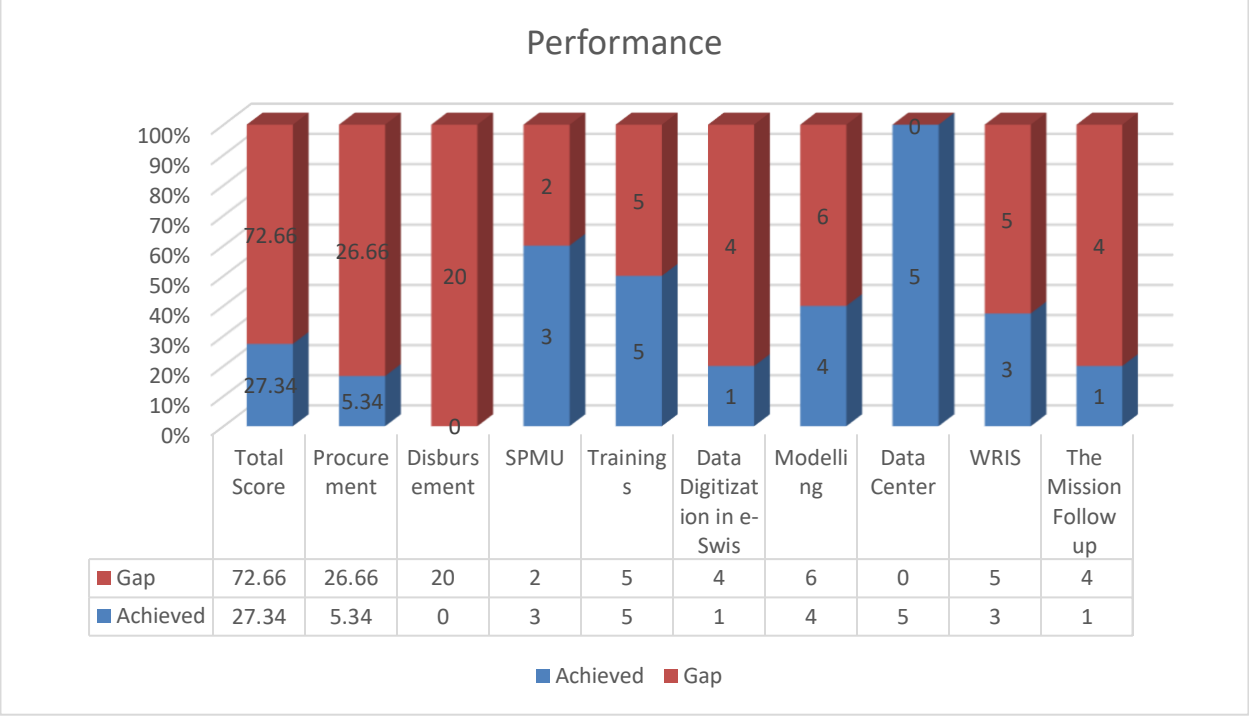
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Designate one engineer as safeguard specialist. Strengthen the SPMU	Immediate	
2	Procurement	Prepare & Submit Data Center Bid	July 15, 2018	
3	Procurement	PDS studies need to be by consultancy in Component C.	Immediate	

Annexure 4.33: Tamilnadu

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
19	26%	33	28%

Performance



Summary

The implementing agency has not shown any progress under the project. Although the SPMU seems to be strengthened but no real activities have started under NHP. The agency is advised to initiate activities as per project implementation plan and start procurement process. The bids for RTDAS and groundwater monitoring should be taken on priority.

Identified Actions

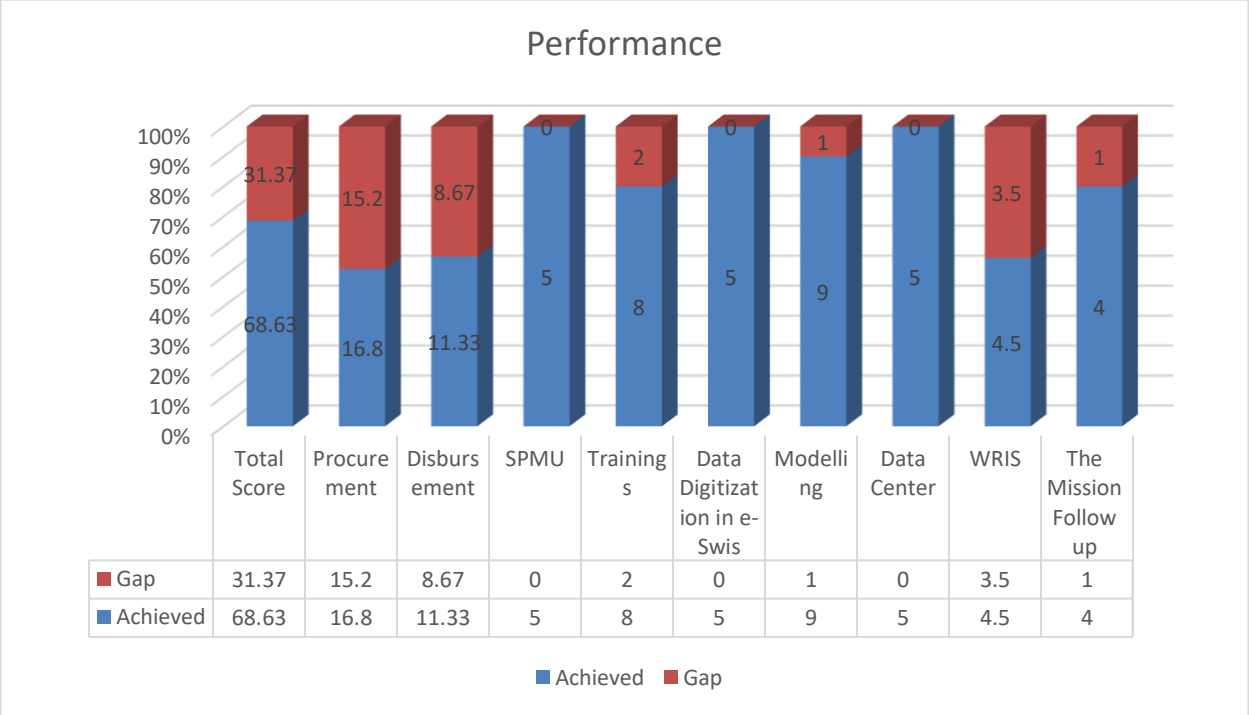
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
4.	Human Resource	SPMU need to actively work on work	Immediately	Dedicated team is needed
5.	Procurement	Finalize the network of piezometers and RTDAS Bid	September 30, 2018	All procurements are delayed and response time is slow.
6.	Procurement	Harmonize MIS and STEP entries for procurement	Immediate	

Annexure 4.34: Telangana – Ground Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
23	25%	1	69%

Performance



Summary

The performance of the implementing agency has improved drastically since last mission. The SPMU has been strengthened and the entire departmental data has been digitized. Development of a dashboard and a decision tool; a web based conjunctive use plan for one basin and the plan to extend the same for other basins were appreciated by mission. The agency should focus on developing bid documents for DWLR, initially for existing 40 locations and later for all other 450 locations.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Data policy	To be harmonized with the National policy	Immediate	
2	Financial	Audit report due for FY 16-17 and FY 17-18	Immediate	
3	Procurement	Procurement of DWLR	N/A	Can be done in phases

Annexure 4.35: Telangana – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
19	26%	13	44%

Performance

Summary

Strengthening of SPMU and development of mobile app for data exchange were appreciated by mission team. The Agency needs to work on developing ToRs for basin assessment and procurement of RTDAS on priority.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Data policy	Update data policy in line with National data dissemination policy	Aug 2018	No pricing
2	Audit	Audit report for FY 16-17 and 17-18 is due	Immediately	

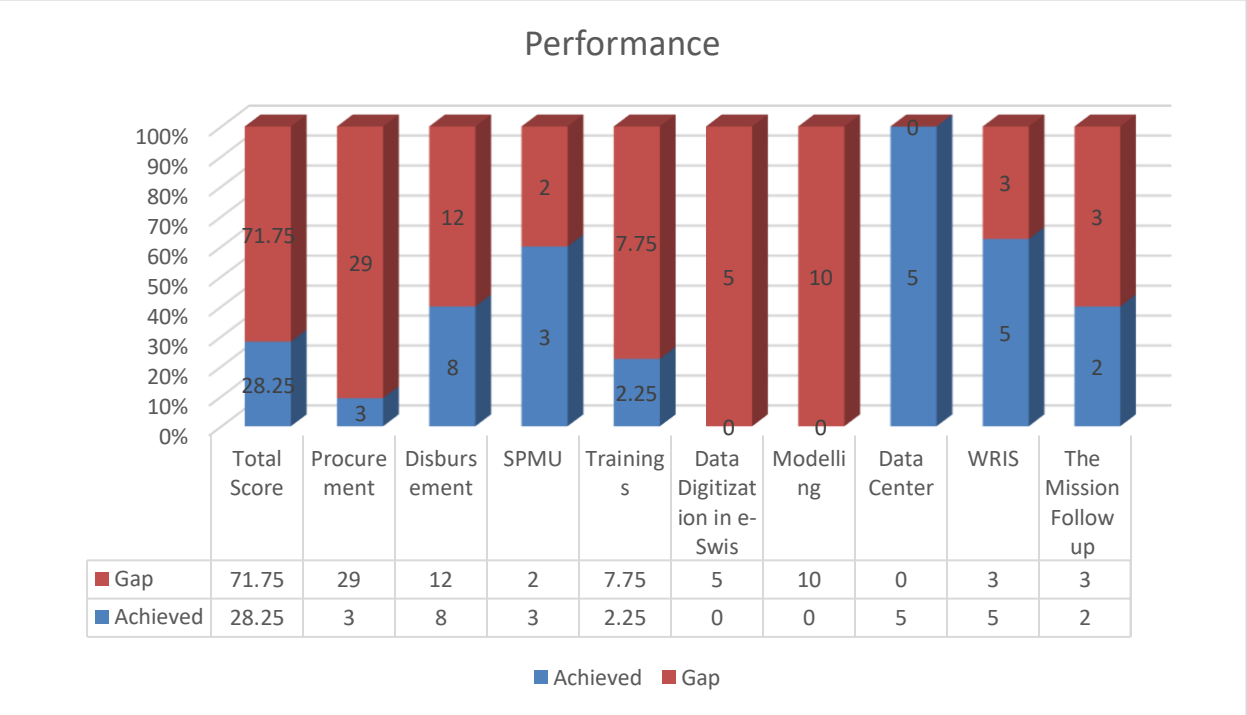
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
2	Procurement	Submit first phase of RTDAS tender to NPMU	June 15, 2018	Going in phased manner
4	Data	Share the extents of LiDAR done for Kaleswaram project	June 15, 2018	Data acquisition can be optimized by SOI

Annexure 4.37: Uttar Pradesh: Ground Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
6	34%	31	29%

Performance



Summary

The performance of UP groundwater has gone down drastically since last mission. The major bottleneck is shortage of SPMU staff and negligible participation in training and knowledge exchange activities. The activities for monitoring of groundwater including water extraction and water budgeting should be initiated on priority. The state need to develop holistic plan for both quality and quantity rather than just focusing on exploited blocks. The deep aquifer need to be monitored for entire alluvium region and CGWB has been required to work with the states.

Identified Actions

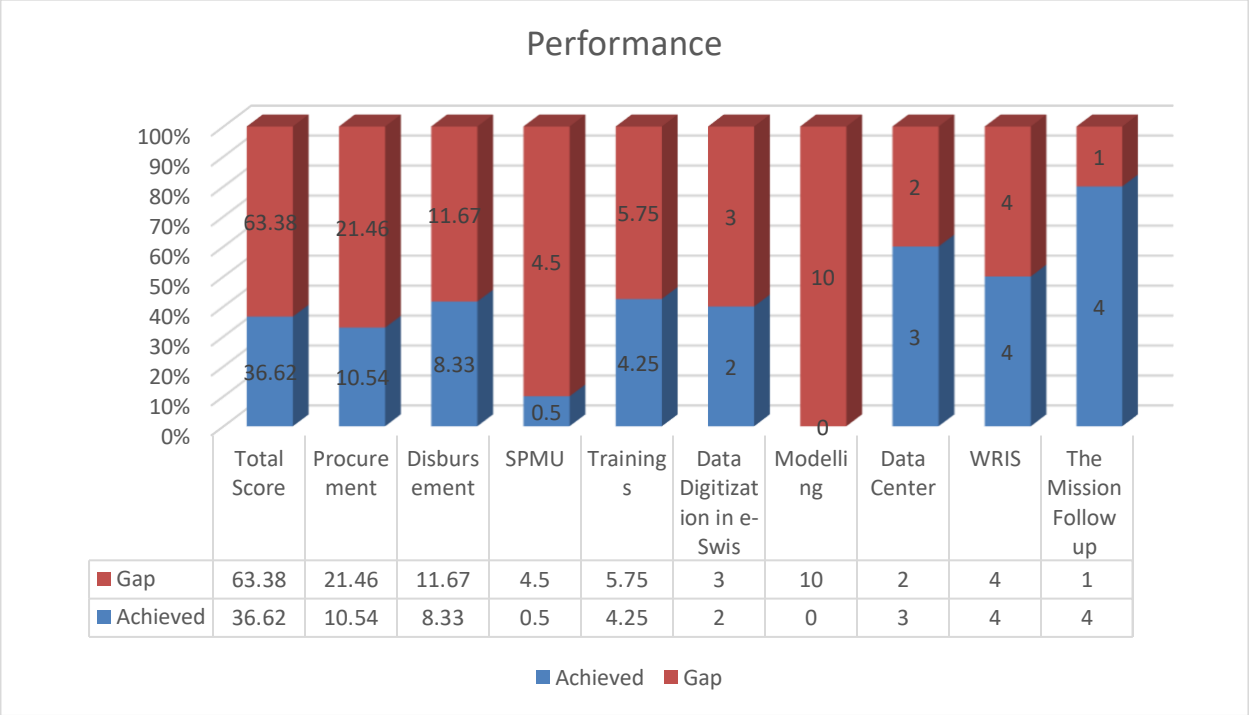
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Strengthening of the SPMU	Immediate	

Annexure 4.38: Uttar Pradesh – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
37	14%	24	37%

Performance



Summary

The performance of the implementing agency has improved since last mission. It is expected that the expenditures will pick up once the bid documents are tendered. The IA now needs to focus on developing analytical skills. Under UPWSRP2, flood forecasting for Rapti has been developed. The IA can take up the extension/development of similar models for all the remaining basins. The agency has a good vision for setting up monitoring system for dams and barrages. However, mission was concerned that entire team was going to change and it may take time for new team to adapt to the project activities.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Designate one engineer as safeguard specialist	Immediate	
2	Human Resource	Special training for e-SWIS required	Immediate	
3	Procurement	RTDAS	June 2018	
4	Procurement	Tender for SCADA	June 2018	
5	Data	Online the Flood Forecasting model for rapti basin	June 2018	
6	Data	Join and upload data in e-Swis		Assign team to attend the e-swis training programs to be hosted by CWC in future

Annexure 4.39: Uttarakhand

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
29	20%	32	28%

Performance:

Summary

The implementing agency has shown considerable progress in procurement and activities related to construction of buildings. However, the progress in component C of the project is completely missing, the agency is advised to initiate ToRs for analytical work, flood forecasting and development of state WRIS,

Identified Actions

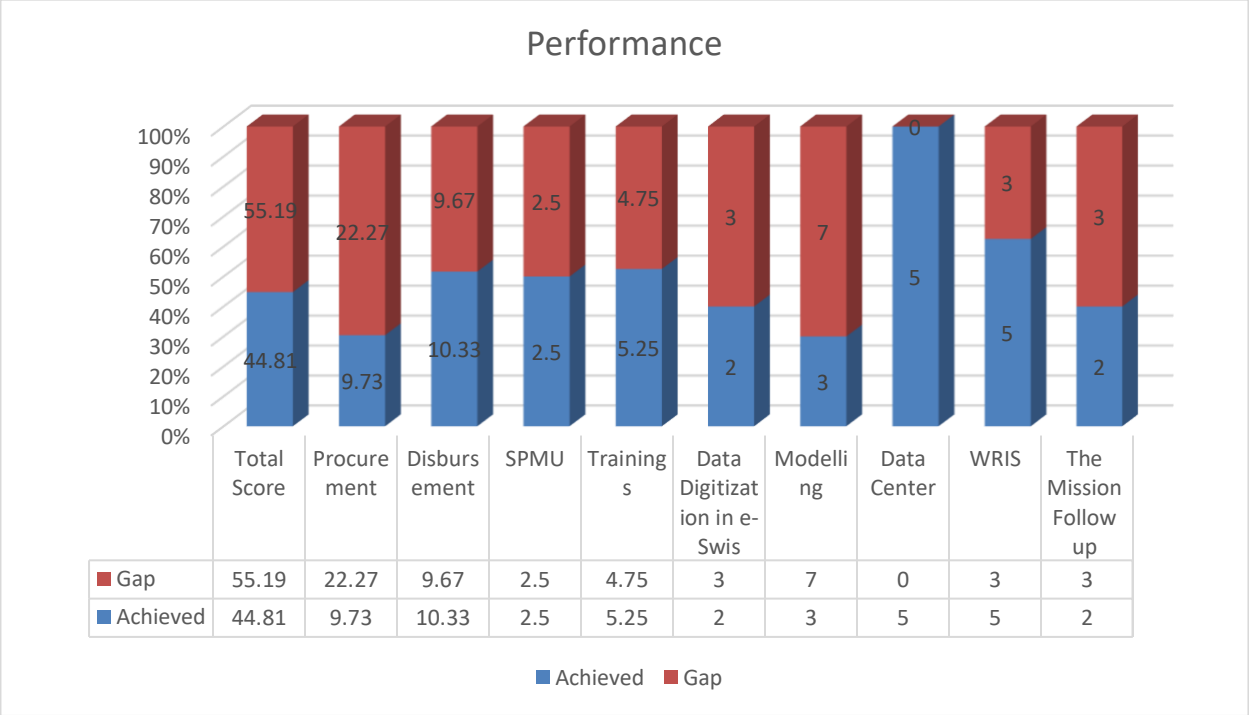
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	STEP entry should be properly carried out in accordance to the rules	Immediate	
2	Technical	Establishment of Partnership with Hydraulic Research Institute	July 2018	
3	Procurement	Floating of RTDAS tender	Aug 2018	

Annexure 4.40: West Bengal – Ground Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
18	26%	11	45%

Performance



Summary

The performance of the Agency has been slow considering the institutional capacity and skilled manpower available for analysis. Any gap in analytical skill may be filled by collaboration with academic institutions. The agency should also focus on finalizing RTDAS bids for DWLRs and surface monitoring in consultation with NPMU.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Designate one engineer as safeguard specialist	Immediate	
2	Procurement	Prepare and Submit RTDAS Bid	May 7, 2018	All suggested changes need to be incorporated in the RTDAS bid, especially for AWS.
3	Procurement	Finalize and submit DWLR Bid documents	May 10, 2018	
4	Technical	Deep drilling in the Western Districts to define the aquifer for GW development and setup piezometer based monitoring for these wells. CGWB help needed for developing correct and long term solutions.		
5	Data	All plans and activities should be incorporated in the SWRIS. E-Swis need to resolve	Immediate	
6	Technical	Prepare hydrographs from the 30 DWLR stations which had been installed for check dam monitoring sites and compare the peak floods generated with WBADMI project	June 30, 2018	

Annexure 4.41: West Bengal – Surface Water

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 41)	Score	Rank (Out of 41)	Score
8	34%	14	44%

Performance

Summary

The performance of West Bengal SW has slowed compared to previous mission. The major bottleneck identified was administrative approval process and nomination for training events. The agency needs to work on streamlining the approval process by empowering nodal officer and SPMU.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	SPMU with Dedicated team		Majority have multiple charges.
2	Procurement	Award contract for SCADA	October 2018	
3	Procurement	Control center for SCADA	September 2018	
5	Data	Join E-SWIS and upload the data	Immediately	Credentials has been shared by CWC during the mission

Annexure 4.42: CGWB

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 8)	Score	Rank (Out of 8)	Score
3	25%	4	48%

Performance

Summary

The progress from CGWB is slow and they need to focus on initiating procurements planned for this year. CGWB also need to provide central database for facilitating data sharing with states and provide modelling support to states.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	Expediate the procurement for construction of Centre of excellence	Immediately	
2	Procurement	Initiate the procurement for installing DWLRs	Immediately	
3	Trainings	Standardize trainings courses and host trainings for states on GW modelling, data analysis, aquifer mapping	Immediately	

Annexure 4.43: CPCB

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 8)	Score	Rank (Out of 8)	Score
7	16%	8	25%

Performance

Summary

There is no considerable progress by CPCB towards implementing NHP activities. The activities started during HP-2 are also in uncertain status, which needs to be addressed immediately. Major procurements including consultancy should be initiated soon

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	Expediate the procurement for consultancy for pollution load	Immediately	
2	Technical	Expediate the standardized software for water quality data and provide access to states	Immediately	
3	Technical	Share the data available upto 2012 on public domain as per Govt of India policy	Immediately	May start first with Govt to Govt sharing and build capacity of states in using database

Annexure 4.44: CWC

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 8)	Score	Rank (Out of 8)	Score
4	22%	2	54%

Performance

Summary

CWC has several important applications to be developed for database management and India-WRIS and river basin planning. India-WRIS is yet to be made accessible for states, major procurements are to be expedited, support for e-SWIS need to be strengthened with two way exchange with the states.

Identified Actions

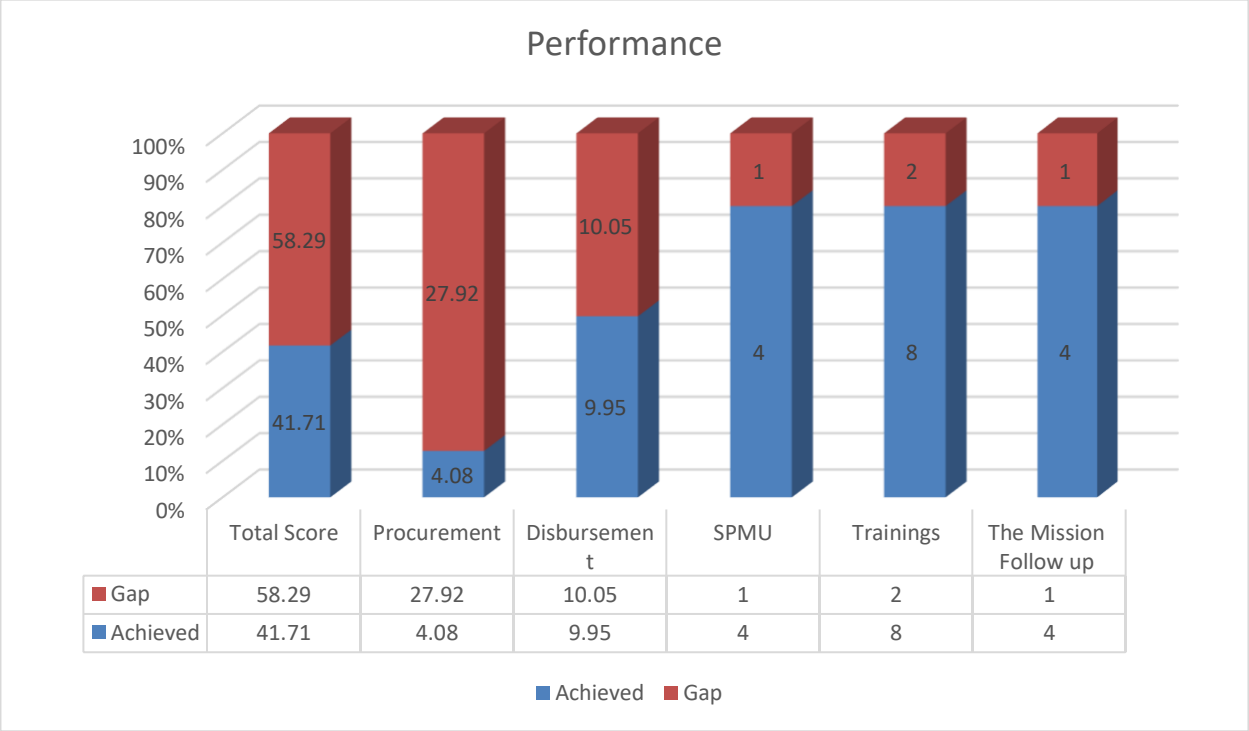
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	Expediate the procurement for consultancy for IWRM, which is in evaluation stage	Immediately	
2	Procurement	Bid document for North-East states for Hydromet	Immediately	
3	Technical	eSWIS data exchange to be made 2-way with access to states enabled	Immediately	
4	Training	Trainings on eSWIS to be made more target oriented with handholding of states which are slow in adopting eSWIS	Immediately	

Annexure 4.45: CWPRS

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 8)	Score	Rank (Out of 8)	Score
2	28%	6	42%

Performance



Summary

CWPRS has made some progress in hosting trainings and initiating some procurements. The trainings need to be standardized and need to introduce online courses for Hydromet. The major activity to be carried out by CWPRS is developing testing lab, for which the progress is quite slow. CWPRS is advised to visit national and international testing facilities and design the lab accordingly. They can start with easy instruments like Rain gauge and DWLR, for which technical know-how is available in country; and later on extend the testing lab to include water level monitoring equipment.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Human Resource	Strengthening SPMU by having additional project staff	Immediate	
2	Procurement	Consultancy for calibration and testing lab	July 15, 2018	CWPRS may explore option for hiring individual consultant instead of company
3	Financial	Pending Audit Report for previous financial years	Immediate	
4	Technical	Standard Training modules for Hydromet Training including online and distant learning modules	Immediate	Include maintenance and, operation for equipment
6	Others	Provide support to other agencies in installation and maintenance of equipment	Immediate	Expenses for the same need to book under own allocation for the project

Annexure 4.46: NIH

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 8)	Score	Rank (Out of 8)	Score
6	17%	5	47%

Performance

Summary

The mission team noted the change in the ranking of the Implementing Agency since the last mission. The PMU has been setup and is functional. It is expected that progress will be made in the DSS front however the progress in the PDS has been slow as there have been delays in the R&D process because of which expenditure has also been slow. It is expected that expenditure for the IA will be picking up this financial year. NIH has a crucial role to play with respect to promoting modelling. There is a need for advanced modelling and NIH can play the role of reaching out to all the implementing agencies and checking in with them with respect to their modelling needs. Also given the lack of human resources with respect to modelling, it was suggested that pooling in resources for now might make more sense. It was appreciated that NIH has engaged modellers and they are being made available to other State IAs as technical resource persons for providing inputs on modelling

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Technical	Internal mapping of all the models/modelling activities which are presently being worked upon.	Immediate	
2	Technical	Internal mapping of all the basins where NIH is presently working on or has worked on.	Immediate	
3	Technical	DSS development needs greater involvement from NIH and a plan of action to realize the same	Immediate	

Annexure 4.47: NRSC

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 8)	Score	Rank (Out of 8)	Score
8	5%	7	34%

Performance

Summary

The implementing agency has made considerable progress in hiring manpower; strengthening CPMU; acquiring high resolution ALTM DEM for Tapi and Godavari; organization of trainings on RS and GIS applications; snow hydrology and GLOF risk assessment. The agency is requested to work in collaboration with NWA to develop online courses, share metadata and develop brochures on standard satellite-based products (DEM, ET estimate etc.) available for states. Apart from that, NRSC needs to follow World Bank procurement procedures for all procurements and introduce PFMS for all transactions.

Identified Actions

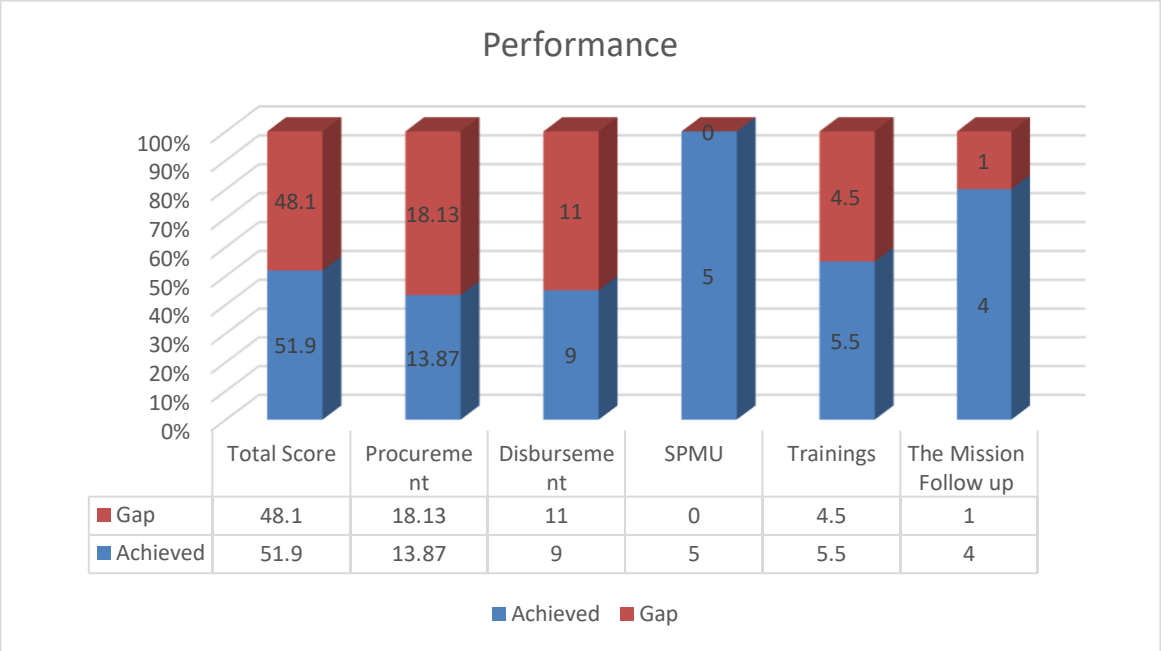
S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Procurement	Need to follow World Bank procedures and e-procurement system compliant with World Bank Requirement	Immediate	
2	Financial	Use of PFMS for all transactions	Immediate	As per requirement of Govt of India
3	Technical	Collaborate with NWA for developing online courses	15 July 2018	This could extend to customized trainings on RS & GIS based Water resources applications
4	Technical	Development of Information Brochures	15 July 2018	Provide metadata and list of standard products available for states
5	Technical	Standardization of Flood modelling software	15 July 2018	Initiate discussion with NPMU and CWC for identifying license free software for flood modelling

Annexure 4.48: Survey of India

Agency Rating

ISR Mission 1- August 2017		ISR Mission 2- April 2018	
Rank (Out of 8)	Score	Rank (Out of 8)	Score
5	22%	3	52%

Performance



Summary

Survey of India has made commendable progress under NHP since last one year. The initiation of activities like CORS and Goid Model were highly appreciated by the Mission. Good progress is made in procurement including construction of Data Centre, 3-5 m & 0.5 m DEM, bidding for Gravimeters, purchase of satellite imageries etc. Survey of India is requested to develop customized training programs and online courses to meet the demands of NHP agencies.

Identified Actions

S. No.	Action Type	Key Action Required	Due Date	Remarks (If any)
1	Technical	Collaborate with NWA / NIH for developing online courses	15 July 2018	This could extend to customized trainings on GIS, Surveys, DEM etc.
2	Technical	Development of Information Brochures	15 July 2018	Provide metadata and list of standard products available for states