GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION
CENTRAL GROUND WATER BOARD

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EXECUTIVE SUMMARY

Central Ground Water Board (CGWB), a subordinate office of the Department of Water Resources, River Development and Ganga Rejuvenation, Government of India, is the National Apex Organisation entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country. Central Ground Water Board was established in 1970 by renaming the Exploratory Tube wells Organization (ETO) under the Ministry of Agriculture, Government of India. Later, it was merged with the Ground Water Wing of the Geological Survey of India in Year 1972. The Board carries out its activities through 18 Regional Offices, 17 Divisional offices and 10 State Unit offices located in States/UTs.

National Aquifer Mapping and Management Programme (NAQUIM)

NAQUIM is one of the important Programme of Department of Water Resources, River Development and Ganga Rejuvenation being implemented by Central Ground Water Board. Under this program, it is envisaged to cover nearly 25 lakh km^2 area of the country for which Aquifer Maps are to be prepared and management plans to be formulated for sustainable management of ground water resources in the country. Several activities such as data collection, data compilation and data generation for preparation of Aquifer Maps and Management Plans are being taken up in phased manner. The areas to be covered have been prioritised considering over-exploitation, ground water contamination and other issues. The cumulative coverage under NAQUIM, since 2012 (upto March 2020) is 13 lakh sq. km. During the period 2019-20, aquifer maps and management plans were developed for an area of 2.16 lakh km^2. Thus, nearly 52.42% of the total mapable area identified (24.8 lakh sq. km) for aquifer mapping has been covered till March 2020.

Ground Water Exploration

Ground Water Exploration is carried to study the sub-surface hydrogeological set up of the aquifer, their interlayering and to evaluate aquifer parameters of aquifer systems. During the year 2019-20, the Board under its in-house Ground Water Exploration programme has constructed 726 wells (534 Exploratory Wells (EW), 179 Observation Wells (OW) and 13 Piezometers (Pz's)to assess the ground water potential in different hydrogeological set-up of the country. Priority was accorded to Over Exploited/ Critical/ Semi-Critical/ Drought Prone and areas affected with groundwater pollution etc. Out of 726 exploratory wells constructed, 609 wells were constructed in hard rock, 116 wells in alluvium and 1 well in Bouldary formation including 94 exploratory wells drilled in the tribal and 38 wells in drought prone areas.

Geophysical Studies

During 2019-20, a total of 1217 Vertical Electrical Soundings (VES), 28 line km 1D resistivity profiling and 29 borehole logging have been conducted in various parts of the country to ascertain water bearing layer at different depths as well as in finalizing the tubewell assembly.

Water Quality Analysis

During the year, 27337 ground water samples have been analyzed, out of which 18658 water samples have been analyzed for determination of basic constituents, while 8675 water samples have been analysed for the Trace elements like As, Cd, Co, Cr, Cu Fe, Mn, Ni, Pb, Zn etc and 4 samples for pesticides. Ground quality analysis helps in understanding variation in water quality and pin pointing areas facing issues of geogenic and anthropogenic contamination of groundwater.

Monitoring of Ground Water Observation Wells

The Board monitors the ground water level in the country four times a year (Jan/ May/ Aug/ Nov) through a network of 22730 ground water observation wells (Dug Wells: 16375 and Piezometers: 6355) throughout the Country. The ground water samples are collected during the pre-monsoon monitoring and analysed for the purpose of ascertaining the changes in chemical quality of ground water. Monitoring of Ground Water Observation Wells for May, August, November 2019 & January 2020 were completed and reports have been prepared describing fluctuation of water levels during each measurement compared to monitoring of previous year, decadal average and pre-monsoon period to depict detailed information regarding short term and long term changes in the ground water regime.

Technical Documentation and Publication

Results of investigations carried out by Central Ground Water Board are suitably documented in the form of reports which are categorized as Aquifer Mapping reports, Ground Water Year Books, State Reports (Hydrogelogical/ Exploration/ Geophysical/ Chemical), District Ground Water Brochures and Basic Data Reports.

During 2019-20, 09 State Reports, 115 District Groundwater Brochures and 23 Ground Water Year Books were prepared.

Water Supply Investigations

The Board carries out request based short-term water supply investigations for Government departments and defence establishments and helps in augmenting their water supply. During 2019-20, the Board conducted 139 such request based investigations in different parts of the country.

Dissemination and Sharing of Technical Know-how

The officers of CGWB participated in various seminars/ symposia/ workshop/ conference to share their experiences in the Ground Water domain and also for getting exposure to new ideas/ technological developments in the Ground Water science with other experts. The officers of the Board also participated in various meetingsand contributed as members of several committees on issues related to ground water development and management in specific areas.

Dynamic Ground Water Resources Estimation

The Annual Replenishable Ground Water Resources as on March 2017 of the Country have been assessed as 432 billion Cubic Metres (bcm) and the Net Annual Ground Water Availability has been estimated as 393bcm. Annual Ground Water Draft as on March, 2017 for all uses is 249bcm. The Stage of Ground Water Development of the country has been worked out as 63%.

Artificial Recharge Studies

Artificial recharge and rainwater harvesting help in sustainaing groundwater and neutralizing the impact of groundwater withdrawal from the aquifer. The Board provides technical guidance and also caters to the capacity building of central & state orgainsation in the field of groundwater. During the year, total of 236 artificial recharge structures (77 check dams, 4 percolation tanks, 2 sub-surface barrier, 46 recharge wells, 66 recharge shaft and 41 piezometers) and 5 Bridge-cum-Bandharas (BCB) have been constructed in coordination with state implementing agencies under guidance of CGWB.

Human Resources Development

It has been the earnest endeavour of the Board to keep its technical personnel abreast of the latest developments in various aspects of ground water development and management. Besides the officers of the Board, officers from State Departments and candidates from abroad were also included in the training programme organized by the Board. During the year 2019-20, a total of 109 Training Courses (46-Tier I, 19-Tier II and 39-TierIII) were conducted by RGNGWTRI in which 7732 Trainees (902- Tier I, 597-Tier II and 6233- Tier-III) were imparted training including 2562 female participants.

National Hydrology Project (NHP)

National Hydrology Project is the continuation of Hydrology Project- Phase II, with an approach of Integrated Water Resources Management for the whole country. NHP will help in gathering Hydro-meteorological data which will be stored and analyzed on a real time basis and can be seamlessly accessed at State/District/village level.

CGWB has taken the following activities under the NHP:

- Domain Specific Training through RGI, Raipur for officers from State and Central Agencies
- A Meeting cum Review session under Center of Excellence for finalization and publication of Ground Water Modeling Reports.

- Participation of officers from CGWB in the 2nd Modelers Meet organized by NIH,Roorkee at New Delhi.
- Awareness Raising Programme on State Specific Ground Water Issues
- Organization of 2nd International Training on Ground Water Flow Modeling for officers from State & Central Implementing agencies under NHP at IHE, Delft, The Netherlands
- Participation of officers from CGWB in the 2nd International Conference on "Sustainable Water Management', at Pune, Maharashtra
- Institutions Capacity Enhancement through various national and international programs/ trainings.

Central Ground Water Authority

Central Ground Water Authority (CGWA) has been entrusted with the responsibility of regulating ground water development and management in the country and issuing necessary directives for the purpose. During the year 2019-20, 2712 NOCs have been issued online using "Web Based Application of Reciept and Issue of NoC for abstraction of Ground Water (www.cgwb-noc.gov.in)" application. In addition, 156 renewals of NOCs have also been issued.

IEC Activity- Mass awareness programs in Tribal Area

During the year 2019-20, a total of 303 mass awareness programmes on Rainwater Harvesting and Artificial recharge were carried out by CGWB across 22 states and UTs of the country. Around 36185 students participated in these mass awareness programmes.

Pradhan Mantri Krishi Sinchayee Yojana

Government of India envisages providing ***'Har Khet Ko Pani (HKKP)'*** with a goal of doubling the farmer incomes. A major thrust area to boost agricultural income is to provide irrigation to all the farmlands to enhance food-grain production with consequent benefits like employment generation etc. at village level. During FY 2019-20, provision of Rs. 319 crore was made towards Central Assistance (CA) for proposals of States Government under the scheme. Central Ground Water Board has recommended proposals of Rs. 1363.31 crore to DoWR, MoJS for approval and sanction of funds. During 2019-20 Rs 221.07 crore has been released to State Government towards central assistance.

Public Interaction Programmes

Public Interaction Programmes, including water budgeting sessions and aquifer specific interventions, are being organized in association with Krishi Vigyan Kendra's (KVK's), Panchayats etc. in areas for which aquifer management plans have been shared with the State Agencies. The programmes are being carried out with representation from Panchayats, block and district level administrations, NGOs, farmers, health and sanitation workers and other stake holders. In the year 2019-20, a total of 399 PIPs were organized through Regional offices of the board in different states with participation of 38997 persons.

Budget & Expenditure

During 2019-20, an expenditure of Rs. 25133.48 lakhs under the Plan and Rs. 23549.61 lakhs under Non - Plan was incurred by the Board to carry out various activities. The Plan- wise expenditure is as indicated below:

Sr. No.	Item of Work	Budget (Rs. in Lakhs)	Revised Estimate (Rs. in Lakhs)	Final Grant (Rs. in Lakhs)	Expenditure (Rs. in Lakhs)
1.	Plan (GWMR+TSP, Gross)	27500.00	25818.00	25741.00	25133.48
2.	Non-Plan	22945.00	24282.00	24282.00	23549.61
3.	RGNGWTRI	548.00	321.00	321.00	269.44
4.	NHP-II (Plan)	108.78	27.90	27.90	19.85
5.	Building for Offices	2000.00	1800.00	1800.00	1736.36
6.	Deduct Recoveries	1500.00	1500.00	1500.00	863.60

1. ABOUT CGWB

1.1 CENTRAL GROUND WATER BOARD

Central Ground Water Board, the National apex organization dealing with Ground Water under the Department of Water Resources, River Development and Ganga Rejuvenation, Government of India, is vested with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country.

1.2 MANDATE AND OBJECTIVES

The mandate of Central Ground Water Board is to "Develop and disseminate technologies, monitor and implement national policies for scientific and sustainable development and management of India's ground water resources including groundwater exploration, assessment, conservation, augmentation, protection from pollution and distribution based on principles of economic and ecological efficiency and equity". Commensurate with the above mandate, the objectives laid down for the Central Ground Water Board are:-

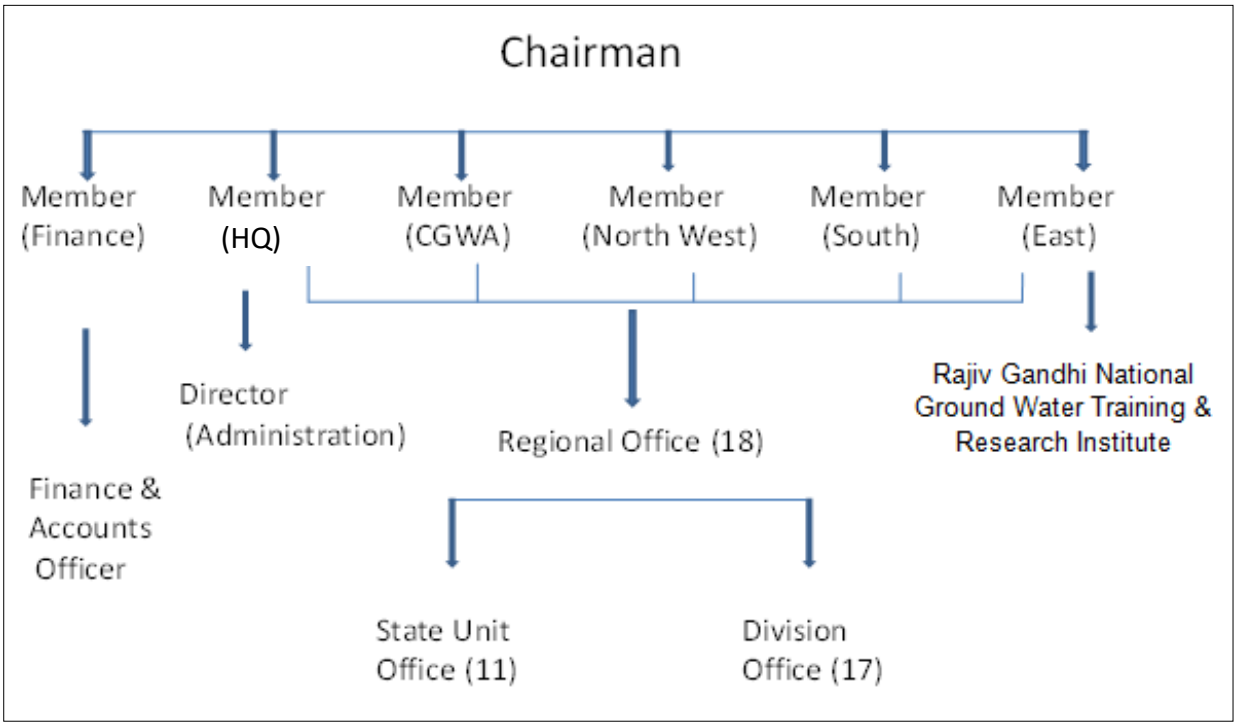
- Aquifer mapping for delineation & disposition of Aquifer Systems to prepare aquifer maps & management plans
- Periodic long term monitoring of ground water regime for creation of time series database through existing and enhanced ground water observation wells.
- Capacity building in ground water development and management through training, information dissemination, education and awareness
- To enhance ground water sustainability through artificial recharge and rainwater harvesting measures for arresting the depleting trends of ground water.
- Regulation of ground water development and sustainable management of ground water resources in coordination with State Government Organizations.
- Technical assistance to Defence and Govt. organizations for providing feasible sites for ground water sources for their water supply schemes.

1.3 ORGANIZATIONAL SET UP

The Central Ground Water Board is headed by the Chairman and has six full time Members namely, Member (Head Quarter- HQ), Member (North & West), Member (South), Member (East & NGI), Member (CGWA) and Member (Finance). The other Members of the Board are all ex-officio being the nominees of institutions in related fields of expertise. The ex-officio members are:

- The Joint Secretary (A), Ministry of Water Resources, River Development and Ganga Rejuvenation.
- The Joint Secretary (GW), Ministry of Water Resources, River Development and Ganga Rejuvenation.
- The JointSecretary & Financial Adviser, Ministry of Water Resources, River Development and Ganga Rejuvenation.
- The Joint Secretary, Ministry of Environment & Forests.
- The Chief Engineer, IMO (WP &P), CWC.
- The General Manager, ONGC, Ministry of Petroleum & Natural Gas.

Structure of Central Ground Water Board



MEMBER (CGWB-HQ)

Responsible for all Policy Planning and Coordination for the following activities:-

- Policy planning and coordination of various activities of CGWB.
- Coordination with other Members of the Board for monitoring of implementation of Annual Action Plan.
- The work pertaining to procurements, Material Management and operation.
- Progress Monitoring of all schemes, Documentation and publications.
- Research, Innovation with various Institutions and Bilateral Cooperation.
- Activities related to NHP, NWM
- Monitoring of Zonal & compilation of National GW Resources Assessment.
- Application of advanced techniques including RS/GIS, Database Management, e-Governance.
- Monitoring of Zonal activities related to Water Conservation, Artificial Recharge, IES activities and training.
- Administration and Human Resources Management.
- Administrative and Technical supervision of the Activities of SUO, Delhi.

MEMBER (SOUTH)

The Member (South) looks after the following activities:

- Technical supervision of Regional Directorates and Divisional offices of CR/SR/SWR/SECR/KR
- Implementation of all the activities including AAP pertaining to the Regions under jurisdiction.
- Planning and execution of all outsourcing activities pertaining to Regions under jurisdiction.
- GW Monitoring and Resources Assessment, Documentation and Publications.
- Material Management
- Coordination with States

MEMBER (NORTH & WEST)

The Member (North & West) looks after the following activities:

- Technical supervision of Regional Directorates and Divisional offices of NWR/NWHR/NHR/NCR
- Implementation of all the activities including AAP pertaining to the Region under Jurisdiction
- Planning and execution of all outsourcing activities pertaining to Regions under jurisdiction.
- .
- GW Monitoring and Resources Assessment, Documentation and Publications.
- Material management
- Coordination with States

MEMBER (EAST)

The Member (East) looks after the following activities.

- Technical supervision of Regional Directorates and Divisional offices of ER/NER/SER/NCCR/MER
- Implementation of all the activities including AAP pertaining to the Region under jurisdiction
- Planning and execution of all outsourcing activities pertaining to Regions under jurisdiction.
- GW Monitoring and Resources Assessment, Documentation and Publication
- Material management
- Coordination with States
- Rajiv Gandhi National Ground Water Training and Research Institutes (RGI)*

*Rajiv Gandhi National Ground Water Training and Research Institute (RGI) located at Raipur, Chhattisgarh caters to the training requirements of Central Ground Water Board and also the State Govt. Organizations, Academic Institutes, NGOs etc. During XII Plan, RGI under "HRD and Capacity Building Scheme" of the Department of Water Resources, River Development and Ganga Rejuvenation is implementing a three tier training programme

keeping in view the requirements of the National Aquifer Management Program. These trainings enable creation of trained workforce for implementation of Program / Scheme for overall sustainable development of ground water resources.

MEMBER (CGWA)

The Member (CGWA) looks after the following activities.

- Supervision of the Regional Directorates and Divisional offices of NR/UR.
- Implementation of all the activities pertaining to the Region under Jurisdiction including Implementation of Annual Action Plan, Physical and Financial Achievements, Administrative, Technical

CGWA

- Policy Planning and implementation
- Regulationof Ground Water Development and management
- Clearancen for Ground Water withdrawal
- Legal matters pertaining to CGWA

IEC

- Planning & Coordination of IEC activities Coordination with MGNREGA for recharge

Parliament Cell

- Parliamentary matters and VIP reference

SUO, Delhi

- GW Monitoring and Resources Assessment, Documentation and Publications
- Coordination with respective State Govt.
- Planning and execution of all outsourcing Activities.

MEMBER (FINANCE)

The Member (Finance) looks after the following activities

- Financial monitoring of Schemes implemented by CGWB
- All matters pertaining to Budget Estimates, Revised Estimates, Demand for Grants, Supplementary Grants
- Liaison with Ministry on all Financial and Budgetary matters
- Submission of Expenditure returns to the Ministry and Controller of Accounts.
- Scrutiny of cases relating to procurement of stores, equipment, machinery etc.
- Disposal of Audit Paras, Audit Notes and Audit Objections.
- Advice and appraise the superiors on financial matters of the Board from time to time.

Central Ground Water Board undertakes various activities through its 18 Regional Directorates (Table 1.1) supported by 17 Engineering Divisions (Table 1.2) and 10 State Unit Offices (Table 1.3).

Table 1.1- REGIONAL OFFICES OF CGWB

Sl. No.	REGIONS & REGIONAL OFFICES		STATES/ UT's
1	NWR, Chandigarh	North Western Region, Chandigarh	Punjab
			Haryana
			Chandigarh
2	NWHR, Jammu	North Western Himalayan Region, Jammu	Jammu, Kashmir & Ladakkh
3	NHR, Dharamshala	North Himalayan Region, Dharamshala	Himachal Pradesh
4	WCR, Ahmedabad	West Central Region, Ahmedabad	Gujarat
			Daman & Diu
5	NCR, Bhopal	North Central Region, Bhopal	Madhya Pradesh
6	WR, Jaipur	Western Region, Jaipur	Rajasthan
7	NR, Lucknow	Northern Region, Lucknow	Uttar Pradesh
8	UR, Dehradun	Uttaranchal, Dehradun	Uttarakhand
9	ER, Kolkata	Eastern Region, West Bengal	West Bengal
			Sikkim
			Andaman & Nicobar Islands
10	NER, Guwahati	North Eastern Region, Guwahati	Assam
			Arunachal Pradesh
			Manipur
			Meghalaya
			Mizoram
			Nagaland
			Tripura
11	MER, Patna	Mid Eastern Region, Patna	Bihar
			Jharkhand
12	SER, Bhubaneswar	South Eastern Region, Bhubaneswar	Odisha
13	NCCR, Raipur	North Central Chhatisgarh Region, Raipur	Chhattisgarh
14	CR, Nagpur	Central Region, Nagpur	Maharashtra
			Pune
			Dadra & Nagar Haveli
15	SWR, Bengaluru	South Western Region, Bengaluru	Karnataka
			Goa
16	SECR, Chennai	South East Central Region, Chennai	Tamil Nadu
			Puducherry
17	SR, Hyderabad	Southern Region, Hyderabad	Andhra Pradesh
			Telangana
18	KR, Thiruvananthapuram	Kerala Region, Thiruvananthapuram	Kerala

Table 1.2- ENGINEERING DIVISION OFFICES OF CGWB

DIVISION		STATE
I	Ahmedabad	Gujarat
		Daman & Div
II	Ambala	Punjab
		Haryana
		Chandigarh
		New Delhi
III	Varanasi	Uttar Pradesh
IV	Chennai	Tamil Nadu
		Puducherry (UTP)
		Kerala
V	Ranchi	Bihar
		Jharkhand
VI	Nagpur	Maharashtra
		Dadra & Nagar Haveli
VII	Guwahati	Assam
		Arunachal Pradesh
		Meghalaya
		Manipur
		Nagaland
		Tripura
VIII	Jammu	Jammu & Kashmir
IX	Hyderabad	Andhra Pradesh
		Telangana
X	Bhubneshwar	Odisha
XI	Jodhpur	Rajasthan
XII	Bhopal	Madhya Pradesh
XIII	Raipur	Chhatisgarh
XIV	Bangalore	Karnataka
		Goa
XV	Kolkata	West Bengal
		Sikkim
		Andaman & Nicobar
XVI	Bareilly	Uttar Pradesh
		Uttarakhand
XVII	Dharamshala	Himachal Pradesh

Table 1.3- STATE UNIT OFFICE's (SUO) OF CGWB

	SUO	STATE	REGIONAL OFFICE
1	Agartala	Tripura	NER, Guwahati
2	Allahabad	Uttar Pradesh	NR, Lucknow
3	Belagavi	Karnataka	SWR, Bengaluru
4	Itanagar	Arunachal Pradesh	NER, Guwahati
5	Jodhpur	Rajashtan	WR, Jaipur
6	R. K. Puram	New Delhi	
7	Pune	Maharashtra	CR, Maharashtra
8	Ranchi	Jharkhand	MER, Patna
9	Shillong	Meghalaya	NER, Guwahati
10	Vishakhapatnam	Andhra Pradesh	SR, Hyderabad

2. NATIONAL AQUIFER MAPPING AND MANAGEMENT PROGRAMME

INTRODUCTION

The National Aquifer Mapping & Management Programme (NAQUIM) has been taken up country-wide under "Ground Water Management and Regulation" Central Sector Scheme of the Department of Water Resources, RD & GR. The major objectives of the program are:

- Delineation and characterization of aquifers in three dimensions to understand their disposition
- Identification and quantification of groundwater issues
- Development of suitable groundwater management plans for interventions to ensure sustainability of ground water resources.

Under the initiative the existing available information of aquifer is compiled, synthesized and data gaps are filled through new data generation through exploration and then preparation of aquifer disposition in 3-D and aquifer-wise management plans suggesting various interventions to optimize ground water withdrawal, identifying aquifers of potable groundwater for drinking purpose in quality affected areas and sustainable management of groundwater resources.

METHODOLOGY & APPROACH

A multidisciplinary scientific approach using advanced tools / techniques including remote sensing, GIS, geophysical techniques, ground water modelling etc. is being followed with broad objective of preparation of aquifer maps and development of management plans. In order to study the application of advanced techniques, initially six pilot projects were taken up by the Board in 5 different States representing the hydrogeological complexity of the country during XII plan. The areas were in Maharashtra (part of Nagpur district), Rajasthan (parts of Dausa and Jaisalmer districts), Bihar (part of Patna district), Karnataka (part of Tumkur district) and Tamilnadu (part of Cuddalore district). The learning of the Pilot projects have been synthesized and adopted nationwide for implementing Aquifer Mapping and Management programme.

The flow diagram showing steps for preparation of aquifer maps and management plans are indicated below:

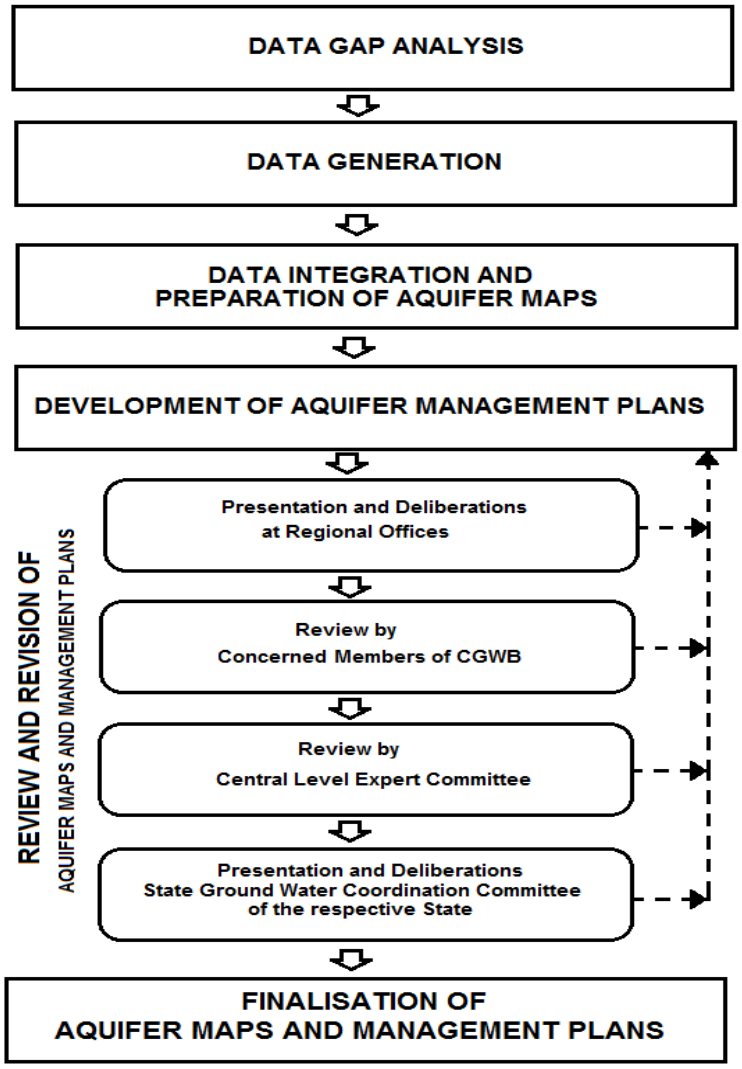


Fig.3.1 Summary of methodology and approach of the Aquifer Mapping and Management Programme

A mutli-tier evaluation process has been put in place to ensure quality of outputs. The aquifer maps and management plans prepared are first reviewed by the Regional Director of the respective regions of the Board. The revised maps and management plans are then presented before the concerned Member of the zone at the central headquarters level. Subsequently the finalized maps and management plans are presented before the National level expert committee (NLEC) having domain specialists, ground water specialists from JNU, Delhi; IIT, Roorkee; Ex-Chairman of CGWB; Agriculture experts etc. Agriculture scientists of ICAR have also been associated in finalization of management plans. In order to coordinate on various issues related to aquifer mapping, between the State and Union Government, State Ground Water Coordination Committee (SGWCC) has been formed in each State and UT, headed by the Principal Secretary of the concerned department. The final outputs are shared and deliberated in State Ground Water Coordination Committee to have mutual

agreement on the proposed aquifer-wise ground water management plans which are shared with the respective State for suitable implementation.

MAJOR ACHIEVEMENTS

National Aquifer Mapping and Management Programme (NAQUIM) was initiated in year 2012 and out of ~32 lakh km^2 of the entire country, an area of ~25 lakh km^2 has been identified to be covered under aquifer mapping in phases. During the XII plan (2012-17), major thrust was on an area of 5.26 lakh km^2 covering parts of eight priority States (Haryana, Punjab, Rajasthan, Gujarat, Andhra Pradesh, Telangana, Karnataka, Tamil Nadu) and Bundelkhand areas of Uttar Pradesh and Madhya Pradesh. These areas have been prioritized considering over-exploitation, ground water contamination and other issues. In addition to these priority areas, aquifer mapping was also taken up in other parts of the country.

During 2017-20, Aquifer maps and management plan for an area of 6.6 lakh sqkm was targeted, however aquifer maps and management plan for an area of 6.67 lakh sqkm have been prepared. During the period 2019-20, aquifer maps and management plans were developed for an area of 2.16 lakh km^2 (Table 2.1).

So far, aquifer maps and management plan for an area of 13 lakh sqkm have been prepared.

Table 2.1: State wise area covered under National Aquifer Mapping and Management Programme during 2019-20

S.No	State/UT	Area for which aquifer maps and management plans have been prepared (km2) during 2019- 20
1	Andhra Pradesh	3743
2	Telangana	16658
3	Tamil Nadu	22548
4	Kerala	2994
5	Karnataka	13417
6	Gujarat	35473
7	Rajasthan	3546
8	Himachal Pradesh	2720
9	Madhya Pradesh	13626
10	Maharashtra	20428
11	Uttar Pradesh	41434
12	West Bengal	1329
13	Chhattisgarh	17883
14	Odisha	21186
Total		**216985**

MEETING OF NATIONAL INTER-DEPARTMENTAL STEERING COMMITTEE (NISC)

National Interdepartmental Steering Committee (NISC) on Aquifer Mapping & Management Program (NAQUIM) has been constituted by the Department of Water Resources, River Development and Ganga Rejuvenation with Secretary (WR, RD & GR) as the Chairman and Additional Secretary (WR, RD & GR) as Vice Chairman. NISC draws Members from various Central Ministries/ Departments related to Water Resources such as NWM, MoDW&S, MoES, MoRD, MoUD, MoS&T, CWC, CGWB, CSIR, JS(A&GW), Planning Commission etc.

Principal Secretaries of related departments from States of Uttar Pradesh, Rajasthan, Punjab, Haryana, Gujarat, Tamil Nadu, Maharashtra, Andhra Pradesh (Undivided) are also Members of NISC. Starting from the first meeting on 21.11.2013 seven meetings were held by the end of 2020.

Eighth meeting of NISC was held on 14th Oct, 2019. In the eighth meeting of NISC, Major achievements were highlighted by Member Secretary (NISC) during the meeting. The progress of NAQUIM was reviewed during the meeting. The salient points of EFC memo (2017-20) of Ground Water Management & Regulation were discussed in brief including major activities proposed; the new initiatives under the EFC (2017-20) of Ground Water Management & Regulation like Bridge cum Bhandara under Aquifer Rejuvenation was reviewed. The outcome of Aquifer Mapping was acknowledged by state Groundwater Department during the meeting and based on the outcome of NAQUIM; States are planning to implement the management plans.

INTERVENTIONS FOR AQUIFER REJUVENATION

The main objective of the project is Aquifer Rejuvenation through construction of suitable area specific Artificial Recharge structures to establish successful & replicable site specific techniques for similar water stressed/ over exploited/ semi critical areas and projecting the impact in terms of sustainability of resources on a long term basis.

Innovative schemes for Aquifer Rejuvenation to develop/ update area specific methodologies based on proven/ innovative technologies in coordination with State Governments/ Institutions/ identified PSUs have been taken up.

In the study, artificial recharge structures have been constructed in parts of following blocks of three Aspirational Districts of Maharashtra, Andhra Pradesh and Telangana state-

- Osmanabad block, Osmanabad District, Maharashtra- Semi Critical
- Pulivendula mandal, YSR Kadapa District, Andhra Pradesh- Over Exploited
- Bachennapet mandal, Warangal District, Telangana- Over Exploited

A detailed hydrogeological study at all the sites was taken up to study the impact assessment on ground water regime of the proposed Bandharas (pre-project & post-project). Aquifer rejuvenation project has been carried out in Osmanabad Block (Osmanabad District, Maharashtra), Pulivendula (Dist. YSR Kadapa, A.P.), Bachennapet (Dist. Warangal, Telangana). The Impact assessment report has been completed at all places.

Aquifer rejuvenation project sites were selected in one block each of Andhra Pradesh and Telanagana whereas in Osmanabad only two watersheds (MR-12 & MR-13) have been covered so that the recharge structures are constructed in cluster to have good impact on ground water regime. State personnel were involved from the start of the project at all the three places.

Similarly, constructions of Bridge cum Bandhara (BCB) have been initiated in Maharashtra state and have been constructed successfully.

MICRO LEVEL AQUIFER MANAGEMENT PROGRAMME

Micro Level Aquifer Management Plans have been prepared for representative Gram Panchayats in various hydrogeological typologies across the country. In 2019-20, a total of 228 Microlevel Aquifer Management plan have been prepared. Selection of the Panchayats were made on the basis of the stage of ground water development, ground water contamination profile, ground water development prospects including requests of the State Agencies to address any specific ground water related problems.

FACILITATING PUBLIC INTERACTION ON AQUIFER MAPS AND MANAGEMENT PLANS

Aquifer maps and Management plans being prepared by CGWB are shared with the State Agencies for implementation. Implementation of the management plans by the State agencies is expected to improve the groundwater situation by de-stressing the aquifers.To facilitate interaction among stake holders including communities on the Aquifer maps and management plans, for greater public participation, CGWB has organized 399 Public Interaction Programmes during 2019-20 in which nearly 38,778 participants including representatives from Panchayats, Block and district level administrations, farmers, health and sanitation workers, NGOs and other stakeholders participated and were sensitised on Aquifer Maps and management Plans .

3. GROUND WATER EXPLORATION

Ground Water Exploration aided by drilling is one of the major activities of the Board. It is aimed at delineation of aquifers in different hydrogeological setups and determination of their hydraulic parameters. The exploratory drilling operations have enabled demarcation of aquifers both in lateral and vertical extensions and evaluation of various aquifer parameters, designing of suitable structures and assessment of their yield potential in various hydrogeological settings. These studies have helped in identifying areas worthy for future ground water development. Ground Water exploration contributes to a large extent in guiding the States to implement ground water development schemes.

Groundwater exploration is being carried out by the Board through its fleet of 82 drilling rigs (27 Direct Rotary, 53 Down the Hole and 02 Dual Rotary). During the year 2019-20, Central Ground Water Board under its in-house Ground Water Exploration programme constructed 726 wells (EW- 534, OW- 179, Pz- 13). The region/division/state wise deployment of rigs during AAP 2019-20 is mentioned below in table 3.1 and the division-wise details of pumping test units is mentioned in table 3.2.

Priority was accorded for exploration in Over Exploited/ Critical/ Semi-Critical/ Drought Prone and areas affected with ground water pollution etc. The statement showing State, Division & Region wise distribution of boreholes drilled/ completed during 2019-20 is presented in Table 3.3& 3.4(a) & (b). Out of 726 exploratory wells, 609 wells were constructed in hard rock, 116 wells in alluvium and 1 well in bouldary formations (Table 3.6) including 94 wells constructed in Tribal areas and 38 wells in Drought prone areas (Table 3.7) of the country.

Fig. 3.1 EW at Samarth gaon village in Satara taluka of Satara district, Maharashtra with discharge of 731 lpm

Fig. 3.2 EW drilled to a depth of 160 mbgl at Dahegaon village in Samudrapurtaluka of Wardha district, Maharashtra yielded a discharge of 465.6 lpm

Fig.3.3. High discharge of ≈1132 lpm has been obtained from the Exploratory Well drilled (Depth: 125m; Fractures: 75-80m) in Hard Rock at Iswarguda, Sahibganj Block, Chandauli district (Aspirational), UP

The Board since inception has drilled 42149 bore holes (including 7682 bore holes through outsourcing) as on 31.03.2020 to identify worthy areas for ground water development in the country. The statement showing State-wise distribution of boreholes drilled/completed till March, 2020 in the country is presented in Table 3.5.

Table 3.1 Region/Division/State wise Deployment of Rigs during AAP 2019-20

Region	Division	State	Number Of Rigs			
			DR	DTH	DUR	T
NWHR,Jammu	VIII,Jammu	Jammu & Kashmir		3	1	**4**
NWR, Chandigarh	II,Ambala	Punjab,Haryana and Chandigarh	2			**2**
SUO,Delhi		Delhi	1			**1**
WR,Jaipur	XI,Jodhpur	Rajasthan	2	3		**5**
WCR,Ahmedabad	I,Ahmedabad	Gujarat	4	2		**6**
NCR,Bhopal	XII,Bhopal	Madhya Pradesh		4		**4**
NCCR,Raipur	XIII,Raipur	Chhattisgarh		4		**4**
CR,Nagpur	VI,Nagpur	Maharashtra		5		**5**
NR,Lucknow	III,Varanasi	Eastern U.P	3	2		**5**
	XVI,Bareilly	Western U.P	3			**3**
MER,Patna	V,Ranchi	Bihar and Jharkhand	1	4		**5**
ER,Kolkatta	XV,Kolkata	West Bengal, Sikkim and Andaman & Nicobar	3	1		**4**
NER,Guwahati	VII,Guwahati	Arunachal Pradesh, Assam, Manipur, Megahalaya,Tripura Mizoram,Nagaland	3	2		**5**
SER,Bhubaneswar	X,Bhubaneswar	Orissa	1	4		**5**
SR,Hyderabad	IX, Hyderabad	A.P, Telangana		5		**5**
SWR,Bangalore	XIV,Bangalore	Karnataka		5		**5**
SECR,Chennai	IV,Chennai	Tamil Nadu	1	4		**5**
KR,Trivendrum	IV,Chennai	Kerala		1		**1**

UR,Dehradun	XVI,Bareilly	Uttarakhand			1	**1**
NHR,Dharamshala	XVII,Dharamshala	Himachal Pradesh		2		**2**
		Total	**24**	**51**	**2**	**77**

Abbreviation :

DR : Direct Rotary **DUR :** Dual Rotary **DTH :** Down The Hole

Table 3.2Division wise details of Pump Unit during AAP 2019-20DIVISION

DIVISION	No. of Pump Unit	Subm. Pump	VT Pump
I.Ahmedabad	2	4	1
II.Ambala	1	3	4
III.Varanasi	2	1	2
IV.Chennai	0	8	0
V.Ranchi	2	1	0
VI.Nagpur	1	3	1
VII.Guwahati	0	1	2
VIII.Jammu	1	1	2
IX.Hyderabad	1	4	0
X. Bhubneshwar	2	6	3
XI.Jodhpur	2	15	0
XII.Bhopal	1	5	0
XIII.Raipur	1	4	0
XIV. Bangalore	1	12	0
XV.Kolkata	2	0	2
XVI.Bareilly	2	1	2
XVII. Dharamshala	1	1	1
TOTAL	**22**	**70**	**20**

Table 3.3 State wise Wells constructed by CGWB during the Year 2019-20 (till 31th Mar., 2020)

STATE	TARGET 2019-20				CUMULATIVE ACHIEVEMENT 2019-20 (SINCE APRIL 2019)			
	EW	OW	PZ	T	EW	OW	PZ	T
Gujarat	23	17		**40**	22	11	0	**33**
Daman & Div				**0**				**0**
Punjab	9			**9**	9	0	0	**9**
Haryana				**0**				**0**
Chandigarh				**0**				**0**
New Delhi			10	**10**	0	0	9	**9**
Uttar Pradesh	23	16		**39**	18	15	2	**35**
Tamil Nadu	37	22		**59**	67	6	0	**73**
Puducherry (UTP)				**0**				**0**
Kerala	7	5		**12**	12	3	0	**15**
Bihar	10	4		**14**	7	2	0	**9**
Jharkhand	15	11		**26**	21	12	0	**33**
Maharashtra	40	20		**60**	56	14	0	**70**
Dadra & Nagar Haveli				**0**				**0**
Assam	9	6		**15**	12	8	0	**20**
Arunachal Pradesh				**0**				**0**
Meghalaya	10	4		**14**				**0**
Manipur				**0**				**0**
Nagaland				**0**				**0**
Tripura				**0**				**0**
Jammu & Kashmir	16	12		**28**	17	6	0	**23**
Andhra Pradesh	36	8		**44**	37	11	0	**48**
Telangana	16	8		**24**	31	14	0	**45**
Odisha	30	18		**48**	33	9	1	**43**
Rajasthan	36	23		**59**	44	9	0	**53**
Madhya Pradesh	28	20		**48**	42	8	0	**50**
Chhatisgarh	36	20		**56**	27	8	0	**35**
Karnataka	42	13		**55**	51	19	0	**70**
Goa				**0**				**0**
West Bengal	25	16		**41**	10	10	0	**20**
Sikkim				**0**				**0**
Andaman & Nicobar Islands				**0**				**0**
Uttar Pradesh	8	6		**14**	9	8	1	**18**
Uttarakhand	1			**1**	1	0	0	**1**
Himachal Pradesh	8	6		**14**	8	6	0	**14**
TOTAL	**465**	**255**	**10**	**730**	**534**	**179**	**13**	**726**

Table3.4(a) Division- wise wells constructed by Central Ground Water Board during 2019-20

DIVISION		TARGET 2019-20				CUMULATIVE ACHIEVEMENT 2019-20 (SINCE APRIL 2019)				Achievement (%)
		EW	OW	PZ	T	EW	OW	PZ	T	
I	Ahmedabad	23	17		**40**	22	11	0	**33**	**83%**
					0				**0**	
II	Ambala	9			**9**	9	0	0	**9**	**100%**
					0				**0**	
					0				**0**	
				10	**10**	0	0	9	**9**	**90%**
III	Varanasi	23	16		**39**	18	15	2	**35**	**90%**
IV	Chennai	37	22		**59**	67	6	0	**73**	**124%**
					0				**0**	
		7	5		**12**	12	3	0	**15**	**125%**
V	Ranchi	10	4		**14**	7	2	0	**9**	**64%**
		15	11		**26**	21	12	0	**33**	**127%**
VI	Nagpur	40	20		**60**	56	14	0	**70**	**117%**
					0				**0**	
VII	Guwahati	9	6		**15**	12	8	0	**20**	**133%**
					0				**0**	
		10	4		**14**				**0**	
					0				**0**	
					0				**0**	
					0				**0**	
VIII	Jammu	16	12		**28**	17	6	0	**23**	**82%**
IX	Hyderabad	36	8		**44**	37	11	0	**48**	**109%**
		16	8		**24**	31	14	0	**45**	**188%**
X	Bhubneshwar	30	18		**48**	33	9	1	**43**	**90%**
XI	Jodhpur	36	23		**59**	44	9	0	**53**	**90%**
XII	Bhopal	28	20		**48**	42	8	0	**50**	**104%**
XIII	Raipur	36	20		**56**	27	8	0	**35**	**63%**
XIV	Bangalore	42	13		**55**	51	19	0	**70**	**127%**
					0				**0**	
XV	Kolkata	25	16		**41**	10	10	0	**20**	**49%**
					0				**0**	
					0				**0**	
XVI	Bareilly	8	6		**14**	9	8	1	**18**	**129%**
		1			**1**	1	0	0	**1**	**100%**
XVII	Dharamshala	8	6		**14**	8	6	0	**14**	**100%**
TOTAL		**465**	**255**	**10**	**730**	**534**	**179**	**13**	**726**	**99%**

Table3.4(b). Region - wise wells constructed by CGWBduring 2019-20

REGION	TARGET 2019-20				ACHIEVEMENT 2019-20 (01.04.19 TO 29.02.2020)				% ACHIEVEMENT
	EW	OW	PZ	T	EW	OW	PZ	T	
NWHR. Jammu	16	12	0	**28**	17	6	0	**23**	82.14%
NWR. Chandigarh	9		10	**19**	9	0	9	**18**	94.74%
WR. Jaipur	36	23	0	**59**	44	9	0	**53**	89.83%
WCR. Ahmedabad	23	17	0	**40**	22	11	0	**33**	82.50%
NCR. Bhopal	28	20	0	**48**	42	8	0	**50**	104.17%
NCCR. Raipur	36	20	0	**56**	27	8	0	**35**	62.50%
CR. Nagpur	40	20	0	**60**	56	14	0	**70**	116.67%
NR. Lucknow	31	22	0	**53**	27	23	3	**53**	100.00%
MER. Patna	25	15	0	**40**	28	14	0	**42**	105.00%
ER. Kolkata	25	16	0	**41**	10	10	0	**20**	48.78%
NER. Guwahati	19	10	0	**29**	12	8	0	**20**	68.97%
SER. Bhubaneshwar	30	18	0	**48**	33	9	1	**43**	89.58%
SR. Hyderabad	52	16	0	**68**	68	25	0	**93**	136.76%
SWR. Bangalore	42	13	0	**55**	51	19	0	**70**	127.27%
SECR. Chennai	37	22	0	**59**	67	6	0	**73**	123.73%
KR. Trivandrum	7	5	0	**12**	12	3	0	**15**	125.00%
UR. Dehradun	1	0	0	**1**	1	0	0	**1**	100.00%
NHR. Dharamsala	8	6	0	**14**	8	6	0	**14**	100.00%
TOTAL	**465**	**255**	**10**	**730**	**534**	**179**	**13**	**726**	**99.45%**

Table 3.5: Status of Cumulative Boreholes Drilled by CGWB till 2019-20 in State's & UT's

S No.	STATE/UT	(I) Through Outsourcing (Contractual)				(II) Through Departmental Rigs (Inhouse)						TOTAL (I+II)
		EW	OW	PZ	Total	EW	OW	PZ	SH	DW	Total	
A.	**STATES**											
1	Andhra Pradesh	418	117	0	**535**	845	407	307	9	4	**1572**	**2107**
2	Arunachal Pradesh	0	0	0	**0**	46	10	0	1	1	**58**	**58**
3	Assam	0	0	0	**0**	436	205	59	16	42	**758**	**758**
4	Bihar	132	25	0	**157**	314	192	74	10	514	**1104**	**1261**
5	Chhattisgarh	300	0	105	**405**	819	262	161	0	28	**1270**	**1675**
6	Goa	13	1	0	**14**	58	18	14	0	31	**121**	**135**
7	Gujarat	305	31	0	**336**	1131	519	498	27	255	**2430**	**2766**
8	Haryana	75	55	80	**210**	406	271	229	23	170	**1099**	**1309**
9	Himachal Pradesh	0	0	0	**0**	254	43	5	1	0	**303**	**303**
10	Jammu & Kashmir	21	0	0	**21**	474	112	37	8	114	**745**	**766**
11	Jharkhand	109	14	0	**123**	458	230	46	4	71	**809**	**932**
12	Karnataka	804	146	0	**950**	1569	715	354	7	5	**2650**	**3600**
13	Kerala	10	0	0	**10**	576	204	231	16	13	**1040**	**1050**
14	Madhya Pradesh	555	41	80	**676**	1358	725	176	8	149	**2416**	**3092**
15	Maharashtra	92	2	88	**182**	1691	547	167	2	166	**2573**	**2755**
16	Manipur	0	0	0	**0**	29	14	1	0	2	**46**	**46**
17	Meghalaya	0	0	0	**0**	116	36	2	2	8	**164**	**164**
18	Mizoram	0	0	0	**0**	3	3	0	0	0	**6**	**6**
19	Nagaland	0	0	0	**0**	15	6	1	0	3	**25**	**25**
20	Orissa	456	18	67	**541**	1677	415	151	21	191	**2455**	**2996**
21	Punjab	121	105	0	**226**	229	212	108	20	14	**583**	**809**
22	Rajasthan	809	195	0	**1004**	1418	520	573	93	591	**3195**	**4199**
23	Sikkim	0	0	0	**0**	31	9	0	0	0	**40**	**40**
24	Tamil Nadu	413	198	179	**790**	1348	441	278	13	93	**2173**	**2963**
25	Tripura	0	0	0	**0**	64	31	1	5	22	**123**	**123**
26	Telangana	303	48	0	**351**	768	526	509	5	27	**1835**	**2186**
27	Uttarakhand	20	4	0	**24**	73	6	3	1	129	**212**	**236**
28	Uttar Pradesh	555	155	0	**710**	1068	726	205	40	501	**2540**	**3250**
29	West Bengal	245	72	100	**417**	571	283	177	12	82	**1125**	**1542**
	TOTAL(A)	**5756**	**1227**	**699**	**7682**	**17845**	**7688**	**4367**	**344**	**3226**	**33470**	**41152**
B.	**UNION TERRITORIES**											
1	Andaman & Nicobar Islands	0	0	0	**0**	46	13	0	1	0	**60**	**60**
2	Chandigarh	0	0	0	**0**	9	17	14	2	15	**57**	**57**
3	Dadra & NagarHaveli	0	0	0	**0**	14	1	0	0	0	**15**	**15**
4	Delhi	0	0	0	**0**	149	64	175	13	380	**781**	**781**
5	Daman & Diu	0	0	0	**0**	0	0	7	0	0	**7**	**7**
6	Pondicherry	0	0	0	**0**	30	20	8	5	14	**77**	**77**
	TOTAL(B)	**0**	**0**	**0**	**0**	**248**	**115**	**204**	**21**	**409**	**997**	**997**
	GRAND TOTAL(A+B)	**5756**	**1227**	**699**	**7682**	**18093**	**7803**	**4571**	**365**	**3635**	**34467**	**42149**

Table 3.6 Division / State / Formation wise Achievement during 2019-20 (as on 31.03.2020)

DIVISION	STATE/ UT	HARD ROCK				ALLUVIUM				BOULDARY				TOTAL			
		EW	OW	PZ	T	EW	OW	PZ	T	EW	OW	PZ	T	EW	OW	PZ	T
I.AHMEDABAD	Gujarat	14	5		**19**	8	6		**14**				**0**	22	11	0	**33**
II.AMBALA	Haryana				**0**				**0**				**0**	0	0	0	**0**
	Punjab				**0**	9			**9**				**0**	9	0	0	**9**
	Delhi				**0**			9	**9**				**0**	0	0	9	**9**
III.VARANASI	Uttar Pradesh	11	9		**20**	7	6	2	**15**				**0**	18	15	2	**35**
IV.CHENNAI	Tamil Nadu	65	6		**71**	2			**2**				**0**	67	6	0	**73**
	Kerala	12	3		**15**				**0**				**0**	12	3	0	**15**
V.RANCHI	Bihar	5	2		**7**	2			**2**				**0**	7	2	0	**9**
	Jharkhand	21	12		**33**				**0**				**0**	21	12	0	**33**
VI.NAGPUR	Maharashtra	56	14		**70**				**0**				**0**	56	14	0	**70**
VII.GUWAHATI	Assam				**0**	7	4		**11**				**0**	7	4	0	**11**
	Arunachal Pradesh				**0**				**0**				**0**	0	0	0	**0**
	Meghalaya	5	4		**9**				**0**				**0**	5	4	0	**9**
	Tripura				**0**				**0**				**0**	0	0	0	**0**
VIII.JAMMU	Jammu & Kashmir	17	6		**23**				**0**				**0**	17	6	0	**23**
IX.HYDERABAD	Andhra Pradesh	37	11		**48**				**0**				**0**	37	11	0	**48**
	Telangana	31	14		**45**				**0**				**0**	31	14	0	**45**
X.BHUBANESWAR	Orissa	30	7	1	**38**	3	2	0	**5**				**0**	33	9	1	**43**
XI.JODHPUR	Rajasthan	27	7		**34**	17	2		**19**				**0**	44	9	0	**53**
XII.BHOPAL	Madhya Pradesh	42	8		**50**				**0**				**0**	42	8	0	**50**
XIII.RAIPUR	Chattisgarh	27	8		**35**				**0**				**0**	27	8	0	**35**
XIV.BANGALORE	Karnataka	51	19		**70**				**0**				**0**	51	19	0	**70**
	Kerala				**0**				**0**				**0**	0	0	0	**0**
XV.KOLKATTA	West Bengal	4	4		**8**	6	6		**12**				**0**	10	10	0	**20**
XVI.BAREILLY	Uttarkhand				**0**				**0**	1			**1**	1	0	0	**1**
	Uttar Pradesh				**0**	9	8	1	**18**				**0**	9	8	1	**18**
XVII.DHARAMSHALA	Himachal Pradesh	8	6		**14**				**0**				**0**	8	6	0	**14**
TOTAL		**463**	**145**	**1**	**609**	**70**	**34**	**12**	**116**	**1**	**0**	**0**	**1**	**534**	**179**	**13**	**726**

Table 3.7: Division/ State /Head wise Achievement in Normal/ Tribal/ Drought areas during 2019-20 (as on 31.03.2020)

DIVISION	STATE/ UT	NORMAL				TRIBAL				DROUGHT				TOTAL			
		EW	OW	PZ	T	EW	OW	PZ	T	EW	OW	PZ	T	EW	OW	PZ	T
I.AHMEDABAD	Gujarat	22	11		**33**				**0**				**0**	22	11	0	**33**
II.AMBALA	Haryana				**0**				**0**				**0**	0	0	0	**0**
	Punjab	9			**9**				**0**				**0**	9	0	0	**9**
	Delhi			9	**9**				**0**				**0**	0	0	9	**9**
III.VARANASI	Uttar Pradesh	7	6	2	**15**				**0**	11	9		**20**	18	15	2	**35**
IV.CHENNAI	Tamil Nadu	67	6		**73**				**0**				**0**	67	6	0	**73**
	Kerala	12	3		**15**				**0**				**0**	12	3	0	**15**
V.RANCHI	Bihar	7	2		**9**				**0**				**0**	7	2	0	**9**
	Jharkhand	21	12		**33**				**0**				**0**	21	12	0	**33**
VI.NAGPUR	Maharashtra	56	14		**70**				**0**				**0**	56	14	0	**70**
VII.GUWAHATI	Assam	7	4		**11**				**0**				**0**	7	4	0	**11**
	Arunachal Pradesh				**0**				**0**				**0**	0	0	0	**0**
	Meghalaya				**0**	5	4		**9**				**0**	5	4	0	**9**
	Tripura				**0**				**0**				**0**	0	0	0	**0**
VIII.JAMMU	Jammu & Kashmir	17	6		**23**				**0**				**0**	17	6	0	**23**
IX.HYDERABAD	Andhra Pradesh	37	11		**48**				**0**					37	11	0	**48**
	Telangana	31	14		**45**				**0**				**0**	31	14	0	**45**
X.BHUBANESWAR	Orissa	33	9	1	**43**				**0**				**0**	33	9	1	**43**
XI.JODHPUR	Rajasthan				**0**	28	7		**35**	16	2		**18**	44	9	0	**53**
XII.BHOPAL	Madhya Pradesh				**0**	42	8		**50**				**0**	42	8	0	**50**
XIII.RAIPUR	Chattisgarh	27	8		**35**				**0**				**0**	27	8	0	**35**
XIV.BANGALORE	Karnataka	51	19		**70**				**0**				**0**	51	19	0	**70**
	Kerala				**0**				**0**				**0**	0	0	0	**0**
XV.KOLKATTA	West Bengal	10	10		**20**				**0**				**0**	10	10	0	**20**
XVI.BAREILLY	Uttarkhand	1			**1**				**0**				**0**	1	0	0	**1**
	Uttar Pradesh	9	8	1	**18**				**0**				**0**	9	8	1	**18**
XVII.DHARAMSHALA	Himachal Pradesh	8	6		**14**				**0**				**0**	8	6	0	**14**
TOTAL		**432**	**149**	**13**	**594**	**75**	**19**	**0**	**94**	**27**	**11**	**0**	**38**	**534**	**179**	**13**	**726**

3.1 Development of Exploratory Well

Once constructed, a tube-well is developed to increase its specific capacity to prevent sand rushing into the well and to obtain maximum well life. Thereafter, pumping tests are conducted for evaluating aquifer parameters i.e. Transmissivity, storage co-efficient and well parameters *viz*. specific capacity and well efficiency, with a view to evolve efficient design for tube wells, assessment of yield capabilities and spacing criteria for tube wells. Total of 149 tubewells were developed and tested during the year 2019-20 (Table 3.8).

Table 3.8 Status of Development & Pumping Test of Wells by CGWB

DIVISION	STATE	No. of Wells constructed and tested during the year 2019-20	Balance No. of wells to be tested (Backlog)
I.Ahmedabad	Gujarat	15	135
II.Ambala	Haryana	2	7
	Punjab	0	18
	Delhi	0	0
	Chandigarh	0	0
III.Varanasi	Uttar Pradesh	5	59
IV.Chennai	Tamil Nadu	6	13
	Kerala	4	1
V.Ranchi	Bihar	0	10
	Jharkhand	1	49
VI.Nagpur	Maharashtra	8	24
VII.Guwahati	Assam	0	44
	Meghalaya	0	28
	Tripura	0	2
	Arunachal Pradesh	0	10
	Nagaland	0	2
VIII.Jammu	Jammu&Kashmir	2	29
IX.Hyderabad	Andhra Pradesh	10	5
	Telangana	3	7
X.Bhubneshwar	Orissa	8	40
XI.Jodhpur	Rajasthan	31	51
XII.Bhopal	Madhya Pradesh	3	19
XIII.Raipur	Chattishgarh	4	15
XIV. Bangalore	Karnataka	18	38
XV.Kolkata	West Bengal	6	35
XVI.Bareilly	Uttar Pradesh	27	40
	Uttranchal	0	3
XVII. Dharamshala	Himachal Pradesh	13	14
	TOTAL	**149**	**538**

3.2 TAKING OVER OF EXPLORATORY WELLS BY STATE AGENCIES

The exploratory drilling sites are selected in consultation with the State Government Departments considering that successful exploratory wells on completion of scientific studies can be converted into production wells once taken over by States for water supply.

Till March, 2020, a total of 18093 exploration wells have been drilled by the Board. Out of a total of 14521 successful wells having adequate ground water discharge, 13659 exploratory wells have been handed over to the State agencies while 862wells are yet to be handed over after the completion of scientific studies by the Board. The status of handing over of exploratory wells drilled by Central Ground Water Board to the State Government as on 31st March, 2020is indicated in Table3.9.

Table 3.9 Status of Handing over of Wells drilled by CGWB in 2019-20 (as on March 2020)

S.No.	States	Total Wells drilled (EW)	No. of Successful Wells (EW)	No. of Wells Handed Over to the user agencies	No. of Wells yet to be handed over
A. STATES					
1	Andhra Pradesh	845	609	598	11
2	Arunachal Pradesh	46	41	40	1
3	Assam	436	413	398	15
4	Bihar	314	277	255	22
5	Chhattisgarh	819	739	735	4
6	Goa	58	49	49	0
7	Gujrat	1131	793	638	155
8	Haryana	406	233	221	12
9	Himachal Pradesh	254	234	220	14
10	Jammu & Kashmir	474	356	330	26
11	Jharkhand	458	352	286	66
12	Karnataka	1569	1379	1308	71
13	Kerala	576	445	436	9
14	Madhya Pradesh	1358	1006	983	23
15	Maharashtra	1691	1443	1411	32
16	Manipur	29	21	14	7
17	Meghalaya	116	114	108	6
18	Mizoram	3	3	3	0
19	Nagaland	15	9	9	0
20	Orissa	1677	1577	1398	179
21	Punjab	229	202	186	16
22	Rajasthan	1418	1079	1050	29
23	Sikkim	31	10	10	0
24	Tamil Nadu	1348	1082	1068	14
25	Tripura	64	62	58	4
26	Telangana	768	606	593	13
27	Uttrakhand	73	62	33	29
28	Uttar Pradesh	1068	878	830	48

29	West Bengal	571	274	245	29
TOTAL(A)		**17845**	**14348**	**13513**	**835**
B. UNION TERRITORIES					
1	Andaman & Nicobar	46	12	10	2
2	Chandigarh	9	9	7	2
3	Dadra & NagarHaveli	14	8	8	0
4	Delhi	149	131	108	23
5	Pondicherry	30	13	13	0
Total(B)		**248**	**173**	**146**	**27**
Total(A+B)		**18093**	**14521**	**13659**	**862**

4.3. HIGH YIELDING WELLS

During 2019-20, CGWB under its scientific exploratory drilling programme has explored high yielding aquifers in various parts of the Country based on hydrogeological studies coupled with remote sensing and geophysical techniques. High yielding wells with discharge ranging from120 to 4248 litres per minute have been explored in the different states of the country (Table 3.10). Such studies will help in identifying similar ground water sources in other parts of the state having similar hydrogeological conditions and in guiding the State agencies to adopt the follow up action with regard to ground water development for drinking water supply and meeting other demands. High Yielding Wells explored during 2019-20are indicatedin Table 3.10 below.

Fig.3.4: High Yielding Well at Borda, Ramtek taluka, Nagpur district, Maharashtra Statedrilled down to a depth of 160.00 m bgl with discharge of 480 lpm.

Table 3.10 High Yielding Wells Explored during 2019-20

High Yielding Wells: **2019-20**							
	State	**District**	**Block/ Taluka/ Mandal**	**Village**	**Depth of Well drilled** *(in m bgl)*	**Discharge (Q)** *in lpm*	**EW/ OW***
1	Andhra Pradesh	YSR Kadapa	Brahmamgari Matham	Mallepali	128	256	EW
2	Andhra Pradesh	YSR Kadapa	Mydukuru	Vanipenta	130	255	OW
3	Andhra Pradesh	YSR Kadapa	Mydukuru	Vanipenta	127	270	EW
4	Chhattisgarh	Balrampur		Shevari	180	180	EW
5	Chhattisgarh	Balrampur		Kakana	202	210	EW
6	Chhattisgarh	Jashpur		Jamjhor	104	234	OW
7	Chhattisgarh	Balrampur	Raipur	Kakna	360	720	EW
8	Himachal Pradesh	Kangra	Indaura	Badhukar	360	300	EW
9	Jammu & Kashmir	Rajouri	Kalakote	Panjaha	146	204	EW
10	Jammu & Kashmir	Udhampur	Ramnagar	Battal	80.3	180	EW
11	Jammu & Kashmir	Rajouri	Kalakote	Sial Sui	153	270	EW
12	Jammu & Kashmir	Udhapur	Sandoh		110	180	EW
13	Jammu & Kashmir	Leh	37th Bn, ITBP		67	120	EW
14	Jammu & Kashmir	Rajauri	Sunderbani	Kuldubi	103	120	EW
15	Jammu & Kashmir	Udhampur	Dwwat		172	210	EW
16	Jharkhand	Dhanbad	Nirsa	Nirsa	154	342	EW
17	Jharkhand	Giridih	Raj Dhanwar	Arkhango	203	204	EW
18	Jharkhand	Deoghar	Karon	Patraul	98	420	EW
19	Jharkhand	Dhanbad	Nirsa	KGB Sec. School Gopalganj	123	738	EW
20	Jharkhand	Dhanbad	Nirsa	KGB Sec. School Gopalganj	74	738	OW
21	Jharkhand	Deoghar	Sonaraithari	Tilakpur	93	540	EW
22	Jharkhand	Giridih	Gandey	Jawahar Navodya Vidyalaya	93	420	EW
23	Jharkhand	Pakur	Hiranpur	Residential High School	45	225	EW
24	Jharkhand	Pakur	Litpara	Kodw	160	420	EW
25	Jharkhand	Pakur	Amrapara	GM School	153.8	234	EW
26	Jharkhand	Pakur	Maheshpur		147	516	EW
27	Karnataka	Tumkur	Tiptur	Chikkahonnavalli	116	660	EW

28	Karnataka	Mysore	Mysore	Chattanehalli	200	552	OW
29	Karnataka	Mandya	K.R.Pet	Santhe Bachenahalli	135	252	OW
30	Karnataka	Tumkur	Tiptur	Chikka Honnavalli	149	323	ew
31	Karnataka	Mysore	Chattanahalli Mandya	Chattanahalli	200	342	ew
32	Karnataka	Mysore	Tiptur/ Mysore	Ayarahalli	134	150	EW
33	Karnataka	Ramnagar	Ramnagar	Kanakapura	120	390	OW
34	Karnataka	Mandya	Nangamanagala	Bindiganavile	200	260	EW
35	Karnataka	Mandya	Nangamanagala	Bindiganavile	200	504	OW
36	Karnataka	Belgaum	Raibug	Mugalkod	200	315	OW
37	Karnataka	Tumkur	B. Rangapura Tiptur	B. Rangapura Tiptur	200	414	EW
38	Karnataka	Ramnagar	Ramnagar	Kanakapura	200	480	EW
39	Karnataka	Belagavi	Raibag	Kuduchi	201	260	EW
40	Karnataka	Belagavi	Raibag	Kuduchi	201	218	OW
41	Karnataka	Mandya	Malavalli	Nelamakana	202	840	OW
42	Karnataka	Belagavi	Raibag	Kappalgudi	201	300	EW
43	Karnataka	Ramnagara	Kanakpura	Horalagallu	200	456	EW
44	Karnataka	Mysore	Periyapatna	Koppa	138	252	EW
45	Karnataka	Belgaum	Hukkeri taluk	Hidkal-Dam	148	414	OW
46	Karnataka	Belgaum	Hukkeri		148	600	EW
47	Kerala	Thrissur	Mulangunnathu kavu	Kila	200	228	EW
48	Kerala	Idukki	Ilamdesam	Chullikkandam	200	228	EW
49	Kerala	Ernakulam	Kodanad	Range Forest Office	200	420	EW
50	Madhya Pradesh	Damoh	Batiyagarh	Maron	124	588	EW
51	Maharashtra	Nandurbar	Nandurbar	Nandurbar	200	464	EW
52	Maharashtra	Nandurbar	Nandurbar	Nandurbar	200	464	OW
53	Maharashtra	Nandurbar	Nandurbar	Pimplod	200	323	EW
54	Maharashtra	Nandurbar	Nandurbar	Pimplod	200	323	OW
55	Maharashtra	Nandurbar	Navapur	Dogegon	200	593	EW
56	Maharashtra	Nandurbar	Navapur	Bhadvad	200	224	EW
57	Maharashtra	Nandurbar	Navapur	Bhadvad	123	1080	OW
58	Maharashtra	Nandurbar	Navapur	Jamanpada	200	323	EW
59	Maharashtra	Wardha	Hinghanghat	Daroda	178	266	EW
60	Maharashtra	Wardha	Wardha	Talegaon	200	190	EW
61	Maharashtra	satara	satara	Samarth gaon	160	731	EW
62	Maharashtra	Wardha	Samudrapurtal uka	Dahegaon	160	466	EW
63	Maharashtra	Wardha	Wardha	Taroda	185	465	EW
64	Maharashtra	Nagpur	Maudha	Kodamendhi	200	466	EW
65	Maharashtra	Nagpur	Mouda	Tarsa	44	588	EW
66	Maharashtra	Nagpur	Ramtek	Borda	160	480	EW

67	Maharashtra	Nagpur	Ramtek	Wadamba	172	210	EW
68	Maharashtra	Wardha	Seloo taluka	Hingni	93	1500	EW
69	Meghalaya	North Garo Hills	Bajengdoba	Bajengdoba	201	192	EW
70	Odisha	Jharsuguda	Lakhanpur	Jogidhipa	172	504	EW
71	Odisha	Cuttack	Niali	Dahijunga	101	600	EW
72	Odisha	Keonjhar	Anandpur	Manoharpur	184	261	EW
73	Odisha	Bhubaneswar,	Unit-1, Govt. High School		91	540	EW
74	Tamil Nadu	Madurai	Kallugudi	T. Pudur	213	200	EW
75	Tamil Nadu	Sivagangai	Singampunari	Mampatti (Eriyur)	200	261	EW
76	Tamil Nadu	Virudhunagar	Srivilliputhur	Krishnankovil	122	194	EW
77	Tamil Nadu	Madurai	Vadakkampatti		190	600	EW
78	Telangana	Mulugu	Mangapet	Kamalapuram	205	600	OW
79	Telangana	Bhadradri Kothagudem	Dammapet	Ankampalem	205	570	EW
80	Telangana	Bhadradri Kothagudem	Dammapet	Ankampalem	60	480	OW
81	Telangana	Mulugu	Venkatapuram	Albaka	305	420	EW
82	Telangana	Bhadradri Kothagudem	Tekulapalli	Bodu	155	255	EW
83	Telangana	Bhadradri Kothagudem	Tekulapalli	Bodu	156	404	OW
84	Telangana	Khammam	Yellandu	Sudimella	20	1967	EW
85	Telangana	Khammam	vemsoor	Arsalapadu	22	324	OW
86	Telangana	Khammam	Mudigonda	Kattukuru	138	323	OW
87	Telangana	Khammam	Yerupalem	Remidicherla	150	360	EW
88	Uttar Pradesh	Sonbhadra	Babhani	Babhani (Banvasi Ashram)	102	≈950	EW
89	Uttar Pradesh	Sonbhadra	Babhani	Babhani (Banvasi Ashram)	123	≈950	OW
90	Uttar Pradesh	Sonbhadra	Myorpur	Govindpur (Old Banvasi Ashram)	185	≈625	EW
91	Uttar Pradesh	Chandauli	Chakia	Firozpur	125	1100	EW
92	Uttar Pradesh	Chandauli	Sahibganj	Iswarguda	125	1132	EW
93	Uttar Pradesh	Ambedkar Nagar	Katehari	Chuipara	90	4248	EW
94	West bengal	Paschim Medinipur	Gopiballavpur-II block,	Rantua site,	147	1140	EW
95	West bengal	Purulia	Barabazar	Bodaldihi	119	750	EW

***EW- Exploratory Well; OW- Observation Well**
lpm- Litres Per Minute

Fig.3.5: EW drilled down to a depth of 185.50 m bgl at Taroda village in the Wardha taluka of Wardha district, Maharashtra state yielded a discharge of 465 lpm

Fig.3.6: Exploratory well drilled down to a depth of 160 m bgl at Samarthgaonin Satarataluka of Satara district, Maharashtra state has yielded a discharge of 12.18 lps in Deccan basalts

4. GEOPHYSICAL STUDIES

Geophysical investigations are used for exploration of groundwater and in delineating the underground structures which control the occurrence, distribution and movement of ground water. Application of geophysical techniques for ground water investigations on regular basis commenced in CGWB during the seventies. The Board has made extensive use of both the surface and the subsurface (well logging) geophysical techniques in the search of groundwater and proper construction of water wells. The findings of the geophysical studies, as a practice, are combined with the hydrogeological and geomorphologic investigations to place them on firm footing. The techniques have become an integral part of the ground water exploration programme.

The Borehole geophysics is used in groundwater to obtain information pertaining to lithology, fractures, permeability, porosity and water quality so as to delineate subsurface disposition of aquifers. Borehole-geophysical logging determines the character and thickness of the different lithological/Hydro-geologic units in drilled pilot boreholes. Saline / brackish water bearing aquifers are present in different parts of India. Fresh water bearing aquifers are often intervened by the saline water aquifers. Such information is essential for proper placement of casing and screens in water-supply wells and for characterizing and remediation of problems related to ground-water salinity. The proper positioning and condition of casing and screen pipes in a well can be rapidly evaluated with geophysical borehole logging.

Surface geophysical surveys specially the traditional Electrical Resistivity survey in soft and hard rock formations are commonly employed in CGWB to delineate the ground water bearing zones/structures, pin-pointing sites for construction of boreholes and providing inputs for formulating proposals for constructing artificial recharge structures. Geophysical survey has also been conducted for delineating the bedrock topography and sandy horizon of non – perennial channel. In recent times, Transient-Electromagnetic techniques (TEM) are also being used for identifying the sub-surface layers parameters in term of Resistivity and thickness as is done through Electrical resistivity surveys. TEM surveys, however, takes less time in comparison to the conventional Electrical resitivity survey. Imaging Resistivity 2-D survey at present is conducting by CGWB by Multi Electrodes Resistivity Meter. Various other techniques like Self Potential, Induced Polarization, Mise-a-la-masse of electrical method, refraction seismic, electromagnetic – the Horizontal Loop, Very Low Frequency (VLF) *and* magnetic were also conducted by CGWB in past. The Heliborne Survey has also been incorporated through pilot project of Aquifer mapping and identification of palaeo-channel in parts of Prayagraj and Kaushambi district in collaboration with CSIR-NGRI. Apart from these, resistivity survey (VES) were also carried out during the year for short-term water supply investigation on request of other Government organization and Public Sector Undertakings. Regionwise details of availability of Geophysical instruments in CGWB are presented below in table 4.1

Sl. No	Region	Geophysical Logger	Resistivity Meter	EM
1	ER-Kolkata	Uptron (18Y) Logger u-1	1.CRM Auto –C (7 y) 2. Res Meter(2 y)	TEM – 1 (New)
2	KR- Trivandrum	Nil	1. Terrameter (21 Y) 2. CRM-500 (15Y**)**	TEM – 1 (New)
3	NCCR- Raipur	Nil	SSR-MP-ATS (adv) (7Y)	TEM – 1 (New)
4	NCR - Bhopal	Nil	1. DDR-4 MP (20Y) 2. SSR-MP1 (18Y)	
5	WCR-Ahmadabad	Uptron (25 y) Logger	1.SSR-1 (7Y) 2.DDR-4 (25Y)	
6	NWHR- Jammu	Uptron (22 y) Logger	1.DDR-4 (18 Y) 2. Terrameter (18Y)	
7	NHR-Dharmshala	Nil		
8	UR - Dehradun	Nil	1.Terrameter SAS 300 (21Y)	
9	NER-Guwahati	Uptron (>27Y) Logger (+Gamma)	1. SSR-MP1 (13Y) 2. Terrameter (18 Y)	
10	CR- Nagpur	1.Uptron (27Y) Logger (+ Gamma), 2. Digital (25Y)Portable Logger (+ Gamma, Flow meter &Temp.) 3.Terrameter spot Logger (part of Terrameter)	1.Terrameter (19Y) 2.CRM – 20 (15Y)	
11	MER - Patna	Uptron (> 20 Y) Logger	1. CRM 500 – 40 W (Ranchi) (15Y) 2. CRM-Auto C – 40 W (5Y)	
12	SER - Bhubaneswar	Uptron (> 15 y) Logger	1. CRM 20 (5Y)	
13	NWR - Chandigarh	Uptron (27Y) Logger (+Gamma)	1. CRM – 500 (20Y)	
14	SR - Hyderabad	1.Upron (3no and 25 y) Logger (+Gamma)	1. DDR- 4 – 80 W (21Y) 2. SSR- MP1 – 80 W (7Y) 3. DDR- 3 – 80 W (7Y) 4. Terrameter with manual logger (22Y) 5. Terrameter LS (6Y) 6. ERT System Terrameter LS – 2D (6)	

15	SWR- Bangalore	Uptron (20Y) Logger(+Gamma)	1. SSR-MP-ATS - 100W – 2 no. (2Y) 2. Res Meter (5Y)	
16	SECR-Chennai	Uptron (19 Y) Logger	1. DDR – 3= (7Y) 2. CRM – 500- (15Y) 3. Adv WTS – 2 No (5Y)	
17	WR - Jaipur	Uptron (27Y) Logger (+Gamma), u-13	1. DDR- 4 – 80 W (19 Y) 2. CRM-Auto-C – 40 W (7 Y)	
18	NR - Lucknow	Uptron (21Y) Logger(+Gamma), u-14	1.Adv. Terrameter LS – 2D (6.5Y) 2.Adv Syscal R2 – 250 W (25 Y) 3. ERT system 4.Terrameter LS – 2D	
	Total Logger (17 No.), two spot logger with resistivity meter	1. Uptron - 14, (+8 gamma) (8 working) 2. OYO potable-1 (+gamma, flow & Temp). (Not working) 3. SAS log 200 – 2 (part of Terrameter), One is working	1. 33 working , 8 Repairable 2. Imaging System-2 no 3. TEM- 9 no	

GEOPHYSICAL STUDIES FOR NAQUIM PROGRAMME

Under the Aquifer mapping programme, Central Ground Water Board has objective for delineating the aquifers up to 300 m depth in areas underlain by soft rock and upto 200 m in areas underlain by hard rock formations. Geophysical survey and investigations play a vital role during exploration in understanding the aquifer disposition and characterisitics.. During recent times, TEM and Imaging system have also been introduced apart from conventional VES survey. The data so generated are used along with the other exploratory data for preparation of aquifer maps (Fig 5.1).

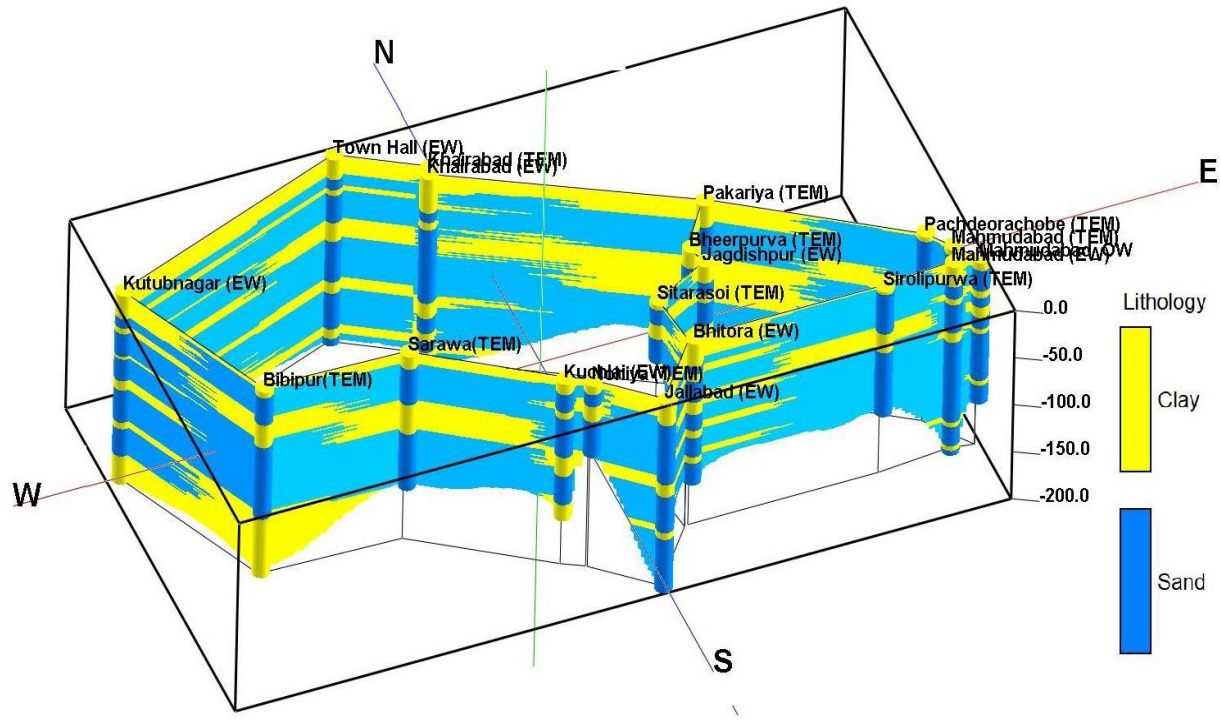


Fig. 4.1 Fence diagram based on GTEM and Exploratory well in Sitapur district

During 2019-20, a total of 1217 Vertical Electrical Soundings (VES), 28 line km 1D resistivity profiling and 29 borehole logging have been conducted in various parts of the country to ascertain water bearing layer at different depths as well as in finalizing the tubewell assembly. Region-wise geophysical progress is mentioned in Table 4.2.

Table 4.2 GEOPHYSICAL ACTVITY PROGRESS during 2019-20

Region	State	VES (l/h.)	VES O/s. (WAPCOS)	1D Profiling/ 2D Imaging (l/h)	Geophysical Logging (l/h.)
CR, Nagpur	Maharashtra	156	69	4.33	
ER, Kolkata	Andaman & Nicobar Islands	30			
ER, Kolkata	Sikkim	0			
ER, Kolkata	West Bengal	25	124	1.00	6
KR, Trivandrum	Kerala	26			
MER, Patna	Bihar	8		0.90	
MER, Patna	Jharkhand	31	428		
NCCR, Chhattisgarh	Chhattisgarh	29		2.00	
NCR, Bhopal	Madhya Pradesh	0	1077		
NR, Lucknow	Uttar Pradesh	25	461	0.94	14
NWHR, Jammu	Jammu and Kashmir	70			

NWR, Chandigarh	Chandigarh	0			
NWR, Chandigarh	Haryana	62			
NWR, Chandigarh	Punjab	96			
SECR, Chennai	Tamilnadu	78	292	2.00	2
SER, Bhubaneswar	Odisha	59	306	0.30	
SR, Hyderabad	Andhra Pradesh	157	119	6.72	
SR, Hyderabad	Telangana	144	98	7.28	
SWR, Bangalore	Karnataka	9	685		
UR, Dehradun	Uttarakhand	75	39	3.00	
WCR, Ahmedabad	Gujarat	33			7
WR, Jaipur	Rajasthan	104			
		1217	**3698**	**28.47**	**29**

I/h.- Inhouse O/s.- Outsourcing

5. GROUNDWATER QUALITY STUDIES

Central Ground Water Board has 16 Regional Chemical Laboratories to carry out Chemical Analysis of major and minor inorganic constituents in water samples. The Chemical laboratories are well equipped to carry out Basic, Trace Metal and Toxic elements determinations using sophisticated instruments like Atomic Absorption Spectrophotometer (AAS), Ion Chromatograph, Flourimeter (Uranium Analyser), Digital PC based UV- VIS Spectrophotometer, Ion Meter, Flame Photometer, pH meter, Conductivity meter, and Nephelometer. The laboratories are also provided with Electronic Monopan and Top loading Balances, Ultra Pure Water System, Deionizer, Double Distillation Plant, Hot Air Oven, Water Bath, Magnetic Stirrer and Hot Plates. Four Regional Laboratories at Kolkata, Hyderabad, Lucknow and Raipur are also equipped with Gas Chromatograph (GC) to undertake the analysis of organic pollutants (Pesticides) at µg/l level. The Chemical Laboratory at Hyderabad, Lucknow and Chandigarh are additionally equipped with Inductive Coupled Plasma Spectrometer (ICPS) for sequential analysis of multiple toxic elements with high accuracy. Total Organic Carbon (TOC) analyzer is installed in the Regional Chemical Laboratory at Chandigarh, Lucknow, Chennai and Kolkata. The Chemical Laboratories at Chandigarh, Lucknow, Nagpur and Bangalore are also equipped with Liquid Scintillation Counter to undertake the analysis of radiation. The Chemical Analysis data generated by these laboratories is utilized for evaluating the groundwater quality in compliance with National Standards (BIS 2012), to study the impact of anthropogenic activities on ground water quality, demarcate areas of water quality deterioration and assess the point and non-point sources of ground water pollution so as to take necessary action for management of ground water resources.

During 2019-20, a total of 27333 ground water samples have been analyzed out of which 18658 water samples have been analyzed for determination of basic constituents, while 8675 water samples have been analyzed for Heavy Metals including As, Fe, U etc. The details of water samples analyzed by different chemical laboratories during 2019-20 are presented in table 5.1 and in the form of graph in Fig. 5.1.

Table 5.1 REGION-WISE GROUND WATER SAMPLESANALYZED DURING 2019-20

S. No.	Regional Offices	Number of Analyzed samples	
		Basic	Heavy Metals (Done by ICPMS including U, As, Fe etc.)
1	NWHR, Jammu	0	92
2	NWR, Chandigarh	833	882
3	WR, Jaipur	1363	1002
4	WCR, Ahmadabad	872	209
5	NCR, Bhopal	1271	151
6	NCCR, Raipur	994	249
7	CR, Nagpur	1684	171
8	NR, Lucknow	2184	1680
9	UR, Dehradun	186	0
10	MER, Patna	592	0
11	ER, Kolkata	1202	1331
12	NER, Guwahati	537	2453
13	SER, Bhubaneswar	1627	130
14	SR, Hyderabad	1118	71
15	SWR, Bangalore	2478	147
16	SECR, Chennai	1160	9
17	KR, Trivandrum	557	98
Total		**18658**	**8675**
Grand Total		**27333**	

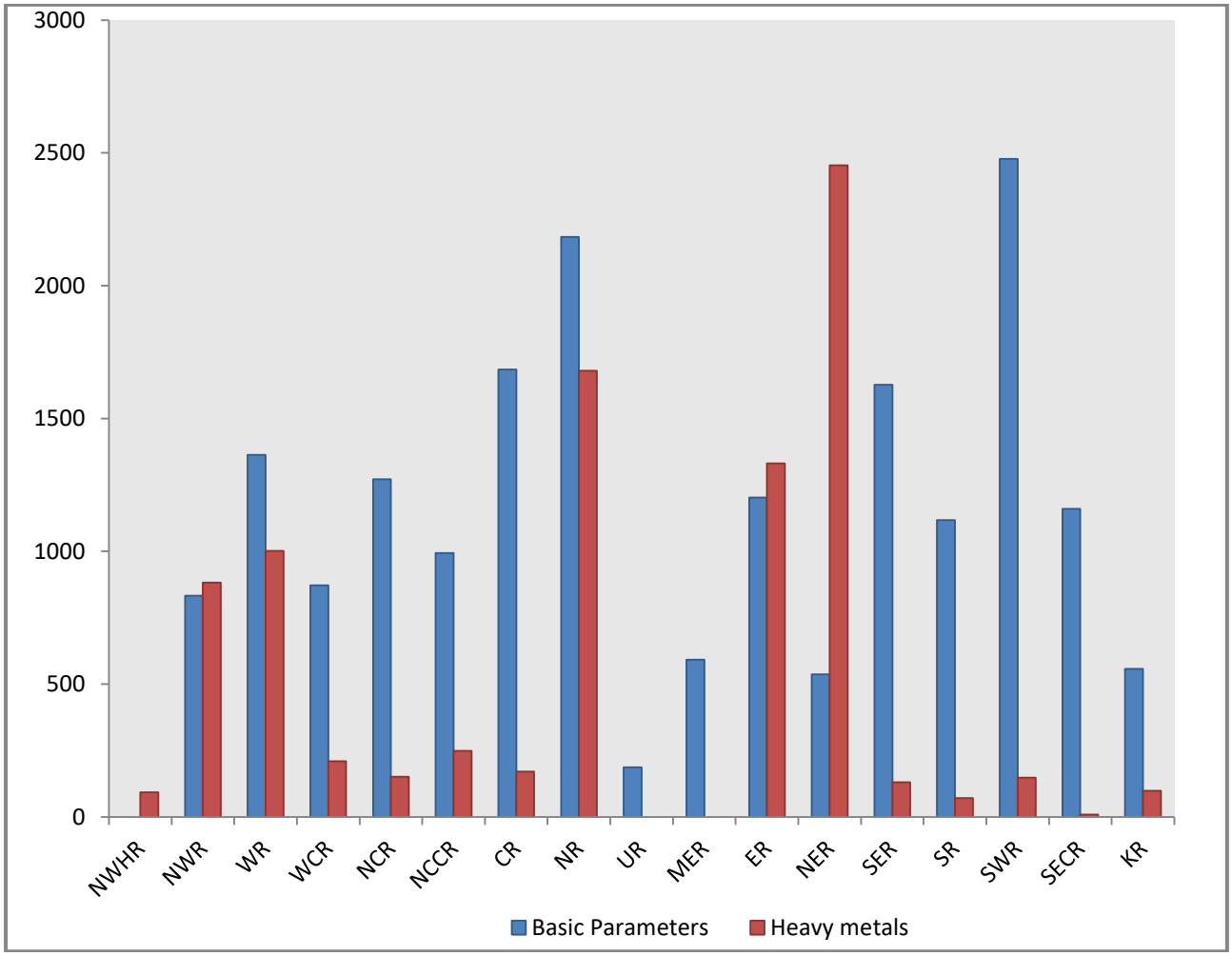


Fig. 5.1: Region Wise Water Sample Analysis during 2019-20

6. HYDROLOGICAL & HYDRO-METEOROLOGICAL STUDY

RAINFALL MEASUREMENT AT BHUJAL BHAWAN

Rainfall is an important and a significant parameter in the hydrological cycle which affects the water resources of any region on earth. The accurate and timely monitoring of rainfall is crucial in assessing the water resources for planning and development purposes. India Meteorological Department has a large number of Automatic Weather Stations and Non-recording and Self-recording type of rain-gauges installed across the country. CGWB at its campus at Bhujal Bhawan, Faridabad campus has installed a non-recording type of rain gauge in October 2019 which has been provided to the department by IMD. Daily rainfall is being monitored using a calibrated Jar and is being recorded in the register. The following image (Fig 6.1) shows the location and layout of the rain gauge station.

Fig. 6.1 Raingauge structure in Bhujal Bhawan, Faridabad campus

The daily rainfall recorded at the ca,pus of CGWB, Faridabad during the period October 2019 to March 2020 is given in Table 6.1 and depicted graphically in Fig 6.2.

Table 6.1: DAILY RAINFALL DISTRIBUITION, BHUJAL BHAWAN, FARIDABAD

Date	Rainfall(mm)
17-1-2020	15.8
28-1-2020	3.4
21-2-2020	2.0
1/3/2020	19.0
6/3/2020	24.8
7/3/2020	27.0
15-3-2020	8.1

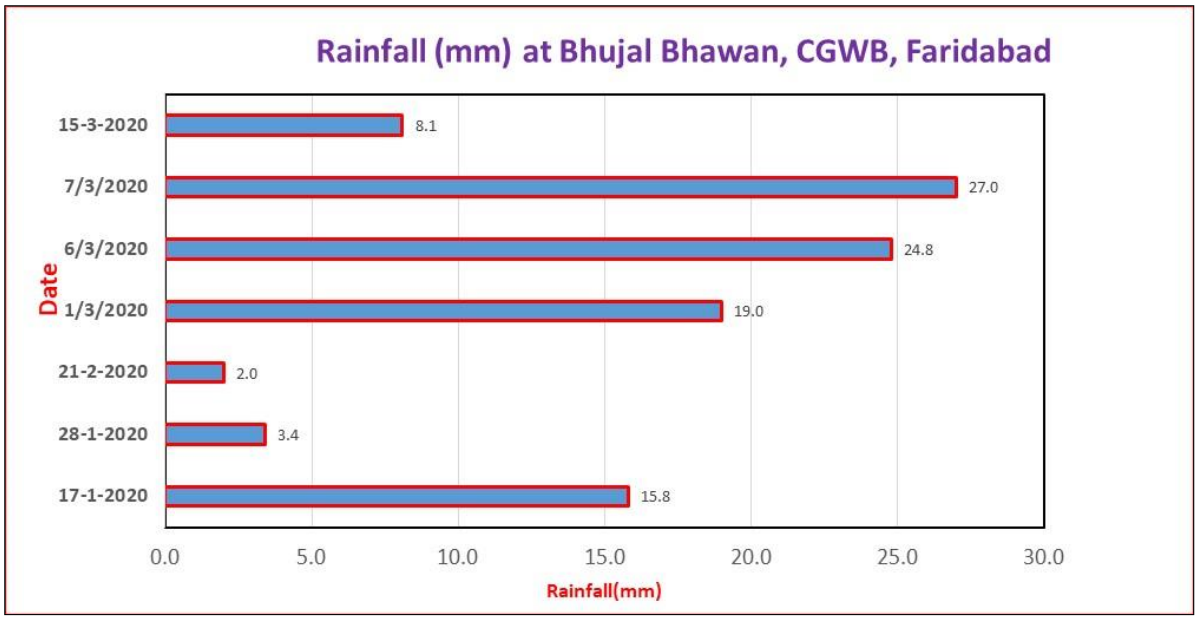


Fig.6.2 Graph showing Rainfall variation in Bhujal Bhawan, Faridabad

RAINFALL ANALYSIS –ALL INDIA: Variability in the onset, withdrawal and quantum of rainfall during the monsoon season has profound impacts on water resources, power generation, agriculture, economics and ecosystems in the country. The variation in climate is perhaps greater than any other area of similar size in the world. There is a large variation in the amounts of rainfall received at different locations. The average annual rainfall is 119 cm, but it has great spatial variations. The areas on the Western Ghats and the Sub-Himalayan areas in North East and Meghalaya Hills receive heavy rainfall of over 250 cm annually, whereas the Areas of Northern parts of Kashmir and Western Rajasthan receive rainfall less than 40 cm. The rainfall pattern roughly reflects the different climate regimes of the country, which vary from humid in the northeast (about 180 days rainfall in a year), to arid in Rajasthan (20 days rainfall in a year). Due to climatic changes, in recent times, the occurrence of high intensity rainfall event has increased and the number of rainy days has decreased. In some years, it has been observed that, the southwest monsoon has extended beyond its normal withdrawal date.

Normal Annual Rainfall: The rainfall over India has large spatial as well as temporal variability. Annual rainfall is more than 200 cm over these regions. For the country as whole, mean monthly rainfall during July (286.5 mm) is highest and contributes about 24.2% of annual rainfall (1182.8 mm). The mean rainfall during August is slightly lower and contributes about 21.2% of annual rainfall. June and September rainfall are almost similar and contribute 13.8% and 14.2% of annual rainfall, respectively. The mean south-west monsoon (June, July, August & September) rainfall (877.2 mm) contributes 74.2% of annual rainfall (1182.8 mm). Contribution of pre-monsoon (March, April & May) rainfall and post-monsoon (October, November & December) rainfall in annual rainfall is mostly the same (11%). Coefficient of variation is higher during the months of November, December, January and February. The Thematic map of distribution of annual normal rainfall is depicted in Fig.7.2. The map shows that, one state i.e., Rajasthan receives annual rainfall between 250 –

500 mm, 7 states between 500 mm – 1000 mm, 16 states between 1000 – 2000 mm, three states between 2000-3000 mm and six states more than 3000 mm in a year.

Normal Monsoon Rainfall: The SW monsoon is the most significant feature of the Indian climate. The season is spread over four months, but the actual period at a particular place depends on onset and withdrawal dates. It varies from less than 75 days over West Rajasthan, to more than 120 days over the south-western regions of the country contributing to about 75% of the annual rainfall. The onset of the SW monsoon normally starts over the Kerala coast, the southern tip of the country by 1 June, advances along the Konkan coast in early June and covers the whole country by middle of July. However, onset occurs about a week earlier over islands in the Bay of Bengal. The monsoon is influenced by global and local phenomenon like El Nino, northern hemispheric temperatures, sea surface temperatures, snow cover etc. Normal monsoon rainfall more than 150cm is being observed over most parts of northeast India, Konkan & Goa. It ranges from 317 mm in Tamilnadu state to 2970 mm in Goa state with an average of 1160 mm. In the North-eastern states it ranges from 1330 mm to 2787 mm with an average of 1716 mm.

Normal Post-monsoon: North-East (NE) monsoon or Post-monsoon season is transition season associated with the establishment of the north-easterly wind regime over the Indian subcontinent. Meteorological subdivisions namely Coastal Andhra Pradesh, Rayalaseema , Tamil Nadu, Kerala and South Interior Karnataka receive good amount of rainfall accounting for about 35% of their annual total in these months. Many parts of Tamil Nadu and some parts of Andhra Pradesh and Karnataka receive rainfall during this season due to the storms forming in the Bay of Bengal. It ranges from 18 mm in Rajasthan state to 910 mm in Puducherry UT with an average of 200 mm. In the northeastern states it ranges from it ranges from 169 mm to 315 mm with an average of 239 mm.

Rainfall Variation in 2019 The distribution of annual rainfall in 2019 is depicted as thematic map in Fig.7.3. The map shows that, two states i.e., Haryana and Delhi received annual rainfall less than 500 mm, 7 states between 500 mm – 1000 mm, 15 states between 1000 – 2000 mm, five states between 2000-3000 mm and three states more than 3000 mm. It may be observed that during 2019, highest rainfall of 4660 mm was recorded at Goa state and the lowest rainfall of 400 mm was received at Haryana state. However, on comparing with normal rainfall, it may be seen that, Daman & Diu state has the highest positive departure of 299% from its normal whereas Meghalaya state is with highest negative departure of 52% from its normal rainfall. Negative departure from normal(more than 10%) in 12 out of 32 states. The national average annual rainfall is 1605 mm with a departure with coefficient of variation of 60% , which is very high and departure of mean rainfall from normal as -3%.

It may be observed from the datathat the variation of southwest monsoon rainfall is very high and it ranges from 286 mm in Jammu & Kashmir to 2899 mm in Goa state. Tamilnadu state received about 55% of its annual rainfall from northeast monsoon season. The states of Punjab, Haryana, Chandigarh, Goa, Himachal Pradesh, Manipur, Mizoram, Orissa, Sikkim,

Telangana, Uttarakhuna and Andaman & Nicobar has received more than normal (positive departure of more than 10%) rainfall in the monsoon season. The states of Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Delhi, Gujarat, Jharkhund, Karnataka, Kerala, Madhya Pradesh and Meghalaya have received rainfall with negative departure (more than 10%) from normal.The national average monsoon rainfall is 780 mm with a negative departure of 15% from normal.

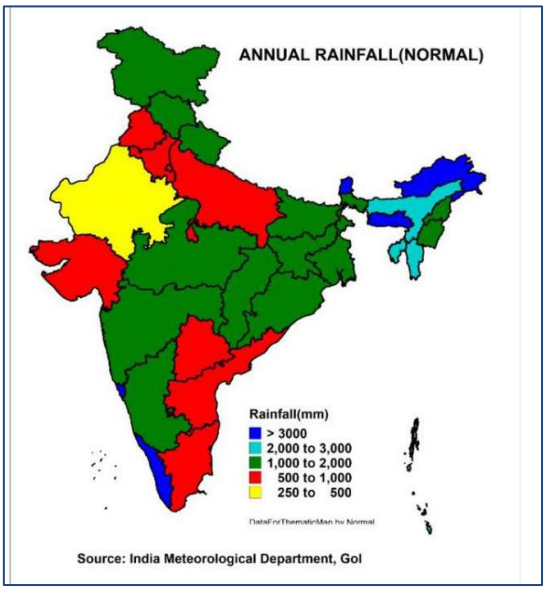


Fig.6.2 Distribution of Annual Normal Rainfall

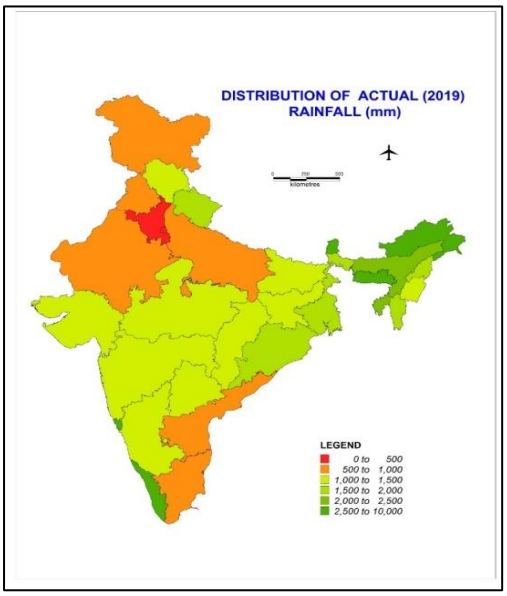


Fig.6.3 Distribution of Actual Rainfall (2019)

7. SHORT TERM WATER SUPPLY INVESTIGATIONS

The Board provides technical assistance to Defence and Government agencies / establishments to solve their immediate water supply problems by conducting request based investigations for selecting suitable sites for construction of ground water abstraction structures. During 2019-20, a total of 139 such request based investigations were carried out by the Board. Region wise/ state wise status of such investigation is given in table 7.1 and fig. 7.1.

Table7.1 REGION/ STATE WISE WATER SUPPLY INVESTIGATIONS DURING 2019-20

	Regions	States	Number of Water Supply Investigations
1	NWR, Chandigarh	Chandigarh	8
2		Punjab	4
3		Haryana	6
4	NWHR, Jammu	Jammu & Kashmir	55
5	NHR, Dharmshala	Himachal Pradesh	1
6	NCR, Bhopal	Madhya Pradesh	2
7	WR, Jaipur	Rajasthan	3
8	NR, Lucknow	Uttar Pradesh	3
9	UK, Dehradun	Uttarakhand	6
10	NER, Guwahati	Assam	16
11		Arunachal Pradesh	1
12		Meghalaya	2
13		Mizoram	2
14		Nagaland	2
15		Tripura	2
16	CR, Nagpur	Maharashtra	3
17	SWR, Banglore	Karnataka	6
18	SECR, Chennai	Tamil Nadu	9
19	SR, Hyderabad	Telangana	6
20	MER, Patna	Bihar	1
21	SER, Bhubneshwar	Odisha	1
			139

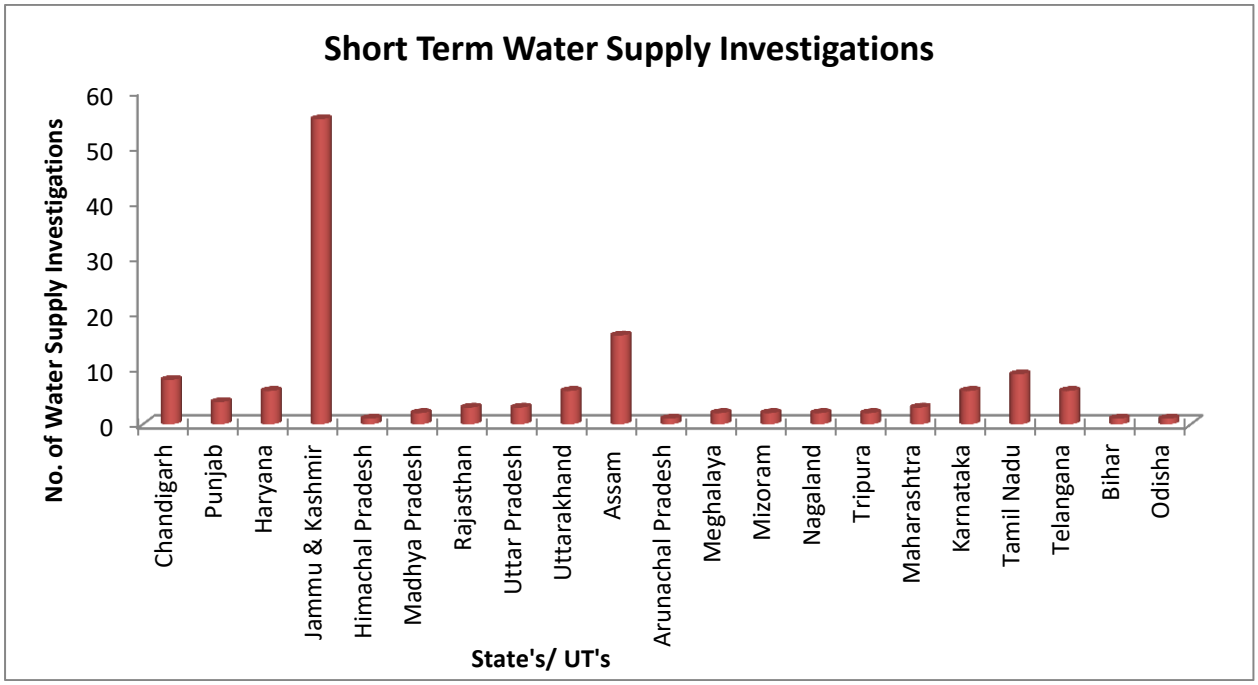


Fig 7.1: Region wise status of Short Term Water Supply Investigations during 2019-20

8. GROUND WATER REGIME MONITORING

Introduction

Ground water regime monitoring is one of the key activities of Central Ground Water Board (CGWB). Monitoring of ground water regime is an effort to obtain information on ground water level and chemical quality through representative sampling. The primary objective of ground water monitoring is to record the response of various natural and anthropogenic stress on the groundwater regime which impacts the recharge and discharge parameters with reference to geology, climate, physiography, land use pattern and hydrologic characteristics on a regional scale. The key applications of the groundwater data acquired during regime monitoring in the country are:

- The data is used for volumetric estimation of groundwater resources.
- To assess the impact of groundwater recharge and draft on long term basis
- To categories area into overexploited, critical, semi-critical and safe based on long term water level trend analysis.
- In deciding the depth of water well drilling as well as depth of lowering the pumps.
- Help in design, implemention and monitoring the effectiveness of groundwater management, protection and conservation program
- To identify groundwater quality affected areas for taking remedial measures.
- To plan groundwater recharge interventions and study the impact in time and space.

At present, CGWB has a network of 22730 (Dug Wells: 16375 and Piezometers: 6355) ground water observation wells throughout the Country. The state wise breakup is given as below in table 8.1.

Table 8.1 State-wise distributionoftheGroundWater Observation Wells

Sl No	Name of the State/UTs	Number of GW Monitoring Stations (March 2020)		
		DW	PZ	Total
State				
1	Andhra Pradesh	674	164	838
2	Arunachal Pradesh	23	4	27
3	Assam	361	24	385
4	Bihar	734	23	757
5	Chhattisgarh	1157	268	1425
6	Delhi	17	84	101
7	Goa	88	44	132
8	Gujarat	638	266	904
9	Haryana	536	785	1321
10	Himachal Pradesh	128	0	128
11	Jammu & Kashmir	287	11	298
12	Jharkhand	447	20	467

13	Karnataka	1413	262	1675
14	Kerala	1381	221	1602
15	Madhya Pradesh	1203	316	1519
16	Maharashtra	1739	180	1919
17	Manipur	0	0	0
18	Meghalaya	56	11	67
19	Nagaland	22	8	30
20	Odisha	1510	92	1602
21	Punjab	205	850	1055
22	Rajasthan	709	556	1265
23	Tamil Nadu	814	472	1286
24	Telangana	306	442	748
25	Tripura	102	13	115
26	Uttar Pradesh	871	260	1131
27	Uttarakhand	39	166	205
28	West Bengal	766	765	1531
Union Territory (UT)				
1	Andaman & Nicobar	111	2	113
2	Chandigarh	1	36	37
3	Dadra & Nagar Haveli	17	0	17
4	Daman & Diu	11	3	14
5	Pondicherry	9	7	16
TOTAL		**16375**	**6355**	**22730**

The ground water levels are measured manually four times a year during the months of January, March/April/ May, August and November coinciding with crop season and onset of monsoon as well as to capture deepest and shallowest water level in the hydrological year. The ground water regime monitoring started in the year 1969 by Central Ground Water Board.

Ground water samples are collected once a year during the month of March/April/May to obtain background information of ground water quality changes on regional scale.

The database thus generated forms the basis for planning the ground water development and management programme. This data is used for assessment of ground water resources and changes in the regime consequent to various development and management activities.

Ground Water Level Scenario

Depth to Water Level – Pre Monsoon 2019

The ground water level data for Premonsoon 2019 indicates that out of the total 14555 wells analysed, 751 (5 %) wells are showing water level less than 2 m bgl (metres below ground level), 3433 (24%) wells are showing water level in the depth range of 2-5 m bgl, 5933 (41 %)

wells are showing water level in the depth range of 5-10 m bgl, 3402 (23%) wells are showing water level in the depth range of 10-20 m bgl, 786 (5%) wells are showing water level in the depth range of 20-40 m bgl and the remaining 250 (2%) wells are showing water level more than 40 m bgl. The maximum depth to water level of 128.00 m bgl is observed in Bikaner district of Rajasthan whereas the minimum is less than 1 m bgl.

Ground water level data of Premonsoon 2019 for the country reveals that the general depth to water level of the country ranges from 5 to 10 m bgl (Fig 8.1). Very shallow water level of less than 2 m bgl is observed in few states, such as Assam, Odisha and Tripura in small patches. Ground Water level in the range of 2-5 m bgl is seen in Assam, northern parts of Uttar Pradesh and Bihar, Coastal parts of Odisha, few pockets in Andhra Pradesh, Gujarat and Maharashtra. Major part of the country shows water level in the range 5-10 m bgl, especially in the states of Madhya Pradesh, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Odisha, Chhattisgarh, Maharashtra, Gujarat, Tamil Nadu, Telangana and Karnataka. In major parts of north-western and western states, especially in the states of Delhi, Haryana, Punjab and Rajasthan, depth to water level is generally deeper and ranges from about 20 to more than 40 m bgl. The peninsular part of country recorded a water level in the range of 5 to 20 m bgl.

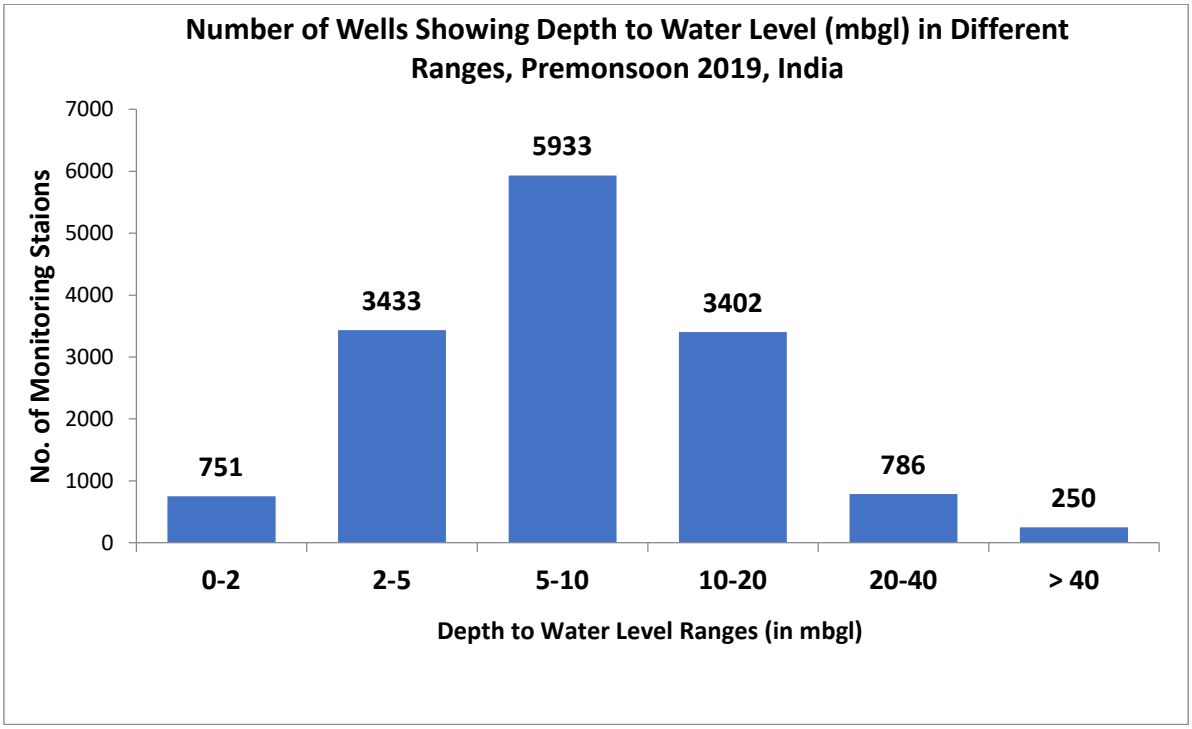


Fig 8.1: No. of wells showing Depth to Water Level (mbgl), April 2019

Depth to Water Level – August 2019

The ground water level data for August 2019 indicate that out of the total 14550 wells analysed, 4592 (31 %) wells are showing water level less than 2 m bgl (metres below ground level), 4307 (30%) wells are showing water level in the depth range of 2-5 m bgl, 3154 (22 %) wells are showing water level in the depth range of 5-10 m bgl, 1641 (11%) wells are showing water level in the depth range of 10-20 m bgl, 599 (4%) wells are showing water level in the depth range of 20-40 m bgl and the remaining 257 (2 %) wells are showing water level more than 40 m bgl. The maximum depth to water level of 115.00 m bgl is observed in Nagaur District of Rajasthan whereas the minimum is less than 1 m bgl.

Ground water level data of August 2019 for the country reveals that the general depth to water level of the country ranges from 0 to 5 m bgl (Fig 8.2). Almost 62 % of the wells analysed show water level in the range of 0- 5 m bgl. Very shallow water level of less than 2 m bgl (32 %) is observed in almost all the states, such as except Chandigarh, Daman & Diu, Punjab, and Tamil Nadu. All the other states/UTs have more or less considerable percentage of wells showing water level of less than 2 m bgl. Almost 30% of the wells analysed show water level in the range of 2 – 5 m bgl, especially in the states of Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh and the western coastal plains. In major parts of north-western and western states, depth to water level is generally deeper and ranges from about 10- 40 m bgl. In parts Delhi, Haryana and Rajasthan, water level of more than 40 m bgl is also recorded. The peninsular part of country recorded a water level in the range of 2 to 20 m bgl.

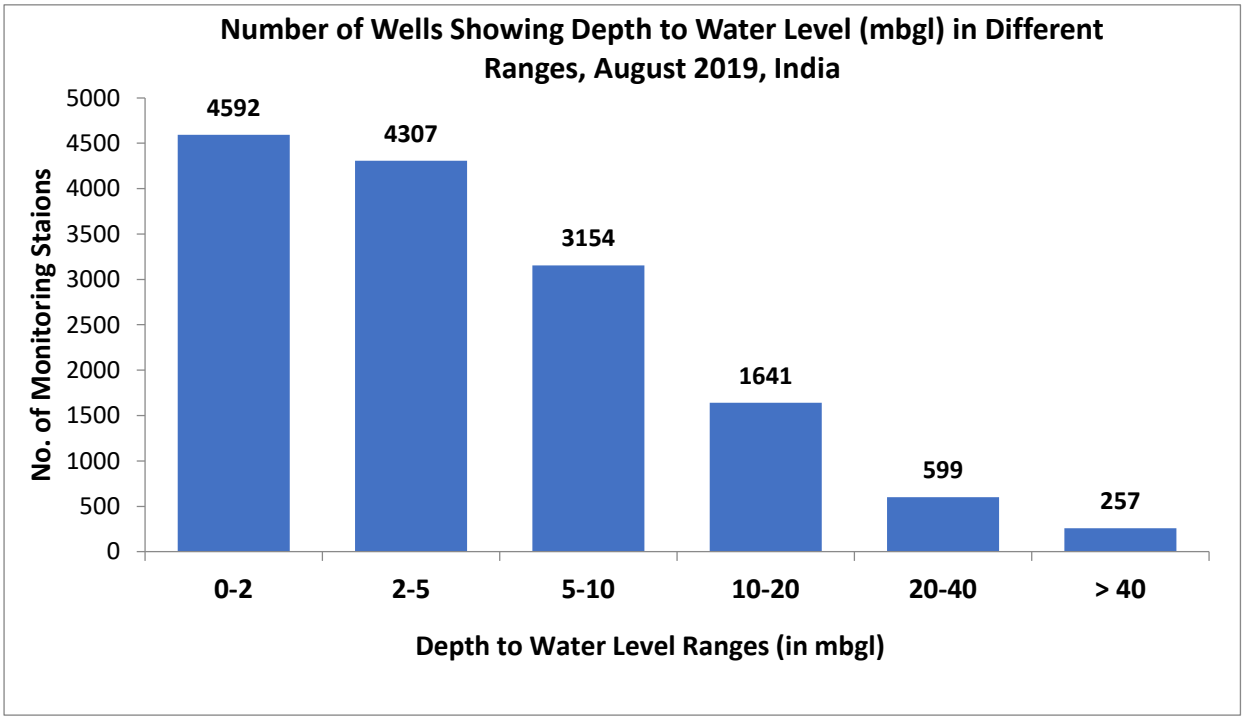


Fig 8.2: No. of wells showing Depth to Water Level (mbgl), August 2019

Depth to Water Level – Post Monsoon 2019

The ground water level data for November 2019 indicates that out of the total 14827 wells analysed, 4077 (28 %) wells are showing water level less than 2 m bgl (metres below ground level), 5711 (38%) wells are showing water level in the depth range of 2-5 m bgl, 3151 (21 %) wells are showing water level in the depth range of 5-10 m bgl, 1142 (8%) wells are showing water level in the depth range of 10-20 m bgl, 512 (3%) wells are showing water level in the depth range of 20-40 m bgl and the remaining 234 (2 %) wells are showing water level more than 40 m bgl. The maximum depth to water level of 121.28 m bgl is observed in Bikaner district of Rajasthan.

Perusal of depth to water level data of November 2019 indicates that in general depth to water level ranges from 0 to 5 m bgl as observed at about 66% of the monitoring stations (Fig 8.3). Very shallow water level of less than 2 m bgl is observed in most of the states (28% of the wells monitored), such as Assam, Odisha, Andhra Pradesh, Madhya Pradesh, Bihar, Uttar Pradesh, Maharashtra, Karnataka. Central, Eastern and Southern part of the country, covering almost all the states and UTs shows water level in the range of 2-5 m bgl. In major parts of north-western and western states, depth to water level is generally deeper and ranges from about 10- 40 m bgl. In parts Delhi, Haryana and Rajasthan, water level of more than 40 m bgl is also recorded.

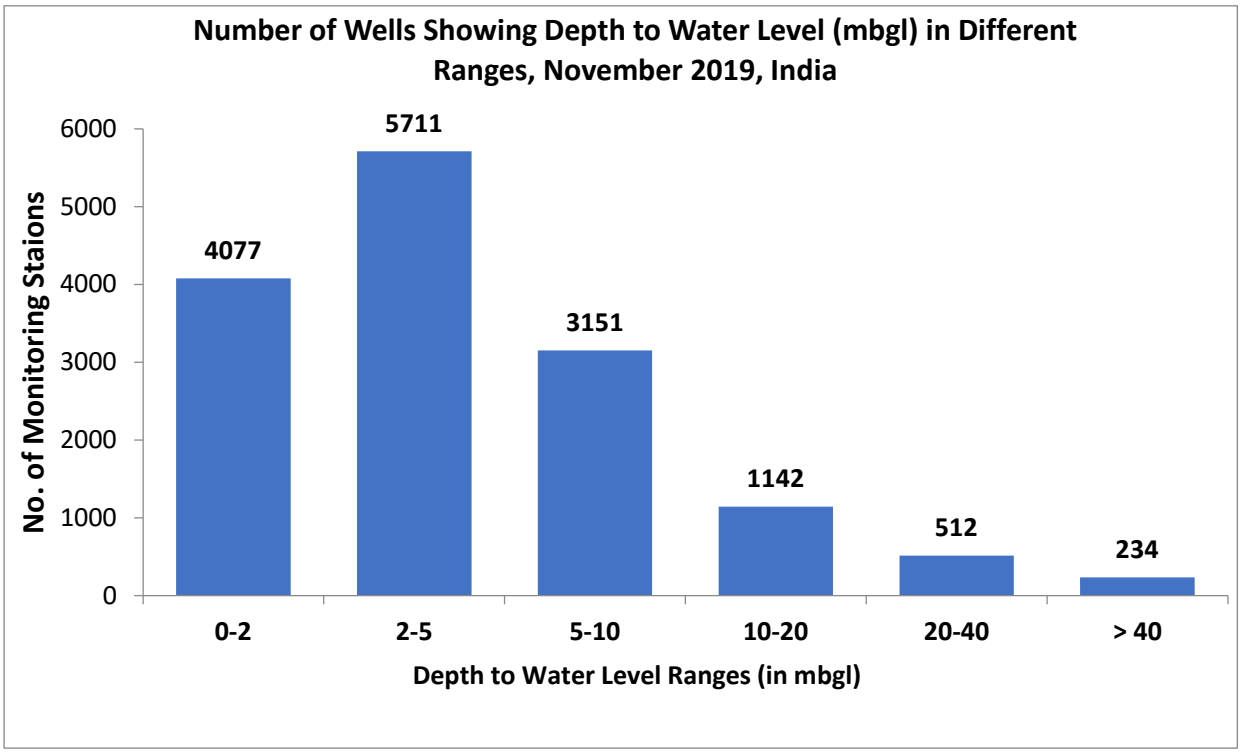


Fig 8.3: No. of wells showing Depth to Water Level (mbgl), November 2019

Depth to Water Level – January 2020

The ground water level data for January 2020 indicates that out of the total 14649 wells analysed, 2009 (14 %) wells are showing water level less than 2 m bgl (metres below ground level), 5881 (40%) wells are showing water level in the depth range of 2-5 m bgl, 4405 (30 %) wells are showing water level in the depth range of 5-10 m bgl, 1595 (11%) wells are showing water level in the depth range of 10-20 m bgl, 513 (3%) wells are showing water level in the depth range of 20-40 m bgl and the remaining 246 (2 %) wells are showing water level more than 40 m bgl. The maximum depth to water level of 121.60 m bgl is observed in Rajasthan.

Perusal of depth to water level data of January 2020 indicates that in general depth to water level ranges from 2 to 10 m bgl as observed at about 70% of the monitoring stations. Very shallow water level of less than 2 m bgl is observed in few states, such as Assam, Odisha, Andhra Pradesh and Maharashtra in very small and isolated patches. Eastern part of the country, covering the states of Assam, Bihar, Odisha, Chhatishgarh, Eastern UP and coastal areas of Andhra Pradesh shows water level in the range of 2-5 m bgl. Western part of Uttar Pradesh sjow water level of 5 to 20 mbgl. In major parts of north-western and western states, depth to water level is generally deeper and ranges from about 10- 40 m bgl. In parts Delhi, Haryana and Rajasthan, water level of more than 40 m bgl is also recorded. The peninsular part of country recorded a water level in the range of 5 to 10 m bgl with intermittent more than 10 m water level.

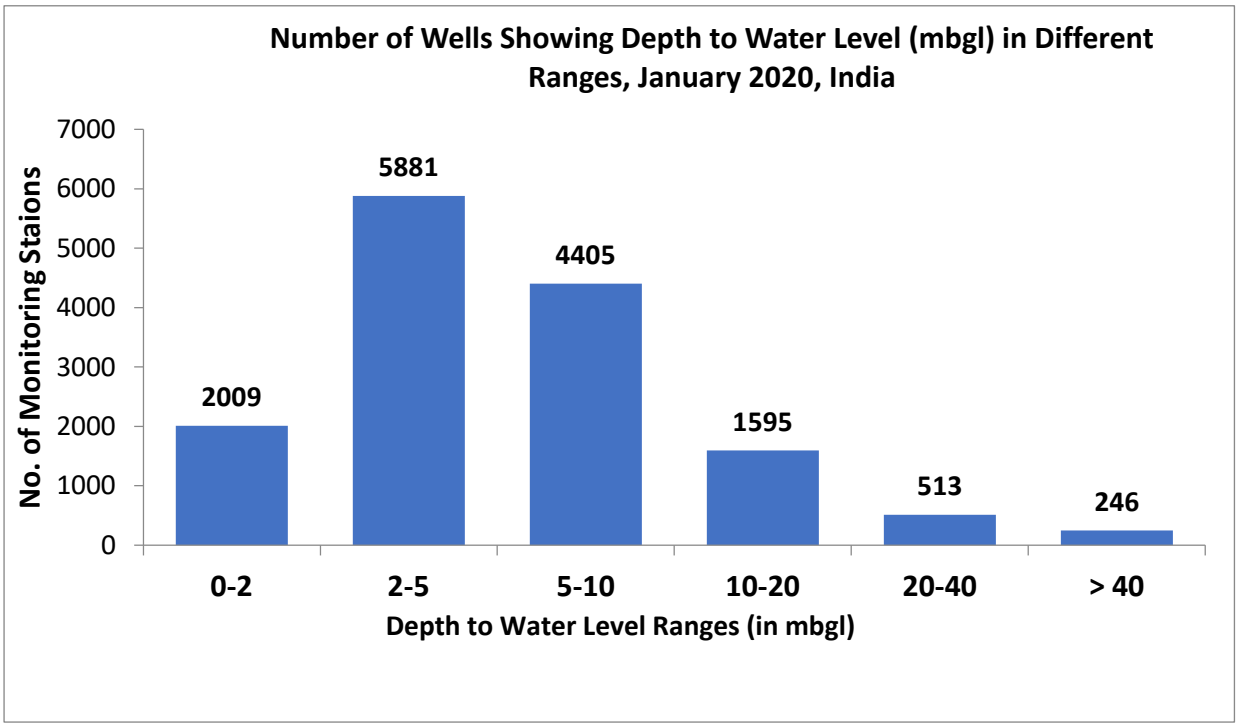
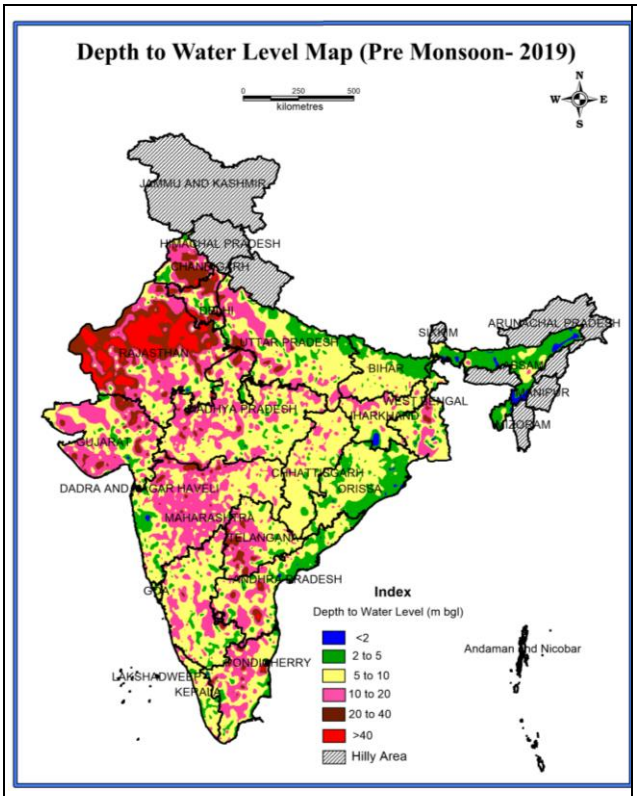
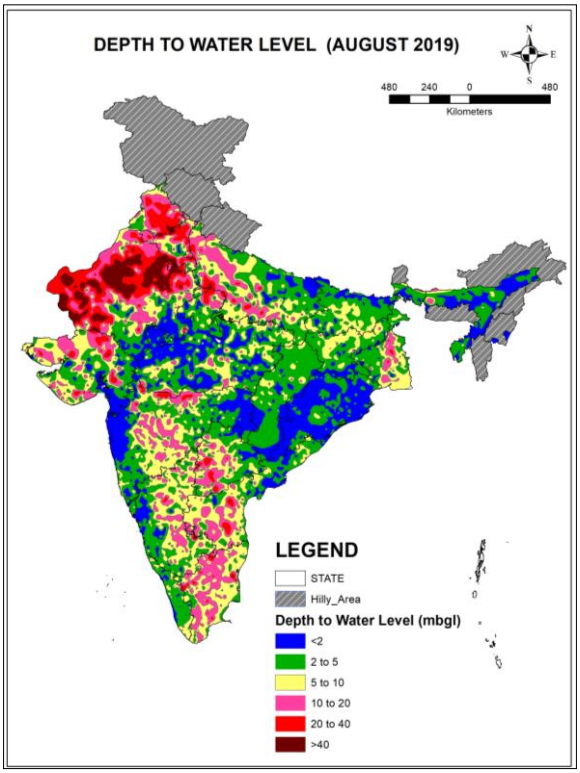
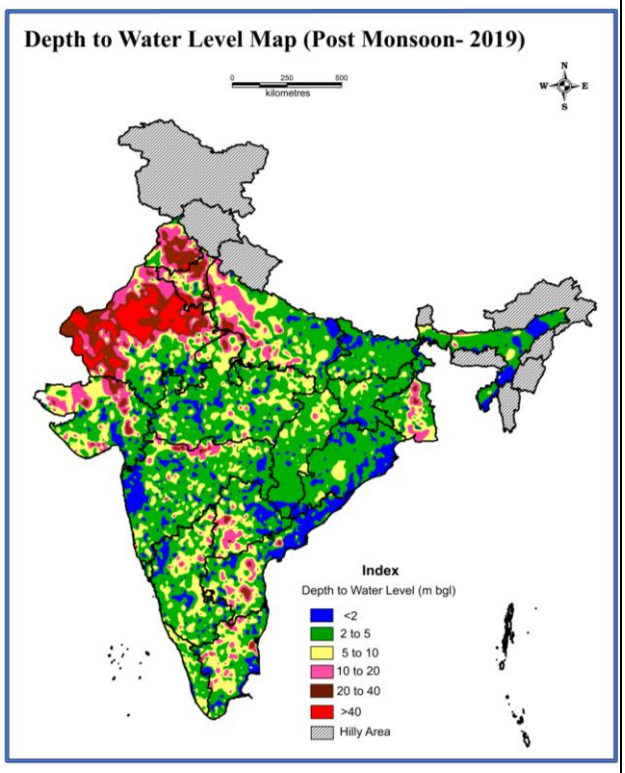


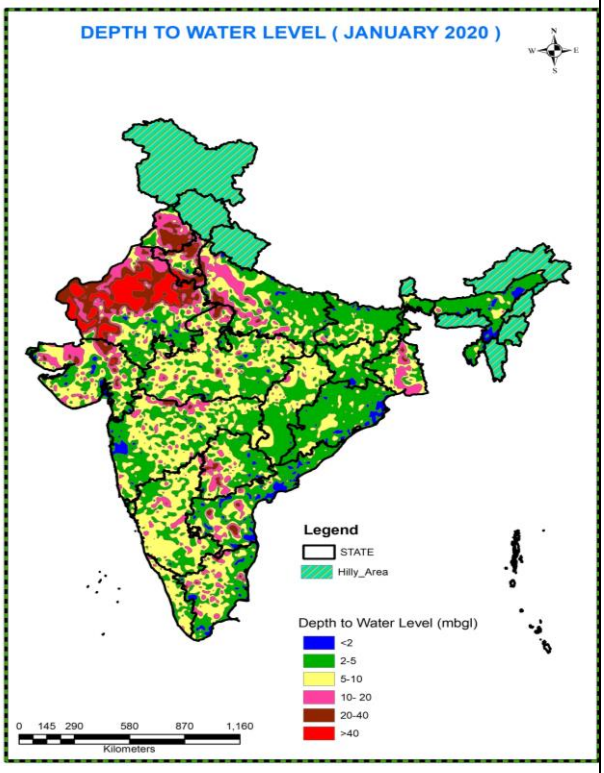
Fig 8.4: No. of wells showing Depth to Water Level (mbgl), January 2019

DEPTH TO WATER LEVEL MAPS AT A GLANCE (2019-2020)









9. RE-ASSESSMENT OF DYNAMIC GROUND WATER RESOURCES

The assessment of Dynamic Ground Water Resourcesof the country is being carried out periodically to assess the prevailing status of its utilization and its availability for future use.The assessment has been carried out for the reference years 1972, 1985, 1995, 2004, 2009, 2011, 2013 & 2017 (latest) till now. The methodology recommended by the Ground Water Estimation Committee- 1997(GEC- 97) was used for the assessment till 2013 whereas the 2017 assessment (GWRA-2017)was done following the GEC-2015 methodology which took into consideration the improvements in data availability and assessment techniques.

A Central Level Expert Group (CLEG) was constituted by the Department of Water Resources, RD & GR, MoJS in 2017 for over-all supervision of the re-assessment of ground water resources in the entire country. The groundwater resources assessment for reference year 2017 at the State Levelswere carried out jointly by State Groundwater Departments and Central Ground Water Board under the supervision of State Level Committees, with technical guidance from the Central Level Expert Group.

The National compilation on GWRA-2017 was approved by CLEG in the month of April 2019 & was approved by Ministry in July 2019. The national compilation has been uploaded on the website of CGWB (www.cgwb.gov.in) and hasalso been shared with all Regional Directors of CGWBfor sharing with respective State/UT counterparts. As per GWRA 2017, the total annual ground water recharge has been assessed as 431.86 billioncubic meters (bcm). Keeping aside an allocation for natural discharge, the total annual extractable ground water resources is of the order of 392.70 bcm. The annual groundwater extraction (as in March, 2017) in the countryis 248.69 bcm. The average stage of groundwater extraction for the country as a whole works out to be about 63%. Out of the total 6881 assessment units in the country, 1186 units (17%) have been categorized as ‘Over-Exploited’ indicating ground water extraction exceeding the total annual ground water recharge. Further, 313units (5%) have been categorised as ‘Critical’, 972 units (14%), ‘semi-critical’ and 4310 units (63%) as ‘Safe‘. Apart from these, there are 100 assessment units (1%), which have been categorised as ‘Saline’ as major part of the ground water in the phreatic aquifers in these units is brackish or saline.

In respect of West Bengal, the results of GWRA-2017 indicated a huge variation with respect of previous assessment of resources and the reasons for the changes in West Bengal was not found reasonable and adequate. Hence, CLEG recommended that the results of 2013 assessment in respect of West Bengal may be used in place of GWRA-2017 assessment for national compilation of GWRA-2017.
The state/UT wise details of ground water resource availability& categorization of assessment units as per the Assessment of Dynamic Ground Water Resources of India, 2017 are given in Annexures I & II respectively.

STATE-WISE GROUND WATER RESOURCES OF INDIA, 2017 (in BCM) ***ANNEXURE- I***

S. No.	States / Union Territories	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	States														
1	**Andhra Pradesh**	9.96	5.62	1.21	4.42	21.22	1.07	20.15	7.85	0.14	0.9	8.9	1.48	12.31	44.15
2	**Arunachal Pradesh**	1.89	0.18	0.95	0.01	3.02	0.36	2.67	0	0	0.01	0.01	0.03	2.64	0.28
3	**Assam**	20.22	0.43	7.28	0.74	28.67	4.42	24.26	1.97	0.06	0.69	2.73	0.79	21.43	11.25
4	**Bihar**	19.83	3.95	3.14	4.5	31.41	2.43	28.99	10.78	0.66	1.83	13.26	1.83	15.78	45.76
5	**Chhattisgarh**	7.82	1.36	0.76	1.64	11.57	1	10.57	3.98	0.05	0.67	4.7	0.79	5.76	44.43
6	**Delhi**	0.13	0.06	0.03	0.11	0.32	0.02	0.3	0.09	0.02	0.24	0.36	0.29	0.02	119.61
7	**Goa**	0.19	0.03	0.01	0.05	0.27	0.11	0.16	0.02	*	0.03	0.05	0.04	0.07	33.5
8	**Gujarat**	15.95	3.4	0	3.02	22.37	1.12	21.25	12.84	0.11	0.63	13.58	0.9	7.98	63.89
9	**Haryana**	3.56	2.55	1.03	3	10.15	1.01	9.13	11.53	0.34	0.63	12.5	0.72	0.87	136.91
10	**Himachal Pradesh**	0.34	0.02	0.11	0.04	0.51	0.05	0.46	0.2	0	0.19	0.39	0.34	0.16	86.37
11	**Jammu & Kashmir**	1	0.5	0.88	0.51	2.89	0.29	2.6	0.2	0.07	0.5	0.76	0.5	1.84	29.47
12	**Jharkhand**	5.25	0.13	0.41	0.42	6.21	0.52	5.69	0.8	0.22	0.56	1.58	0.56	4.13	27.73
13	**Karnataka**	6.59	4.36	2.67	3.22	16.84	2.05	14.79	9.39	*	0.95	10.34	1.14	5.41	69.87

S. No.	States / Union Territories	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
14	Kerala	3.91	0.04	0.68	1.13	5.77	0.56	5.21	1.22	0.01	1.44	2.67	1.57	2.41	51.27
15	Madhya Pradesh	27.1	1.51	0.82	6.99	36.42	1.95	34.47	17.43	0.22	1.24	18.88	1.72	15.84	54.76
16	Maharashtra	20.59	2.29	0.53	8.23	31.64	1.74	29.9	15.1	0.003	1.22	16.33	2.28	12.91	54.62
17	Manipur	0.23	0.01	0.17	0.02	0.43	0.04	0.39	0	0	0	0.01	0.04	0.34	1.44
18	Meghalaya	1.37	0.01	0.43	0.02	1.83	0.19	1.64	0.03	0	0.01	0.04	0.02	1.59	2.28
19	Mizoram	0.16	0	0.05	0	0.21	0.02	0.19	0	0	0.01	0.01	0.01	0.18	3.82
20	Nagaland	1.65	0.03	0.52	0	2.2	0.22	1.98	0	0	0.02	0.02	0.02	1.96	0.99
21	Odisha	10.53	2.34	1.5	2.37	16.74	1.17	15.57	5.28	0.14	1.15	6.57	1.3	8.85	42.18
22	Punjab	5.54	11.83	1.31	5.25	23.93	2.35	21.58	34.56	0.2	1.01	35.78	1.41	1.09	165.77
23	Rajasthan	9.74	0.78	0.24	2.44	13.21	1.22	11.99	14.85	0	1.92	16.77	2.67	0.88	139.88
24	Sikkim	5.2	0	0.43	0	5.63	4.11	1.52	0	0	0	0	0.01	1.51	0.06
25	Tamil Nadu	6.67	9.41	1.89	2.26	20.22	2.02	18.2	13.06	0	1.67	14.73	1.85	5.66	80.94
26	Telangana	7.56	1.42	1.88	2.76	13.62	1.25	12.37	7.09	*	1	8.09	1.39	4.26	65.45
27	Tripura	0.8	0.06	0.4	0.26	1.53	0.29	1.24	0.02	0	0.08	0.1	0.11	1.11	7.88
28	Uttar Pradesh	37.73	11.67	1.59	18.93	69.92	4.6	65.32	40.89	*	4.95	45.84	5.96	20.36	70.18
29	Uttarakhand	1.15	0.93	0.09	0.87	3.04	0.15	2.89	1.3	0.13	0.22	1.64	0.22	1.25	56.83

S. No.	States / Union Territories	Ground Water Recharge					Total Natural Discharges	Annual Extractable Ground Water Resource	Current Annual Ground Water Extraction				Annual GW Allocation for for Domestic Use as on 2025	Net Ground Water Availability for future use	Stage of Ground Water Extraction (%)
		Monsoon Season		Non-monsoon Season		Total Annual Ground Water Recharge			Irrigation	Industrial	Domestic	Total			
		Recharge from rainfall	Recharge from other sources	Recharge from rainfall	Recharge from other sources										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
30	**West Bengal****	18.71	1.51	5.26	3.85	29.33	2.77	26.56	10.84	*	1	11.84	1.53	14.19	44.6
	Total States	**251.36**	**66.41**	**36.3**	**77.06**	**431.13**	**39.09**	**392.04**	**221.33**	**2.38**	**24.77**	**248.5**	**31.52**	**172.82**	**63.38**
	Union Territories														
1	**Andaman & Nicobar**	0.35	0	0.02	0	0.37	0.04	0.33	0	0	0.01	0.01	0.01	0.32	2.74
2	**Chandigarh**	0.02	0.01	0	0.01	0.04	0	0.04	0	*	0.03	0.03	0.03	0	89
3	**Dadra & Nagar Haveli**	0.06	0	0	0.01	0.07	0	0.07	0.01	*	0.01	0.02	0.01	0.04	31.34
4	**Daman & Diu**	0.02	0	0	0	0.02	0	0.02	0.01	0	0	0.01	0	0	61.4
5	**Lakshdweep**	0.01	0	0	0	0.01	0.01	0.004	0	0	0.002	0.002	0	0	65.99
6	**Puducherry**	0.09	0.07	0.02	0.05	0.23	0.02	0.2	0.11	*	0.04	0.15	0.04	0.05	74.33
	Total UTs	0.54	0.08	0.05	0.07	0.73	0.08	0.66	0.13	0	0.1	0.23	0.1	0.43	34.51
	Grand Total	**251.9**	**66.49**	**36.34**	**77.13**	**431.86**	**39.16**	**392.7**	**221.46**	**2.38**	**24.87**	**248.7**	**31.62**	**173.25**	**63.33**

Note: *Industrial and domestic draft has not been estimated separately in Goa, Himachal Pradesh, Karnataka, Rajasthan, Tamil Nadu, Uttar Pradesh, Chandigarh, Dadra & Nagar Haveli and Puducherry

**The Ground Water resources assessment as on 2013 has been considered for the state of West Bengal

ANNEXURE II

CATEGORIZATION OF BLOCKS/ MANDALS/ TALUKAS IN INDIA (2017)												
S.No.	States / Union Territories	Total No. of Assessed	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%
	States											
1	**Andhra Pradesh**	670	501	75	60	9	24	4	45	7	40	6
2	**Arunachal Pradesh**	11	11	100	0	0	0	0	0	0	0	0
3	**Assam**	28	28	100	0	0	0	0	0	0	0	0
4	**Bihar**	534	432	81	72	13	18	3	12	2	0	0
5	**Chattisgarh**	146	122	84	22	15	2	1	0	0	0	0
6	**Delhi**	34	3	9	7	21	2	6	22	65	0	0
7	**Goa**	12	12	100	0	0	0	0	0	0	0	0
8	**Gujarat**	248	194	78	11	4	5	2	25	10	13	5
9	**Haryana**	128	26	20	21	16	3	2	78	61	0	0
10	**Himachal Pradesh**	8	3	38	1	13	0	0	4	50	0	0
11	**Jammu & Kashmir**	22	22	100	0	0	0	0	0	0	0	0
12	**Jharkhand**	260	245	94	10	4	2	1	3	1	0	0
13	**Karnataka**	176	97	55	26	15	8	5	45	26	0	0
14	**Kerala**	152	119	78	30	20	2	1	1	1	0	0
15	**Madhya Pradesh**	313	240	77	44	14	7	2	22	7	0	0
16	**Maharashtra**	353	271	77	61	17	9	3	11	3	1	0
17	**Manipur**	9	9	100	0	0	0	0	0	0	0	0
18	**Meghalaya**	11	11	100	0	0	0	0	0	0	0	0
19	**Mizoram**	26	26	100	0	0	0	0	0	0	0	0
20	**Nagaland**	11	11	100	0	0	0	0	0	0	0	0
21	**Odisha**	314	303	96	5	2	0	0	0	0	6	2
22	**Punjab**	138	22	16	5	4	2	1	109	79	0	0
23	**Rajasthan**	295	45	15	29	10	33	11	185	63	3	1
24	**Sikkim**	4	4	100	0	0	0	0	0	0	0	0
25	**Tamil Nadu**	1166	427	37	163	14	79	7	462	40	35	3
26	**Telangana**	584	278	48	169	29	67	11	70	12	0	0
27	**Tripura**	59	59	100	0	0	0	0	0	0	0	0
28	**Uttar Pradesh***	830	540	65	151	18	48	6	91	11	0	0
29	**Uttarakhand**	18	13	72	5	28	0	0	0	0	0	0
30	**West Bengal ****	268	191	71	76	28	1	0	0	0	0	0
	Total States	**6828**	**4265**	**62**	**968**	**14**	**312**	**5**	**1185**	**17**	**98**	**1**
	Union Territories											
1	**Andaman & Nicobar**	36	35	97	0	0	0	0	0	0	1	3
2	**Chandigarh**	1	0	0	1	100	0	0	0	0	0	0
3	**Dadra & Nagar Have**	1	1	100	0	0	0	0	0	0	0	0
4	**Daman & Diu**	2	1	50	0	0	1	50	0	0	0	0
5	**Lakshdweep**	9	6	67	3	33	0	0	0	0	0	0
6	**Puducherry**	4	2	50	0	0	0	0	1	25	1	25
	Total UTs	**53**	**45**	85	**4**	8	**1**	2	**1**	2	**2**	4
	Grand Total	**6881**	**4310**	**63**	**972**	**14**	**313**	**5**	**1186**	**17**	**100**	**1**

Note

Blocks- Bihar, Chattisgarh, Haryana, Jharkhand, Kerala, M.P., Manipur, Mizoram, Orissa, Punjab, Rajasthan, Tripura, Uttar Pradesh,

Taluks -Karnataka, Goa, Gujarat, Maharashtra

Mandals - Andhra Pradesh, Telangana

Districts/Valley- Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Mizoram, Nagaland

Islands - Lakshdweep, Andaman & Nicobar Islands

Firka-Tamil Nadu

Region - Puducherry

UT - Chandigarh, Dadar & Nagar Haveli, Daman & Diu

Tehsil-NCT Delhi

***Uttar Pradesh:** There are total 820 block and 10 Cities

**The Ground Water resources assessment as on 2013 has been considered for the state of West Bengal

10. AQUIFER REJUVENATION

ARTIFICIAL RECHARGE

Aquifer Rejuvenation project through Artificial Recharge (AR) has been implemented by Central Ground Water Board (CGWB), Department of Water Resources, RD & GR in selected over-exploited blocks in the Country. As a part of this, Aquifer rejuvenation project has been initiated by -

- CGWB, CR, Nagpur in Water Shed 12 & 13 (MR-12 & MR-13) in Manjra (MR) sub basin, Godavari basin, Over Exploited water shed of Osmanabad Taluka, Osmanabad District, Maharashtra State
- CGWB, SR, Hyderabad in --Pulivendula mandal (Over Exploited), YSR Kadapa District, Andhra Pradesh State &
  - in Bachannapeta mandal (erstwhile Warangal district), Telangana State

The project has been initiated on pilot basis to assess the impact of artificial recharge on aquifer rejuvenation and resultant agro-economical improvements by constructing site specific artificial recharge structures.

The location wise details of area undertaken are as below:

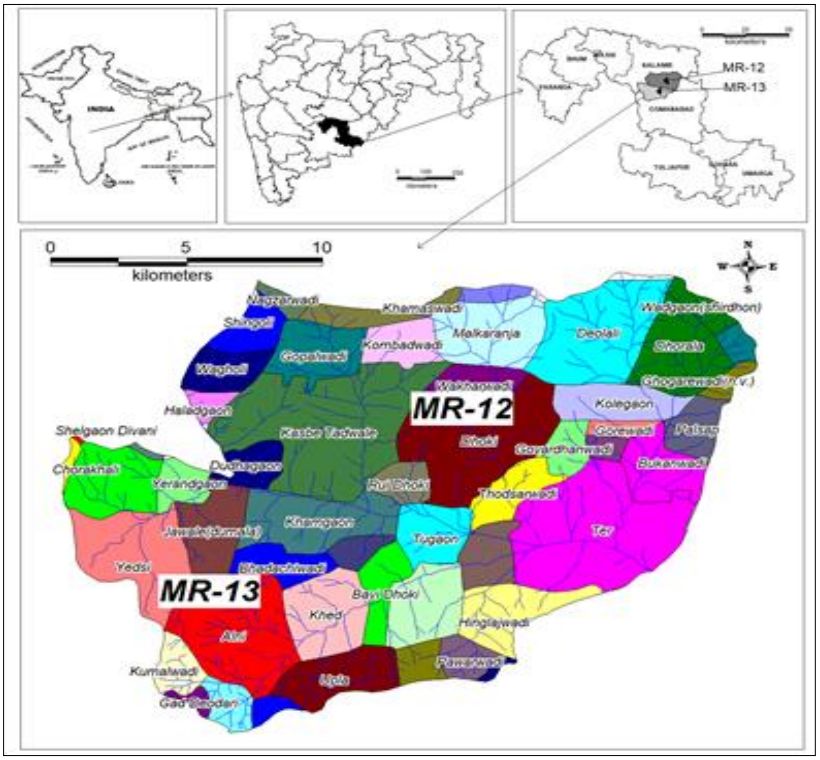


Fig.10.1 MR-12 & MR-13 Over Exploited water shed of Osmanabad Taluka, Osmanabad District, Maharashtra state

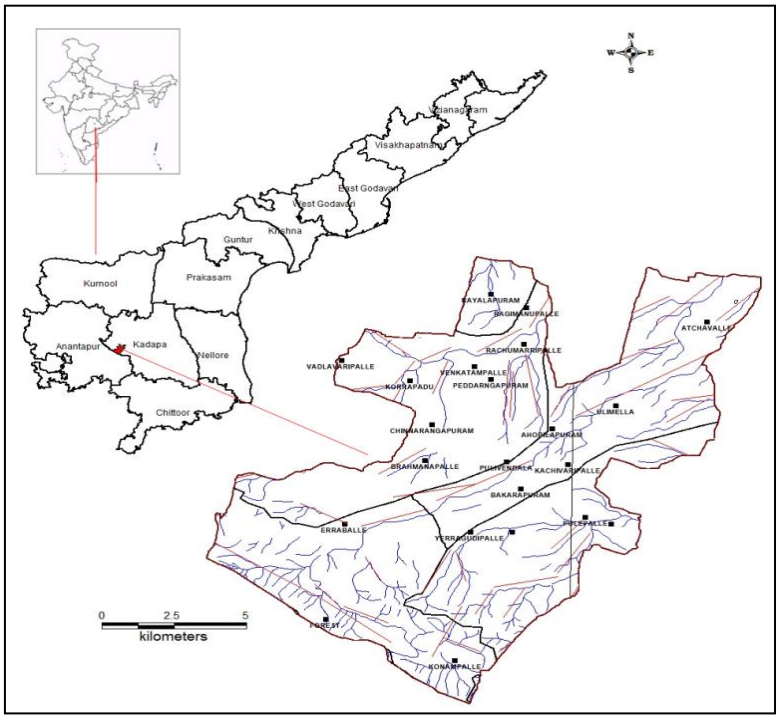


Fig.10.2 Pulivendula mandal (Over Exploited), YSR Kadapa District, Andhra Pradesh

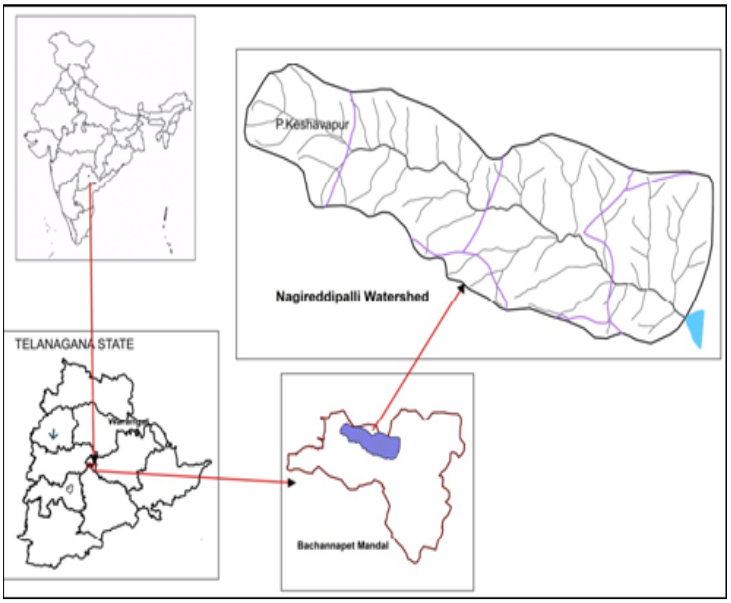


Fig.10.3Bachannapeta mandal, erstwhile Warangal district, Telangana State

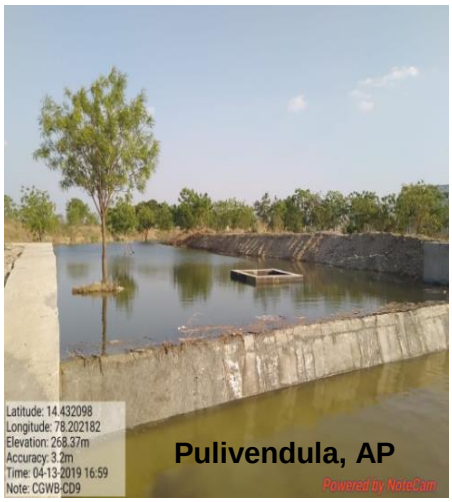
The construction of AR structures started in all the three areas during Nov - Dec 2019. The progress till March 2020 is as below in table 10.1.

Table 10.1 PROGRESS OF AR STRUCTURES TILL MARCH 2020		
S.No.	**Name of the Block**	**Progress** (till March, 2020)
1	Osmanabad Block (Osmanabad District, Maharashtra)- Semi Critical	Check Dam: All 55 main Check Dam completed. Cement Concrete (CC) in the upstream and downstream sides at 5 CD sites is yet to be completed. Piezometer: All 20 completed. Installation of AWLR completed. Recharge well: All 46 completed.
2	Pulivendula (Dist. YSR Kadapa, Andhra Pradesh)- Over Exploited	**Project completed in November 2019** Check Dam: All 16 completed, Percolation Tank: All 4 completed Sub Surface Barrier: 01 completed. Recharge Shafts: 35 completed. Piezometer: 13 completed
3	Bachennapet (Dist. Warangal, Telangana)- Over Exploited	**Project completed in November 2019** Check Dam: All 06 completed, Sub Surface Barrier: 01 completed Recharge Shaft: All 31 completed Piezometer: All 08 completed.

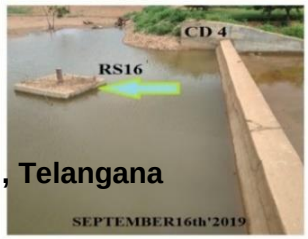
Fig.10.4 Photographs of activities at some of the sites in Osmanabad distt., Maharashtra

Fig.10.4 Percolation pond under construction

Fig.10.5 Sub-surface barrier under construction



Pulivendula, AP



Nagireddypalli, Telangana

Anticipated impact of artificial recharge structures:

- Artificial recharge structures will augment ground water resources, by utilizing the monsoon runoff and also the surface water released from the canal to the existing MI tanks in the area.
- Help in sustenance of bore wells during *rabi* season and soil moisture availability.
- Help in stabilization of ayacut under ground water irrigation and increased financial returns to the farmers.
- By utilizing surface water for enhanced groundwater recharge, evaporation losses can be reduced.

BRIDGE CUM BHANDARA

Construction of Bridge cum Bandharas have beentaken up by CGWB at 5 locations in Wardha and Amravative districts of Maharashtra.Bridge cum Bandhara (BCB) serves the dual purpose of transportation as well as storage of water in the upstream side for drinking and irrigational needs besides other purposes such as ground water recharge.

In order to store water immediately after the monsoon season, which can be utilized during lean period, Bandharas in the vicinity of existing Bridges are proposed to be constructed to address the water scarcity problem of water scarce areas in few potential sites which can be taken up as pilot project.

Accordingly, projects have been taken up in the eastern region of Maharashtra covering districts of Wardha and Amravati at five potential locations which are as follows:

1. Sarwadi, Tehsil: Karanja, District: Wardha
2. Deoli, Tehsil: Deoli, District: Wardha
3. Jamni, Tehsil: Selu, District: Wardha
4. Tiwasa, Tehsil: Tiwasa, District: Amravati
5. Ajra Phata, Tehsil: Samudrapur, District: Wardha

Bandharas are proposed to be constructed by using state of art technology. Automatic radial gates/Rubber dam shall be installed to regulate the flow of water in the streams. The work has been completed at all the sites and details of the work are given below in table 10.2 along with some photographs shown below:

Table 10.2 Details of Bandharas Constructed

Sl. No.	Description of work	Name of location				
		Sarwadi	Deoli	Jamni	Tiwasa	Ajra Phata
1	Construction of Bandhara	Completed	Completed	Completed	Completed	Completed

2	Date of completion	05.06.2019	17.07.2020	10.03.2020	15.03.2020	13.03.2020

Photographs of Bridge-cum-Bhandara in Wardha and Amravati districts, Maharashtra

Sarwadi (Gates in closed position)

Jamni (Gates in open position)

Tiwasa (Gates in open position)

Ajra Phata (Rubber Dam – Inflated Position)

Deoli (Gates in open/closed position)

11. NATIONAL HYDROLOGY PROJECT

National Hydrology Project (NHP) is a continuation of Hydrology Project (HP)- I and HP- II, a central sector scheme of Department of Water Resources, RD&GR, Ministry of Jal Shakti, Government of India with a total outlay of Rs. 3679.7674 Crore (Rs. 3,640 Crore for NHP and Rs. 39.7674 Crore for establishment of National Water Informatics Centre (NWIC), a repository of Nation-wide Water Resources data for a period of 08 years extending from 2016-17 to 2023-24. Out of the total outlay, 50% of the amount has to be repaid by Central Government to the Word Bank (WB) and the remaining 50% would be Central Assistance. The project will be implemented by 49 agencies involving 10 Central and 39 States agencies. Since CGWB is one of the implementing agencies of the NHP project, a budget of Rs. 85.00 Crore has been allocated for the purpose.

Objective of NHP

To improve the extent, quality, and accessibility of water resources information, decision support system for floods and basin level resource assessment/ planning and to strengthen the capacity of targeted water resources professionals and management institutions in India.

The components of NHP are:

- **Component A:** Water Resources Monitoring systems
- **Component B:** Water Resources information systems
- **Component C:** Water Resources Operation and Planning systems
- **Component D:** Institutional Capacity Enhancement

NHP will improve and expand hydrology data and information systems, strengthen water resources operation and planning systems, and enhance institutional capacity for water resources management. The project will strengthen the information base and institutional capacity for effective decision making in water resources planning and operational management at the basin level across the country using the latest available technology and tools. NHP will also help in contributing to the Digital India initiative by integrating water resources information across state and central agencies.

Role of CGWB in NHP

CGWB being the Nodal Agency for Ground Water, NHP cell in all the CGWB, Regional Offices have been created for providing Technical Guidance & Support to States in the implementation of NHP.

The proposed major activities of CGWB under NHP

- **Real time monitoring of Water Level &Water Quality in coastal aquifers of Tamil Nadu & UT of Puducherry** through construction of 60 piezometers & installation of 60 DWLRs.
- **Establishment of Center of Excellence for groundwater modeling** for providing technical support to the Central/ State Agencies in Ground Water Flow Model Studies.
- **Real time monitoring of Water Level through Installation of 3400 additional DWLRs in the existing Piezometers** located in the Overexploited, Critical and Semi-Critical Blocks of the Country.
- **Capacity Building** of the officers from Central and State agencies through National and International level trainings every year.
- **Awareness Campaigns** are being conducted at six places every year on state specific groundwater issues.
- Organizing **National Level Workshops** on need based Topics

A brief of various activities taken by CGWB under NHP during 2019-20 are given below:

- Activities under Center of Excellence (CoE) for Ground Water Modelling during the period are:
  - A Meeting cum Review session under CoE has been organized for finalization and publication of GW Modeling Reports on 19-20, Nov 2019 at CGWB, Faridabad. About 11 officers from different regional offices of CGWB have presented their modeling work.
  - About 12 Officers from CGWB has been attended the 2nd Modelers Meet organized by NIH, Roorkee at New Delhi and 04 Officers have presented their Modeling work during the meet.

- Organized 03 Nos of Domain Specific Training through RGI, Raipur for officers from State and Central Agencies *viz*.:
  - 01 weeks training on Basics of GW Modelling – Total Participants 27 Nos (12 Central + 15 State).
  - 01 week training on Basics of Groundwater - Total Participants 08 Nos (03 Central + 05 State).
  - 01 week training on Rainwater Harvesting - Total Participants 12 Nos (03 Central + 09 State).

- Organized 05 Nos of Awareness Raising Programme on State Specific Ground Water Issues through different Regional Offices of CGWB:
  - CR, Nagpur in Pune, Maharashtra
  - NCCR, Raipur in Raipur, Chhattisgarh
  - NER, Guwahati in Mizoram
  - NHR, Dharamshala in Dharamshala
  - SWR, Bangalore in Goa

- About 15 officers from CGWB have been participated in the 2nd International Conference on "Sustainable Water Management', at Pune, Maharashtra during 6-8, Nov 2019. Hon'ble Minister, Ministry of Jal Shakti, has released the Book edited by CGWB entitled"Empowering Village Communities for a Sustainable Water Future - A Resource Book for Jaldoots" in the 2nd International Conference at Pune. About 09 abstracts/Full papers have been accepted by the organizer from CGWB on various topics relating to Sustainable Water Management and Senior level officers have presented the various ground water challenges and the way forward.

- Co-ordinated with IHE-Delft, The Netherlands and organized 2nd International Training on Ground Water Flow Modelling for 25 Officers from State & Central Implementing agencies under NHP during July-August, 2019 at IHE, Delft, The Netherlands (07 Officers – State Agencies; 16 CGWB Officers + 02 Officers –Central Agencies)

12. CENTRAL GROUND WATER AUTHORITY (CGWA)

Central Ground Water Authority (CGWA) has been entrusted with the responsibility of regulating and controlling ground water development and management in the country. The functions/ responsibilities of CGWA include:

- Exercise of powers under section 5 of the Environment (Protection) Act, 1986 for issuing directions and taking such measures in respect of all the matters referred to in sub-section (2) of section 3 of the said Act.
- To resort to penal provisions contained in sections 15 to 21 of the said Act.
- To regulate and control, management and development of ground water in the country and to issue necessary regulatory directions for the purpose.
- Exercise of powers under section 4 of the Environment (Protection) Act, 1986 for the appointment of officers.

Important activities of CGWA during the period mentioned are given below:

1. PROCESSING OF APPLICATIONS FOR GRANT / RENEWAL OF NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER WITHDRAWAL

CGWA continued to evaluate applications from Industries/ Infrastructure Units / Mining Projects for grant of NOC for ground water withdrawal as per provisions of the guidelines except in OCS areas. A total of 2712 nos. of new NOCs were issued and 156 nos. of NOCs renewed during the period. In the year 2019-20 as compared to the previous annual year a remarkable jump of 40% increase in issuance of new NOC and an increase of 64.7% in renewal of NOC has been observed. In Over-exploited, Critical and Semi-critical areas, NOCs were not issued due to prohibition except for drinking/ domestic and green belt uses by the NGT vide its order dated 3.1.2019 in OA No. 176/2015.

Also as per Public Notice dated 15.10.2019 all existing Ground water user including industrial, infrastructure and mining projects were given an extension till 31.3.2020 to submit their application and were asked to obtain a valid NOC from CGWA by submitting their application for NOC online through NOCAP portal of CGWA on or before then said date.

2. MONITORING OF COMPLIANCE OF CONDITIONS STIPULATED IN THE NOC

CGWA has developed online self-compliance format for the project proponent to upload the compliance conditions as stipulated in the NOC and the same is being monitored by the Regional Offices for ensuring the compliance conditions by the project proponent.

Subsequently, Show-cause Notices were issued to units, which were not found to have fully complied with the NOC conditions. Orders for sealing of bore/tube wells and/ or disconnection of electricity supply through the concerned DCs/ DMs were also issued in respect of units, which did not give satisfactory replies to the show-cause notice.

While processing applications for renewal of NOC, compliance of NOC conditions by the proponents was ensured. Penalty of Rs. 1 lakh under Section 15 of Environment (Protection) Act of 1986 was imposed on the violators. NOC was issued after the compliance was completed and penalty was deposited by such offenders to the concerned Regional Office of CGWB.

3. REVISION OF GUIDELINES FOR GROUND WATER REGULATION

As directed by the NGT vide its order dated 3/1/2019 in OA No. 176/2015, the revised guidelines notified on 12.12.2018 were not given effect to. The NGT had constituted anExpert Committee headed by JS, MoEF& CC to examine the issue of appropriate policy for conservation of ground water with a robust institutional mechanism for surveillance and monitoring with a view to enhance access to ground water for drinking purposes in OCS areas by way of appropriate replenishment practices which can be properly accounted and measured for as well as to sustain the floodplains of rivers in terms of e-flows and other water bodies.

The report submitted to NGT by the committee under JS (NRWCD), MoEF&CC on 23.08.2019 was not found satisfactory by the NGT and vide its order dated 11.9.2019, another committee headed by JS, DoWR, RD&GR, MoJS was constituted to look into the issues. The Committee headed by JS, DoWR, RD&GR, MoJS had submitted its report along with revised guidelines to NGT on 16.3.2019.

4. 43rd Meeting of Central Ground Water Authority

The 43rd meeting of Central Ground Water Authority was held on 27.12.2019 under the Chairmanship of Sh. K. C. Naik, Chairman, CGWA at CGWA Jamnagar House, Mansingh Road, New Delhi.

The members were apprised of the draft guidelines that were under formulation by the committee headed by JS, DoWR, RD&GR. The Authority had approved relaxation of recharge conditions in select districts of western Rajasthan in view of low rainfall and high evaporation rates; waiving off of condition of formulation and implementation of water security plan; dropping of mandatory conditions of water level and water quality monitoring by proponents drawing ground water upto 10 KLD; and modification in the number of piezometers, digital water level recorders and telemetry based on quantum of groundwater abstraction.

The Members had also agreed to the following proposals:

- Renewal of NOC after submission of an affidavit by the proponent that the firm has fully complied with the conditions laid down in the NOC and shall be liable to pay

penalty in case of violation of NOC conditions is observed during random site inspection.

- Development of dedicated software and on site physical verification for monitoring of NOC conditions through outsourcing.
- Dropping of Environmental Clearance, Consent to Establish/ Consent to Operate from the list of mandatory documents as MoEF&CC and several State Pollution Control Boards have made NOC for ground water abstraction a pre-requisite for issuance of Environmental Clearance/ CTE/ CTO.

5. ON SITE INSPECTION BY CGWB

On-site inspections were carried out by the Regional Offices of CGWB to check the compliance of NOCs accorded by CGWA before recommending the renewal applications to CGWA, New Delhi. Necessary show- cause notices were issued to the project proponents who have not complied with the conditions of the NOC issued by CGWA.

6. UPDATION OF NOCAP WEBSITE PORTAL OF CGWA

During the explicit period necessary changes have been made in the NOCAP website portal of CGWA wherein defined table for estimation of quantum of runoff available through Rain water harvesting (within premises) has been updated on NOCAP web portal thereby making the application submission process for Ground water abstraction more user friendly and accurate. Also to facilitate user while applying online in NOCAP for ground water abstraction, self declaration/non- availability of Ground water document has been uploaded on web portal in dual language vis-a-vis in Hindi and English.

7. COMPLETE ONLINE PROCESSING OF NOC APPLICATIONS

As a measure to stop offline documentation and in an effort to start paperless filing to support Digital India initiative as per Government order, no hard copy of application or any other documents are being accepted at Regional Offices w.e.f. 05/02/2020. All the documents are to be uploaded on NOCAP portal while submitting application. Applications submitted online prior to 05/02/2020 were processed only after receipt of printed form duly signed by the applicant along with all relevant enclosures at the Regional Director within seven (7) days of uploading completed application online.

13. PRADHAN MANTRI KRISHI SINCHAYI YOJNA – HAR KHET KO PAANI- GROUND WATER

Government of India envisages providing ***'Har Khet Ko Pani (HKKP)'*** with a goal of doubling the farmer incomes. A major thrust area to boost agricultural income is to provide irrigation to all the farmlands to enhance food-grain production with consequent benefits like employment generation etc. at village level. Government of India has approved *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY), a Centrally Sponsored Scheme during 2015-20, inter-alia, a component of Ground Water and creating additional irrigation potential of 2.5 lakh hectare during 2015-20.

Ground water component aims at utilizing ground water for irrigation purpose in areas where ground water is sufficiently available. Further, to enhance small and marginal farmer's income in such areas by providing assured irrigation facility under the scheme. Operational guidelines for Ground Water component were issued by the Department of Water Resources, RD & GR, Ministry of Jal Shakti, in July 2016. However, keeping in view of various requirements to implement the scheme, guidelines have been revised on 8.11.2018 and 28.05.2019.

Pradhan Mantri Krishi Sinchayi Yojna – Har Khet Ko Paani- Ground Water (PMKSY-HKKP-GW) was launched by Hon'ble Minister of Jal Shakti, Shri Gajendra Singh Shekhawat on 16.07.2019, in presence of Hon'ble Chief Minister of Assam, Sri Sarbanada Sonowal, Hon'ble Irrigation Minister of Assam, Sri Bhabesh Kalita and Secretary, DoWR, RD & GR, GOI, Sri Upendra Prasad Singh as shown below in Fig.13.1.

1. Sri Gajendra Singh Shekhawat, Hon'ble Minister of Jal Shakti, 2. Sri Sarbanada Sonawal, Hon'ble Chief Minister of Assam 3. Sri Bhabesh Kalita, Hon'ble Irrigation Minister, Assam, 4. Sri Upendra Prasad Singh, Secretary, DoWR, RD & GR, GOI 5. Sri Snajay Lohia, Principal Secretary to CM Assam

Fig.13.1 Launch of PMKSY-HKKP-GW

As per the operational guidelines the eligible assessment units/ blocks for implementation of the scheme have been selected based on the following criteria:

- Less than 60 per cent of the annual replenishable groundwater resources have been developed i.e. there is sufficient scope for further groundwater development without endangering groundwater sustainability with maximum permissible extraction level of 70% at any point of time.
- Average annual rainfall of 750 mm or more and
- Shallow groundwater levels (within15 m below ground level in last 5 years).

The beneficiary under this scheme are Small and Marginal farmers only with priority to be given to SC/ST and Women farmers and are being identified by State Governments. The scheme expects to give a boost to assured irrigation in tribal and backward areas (with abundant replenishable groundwater) of the Country, which are deprived of benefits of irrigation projects.

A large part of the target areas particularly falls in North Eastern States, Chhattisgarh, Madhya Pradesh, Odisha and Jharkhand and are occupied by tribal population. Better irrigation facilities are expected to result in improved socio-economic conditions of small and marginal farmers and may enhance food production by more than two fold in target areas. Implementation of the scheme is also expected to generate employment for skilled/unskilled personnel including ground water professionals.

Implementation of Scheme in Arunachal Pradesh & Assam

During FY 2019-20, provision of Rs. 319 crore was made towards Central Assistance (CA) for proposals of States Government under the scheme. Central Ground Water Board has recommended proposals of Rs. 1363.31 crore to DoWR, MoJS for approval and sanction of funds. Department of Water Resources, Ministry of Jal Shakti, has issued Administrative Approvals to all the proposals pertaining to the States of Assam, Arunachal Pradesh, Gujarat, Nagaland, Tripura, Mizoram, Manipur, Uttar Pradesh, Tamil Nadu, Telangana, and West Bengalfor providing assured irrigation in 1.26 lakh ha land benefitting around 1.73 lakh small and marginal farmers. During 2019-20 Rs 221.07 crore has been released to State Government towards central assistance. Since the release of funds has commenced only from August 2019, projects are under various stages of execution. State-wise details of administrative approvals issued and funds released are as below in table 13.1

Table 13.1 STATE-WISE DETAILS OF ADMINISTRATIVE APPROVALS ISSUED AND FUNDS RELEASED						
S.No	State	Total Project Command	Beneficiaries	Cost of Proposal	Central Assistance	CA released as on March 2020
		(Ha)	(Nos.)	(Rs. Crore)	(Rs. Crore)	(Rs. Crore)
1	Assam-Phase-I	19116	19643	246.07	221.07	132.87
2	Arunachal Pradesh-Phase-I	1785	992	45.3	40.77	24.46
3	Gujarat	3768	3655	163.29	98.13	6.00
4	Nagaland	667	264	18.15	16.25	9.75
5	Tripura Phase-I	339	851	13.31	11.91	7.15
6	Uttar Pradesh	34659	14847	46.6	27.83	16.69
7	Arunachal Pradesh Phase –II	1957	519	44.95	40.25	24.15
8	Tamil Nadu	610	1233	10.19	6.11	
9	Manipur	2057	1445	61.68	55.51	
10	Mizoram	553	411	16.04	14.46	
11	Telangana	22925	24000	379.49	227.7	
12	West Bengal	37840	103596	318.24	191.38	
	Total	**126276**	**171456**	**1363.31**	**951.37**	**221.07**

Ground water development for irrigation is planned in such a way that after implementation of the project, stage of Ground Water extraction should not exceed 70% at any time. Scheme includes measures to prevent over-exploitation and facilitate recharge to ground water. Suitable recharge measures are to be taken up under NRM component of MGNREGS or any other recharge scheme in the target area of the present scheme to provide sustainability to ground water. State/UT Government ensures that micro-irrigation practices are implemented in at least 30% of the proposed irrigated area in convergence with relevant scheme(s) of Central/State/UT Governments.

Implementation of Scheme in Assam, Arunachal Pradesh and Tripura

14. RAJIV GANDHI NATIONAL GROUND WATER TRAINING AND RESEARCH INSTITUTE

Rajiv Gandhi National Ground Water Training and Research Institute (RGNGWTRI)

Rajiv Gandhi National Ground Water Training and Research Institute (RGNGWTRI) located at Raipur, Chhattisgarh caters to the training requirements of Central Ground Water Board (CGWB) and also many State Govt. Organizations, Public Sector Undertakings (PSUs), Academic Institutions, NGOs etc. in the field of ground water. Since the XII Plan, RGNGWTRI under HRD and Capacity Building Scheme of Ministry of Water Resources, River Development and Ganga Rejuvenation has been implementing a three-tier training programme keeping in view the requirements of the National Aquifer Mapping Project (NAQUIM). These training courses enable creation of a trained workforce for implementation of NAQUIM and overall sustainable development of the ground water resources of the country.

HumanResourceDevelopment

It has been the earnest endeavor of CGWB to keep its technical personnel abreast of the latest developments in all aspects related to ground water development and management across the globe. Besides Officers of the Board, trainees from State Departments, PSUs, NGOs and candidates from abroad also participated in the training courses being organized by CGWB/RGNGWTRI. During the year 2019-20, a total of 109 numbers of Training Courses (46-Tier I, 19-Tier II and 39- TierIII) were conducted by RGNGWTRI in which a total of 7732 Trainees (902- Tier I, 597-Tier II and 6233- Tier-III) were imparted training including 2562 female participants.National Level training courses (Tier-I) were conducted at RGNGWTRI, Raipur. The State and Block Level training programmes (Tier-II and Tier-III) were organized by the respective Regional Offices of CGWB. The actual expenditure incurredunder HRD & CB Scheme-RGI componentfor FY 2019-20 is Rs. 1.95 Cr.

Summary details of the training programmes are given below in Table 14.1.

Table 14.1 DETAILS OF TRAINING PROGRAMMES ORGANIZED BY CGWB

Training Programmes	Total No. of Trainings Conducted	Total No. of Participants	Female participants
TIER – I (National Level)	46	902	210
TIER – II (State Level)	19	597	127
TIER – III (Block Level)	44	6233	2225
Total	**109**	**7732**	**2562**

The newly constructed building of Rajiv Gandhi National Ground Water Training & Research Institute, at Atal Nagar, Naya Raipur was inaugurated by Shri Gajendra Singh Shekhawat, Hon'ble Minister of Jal Shakti, Government of India on 25th February, 2020.

Inaugural Address Address by Shri Gajendra Singh Shekhawat, Hon'ble Minister of Jal Shakti, Government of India during the Inauguration of newly constructed RGNGWTRI Building, Naya Raipur, Chattishgarh

Few photographs of theTier – I Training Courses during 2019-20

Interaction by Sh. K.C.Naik, Chairman,CGWB and Sh. Sunil Kumar, Member (RGI), CGWB with the trainees ofILTC

Map reading and Well Inventory during ILTC Field trip to Jagdalpur Area, Chattishgarh State

Certificates distribution and Valedictory address by Sh. G.C.Pati, Chairman, CGWB during the Valedictory Function of the Training Course on 'Induction Level Training Course'

Valedictory Function of the Training Course on 'Ground Water Resource Estimations'

Lecture by Shri R. M. Khan, SP, CBI on Vigilance part of the Training Course on "Administration & Finance"

Demonstration of Artificial Recharge Structures in J. K. Laxmi Cements, Durg District, Chattishgarh as part of the Training Course on "Roof Top Rain Water Harvesting"

Group Activity – Preparation of DPR as part of the Training Course on "Roof Top Rain Water Harvesting"

Quiz and Debate Competition in Swachhata Hi Seva Plastic Mukht Abhiyan held at Pt. Ravishankar Shukla University, Raipur

15. IEC ACTIVITIES

MAJOR IEC ACTIVITIES CARRIED OUT BY CGWB IN 2019-20

Awareness Programm on Rain Water Harvesting (RWH) and Artificial Recharge (AR):

During the year 2019-20 a total 303 mass awareness programmes related to Rainwater Harvesting and Artificial recharge were carried out by CGWB across 22 states and UTs of the country. Around 36185 students had participated in these mass awareness programmes. Details of the programmes organized in different states are presented in Table 15.1 Some photographs of rain centers created in different regions of CGWB are also shownbelow.

Table 15.1 REGION WISE AWARENESS PROGRAMMES CONDUCTED ON RWH & AR during 2019-20

Name of the Region	Name of the State/UT	As on 31.03.2020	Number of students	Creation of Rain Center	RWH in office premises
NWHR, Jammu	J&K	5	349	Yes	Yes
	Laddakh				
NHR, Dharamshala	Himachal Pradesh	7	702	Yes	Yes
NWR, Chandigarh	Haryana	9	2250	Yes	Yes
	Punjab	3	392		
	Chandigarh	21	1331		
NR, Lucknow	Uttar Pradesh	5	720	Yes	No
WR, Jaipur	Rajasthan	20	2378	Yes	Yes
WCR, Ahmedabad	Gujarat	19	1489	Yes	No
	Daman & Diu			Yes	
NCR, Bhopal	Madhya Pradesh	6	730	Yes	No
CR, Nagpur	Maharashtra	18	4132	Yes	No
SR, Hyderabad	Andhra Pradesh	20	2675	Yes	Yes
	Telangana				
SWR, Bangalore	Karnataka	19	2131	Yes	Yes
	Goa				
SECR, Chennai	Pudducherry	20	2095	Yes	Yes
	Tamilnadu				
KR, Trivandrum	Kerala	21	2347	Yes	No
NCCR, Raipur	Chhattisgarh	22	1752	Yes	
SER, Bhuwaneshwar	Odisha	11	1173	Yes	Yes
ER, Kolkata	West Bengal	20	1993	Yes	Yes
	Sikkim				
	A&N				
MER, Patna	Bihar	19	2558	Yes	No
	Jharkhand				
NER, Guwahati	Assam	20	1188	Yes	Yes
	Tripura				
	Meghalaya				
	Nagaland				
	Arunachal Pradesh				
	Manipur				
	Mizoram				
UR, Dehradun	Uttrakhand	10	3160	Yes	No
SUO, Delhi	Delhi	3	215	Yes	No
CHQ, Faridabad	Faridabad	5	425	Yes	Yes
	Total	**303**	**36185**		

Glimpses of School Awareness Programmes by CGWB, NR Officers during February 2020

16. PUBLIC INTERACTION PROGRAMME (PIP)

Facilitating Public Interaction on Aquifer Maps and Management Plans

Aquifer maps and Management plans being prepared by CGWB are shared with the State Agencies for implementation. Implementation of the management plans by the State agencies is expected to improve the groundwater situation by de-stressing the aquifers. However, there is need to facilitate interaction among stake holders including communities on the Aquifer maps and management plans for greater public participation. Public Interaction Programmes, including water budgeting sessions and aquifer specific interventions, are to be organized in association with Krishi Vigyan Kendra's (KVK's), Panchayats etc. in areas for which aquifer management plans have been shared with the State Agencies. The programmes are proposed to be carried out during 2017-20 with representation from Panchayats, block and district level administrations, NGOs, farmers, health and sanitation workers and other stake holders. One national level interaction programme is also proposed for various stakeholders.

In the year 2019-20, a total of 399 PIPs were organized through Regional offices of the board in different states. A total of 38997, including 15834 females, participated in the program. State wise break up of the PIP's organized in AAP 2019-20 is mentioned below in table 16.1.

Table 16.1: Status of Public Interaction Programme's (PIP) in AAP 2019-20

	State	Total number of PIPs conducted (till March 2020)	Total number of participants (since April 2019)	No. of Female Participants (since April 2019)
1	Andhra Pradesh	11	447	81
2	Assam	28	1402	550
3	Chattisgarh	28	3040	1514
4	Gujarat	14	1559	426
5	Himachal Pradesh	20	2023	1089
6	Jharkhand	14	1555	828
7	Karnataka	10	1041	442
8	Kerala	22	2317	1730
9	Madhya Pradesh	23	2805	512
10	Maharashtra	22	2449	753
11	Mizoram	-	-	-
12	Odisha	29	3330	1402
13	Punjab	5	2194	1014
14	Rajasthan	-	-	-
15	Sikkim	1	80	31
16	SUO- Delhi	1	46	16
17	Tamil Nadu	30	3744	2400
18	Telangana	35	856	454
19	Uttar Pradesh	26	2931	
20	Uttarakhand	0	0	0
21	West Bengal	30	2707	740
	Total	**399**	**38997**	**15834**

Public Interaction Program at Mandwadi village, Rajpur block, Distt Barwani, Madhva Pradesh state on 19.11.2019

Public Interaction Program at Raikhed village, Pansemal block, Distt Barwani, Madhya Pradesh State- 70 school children also participated along with other participants.

17. COLLABORATIVE STUDIES

For value addition to the Aquifer Mapping Programme, Central Ground Water Board has embarked upon collaborative studies with some of the leading research/academic institutions of National importance and other related Central departments.

- An MoU has been signed between Central Ground Water Board (CGWB), Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti, Government of India and MARVI partners (Western Sydney University, Australia; CSIRO Land and Water, Australia; Arid Communities and Technologies, Bhuj, Gujarat; Development Support Centre, Ahmedabad; Maharana Pratap University of Agriculture and Tecchnology, Udaipur; Vidya Bhawan Krishi Vigyan Kendra, Udaipur, Rajasthan) on 22.11.2019 (Fig 18.1).
- **Salient features of MoU**
  - Cooperation in training, education and research to achieve water security for agriculture, urban, industrial and environmental purposes.
  - Development of grassroots and village level capacity building and support for ground water monitoring, management to improve livelihood of village communities in India.

Photographs during signing of Memorandum of Understanding (MoU) between CGWB and MARVI Partners at Dr Ambedkar International Centre, New Delhi on 22.11.2019

- A tripartite agreement has been signed between CGWB, NMCG and CSIR-NGRI on 14th February 2020 for data generation through heliborne geophysical studies and other scientific investigations for Aquifer Mapping in ~ 8500 km^2 area falling in Ganga Yamuna doab region in Kanpur and Kaushambi districts of Uttar Pradesh.

  The objectives of the study are
  (i) Tracing the extension of the paleochannel inferred in an earlier study in Ganga Yamuna doab region carried out in parts of Prayagraj and Kausambi
  (ii) 3D Mapping of the Principal Aquifer System
  (iii) Establishing linkages between aquifer system including paleochannels with the river system
  (iv) Locating suitable sites for development of a plan for Managed Aquifer Recharge

- An MoU has been signed between CGWB and the National Centre for Earth Science Studies (NCESS) Thiruvananthapuram, Minsitry of Earth Sciences, Govt of India on 24/4/2019 with a tenure of two years to study the Submarine Ground Water Discharge (SGD) zones along the Indian subcontinent and its islands. The study aims at (i) identification of submarine groundwater discharge and salt water intrusion along the east and west coast of India upto 50 m depth and computation of SGD flux for carbon and nutrient load and (ii) Assessment of site-specific societal and environmental implications of SGD.

- **CGWB** has undertaken collaborative study with **National Remote Sensing Centre, Hyderabad on "Joint use of Geospatial Technology in Aquifer Mapping and Management"**to includes Satellite data interpretation and capacity building of officers from CGWB and MDWS on application of space technology in groundwater management, use of geospatial and other data. Under the collaborative project, NRSC has provided the GIS layers for Lithgeom, geology & structure to CGWB for the priority States which are being used for Aquifer Mapping. Besides, one training Programme has also been conducted by NRSC for capacity building of officers from CGWB. A pilot area in Madhugiri Taluk of Karnataka Districts has been taken up for detailed study as a part of this collaboration.

- **CGWB** has collaborative study with **Geological Survey of India, Ministry of Mines, Government of India on Sharing of 1:50,000 Scale Geological Map Data, Hydrogeological Maps for National Project on Aquifer Management."** The objective of the collaboration includes sharing of available 1:50,000 Scale map data (comprising of Lithological and structure layers), Ground water quality and aquifer mapping data generated out of NAQUIM with GSI.

18. SEMINARS AND WORKSHOPS

Seminar / Workshop Organized

- Ms. Anu Radha Bhatia, SHG, CGWB, CR, Nagpur attended the Foundation Day Programme of India Institute of Geomagnetism (IIG) at Panvel, Raigad district, Maharashtra on 01.04.2019. Sri. K.C.Naik, Chairman, CGWB was the Chief Guest of the function.
- Shri Amlanjyoti Kar, Suptdg HG, CGWB ER Kolkata attended the Workshop on 27.05.2019 at Anna University, Chennai organized jointly by NCESS, Trivandrum and Anna University. Sh. Kar delivered a lecture on the work done by CGWB in Andaman & Nicobar Islands & West Bengal coast. The workshop was also attended by experts from SAC, NRSA, NCESS, Anna University, NIH, CGWB SECR, Chennai and other universities of Tamil Nadu.
- On 29th May, 2019 officers from North-Eastern Regional office attended State-level workshop on: "**Springshed Management in The North-Eastern States of the Indian Himalayan Region**" organised by Advanced Centre for Water Resources Development And Management (ACWADAM), Pune with Land Resource Development, Govt. of Nagaland at New Secretariat Road, Kohima, Nagaland.
- Shri Tapan Chakraborty, Scientist-D, CGWB SUO, Shillong had attended the foundation day of NABARD and delivered one lecture on "**Aquifer Management Plan in East Khasi Hills District, Meghalaya**" on 12/07/2019.
- CGWB, NR, Lucknow organised an awareness program on '**Water Quality & Health**' for about **40 students** of Government Girls Inter College, Gomti Nagar, Lucknow on **25.07.2019** in association with **Prithvi Innovations**, an **NGO**. The students were educated about the effect of water quality on human health and they visited the Regional Chemical Laboratory, CGWB, NR where they were introduced to the functioning of various Chemical Equipment and analytical procedures.

- A presentation on ''Ground Water Scenario of Bihar'' was delivered by Dr. S. K. Samanta, Suptdg. Hg, CGWB MER Patna in "**Consultation Workshop on Water Crisis"**organized by BSDMA (Bihar State Disaster Management Authority) on 26.06.19.
- As a Guest Faculty, Ms. Anuradha Bhatia, Sc-D CGWB, CR, Nagpur delivered a lecture on *Jal Shakti Abhiyan*, in an **Orientation programme for Song, dance-drama troupe,**

registered with Regional Outreach Bureau, Ministry of Information & Broadcasting, Pune on 01.08.2019.

- Sh. J. Sivaramakrishnan, Scientist 'B', CGWB SWR Bangalore, imparted **Capacity building training of NRM works using Geo spatial technologies** on Selection of artificial recharge sites and type of structures to be constructed to 120 Taluk/District level officers from MNREGA, Govt. of Karnataka at RTTC, Mysore on 12-09-2019.
- A one-day introductory workshop on Automation *of* **Estimation of Dynamic Ground Water Resources using GEC-2015 Methodology**was held at IIT-Hyderabad on 17-09-2019. Officers from all the regional offices of CGWB had attended the workshop.
- Dr. K R Sooryanarayana, HOO, CGWB KR Trivandrum presented a paper on **'Ground Water Development in Kerala Retrospects and Prospects'** during a two day National Seminar on "**Kerala's Water Woes-Challenges and Mitigation**"organised by Institute of Engineers–India(Kerala Chapter) at Thiruvananthapuram on 19.09.2019.
- Shri A.K. Agrawal, Regional Director, CGWB MER Patna attended one day workshop organised by Central Water Commission on its 75th Anniversary at Patna on 20.09.2019 on **"River Help and Water Quality"** as Guest of Honour in inaugural session. He presented a paper on "Fluoride contamination in Munger, Jamui and Lakhisarai district with special reference on Khaira village." Other officers who attended the workshop were Dr. Indranil Roy, Sr. HG and Sri Sudama Upadhyay, Sc-D.
- Dr. P.K. Jain, Regional Director CGWB, CR, Nagpur delivered an expert talk on **"Water Conservation and Artificial Recharge"** in the **11th Agrovision workshop** on 22nd November 2019 at Reshimbagh Grounds, Nagpur. Dr. Jain also shared the dais with the Hon'ble Minister Shri. Nitin Gadkari during the inaugural session of the programme.

- A Workshop **on Ground Water Resources, Water Conservation and its Management** was organised by NWR, Chandigarh in association with Haryana Waqf Board, at Mewat Engineering Collage, Nuh, Haryana on dated 03.12.2019 where 90 participants (Farmers, Students, NGOs, State Govt. Officers etc.) had participated. Sh. Anoop Nagar Regional Director delivered a lecture on "Ground Water Conservation and its Management in Haryana State."
- Sh. P K Jain, HOO and Dr. Seraj Khan, Sc D, CGWB NCR Bhopal attended the workshop reg. **Indo-German project on Water Security & Climate adaptation in Rural India** organized by Ministry of Rural Development, Govt of India, Department of Rural Development, Madhya Pradesh and GIZ on 04.12.2019.
- Shri P K Tripathi, Scientist D, CGWB NR Lucknow attended **4th India Water Impact Summit, IWIS 2019** organized by NMCG and Centre for Ganga River Basin

Management and Studies (cGanga) at Vigyan Bhawn, New Delhi during **05.12.2019-07.12.2019**

- A **Workshop on Atal Bhujal Yojana (ABHY)** was organized on 12th February 2020 at CWC Conference hall, Sewa Bhawan, RK Puram, New Delhi to discuss the preparatory activities, program guidelines, comments/suggestions and the way ahead for implementation of ABHY.
- Dr. A. Subburaj, HOO, CGWB SWR Bangalore, attended **Workshop on State Specific Action Plan (SSAP) on water"Towards water security, safety and sustainable 2050 for Karnataka State"** on 20-12-2019 at Bangalore by Water Resources Department Government Of Karnataka in collaboration with ACIWRM , to finalise the draftreport prepared as per the templates provided from National WaterMission.
- Dr VS Joji, Sc- D, CGWB KR Trivandrum delivered a lecture on Govt measure to control water depletion & promote Rain water harvesting for the executives of Agriculture department of UP and other states conducted by Great Noida Productivity council on 21st February at Poovar, Thiruvananthapuram
- Sh. Ravikalyan Bussa, Scientist-C, CGWB UR Dehradun, delivered lecture on **Groundwater Scenario of Uttarakhand and Local Groundwater Issues** at Uttarakhand state Science Education and Research Centre (USERC), Dehradun during the celebration of Science Day on "**Women in Science**" on 28/02/2020.
- Dr. D. Gnanasundar, Scientist-D, CGWB SECR Chennai was nominated in respect of CGWB to the newly constituted committee of the BIS on Coastal Zone Water Management (WRD 28). Dr. D. Gnanasundar, Scientist-D participated in the Seminar on "**Coastal Zone Water Management**" held at Goa on 13th March 2020 and delivered a lecture on the topic "**Ground Water Management in Coastal Zones/Aquifers of India**".

19. TECHNICAL DOCUMENTATION AND PUBLICATION

Results of investigations carried out by the Central Ground Water Board are suitably documented in the form of reports. All the Regional offices of the Board have Report Processing Section which is responsible for the scrutiny and issuance of reports of various assignments carried out by the officers in concerned regional office.

REPORTS

Details of various types of technical reports issued by respective regional offices of the Board are as follows:

STATE GROUND WATER REPORT

State Reports containing complete details of ground water surveys, exploration and other ground water related information are prepared to understand the status of ground water development in the State. Based upon the reports, ground water development perspectives are worked out and future strategies are planned. During 2019-20, 09State reports (Delhi, Madhya Pradesh, Himachal Pradesh, Gujarat, Daman & Diu (UT), Kerala, Tamil Nadu, Andhra Pradesh and Goa) have been issued.

DISTRICT BROCHURES

The Central Ground Water Board also preparesDistrict Ground Water Brochures for each district containing information collected during ground water surveys, exploration and other related studies. Further, ground water development perspectives are also worked out at district level for the benefit of user agencies. The brocuhres have been found very useful by the stakeholder sectors for planning strategies for future ground water development project at State level. During 2019-20, 115district brochures were issued.

GROUND WATER YEAR BOOK

The Central Ground Water Board compiles ground water year books to elucidate the changes in ground water levels and water quality. The accurate monitoring of the ground water levels and its quality both in space and time are the main requisite for assessment, scientific development and planning of this vital resource. During 2019-20, 23year bookswere prepared. Region wise status of preparation of ground water year book isindicatedin table 20.1.

Table 19.1 Status of Ground Water Year Books completed during 2019-20

Sl. No	Region	State's/ UT's	No.ofGround Water Year Book prepared
1.	North West Himalayan Region	Jammu & Kashmir	1
2.	North Himalayan Region	Himachal Pradesh	1
3.	North Western Region	Punjab&Haryana	2
4.	Western Region	Rajasthan	1
5.	State Unit Office	Delhi	1
6.	West Central Region	Gujarat	1
7.	North Central Region	Madhya Pradesh	1
8.	Central Region	Maharashtra	1
9.	Mid Eastern Region	Bihar& Jharkhand	3
10.	Eastern Region	West Bengal	1
11.	North Eastern Region	North Eastern States	1
12.	South Eastern Region	Odisha	1
13.	Southern Region	Andhra Pradesh&Telengana	2
14.	South Western Region	Karnataka	2
15.	South Eastern Coastal Region	Tamilnadu	1
16.	Kerala Region	Kerala	1
17.	Northern Region	Uttar Pradesh	1
18.	Uttaranchal Region	Uttarakhand	1
	Total		**23**

PUBLICATIONS

- Dr. K R Sooryanarayana, HOO et.al presented a paper on **'Ground Water Development in Kerala Retrospects and Prospects'** during the two day National Seminar on "Kerala's Water Woes – Challenges and Mitigation" organised by Institute of Engineers – India(Kerala Chapter) at Thiruvananthapuram on 19th September 2019
- Ms. PournimaBarahate, Sc-B presented a paper on "Delineation of Aquifer in Washim District, Maharashtra" in National seminar on "Challenges in Ground Water and Surface water Resources in India" on 28-11-2019 at VANAMATI, Nagpur.
- Shri. P. Narendra, Sc-D (GP) presented a paper on " Integrated Hydrogeological and Geophysical Approach for delineating GW potential zones, Narkhad Taluka, Maharashtra" in National seminar on "Challenges in Ground Water and Surface water Resources in India" on 29-11-2019 at VANAMATI, Nagpur.
- Dr. P. K. Naik, Head of Office, RGI delivered a Key-note address on "Ground Water Scenario of India" at NIT, Raipur on 27.01.2020 in the workshop on "Application of remote Sensing, GIS and Electricical Resistivity Techniques in Groundwater Investigation"

- 9 Extended abstracts have been published in the proceedings of 2nd International Groundwater Conference (INGWC), held at CWRDM, Kozhikode during 17-20th Feb 2020
- Excerpts from the Karanth Endowment lecture " Status of Groundwater Governance in India: Challenges and Constraints with Case Studies" – V. Kunhambu, Regional Director, Central Ground Water Board, SWR, Bengaluru published in Journal of Geological Society of India, Vol 95, February 2020

20. INFRASTRUCTURE DEVELOPMENT

Infrastructure Development Scheme (IDS) viz. Land & Building (CGWB) has been approved with an outlay of Rs. 17.81 Crore for the period of FY 2019-20. The objective of the scheme is to provide better working environment in the officers, creation of assets and savings on payment of monthly rent.

To achieve this objective, construction work of offices, workshops and stores of various CGWB offices (7 nos.) has been undertaken. The details of these works are as indicated below.

1. Construction of Regional and Divisional office, workshop and store at **Guwahati**.
2. Construction of boundary wall and Building for RGI training institute at **Raipur**.
3. Construction of boundary wall, guard room for Divisional Workshop & Store at **Chennai**.
4. Construction of Regional and Divisional office building at **Ahmedabad**.
5. Construction of Building for Divisional, Workshop & Store Division-II at **Ambala**.
6. Construction of boundary wall, guard room for Divisional, Workshop & Store at **Jodhpur**.

During the financial year 2019-20, an amount of Rs.1780.84 Lakhs was allocated / sanctioned under lD Scheme. The financial progress up to 31.12.2019 is as under:

S. No.	Name of the office	Nature of Work	Funds released (Rs. In Lakh)
1	NER, Guwahati	Construction of Regional and Divisional office building at Guwahati. (Civil / Electrical)	35.98
2	RGI, Raipur	Construction of training Institute at RGI, Raipur	1474.50
3	Div-IV, Chennai	Construction of boundary wall, guard room at Chennai	15.00
4	WCR, Ahmedabad	Construction of Regional and Divisional office building at Ahmedabad	6.86
5	Div-II, Ambala	Construction of Divisional office building at Ambala	187.37
6	Div-XI, Jodhpur	Construction of boundary wall, guard room at Jodhpur	61.13
		TOTAL	1780.84

Status of construction work undertaken

- The construction of **Guwahati** office building is under progress and likely to be completed in the FY 2020-21.

- The **Construction of** RGI training institute building is under progress and likely to be completed in the FY 2020-21.
- The construction of boundary wall, guard room for Divisional workshop & store at **Chennai** has been completed.
- The Construction of Regional & Divisional office at **Ahmedabad** is under progress. The construction is likely to be completed during FY 2021-22.
- The Construction of Divisional office at **Ambala** is under progress. The construction is likely to be completed during FY 2021-22.
- The construction of boundary wall, guard room for Divisional workshop & store at **Jodhpur** is under progress and likely to be completed in the financial year 2020-21.

The action to handover the land to NPCC Ltd. for construction of Divisional office, workshop & Store building at **Jammu** is under progress. The construction is likely to be completed during FY 2021-22.

21. राजभाषा हिन्दी का प्रसार और प्रगामी उपयोग

- केंद्रीय भूमि जल बोर्ड और इस के सभी अधीनस्थ क्षेत्रीय, प्रभागीय और राज्य के कार्यालयों में वर्ष 2019-20 के दौरान राज भाषा हिन्दी के कार्यान्वयन और प्रचार प्रसार के सक्रिय प्रयास जारी रखे गए। केंद्रीय भूमि जल बोर्ड राजभाषा हिंदी के प्रगामी प्रयोग व कार्यान्वयन के लिए प्रतिबद्ध है। राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम के अनुसार निर्धारित लक्ष्य को प्राप्त करने के लिए बोर्ड सतत प्रयत्नशील है। राजभाषा विभाग, गृह मंत्रालय, जल शक्ति मंत्रालय और नगर राजभाषा कार्यान्वयन समिति से समय –समय पर प्राप्त अनुदेशों और दिशानिर्देशों के पूर्ण अनुपालन सुनिश्चित करने तथा संघ की राजभाषा नीति के प्रावधानों के कार्यान्वयन और वार्षिक कार्यक्रम में निर्धारित लक्ष्यों को प्राप्त करने के उद्देश्य से सभी अधीनस्थ कार्यालयों और मुख्यालय के सभी अनुभागों को इससे अवगत कराया गया।

- सरकारी कामकाज में हिंदी के प्रयोग को बढ़ाने के लिए नियमित रूप से विभिन्न परिपत्र, आदेश और अपील जारी किए गए। कार्यालय में हिन्दी में टिप्पण और आलेखन को बढ़ावा देने के उद्देश्य से राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम 2019-20 की प्रति, द्विभाषी मानक मसौदे, प्रशासनिक शब्दावली आदि सभी अधिकारियों और कर्मचारियों को उपलब्ध कराये गए। सभी कम्प्यूटरों पर हिन्दी में काम करने की सुविधा प्रदान करने हेतु यूनिकोड सुविधा उपलब्ध कराई गयी।

- राजभाषा हिन्दी के प्रभावी प्रचार – प्रसार और कुशल कार्यान्वयन के लिए राजभाषा विभाग, गृह मंत्रालय द्वारा जारी समस्त प्रोत्साहन योजनाओं यथामूल रूप से हिन्दी में टिप्पण – आलेखन, श्रुतलेखन, हिन्दी में टंकण आदि योजनाओं को कार्यालय में लागू किया गया है तथा अधिक से अधिक अधिकारी और कर्मचारी उत्साहपूर्वक इन योजनाओं में भाग ले रहे हैं।

- केंद्रीय भूमि जल बोर्ड की वेबसाइट को द्विभाषी रूप में तैयार किया गया है। राजभाषा से संबन्धित विभिन्न गतिविधियों और महत्वपूर्ण उपलब्धियों को इसमे विशेष स्थान दिया जाता है।

- राजभाषा हिन्दी के प्रभावी कार्यान्वयन और इस की प्रगति की मॉनिटरिंग के लिए बोर्ड और इस के समस्त अधीनस्थ कार्यालयों में राजभाषा कार्यान्वयन समिति का गठन किया गया है। इस समिति की बैठकें नियमित रूप से प्रत्येक तिमाही में आयोजित की जाती हैं। इन बैठकों में राजभाषा विभाग, गृह मंत्रालय द्वारा जारी वार्षिक कार्यक्रम में निर्धारित लक्ष्यों की प्राप्ति हेतु विभिन्न मुद्दों पर विचार-विमर्श द्वारा कार्यनीति तैयार की जाती है। इन बैठकों में लिए गए निर्णयों पर प्राथमिकता के आधार पर अनुवर्ती कार्रवाई की जाती है।

- गृह मंत्रालय द्वरा जारी दिशा निर्देश के अनुसार सितंबर माह में दिनांक 14.9.2019 से 28.9.2019 के दौरान बोर्ड और इसके समस्त अधीनस्थ कार्यालयों में हिन्दी दिवस, हिन्दी सप्ताह,

हिन्दी पखवाड़ा, हिन् माह का आयोजन किया गया।इस दौरान अधिकारियों और कर्मचारियों के लिए कई प्रतियोगिताओं जैसे हिन्दी निबंध प्रतियोगिता,टिप्पण-आलेखन,टंकण,वाद-विवाद ,प्रश्नमंच आदि का आयोजन किया गया। सभी अधिकारियों और कर्मचारियों ने इन प्रतियोगिताओं में बढ़-चढ़ कर भाग लिया।

- भारत सरकार की राजभाषा नीति के अनुसरण में राजभाषा अधिनियम, 1963की धारा3(3) के तहत सभी दस्तावेज हिंदी और अंग्रेजी दोनों में तैयार किए जाते हैं। राजभाषा नियम, 1976 के नियम 5 के तहत हिन्दी में प्राप्त सभी पत्रों के उत्तर अनिवार्य रूप से हिन्दी में ही दिये जा रहे हैं। वार्षिक कार्यक्रम में निर्धारित लक्ष्यों को ध्यान में रखते हुए कार्यालय में जांच बिन्दु स्थापित किए गए हैं, ताकि इस दिशा में किए जा रहे कार्यों की मॉनिटरिंग की जा सके।

- जल शक्ति मंत्रालय के संबंद्ध एवं अधीनस्थ कार्यालयों के मध्यराज भाषा हिन्दी के प्रति सकारात्मक वातावरण के सृजन के उद्देश्य से मंत्रालय द्वारा राज भाषा वैजयंती पुरस्कार योजना लागू की गई है। जल शक्ति मंत्रालय द्वारा राज भाषा के क्षेत्र में उत्कृष्ट कार्य करने के लिए केंद्रीय भूमि जल बोर्ड को इस वर्ष राजभाषा वैजयंती पुरस्कार प्रदान किया गया। मंत्रालय द्वारा आयोजित एक भव्य समारोह में अध्यक्ष, केंद्रीय भूमि जल बोर्ड को शील्ड और प्रशस्ति पत्र से सम्मानित किया गया।

- राजभाषा विभाग, गृह मंत्रालय द्वारा समयसमय पर जारी दिशा निर्देशों के अनुपालन में केंद्रीय भूमि जल बोर्ड, मुख्यालय और इसके अधीनस्थ कार्यालयों में नियमित रूप से प्रत्येक तिमाही मे हिन्दी कार्यशालाओं का आयोजन किया जा रहा है।

- केंद्रीय भूमि जल बोर्ड, मुख्यालय फ़रीदाबाद में समृद्ध पुस्तकालय है। इस पुस्तकालय में वैज्ञानिक एवं तकनीकी मानक ग्रन्थों, जर्नल आदि के अतिरिक्त प्रशासनिक और अन्य विषयों पर प्रचुर पठनीय साहित्य उपलब्ध है। पुस्तकालय में हिन्दी पुस्तकों की खरीद वार्षिक कार्य क्रम में निर्धारित लक्ष्यों के अनुसार की जा रही है।

- माननीय संसदीय राज भाषा समिति की दूसरी उपसमिति द्वारा दिनांक16.01.2020 को केंद्रीय भूमि जल बोर्ड,दक्षिण पूर्वी तटीय क्षेत्र, चेन्नई कार्यालय का राजभाषायी निरीक्षण किया गया। समिति द्वारा कार्यालय में राजभाषा के प्रचार-प्रसार और इस के कार्यान्वयन की दिशा में किए जा रहे कार्यों पर संतोष प्रकट किया गया।

- केंद्रीय भूमि जल बोर्ड हिंदी के प्रगामी प्रयोग वकार्यान्वयन के लिए प्रतिबद्ध है। राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम के अनुसार निर्धारित लक्ष्न को प्राप्त करने के लिए बोर्ड सतत प्रयत्नी शील है।

22. VIGILANCE

Information for Annual Report 2019-20, for the period from 1.4.2019 to 31.3.2020, pertaining to Vigilance Section is given as under:

12 Complaints were brought forward w.e.f. 1.4.2019 and 8 new complaint cases were received during the period. Out of these (12+8) 20 complaints, 3 were closed and 1 complaint was taken up to initiate disciplinary proceedings. Therefore, 16 complaint cases carried forward to next year.

5 cases of disciplinary proceedings were B/F w.e.f. 1.4.2018 and 1 new case of disciplinary proceeding was received during the year. Out of these (5+1) 6 cases 1 case was disposed off. Thus total 5 cases of disciplinary proceedings carried forward to next year.

23. RTI

The opening balance of RTI applications as on 01.04.2019 was 86 requests and 9 appeals. During the year 2019-20, 287 RTI requests and 34 appeals were received. Number of cases which were transferred to other public authorities is 3. Total RTI requests and RTI appeals disposed of were 373 and 43 respectively. An amount of Rs. 1040/- was received towards application fee. Details are given in table 24.1.

Table 23.1 STATUS OF RTI APPLICATIONSFOR YEAR 2019-20

Opening balance as on 01.04.2019	Received during the year (including cases transferred form other public authorities)	No. of cases transferred to other public authorities	Decisions where requests/ appeals rejected	Decisions where requests /appeals accepted	Amount of charges collected in Rs.
Requests -86	Requests-287	Requests-03	Requests-0	Requests-373	Total amount
Appeals-9	Appeals-34	Appeals -0	Appeals-0	Appeals-43	1040/-

24. HUMAN RESOURCE

The Board has been taking necessary action for implementation of Government polices in regard to reservation in services and other benefits to Scheduled Casts, Scheduled Tribes, other Backward Classes, Ex- Servicemen and Handicapped persons. Efforts have been taken to address the gender related issues. Besides constituting Internal Complaints Committees in each offices to look into the complaints of Women employees, opportunities have also been given to them to directly meet the Chairman, CGWB and Director(Admn.) and other senior officers for presenting any sort of complains either related to service matters of other nature of complaints. Internal Complaints Committees also visited several offices to hear the complaints of women employees and appropriate actions have been taken based on their reports.

.The Sanctioned strength,filled up and vacancy position(category–wise) of personnel deployed in the Board are presented in table 25.1.

Table 25.1 Personnel Deployment in Central Ground Water Board during the year-2019-20 (1st April, 2019 to 31st March, 2020)

GROUP"A"							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	406	297	109	52	02	55	17
Ministerial	08	04	04	00	00	00	00
Engineering	56	36	20	10	00	05	05
Total	**470**	**337**	**133**	**62**	**02**	**60**	**22**
GROUP "B"(Gazetted)							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	218	120	98	29	01	22	11
Ministerial	44	31	13	00	01	03	05
Engineering	89	75	14	08	00	21	09
Total	**351**	**226**	**125**	**37**	**02**	**46**	**25**
GROUP "B"(Non-Gazetted)							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	179	89	90	14	00	14	06
Ministerial	190	150	40	12	06	25	10
Engineering	265	160	105	15	02	36	27
Total	**634**	**399**	**235**	**41**	**08**	**75**	**43**
GROUP "C"							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	77	32	45	05	00	08	03
Ministerial	1025	710	315	148	08	154	69
Engineering	1458	1056	402	195	02	230	86
Total	**2560**	**1798**	**762**	**348**	**10**	**392**	**158**
Grand Total							
Groups	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
GROUP"A"	470	337	133	62	02	60	22
GROUP "B"(Gazetted)	351	226	125	37	02	46	25
GROUP "B"(Non-Gazetted)	634	399	235	41	08	75	43
GROUP "C"	2560	1798	762	348	10	392	158
Total	**4015**	**2760**	**1255**	**488**	**22**	**573**	**248**

25. BUDGET AND EXPENDITURE

Statement showing Budget Estimates & actual expenditure incurred by the CGWB during F.Y. 2019-20 under Ground Water Management & Regulation, Establishment Expenditure, TSP, RGI, Recovery & Infrastructure Development Schemes are shown in table 26.1.

Demand No. 60 PLAN (GWM & R)							
2702 (REVENUE)							
Major Head: 2702-MINOR IRRI-02-005-GROUND WATER INVESTIGATION							
Sub Head: 16-GROUND WATER MANAGEMENT & REGULATION –01 (Ext.)02(Dom.)							
Monthly Expenditure For the Month of March Supplimentry, 2020							
इकाई का कोड/नाम Unit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
1	2	3	4	5	7	8	9
16.02 Dom.Supp.(GWM&R) PLAN							
समयोपरिभत्ता 16.02.03 OTA	5.00	0.50	0.50	0.00	0.00	0.00	5.00
चिकित्सा 16.02.06 M/Treat.	320.00	180.00	180.00	180.28	0.12	180.40	139.60
यात्राव्यय 16.02.11 D.T.E.	1840.00	2100.00	2100.00	2058.32	-1.20	2057.12	-217.12
विदेशयात्रा व्यय 16.02.12 F.T.E.	50.00	55.00	55.00	51.56	0.00	51.56	-1.56
कार्यालयव्यय 16.02.13 O.E.	1495.00	1500.00	1500.00	1408.70	-4.11	1404.59	90.41
किराया, दर एवं कर 16.02.14 R.R.T.	450.00	450.00	450.00	375.56	5.08	380.64	69.36
प्रकाशन 16.02.16 Pub.	100.00	25.00	25.00	8.13	0.01	8.14	91.86
16.02.20 O.A.E.	50.00	100.00	100.00	53.22	-5.90	47.32	2.68
16.02.24 P.O.L.	1532.00	1432.00	1432.00	1356.47	-6.14	1350.33	181.67
16.02.27 Min/Works	300.00	275.00	275.00	228.03	0.00	228.03	71.97
वृत्तिकसेवाएँ 16.02.28 P.S.	200.00	100.00	100.00	83.66	0.31	83.97	116.03
16.02.30 Other Contractual Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.02.33 Subsidies	5.00	0.50	0.50	0.03	0.00	0.03	4.97
उचंतस्टाक 16.02.43 S/Stock	1150.00	1227.00	1150.00	1173.71	-9.22	1164.49	-14.49
अन्यप्रभार 16.02.50 O. C.	50.00	30.00	30.00	22.71	0.00	22.71	27.29
16.02.64 W.O.L.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Dom Support (PLAN)GWM&R	**7547.00**	**7475.00**	**7398.00**	**7000.38**	**-21.05**	**6979.33**	**567.67**
PLAN (GWM & R)							

Major Head: 4702-MINOR IRRI-02-005-Capital Nature Expenditure (GWM & R)							
Sub Head: 06.01-GROUND WATER MANAGEMENT & REGULATION							
4702.00.800.06 (Capital Nature Expenditure) GWM & R Dom. Supp. PLAN							
1	2	3	4	5	6	7	8
06.01.51 M.V.	500.00	265.00	265.00	268.02	-0.16	267.86	232.14
06.01.52 M & E मशीनरी एवं उपस्कर	3500.00	2600.00	2600.00	2558.08	0.16	2558.24	941.76
06.01.53 M/Works मुख्य कार्य	13953.00	14900.00	14900.00	14841.64	0.00	14841.64	-888.64
Total Capital Nature Expenditure	**17953.00**	**17765.00**	**17765.00**	**17667.74**	**0.00**	**17667.74**	**285.26**
Grant Total (Revenue + Capital)	**25500.00**	**25240.00**	**25163.00**	**24668.12**	**-21.05**	**24647.07**	**852.93**

							Tribal Sub Plan
Demand No. 60							**01.796 (REVENUE)**
Major Head: 01.796 Tribal Sub Plan (Rewvnue)MINOR IRRI-00-445-GROUND WATER INVESTIGATION							
Sub Head: 16-GROUND WATER MANAGEMENT & REGULATION –02.01 (Ext.)02(Dom.)							
Monthly Expenditure For the Month of March Supplimentry, 2020							**(Fig.in lacs)**
इकाई का कोड/नाम Unit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
1	2	3	4	5	6	7	8
02.01 Dom.Supp.(GWM&R) PLAN							
चिकित्सा 16.02.06 M/Treat.	30.00	20.00	20.00	19.52	-0.01	19.51	10.49
यात्राव्यय 16.02.11 D.T.E.	160.00	200.00	200.00	191.63	-1.25	190.38	-30.38
विदेशयात्रा व्यय 02.01.12 F.T.E.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
कार्यालयव्यय 16.02.13 O.E.	130.00	125.00	125.00	114.26	-0.09	114.17	15.83
किराया, दर एवं कर 16.02.14 R.R.T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
प्रकाशन 16.02.16 Pub.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.02.20 O.A.E.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.02.24 P.O.L.	133.00	133.00	133.00	67.00	-0.06	66.94	66.06
16.02.27 Min/Works	0.00	0.00	0.00	0.00	0.00	0.00	0.00
वृत्तिकसेवाएँ 16.02.28 P.S.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16.02.30 Other Contractual Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00

उचंतस्टाक 16.02.43 S/Stock	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Dom Support (PLAN)	**453.00**	**478.00**	**478.00**	**392.41**	**-1.41**	**391.00**	**62.00**
Total Revenue (GWMR + TSP)	**8000.00**	**7953.00**	**7876.00**	**7392.79**	**-22.46**	**7370.33**	**629.67**

							00.796- CAPITAL
Monthly Expenditure For the Month of March Supplimentry, 2020							
Demand No. 60							**Tribal Sub Plan**
Major Head:00.796-Tribal Sub Plan CAPITAL OUTLAY-00.112 GROUND WATER (M.I.)							
Sub Head: 01.01-Tribal Sub Plan (Capital)							
00.796- CAPITAL							
1	**2**			3		5	6
01.01.51 मोटर वाहन Motor Vehicle	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01.01.52 M & E मशीनरी एवं उपस्कर	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01.01.53 M/Works मुख्य कार्य	1547.00	100.00	100.00	95.12	0.29	95.41	1451.59
Total: 00.796- CAPITAL	**1547.00**	**100.00**	**100.00**	**95.12**	**0.29**	**95.41**	**1451.59**
Total CAPITAL (GWMR + TSP)	**19500.00**	**17865.00**	**17865.00**	**17762.86**	**0.29**	**17763.15**	**1736.85**
Grant Total TSP (Revnue+Capital)	**2000.00**	**578.00**	**578.00**	**487.53**	**-1.12**	**486.41**	**1513.59**
Grant Total (TSP +GWMR) Gross	**27500.00**	**25818.00**	**25741.00**	**25155.65**	**-22.17**	**25133.48**	**2366.52**

Demand No. 60	**4702 Capital**	**DEDUCTED RECOVERY**
केन्द्रीय भूमि जल बोर्ड (जल संसाधन मंत्रालय)		**ISSUE TO WORK & OTHER CREDITS**

Monthly Expenditure For the Month of March Supplimentry, 2020							
Major Head: 4702-MINOR IRRI-00-800-Capital Nature Expenditure (GWM & R) (PLAN)							
Sub Head: 06 ISSUE TO WORK & OTHER CREDITS							
इकाई का कोड/नाम Unit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
1	2	3	4	5	6	7	8
06.01.70 Issue to Work	1500.00	1500.00	1500.00	1195.02	-331.42	863.60	636.40
06.02.70 Other Suspense Charges	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Recoveries	**1500.00**	**1500.00**	**1500.00**	**1195.02**	**-331.42**	**863.60**	**636.40**

NET CGWB (GWM&R)	**24000.00**	**23740.00**	**23663.00**	**23473.10**	**310.37**	**23783.47**	**216.53**
NET CGWB (GWM&R + TSP)	**26000.00**	**24318.00**	**24241.00**	**23960.63**	**309.25**	**24269.88**	**1730.12**

							NON PLAN
Demand No. 60				**Establishment Expenditure 2702 (Revenue)**			
Major Head: Establishment Expenditure 2702-MINOR IRRI-02-005-GROUND WATER INVESTIGATION							
Sub Head: 01-CGWB-01.01-H/QRS.							
Monthly Expenditure For the Month of March Supplimentry, 2020							**(Fig.in lacs)**
इकाई का कोड/नाम Unit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
1	2	3	4	5	6	7	8
16.02 Domestic Support N.PLAN							
वेतन 01.01.01 Salary	22200.00	23546.75	23546.75	22919.42	3.43	22922.85	-722.85
मजदूरी 01.01.02 Wages	220.00	220.00	220.00	197.81	-3.80	194.01	25.99
समयोपरिभत्ता 01.01.03 OTA	1.00	0.25	0.25	0.21	0.03	0.24	0.76
चिकित्सा 01.01.06 M/Treat.	150.00	100.00	100.00	80.14	-1.54	78.60	71.40
यात्राव्यय 01.01.11 D.T.E.	248.60	300.00	300.00	276.64	-0.17	276.47	-27.87
विदेशयात्रा व्यय 01.01.12 F.T.E.	3.00	3.00	3.00	1.37	0.00	1.37	1.63
कार्यालयव्यय 01.01.13 O.E.	80.00	80.00	80.00	69.93	-1.13	68.80	11.20
किराया, दर एवं कर 01.01.14 R.R.T.	0.10	0.00	0.00	0.00	0.00	0.00	0.10
प्रकाशन 01.01.16 Pub.	0.10	0.00	0.00	0.00	0.00	0.00	0.10
01.01.20 O.A.E.	1.00	0.00	0.00	0.00	0.00	0.00	1.00
01.01.24 P.O.L.	0.10	0.00	0.00	0.00	0.00	0.00	0.10
01.01.26 Adv. & Publicity	1.00	0.00	0.00	0.00	0.00	0.00	1.00
वृत्तिकसेवाएँ 01.01.28 P.S.	5.00	2.00	2.00	1.99	0.60	2.59	2.41
Other Contractual Services 01.01.30	0.10	0.00	0.00	0.00	0.00	0.00	0.10
अन्यप्रभार 01.01.50 O. C.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Dom Support (N. PLAN)	**22910.00**	**24252.00**	**24252.00**	**23547.51**	**-2.58**	**23544.93**	**-634.93**

Major Head: 4702-MINOR IRRI-02-005-GROUND WATER INVESTIGATION (Establishment Expenditure)							
Sub Head: 05. 01-CGWB-01.01-H/QRS.							
इकाई का कोड/नाम Unit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
4702.00.800.05 (Capital Nature Expenditure) CGWB Head Quarter (NON PLAN)							
1	2	3	4	5	6	7	8
05.01.51 M.V.	5.00	0.00	0.00	0.00	0.00	0.00	5.00
05.01.52 M & E मशीनरी एवं उपस्कर	0.00	0.00	0.00	0.00	0.00	0.00	0.00
05.01.53 M/ Works मुख्य कार्य	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Capital Nature Expenditure	**5.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5.00**
Grant Total (N.PlAN)	**22915.00**	**24252.00**	**24252.00**	**23547.51**	**-2.58**	**23544.93**	**-629.93**

				Swachhta Action Plan			**NON PLAN**
Demand No. 60				**Establishment Expenditure 2702 (Revenue)**			
Major Head: Establishment Expenditure 2702-MINOR IRRI-02-005-GROUND WATER INVESTIGATION							
Sub Head: 01-CGWB-01.01-H/QRS.							
Monthly Expenditure For the Month of March Supplimentry, 2020							
इकाई का कोड/नाम Unit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
01.96 Swachhta Action Plan							
कार्यालयव्यय 01.96.13 O.E.	10.00	10.00	10.00	5.06	-0.38	4.68	5.32
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**10.00**	**10.00**	**10.00**	**5.06**	**-0.38**	**4.68**	**5.32**
Total (Estt. Exp. + SAP)	**22925.00**	**24262.00**	**24262.00**	**23552.57**	**-2.96**	**23549.61**	**-624.61**

				Information Technology			**NON PLAN**
Demand No. 60				**Establishment Expenditure 2702 (Revenue)**			
Major Head: Establishment Expenditure 2702-MINOR IRRI-02-005-GROUND WATER INVESTIGATION							

Sub Head: 01-CGWB-01.01-H/QRS.							
01.99 Information Technology							
कार्यालयव्यय 01.99.13 O.E.	20.00	20.00	20.00	0.00	0.00	0.00	20.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (Information Technology)	**20.00**	**20.00**	**20.00**	**0.00**	**0.00**	**0.00**	**20.00**
Total (Estt. Exp. + SAP +IT)	**22945.00**	**24282.00**	**24282.00**	**23552.57**	**-2.96**	**23549.61**	**-604.61**

							R.G.N.G.W.T.R.I
Demand No. 60							**2702 (REVENUE)**
Major Head: 2702-02-005-18-HRD/Capacity Building (PLAN)							
Sub Head: 18.01-RGN. G/W TRG AND RESURCH INSTITUTE.							
Monthly Expenditure For the Month of March Supplimentry, 2020							**(Fig. in lacs)**
इकाई का कोड/नाम Unit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
1	2	3	4	5	6	7	8
18.01 Domestic Support (RGI)							
चिकित्सा 18.01.06 M/Treat.	3.00	3.00	3.00	2.46	-0.01	2.45	0.55
यात्राव्यय 18.01.11 D.T.E.	15.00	25.00	25.00	22.75	0.00	22.75	-7.75
विदेशयात्रा व्यय 18.01.12 F.T.E.	121.00	2.10	2.10	2.10	0.00	2.10	118.90
कार्यालयव्यय 18.01.13 O.E.	85.00	64.15	64.15	41.60	-0.01	41.59	43.41
किराया, दर एवं कर 18.01.14 R.R.T.	60.00	60.00	60.00	55.54	-0.04	55.50	4.50
प्रकाशन 18.01.16 Pub.	2.00	3.75	3.75	3.54	0.00	3.54	-1.54
18.01.24 P.O.L.	6.00	6.00	6.00	5.54	0.00	5.54	0.46
18.01.30 Other Contractual Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00
वृत्तिकसेवाएँ 18.01.28 P.S.	246.00	156.00	156.00	137.72	-1.75	135.97	110.03
Total Dom Support (RGI)	**538.00**	**320.00**	**320.00**	**271.25**	**-1.81**	**269.44**	**268.56**

							R.G.N.G.W.T.R.I
Demand No. 60							**4702 (CAPITAL)**
Major Head: 4702-06.01 HRD/Capacity Building (PLAN)							
Sub Head: 07.01-RGN. G/W							

TRG AND RESURCH INSTITUTE.							
4702 Capital Nature Expenditure RGNT &RI (PLAN)							
1	2	3	4	5	6	7	8
07.01.51 Motor Vehicle.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
07.01.52 M & E मशीनरी एवं उपस्कर	10.00	1.00	1.00	0.00	0.00	0.00	10.00
07.01.53 M/Works मुख्य कार्य	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Capital Nature Expenditure	**10.00**	**1.00**	**1.00**	**0.00**	**0.00**	**0.00**	**10.00**
Grant Total (RGI) PLAN	**548.00**	**321.00**	**321.00**	**271.25**	**-1.81**	**269.44**	**278.56**

							Hydrology Project-Phase-III
Demand No. 60				**2701**			
Major Head: 2701-.80.004.08.01(Ext.Supp.) & 08.02 (Dom. Supp) National Hydrology Project-Phase-III **(PLAN)**							
Monthly Expenditure Return for the Month of March Supplimentry, 2020							
							(Figures in lacs)
इकाईकाकोड/नामUnit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
08.01 Ext. Support NHP-III 1	2	3	4	5	6	7	8
08.01.11 D.T.E.	3.54	3.00	3.00	2.88	-0.08	2.80	0.74
विदेशयात्राव्यय08.02.12 F.T.E.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
कार्यालयव्यय08.01.13 O.E.	1.15	1.00	1.00	0.38	0.01	0.39	0.76
08.01.20 Other AdminstativeExpe.	7.95	7.95	7.95	6.67	-0.19	6.48	1.47
08.01.27 Minor/Works	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08.01.28 Professional Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08.01.30 Other Contratual Services	0.75	2.00	2.00	0.40	-0.01	0.39	0.36
TOTAL (NHP) Ext. Support	**13.39**	**13.95**	**13.95**	**10.33**	**-0.27**	**10.06**	3.33

							08.02 Dom. Support (NHP)-III
08.02.11 D.T.E.	3.54	3.00	3.00	2.90	0.09	2.99	0.55
विदेशयात्राव्यय08.02.12 F.T.E.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
कार्यालयव्यय08.02.13 O.E.	1.15	1.00	1.00	0.38	0.01	0.39	0.76

08.02.20 Other AdminstativeExpe.	7.95	7.95	7.95	5.83	0.19	6.02	1.93
08.02.27 Minor/Works	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08.02.28 Professional Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08.02.30 Other Contratual Services	0.75	2.00	2.00	0.40	-0.01	0.39	0.36
TOTAL (NHP)Dom.Support	**13.39**	**13.95**	**13.95**	**9.51**	**0.28**	**9.79**	**3.60**
TOTAL (NHP) Ext &Dom.Support	**26.78**	**27.90**	**27.90**	**19.84**	**0.01**	**19.85**	**6.93**

Demand No. 60	**4701**	**CAPITAL**					
Major Head: 4701-.80.004.08.01 (Ext. Supp) & 08.02 (Dom. Supp)Hydrology Project-Phase-III **(PLAN)**							
Sub Head: 06-GROUND WATER MANAGEMENT & REGULATION –01 (Ext.)02(Dom.)							
4701. 80.004.04.02 (Capital Nature Expenditure) National Hydrology Project (PLAN)						**(Figures in lacs)**	
इकाईकाकोड/नामUnit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
4701. 08.01 Ext. Supp. NHP (Capital)							
08.01.51. M V	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08.01.52 M & E	41.00	0.00	0.00	0.00	0.00	0.00	41.00
Major/Works 08.01.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08.01.60 Other Capital Expenditure	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Capital Nature Exp. Ext. Supp.	**41.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	41.00
4701. 08.02 Dom. Supp. NHP (Capital)							
08.02.51. M V	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08.02.52 M & E	41.00	0.00	0.00	0.00	0.00	0.00	41.00
Major/Works 08.02.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08.02.60 Other Capital Expenditure	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Capital Nature Exp. Dom.Supp.	**41.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	41.00
Total Ext.Sup.&Dom.Sup.(Capital)	**82.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**82.00**
G.Total Revenue + Capital (NHP-III)	**108.78**	**27.90**	**27.90**	**19.84**	**0.01**	**19.85**	**88.93**

							4702-CAPITAL OUTLAY
Monthly Expenditure For the Month of March Supplimentry, 2020							
							INFRASTRUCTURE DEVELOPMENT
Demand No. 60							**4702 (CAPITAL)**
Major Head:4702-CAPITAL OUTLAY-00.102 GROUND WATER (M.I.)							
Sub Head: 06-INFRASTRUCTURE DEVELOPMENT							
इकाईकाकोड/नामUnit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
4702 Capital Nature Expenditure Infrastructure Development (ID) PLAN							
Dom. Supp. 4702 (ID) Capital (CNE)							
03.00.51 मोटरवाहनMotor Vehicle	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03.00.52 M & E मशीनरीएवंउपस्कर	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03.00.53 M/Works मुख्यकार्य	2000.00	1800.00	1800.00	1736.36	0.00	1736.36	263.64
Total 4702 (ID) Capital N. Expdt.	**2000.00**	**1800.00**	**1800.00**	**1736.36**	**0.00**	**1736.36**	**263.64**
GrantTotal 4702 (ID) Capital	**2000.00**	**1800.00**	**1800.00**	**1736.36**	**0.00**	**1736.36**	**263.64**

Demand No. 60					**IEC (SCHEME)**		
केन्द्रीयभूमिजलबोर्ड (जलसंसाधनमंत्रालय)							
Monthly Expenditure For the Month of March Supplimentry, 2020							
Major Head: 2701-MINOR IRRI-02-005-GROUND WATER INVESTIGATION (PLAN)							
Sub Head: 20 MASS AWARENESS ACTIVITIES (IEC) (PLAN)							
इकाईकाकोड/नामUnit of Appropriation	**Budget Estimate 2019-20**	**Revised Estimate 2019-20**	**Modi. Final Bud. after Re-aprop. 2019-20**	**Prog. Exp. upto the Prev. Month of 03/2020**	**Exp. Duri. The Month of 03.2020 aft. Recon. In PAO**	**Progressive Expenditure of PAO**	**Variation (+) Exces (-) Saving**
1	2	3	4	5	6	7	8
20.01.13 Office Expenses	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.01.20 Other Administrative Expenses	0.00	0.00	0.00	0.00	0.00	0.00	0.00

20.01.26 Advertising & Publicity	0.00	0.00	0.00	1.26	12.50	13.76	-13.76
20.01.28 Professional Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.01.31 Grant-in-aid-General	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (IEC) PLAN	**0.00**	**0.00**	**0.00**	**1.26**	**12.50**	**13.76**	-13.76

26. PARLIAMENT CELL

1. Parliament Standing Committee on Water Resources examining various subjects:

a) CGWB has submitted further action taken statement to 18th report on the action taken by the government on the observations contained in the 13th Report on the subject **"Indigenous and Modern forms of Water Conservation – Techniques and Practices"** by Parliament Standing Committee on Water Resources (2016-17).

b) CGWB has submitted material to the List of Points (LoP's) raised by Parliament Standing Committee on Water Resources examining **'Demand for Grants' (2019-20).**

c) CGWB has submitted responses/answer to the post evidence List of Points (LoP's) raised by Parliament Standing Committee on Water Resources examining "**Conservation, Development, Management and Abatement of Pollution in river Ganga and its Tributaries and Rejuvenation of river Cauvery**"

d) CGWB has submitted a background note to the Parliament Standing Committee on Water Resources examining "**Groundwater: A Valuable but Diminishing Resource**" (2019-20).

e) CGWB has submitted material to the List of Points (LoP's) raised by Parliament Standing Committee on Water Resources examining"**Groundwater: A Valuable but Diminishing Resource**"(2019-20).

f) CGWB has submitted the Compliance of the recommendation of 23rd Report of the Standing Committee on Water Resources on the subject "**Socio-Economic Impact of Commercial Exploitation of Water by Industries**", 2017-18.

g) CGWB has submitted a report on Study of Ground Water Contamination due to Packaged DrinkingWater Industries to the Parliament Standing Committee on Water Resources (2017-18) examining "**Socio-economic Impact of Commercial Exploitation of Water by Industries' related to contamination of ground water by packaged drinking water industries**".

h) CGWB has submitted a background note to the Parliament Standing Committee on Urban Development (2019-20) on the subject selected "**Fall in Water Table of Cities: The Solution**".

i) CGWB has submitted reply to Reply to List of points raised by Estimate Committee on Examination of the subject "**Drought Situation in the country**" pertaining to the Ministry of Agriculture and Farmers Welfare, Department of Agriculture, Cooperation and Farmers Welfare.

2. Matters Related to Lok Sabha and Rajya Sabha Assurance

CGWB has furnished suitable replies / material for framing the replies to Assurance on Parliament Questions of Ministry of Jal Shakti.

3. Matter Related to Constitution Bill

a) CGWB has examined and submitted the comments on proposed '**The Indian Easement (Amendment) Bill**', 2019 submitted by Hon'ble Member of Parliament Dr. Kirit Premjibhai Solanki.

b) CGWB has examined and submitted the comments on proposed '**The Compulsory Rainwater Harvesting in Government Establishment and Schools Bill**', 2019 submitted by Hon'ble Member of Parliament Dr. Sujay Radha Krishna Vikhe Patil.
c) CGWB has examined and submitted the comments on proposed '**The Rainwater (Harvesting and Storage) Bill**', 2019 submitted by Hon'ble Member of Parliament Prof. Rita Bahuguna Joshi.
d) CGWB has examined and submitted the comments on proposed '**The Irrigation Maintenance Expansion and Modernization Commission Bill**', 2019 submitted by Hon'ble Member of Parliament Shri Nihal Chand.
e) CGWB has examined and submitted the comments on proposed '**The Water (Accessibility and Conservation) Bill', 2018** submitted by Hon'ble Member of Parliament Shri Anurag Singh Thakur
f) CGWB has examined and submitted comments on proposed '**The Constitution (Amendment) Bill',2019** submitted by Hon'ble Member of Parliament Shri Vinod Kumar Sonkar
g) CGWB has examined and submitted the comments on proposed '**The Nationalization of Inter-State Rivers Bill', 2019** submitted by Hon'ble Member of Parliament Shri K. Navaskani.

4. Matter Related to Rule 377

CGWB has furnished suitable replies/material for framing the replies to matter raised under Rule 377 in Lok Sabha of Ministry of Jal Shakti.

5. Matter Related to Special mention in Rajya Sabha

CGWB has furnished Suitable replies for framing the replies to List of Points raised by Committee on Petition, Rajya Sabha on"Petition Praying for Development of Capacity to Make Real Time Forecasting of Floods so as to Issue Timely Warning to The Affected People"Ministry of Jal Shakti.

6. Replies to Parliament Questions

CGWB has furnished suitable replies for framing the replies to Parliament Questions of Ministry of Jal Shakti, Ministry of Environment, Forests & Climate Change, Ministry of Health & Family Welfare, Ministry of Agriculture and Farmers Welfare, Ministry of Rural Development and Ministry of Urban Development and Ministry of Drinking Water Supply & Sanitation and number of other ministries and State Legislative Assemblies of various states.

7. VIP references/PMO references

CGWB has satisfactorily furnished replies to about 39 References received from PMO and 54 VIP references received through Ministry of Jal Shakti.