

No. G-20/1/2017-GA  
Government of India  
Ministry Jal Shakti  
Department of Water Resources, RD and GR  
(General Administration)  
\*\*\*\*\*

Shram Shakti Bhawan, Rafi Marg,  
New Delhi, dated 04.12.2019

**Subject: Forwarding of records/information to visiting audit party of Director General of Audit, Scientific Departments for FY 2018-19.**

Please find enclosed **Audit Memo No.35 & 36** dated 28.11.2019 received from the Audit Party from O/o the Director General of Audit, Scientific Departments, New Delhi, which has come to conduct the Audit of Ministry for the year FY 2018-19.

2. The relevant information as desired by Audit Party may kindly be sent directly to them immediately to Room No. 621'B', 6<sup>th</sup> Floor, Shram Shakti Bhawan.

Encl: As above.



(A.K.Kaushik)

Under Secretary to the Govt. of India

Ph: 011-23710303

To

1. Sr. JC(PP), DoWR, RD & GR, Shastri Bhavan, New Delhi.

Copy to:

Controller of Accounts, DoWR, RD & GR, Shastri Bhawan.

OK

4/12/19



**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

Audit Memo No. 35

Dated: 28 November 2019

**Subject: Financial progress under "Development of Water Resources Information System" scheme**

The yearwise financial output/ deliverables<sup>1</sup> for "Development of Water Resources Information System" scheme for 2017-2020 are given in table below. The actual expenditure against each component may please be provided in the corresponding column to the right (alongwith the reasons for shortfall):

(Rupee in lakh)

S.No.	Component	2017-18		2018-19		2019-20		Total 2017-20	
		Target	Actual expenditure & reasons for shortfall	Target	Actual expenditure & reasons for shortfall	Target	Actual expenditure (till date) & reasons for shortfall	Target	Actual expenditure till date & reasons for shortfall
1.1	Running & Maintenance of Hydrological Stations continued during XII Plan (878 stations)	8369.06		6709.77		7917.54		22996.37	
1.2	Running & Maintenance of Hydrological Stations opened during 12 <sup>th</sup> Plan Period	2163.95		7419.17		9028.07		18611.19	
1.3	Runing and maintenance of Water Quality Laboratories for monitoring of Water Quality at existing stations	1392.12		1746.17		2562.65		5700.94	
1.4	Collection of Storage data on the 66 major reservoirs.	683.00		33.00		45.00		761.00	
1.5	Coastal Management Information System (CMIS)	1115.33		1176.71		228.56		2520.60	
1.6	Flood Forecasting	5795.11		3607.17		2667.43		12069.71	
1.7	Integrated Reservoir Operation	117.20		468.55		0.00		585.75	
	<b>Sub Total</b>	<b>19635.77</b>		<b>21160.54</b>		<b>22449.25</b>		<b>63245.56</b>	
2	<b>Irrigation Census</b>								
2.1	Pilot Census of Major and Medium Irrigation Project	60.00		0.00		0.00		0.00	
	<b>Sub Total</b>	<b>60.00</b>		<b>0.00</b>		<b>0.00</b>		<b>60.00</b>	
3	<b>Strengthening of Monitoring Unit in CWC</b>	<b>630.00</b>		<b>745.00</b>		<b>825.00</b>		<b>2200.00</b>	
4	<b>Data bank and Information System</b>								
4.1	Reassessment of Water availability in the country	20.43		20.00		0.00		40.43	
4.2	Up-gradation and Modernization of Library Information Bureau	6.00		157.00		153.00		316.00	
4.3	Software Management in CWC	654.00		671.00		635.00		1960.00	

<sup>1</sup> As per Approved Memorandum For Expenditure Finance Committee

**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

	Sub Total	680.43		848.00		788.00		2316.43	
5	Integrated Water Resources Management Studies	0.00		220.00		200.00		420.00	
	Grand Total	21006.20		22973.54		24262.25		68241.99	

  
Sr. Audit Officer

✓ The JS&FA, DWR, RD&GR, Shram Shakti Bhawan, New Delhi  
The Director, RDC, Sewa Bhawan



**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

Audit Memo No. 36

Dated: 28 November 2019

**Subject: Integrated Reservoir Operation component under "Development of Water Resources Information System" scheme**

According to the approved Memorandum For Expenditure Finance Committee for "Development of Water Resources Information System" (2017-2020) two new components viz. Integrated Reservoir Operation and Integrated Water Resources Management Studies) had been added. The Integrated Operation of reservoirs was envisaged to be a part of Crisis Management Plan Flood Forecasting, Dam Failures, Incidents Consequent to Extreme Natural Events and Integrated Reservoir Operation for Flood Management.

In the EFC, it was mentioned that a number of reservoirs have been planned and constructed in India for conservation and utilisation of the water resources for deriving various benefits including flood moderation. In the initial stages of development, the projects were generally planned to serve single purpose such as irrigation, hydropower generation, flood control, municipal and industrial supply etc. However, in the past few decades, the country has witnessed immense urbanization and industrialization. These economic developments, coupled with increase in population have resulted in perceivable increase in demand for water. The ever increasing demands for sufficient quantity and quality of water distributed in time and space, have resulted in contemplation and implementation of even more comprehensive, complex, multi-purpose, and ambitious plans for water resources system. The operation of reservoir(s) in the wake of conflicting nature of conservation demands and flood moderation becomes very complex. In many reservoirs, a delicate balance is always needed, whether to keep the reservoir empty for absorbing the incoming flood or fill it as soon as possible, to cater to the demands in leaner months. What if the reservoir does not fill up later? What if the forecasted flood does not come? Such apprehensions, in the mind of reservoir manager or the project authorities, make the reservoir operation quite tricky in real time.

The development of integrated operation of reservoirs manual and Decision Support System were proposed to be conducted through hiring of Consultants. For developing the plan for Integrated Operation of reservoirs, 8 river basins have been identified, namely: Ganga, Krishna, Godavari, Mahanadi, Cauvery, Mahi, Tapi, and Subarnarekha. In these 8 basins, 74 reservoirs / barrages had been tentatively identified under 27 reservoir systems. Some reservoir systems have 6-7 reservoirs, whereas some have 2 reservoirs. **The study was proposed to be completed in one year time span after award of work.**

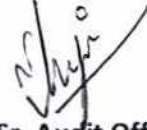
**The yearwise output/ deliverables for this component were:**

(Rupee in lakh)

Sl No	Component	2017-18		2018-19		2019-20		Total	
		Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
1.7	Integrated Reservoir Operation	8 river basins (To be completed in 1 years after award)	117.20	Continuing of ongoing activity at 8 river basins.	468.55		0.00		585.75

**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

The actual achievements (including reasons for shortfall) of **Integrated Reservoir Operation component** during 2017-18, 2018-19 and 2018-till date, may please be made available to audit immediately along with relevant records/ files.



**Sr. Audit Officer**

✓ The JS&FA, DWR, RD&GR, Shram Shakti Bhawan, New Delhi  
Copy to: The Director, RDC, Sewa Bhawan

No. G-20/1/2017-GA  
Government of India  
Ministry Jal Shakti  
Department of Water Resources, RD and GR  
(General Administration)

\*\*\*\*\*

Shram Shakti Bhawan, Rafi Marg,  
New Delhi, dated 04.12.2019

**Subject: Forwarding of records/information to visiting audit party of Director General of Audit, Scientific Departments for FY 2018-19.**

Please find enclosed **Audit Memo No.37 to 39** dated 29.11.2019 received from the Audit Party from O/o the Director General of Audit, Scientific Departments, New Delhi, which has come to conduct the Audit of Ministry for the year FY 2018-19.

2. The relevant information as desired by Audit Party may kindly be sent directly to them immediately to Room No. 621'B', 6<sup>th</sup> Floor, Shram Shakti Bhawan.

Encl: As above.



(A.K.Kaushik)

Under Secretary to the Govt. of India

Ph: 011-23710303

To

1. Sr. JC(PP), DoWR, RD & GR, Shastri Bhawan, New Delhi.

Copy to:

Controller of Accounts, DoWR, RD & GR, Shastri Bhawan.

5/12/19

OK





**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

**Audit Memo No. 37**

**Dated: 29 November 2019**

**Subject: Development of Water Resources Information System” scheme - Financial and physical progress regarding Machinery & Equipment under Subcomponent “Running & Maintenance of Hydrological Stations opened during 12th Plan Period (720 opened and 80 under process)”**

The financial and physical progress along with the reasons for shortfall regarding Machinery & Equipment under Subcomponent “Running & Maintenance of Hydrological Stations opened during 12th Plan Period (720 opened and 80 under process)” may please be provided (alongwith supporting records/files) in the corresponding column to the right:

(Rupee in lakh)

Item	Targeted Quantity to be procured	Actual Procurement (till date)	Targeted expenditure during 2017-20	Actual expenditure (till date)	Reason for shortfall, if any
Procurement of Acoustic Doppler Current Profilers (ADCP) with associated software, laptop and other accessories	14		462		
Out Boat Engine (45 HP)	35		371.25		
AOTT Type Current meter	20		50.82		
Boat Outfit	100		28.88		
Boat and Navigational equipments (lifebuoy & life Jacket - 5 each, Anchor-4)	100		554.4		
Silt equipments (Silt Sampler-1, Sieve set-1, Oven-1, Physical Balance with weight-1, Enameled Bucket & Mug, Decicator-1, Gas Stove-1)	200		231		
Survey equipment (Auto level with stand-1, Levelling Staff-2, Metallic Tape-1, Ranging Rod-6, Prismatic compass with stand-1, etc.)	342		402.82		
Telemetry based snow observatory including meteorological parameters	0		0		
Portable Ecosounder	150		70.4		
Meteorological equipments (Steven Screen-1, Maximum-Minimum Thermometer-1, ORG-1, Ordinary Thermometer-1, Anemometer-1, Pan Evaporimeter-1)	200		138.6		
Camp equipments (Tent -1, Petromax-1, GI Box-1, Rain coat, Umbrella, Torch, Gum Boot, Folding Table-1, Folding Chair-2)	50		57.75		
Water Quality Equipment(Conductivity Meter-1, DO Meter-1, pH Meter-1, Desicators-1, Enamel Bucket & mug, DO Sampler etc)	147		167.2		
Office furniture for site	720		535.08		
Propeller/cup type Current meter with digital counter & accessories with fish	1535		509.21		

**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

weight					
Pgrmi type Current meter with digital counter & accessories	150		16.55		
Misc & Unforeseen items	1350		752.88		
Sub Total (M&E)			4348.84		
Grand Total			18611.19		

  
Sr. Audit Officer

✓ The JS&FA, DWR, RD&GR, Shram Shakti Bhawan, New Delhi  
Copy to: The Director, RDC, Sewa Bhawan



**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

**Audit Memo No. 38**

**Dated: 29 November 2019**

**Subject Integrated Water Resources Management Studies component under "Development of Water Resources Information System" scheme**

According to the approved Memorandum for Expenditure Finance Committee for "Development of Water Resources Information System" (2017-2020) two new components viz. Integrated Reservoir Operation and Integrated Water Resources Management Studies) had been added.

In the EFC, it was mentioned that, *"The institutionalization and implementation of Integrated Water Resources Management (IWRM) in India supported by River Basin Organizations and following the internationally acknowledged river basin planning cycle is a major target for the Government of India. The development of River Basin Management Plans for all Indian River basins takes a key role within this process. Significant steps have already been taken in the past, such as the development of specific projects for assessing water resources availability, the establishment of river basin management concepts and – most recently – the ongoing study for preparation of a Ganga River Basin Management Plan, initiation of process for enactment of Basin Management Act etc.*

*Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD & GR) aims to develop its ability to manage basins to support optimum use of water resources. The major objectives are to: align water resources development goals in line with the National Water Policy 2012; bring all States on equal footing regarding Hydrological Information System (HIS) and its use; and, specifically, to move towards IWRM process.*

*A coordinated action between States sharing various river basins is a must to achieve and, in particular, implement the principles of IWRM and other objectives where States are the main authority on water resources planning and development by virtue of powers given to them under the Indian Constitution.*

*The river basins in India are characterized by quite a variety of features regarding socio-economic, environmental imprints, water availability, water uses and impacts. The water management issues vary significantly between different basins. Therefore, river basin planning and management has to be developed and aligned accordingly, ensuring well designed governance and coordination mechanisms that hold a level of flexibility through „top-down/bottom up approaches“ in order to enable adaptation to the different conditions in the basins. Effectively coordinated input from the national and State level into the river basin level as well as vice versa can support continuous planning and management as basis of IWRM.*

*On all levels, India's current water resources management has established structures in place that need to be fully taken into account when designing aligned coordination mechanisms for river basin management that shall allow for development as well as implementation of River Basin Management Plan (RBMP).*

*Given the organization structure of MoWR, RD & GR, several existing institutions like the CWC, CGWB, and NIH will play a critical role in development of governance tools and models for water resources planning and operation as they are the custodian of basins' data and information. State Water Resources/Irrigation Departments and Central/State Pollution Control Board (CPCB) will also*

**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

*play a crucial role in the consideration of water quality throughout the planning process and the development of specific basin models. Hence, coordination mechanisms need to be integrative.*

*To achieve these, assistance from international/national experts will be required to underpin the political process of decision-making and adopting RBMPs. The expert consultants will support in establishment of an integrated river basin approach which should include the full chain from assessment of existing data, monitoring, stream flow prediction and water resources assessment up to the development of a programme of important measures, integrating surface water, ground water and water quality aspects. The establishment of proper River Basin Organizations, including the development of a better coordinated approach of the existing competent authorities as well as building their capacity are complementary though fundamental elements”*

**CWC had planned to take up IWRM studies in 2 river basins through IIT/IISc/similar institutes.**

In this connection, the following information **along with relevant records** may please be furnished to audit, immediately:

1. The key deliverables under this component are given in Column 1 of the table below. The actual achievements and reasons for shortfall may be given in Column 2 and 3 respectively:

Key deliverables	Actual achievements	Reasons for shortfall
1. Preparation of inception report indicating Key Water Management Issues (KWMI) such as key socio-economic features, cultural and religious aspects, issues, risks, pressures, impacts, opportunities, detailed work plan to achieve the assigned objectives, data requirement, review of available data and data gaps, if any, capacity building needs etc. The pressure and impact analysis/risk assessment shall be presented as texts and coloured maps, based on a robust geographical information system (GIS). The inception report shall indicate the time schedule represented by weekly Gantt chart showing major milestones, deliverables, completion dates and any other interdependencies.		
2. Document on characteristics of delineated river basins and its relevant sub-basins including surface water and groundwater units of assessments (e.g. groundwater bodies or aquifers, entire rivers, river reaches, lakes, wetlands, estuaries or other water bodies).		
3. Designing of an adequate monitoring network and programme to be established.		
4. Overview document identifying modelling needs and assessment in the river basin for RBMP purposes; an overview on existing information/datasets to support modelling purposes, available modelling tools and selection of the most suitable ones		



**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

5. Preparation of model development report comprising chapters on objectives, study area, methodology/ approach for model development, model and data (both geospatial and non-spatial) used, analysis of various scenarios, projections for future and assumptions made for the study, output of the modelling work in the form of text, analysis, digital maps, GIS layers (raster and vector), graphs, charts, confidence limit in result prediction, uncertainty analysis in model development, shortcomings/limitations in the models, results, discussion, conclusions and recommendations, etc		
6. Final report.		
7. Monitoring and Assessment of basin wise activities to evaluate project progress and success by devising and applying appropriate indicators and criteria.		

2. The physical and financial progress along with the reasons for shortfall regarding establishment of Modelling Center under BPMO, CWC at New Delhi

3. The yearwise actual expenditure under the component in the table below:

2017-18		2018-19		2019-20		Total	
Targeted	Actual Expenditure	Targeted	Actual Expenditure	Targeted	Actual Expenditure (till date)	Targeted	Actual Expenditure (till date)
0		220		200	200	585.75	585.75

  
**Sr. Audit Officer**

✓ The JS&FA, DWR, RD&GR, Shram Shakti Bhawan, New Delhi  
**Copy to: The Director, RDC, Sewa Bhawan**

**C&AG AUDIT PARTY**  
**Office of the Director General of Audit, Scientific Departments, New Delhi**  
**Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan**

Audit Memo No. 39

Dated: 29 November 2019

**Subject: Hydro-meteorological observation activities of CWC**

drological data observation is specialized work and Central Water Commission (CWC) has been mandated to carry the same on national basis. CWC has developed enough expertise through its network of hydrological observation stations and has got trained manpower.

**The Objective of Hydro-meteorological Observation are:**

- Assessment of Basin wise/sub-basin wise Water Resources
- International Issues arising out of trans boundary rivers
- Inter-State issues/ Conflict resolution
- Flood Forecasting, Inflow forecasting, reservoir regulation for Dam safety, flood inundation mapping and development of mathematical models
- Provide necessary water related data for better research, planning, development, management in the area of water resources
- Preparation of DPR
- Assessment of navigational potential for inland waterways
- To provide necessary water related data for better research, planning, development, management in the area of water resources

**The Frequency of Observation is:**

**Gauge (Water Level):-** Gauges are being observed three times a day (8.00, 13.00, 18.00 hrs) during non-monsoon period and hourly during monsoon period.

**Discharge:** Discharge is being observed once a day at 8:00 AM except on holidays.

**Silt:** Silt samples are collected daily along with discharge observation. Thereafter, the samples are being analysed in the field laboratories (for coarse, medium and fine sediment).

**Bed Material:** Bed material analysis is being done at 14 sites. The frequency of observation is thrice a year.

**Water Quality:**

1. **Base Station:** One sample is being collected every two months and total six samples in a year.
2. **Trend Stations:** Sample is being collected once in every month.
3. **Flux Stations:** Samples is being collected thrice in a month,
4. **Trace and toxic metal** is being analysed twice in a year.

**Rainfall:** Rainfall are being observed twice daily (8:00 AM and 8:00 PM)



## C&AG AUDIT PARTY

Office of the Director General of Audit, Scientific Departments, New Delhi  
Camp: CWC, 5<sup>th</sup> Floor Sewa Bhawan

**Temperatures:** Daily maximum and minimum temperatures are recorded at each site. In addition river water and well water temperatures are also recorded at the time of observations.

**Data Transmission:** Data collected at sites are recorded in the corresponding standard forms and sent to sub-division office in physical format. After checking, it is entered in SWDES/eSWIS software developed under Hydrology Project. Thereafter, the validation of data is being carried out at Division level and compiled in the forms of books namely; Water Year Book, Sediment Year Book, Water Quality Year Book & Bed Material Year Book.

In this connection, the following information (till date) may be provided to audit in respect of 800 new sites proposed to be opened under CWC during 12th plan under plan scheme development of 'Water Resources Information System (DWRIS):

S. No.	Name of sites alongwith State	River	Date of award of work to the outsourcing agency	Date of commencement of operation at the site	Whether all necessary equipments have been installed	Whether data collected and received as per prescribed frequency	If yes whether data entered in the software of CWC HQs?	Whether the water quality in the rivers has been monitored	Reasons of shortfall, if any

Sr. Audit Officer

✓ The JS&FA, DWR, RD&GR, Shram Shakti Bhawan, New Delhi  
Copy to: The Director, RDC, Sewa Bhawan