ANNUAL REPORT
2013-14

GOVERNMENT OF INDIA

CENTRAL GROUND WATER BOARD

MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION

FARIDABAD

2015

Govt. of India

CENTRAL GROUND WATER BOARD

Ministry of Water Resources, River Development and Ganga Rejuvenation

ANNUAL REPORT
2013-14

FARIDABAD

Contents

EXECUTIVE SUMMARY

Central Ground Water Board (CGWB), in the Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India, is the National Apex Agency entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country. It carried out its activities through 18 Regional Offices, 17 Divisional offices and 11 state unit offices located in States/UTs.

National Project on Aquifer Management (NAQUIM)

It is a flagship programme of Ministry of Water Resources, River Development and Ganga rejuvenation being implemented by Central Ground Water Board. Under NAQUIM, An area of 8.89 lakh sq.km. has been identified for aquifer mapping during XII plan. The activities are being taken up in phased manner and have been divided into various component of data compilation and generation of additional data. Under the data procurement, topographical maps were procured for 1.54 lakh sq.km. area, database for exploratory wells was compiled for 1.66 lakh sq.km area, hydrogeology for 1.20 lakh sq.km., for geophysics geochemical and hydrology ~55000 sq.km. area was completed. Data gap analysis was done for an area of approx 1.0 lakh.sq.km. and additional data generation for 54000 sq.km. area.

Ground Water Exploration

Ground Water Exploration is being carried out to study the sub-surface hydrogeological setup and to evaluate various aquifer parameters of different aquifer systems. During the year 2013- 14, Central Ground Water Board under their Ground water Exploration programme, constructed 649 wells Exploratory Wells(EW) -426, Observatory Wells (OW) -137, Piezometers (PZ) -86} including 36 high yielding wells to assess the ground water potential in different hydrogeological set up. Priority was accorded to tribal areas, drought affected areas, hard rock areas, areas affected with ground water pollution etc. Out of 649 exploratory wells constructed, 496 wells, 143 wells and 10 wells were constructed in hard rock, alluvium and bouldary formation respectively. 120 wells and 92 wells were constructed in the tribal and drought prone areas respectively.

Monitoring of Ground Water Observation Wells

The Board is monitoring the ground water levels in the country four times in a year (Jan/May/Aug/Nov) through a network of around 20694 Ground Water Observation Wells. The ground water samples collected during the pre-monsoon monitoring were analysed for the purpose of ascertaining the changes in chemical quality of ground water. Monitoring of Ground Water Observation Wells for May, August, November 2013 & January 2014 have been completed and reports describing fluctuation of water levels during each measurement compared to monitoring of previous year, decadal average and pre-monsoon period have been compiled to depict detailed information regarding short term and long term changes in the ground water regime.

Geophysical Studies

During 2013-14, 2294 Vertical Electrical Soundings (VES), 88.00 line kilometre resistivity profiling and 71 nos of borehole logging have been conducted in various parts of the country.

Water Quality Analysis

During 2013-14, 21363 No. of water samples have been analyzed for determination of basic constituents. Analysis of 1439 no. of organic parameters was carried out under specific studies while analysis of 1375 No. of water samples has been done for the Trace elements like As, Cd, Co, Cr, Cu Fe, Mn, Ni, Pb and Zn etc.

Reports and Information Booklets

Results of investigations carried out by Central Ground Water Board are suitably documented in the form of reports and maps which are categorized under five main heads viz. Ground Water Year Books, district reports, state reports , District Brochures and basic data reports. During 2013-14, 3 State Reports were submitted, 5 State Chemical Quality Reports, 491 District Brochures, 4 Ground Water Exploration Reports and 24 Ground Water Year Books were issued.

Water Supply Investigations

The Board carries out short-term water supply investigations for Government departments and helps them in augmenting their water supply. The Board has carried out a total of 179 investigations during this year.

Dissemination and Sharing of Technical Know-how

Central Ground Water Board has organized 20 workshops under IEC program as also the officers of CGWB participated in various Seminars/ symposia/ workshop/ conference with a view to share the expertise in the field of Ground Water and also for getting exposure to new ideas / technological developments in the field Ground Water science with others. The officers of the Board also participated in various meetings /committees etc. to render advice on ground water development in specific areas.

Re-Assessment of Dynamic Ground Water Resources

The Total Annual Replenishable Ground Water Resources as on March 2011 of the Country have been reassessed as 433 Billion Cubic Metres (bcm) and the Net Annual Ground Water Availability has been estimated as 398 bcm. Annual Ground Water Draft as on March, 2011 for all uses is 245 bcm. The Stage of Ground Water Development has been worked out as 62%.

Artificial Recharge Studies

During 2013-14, Total of 310 artificial recharge structures have been constructed. Spill over balance funds of Rs. 7.34 crores were released as second instalment for on-going projects.

Technical Examination of Major/Medium Irrigation project proposals

During 2013-14, 12 major and minor irrigation project proposals of Central Water Commission were examined.

Human Resources Development

It has been the earnest endeavour of the Board to keep its technical personnel abreast with the latest developments in all aspects related to ground water development & management. Besides the officers of the board, trainees from State Departments and candidates from abroad are included in the training programme being organized by the Board. During the year 2013-14, 168 (32- tier I, 36-tier II and 97 tier-III training programmes were conducted by RGI and a total of 14284 (486- tier I, 1112-tier II and 12686 tier-III) trainees were trained including 3648 female participants.

Hydrology Project II

During 2013-14, the implementation of Pilot Project on Aquifer Mapping under Purpose Driven Study component was under progress in six different Hydrogeological terrains of the country covering states of Bihar, Rajasthan, Tamil Nadu, Karnataka and Maharashtra. The activity of data generation to fill the data gap commenced, monthly monitoring of water level completed up to March, 2014; 74 wells have been constructed. First phase of VES, Ground TEM and ERT geophysical survey and some ground survey post-Heliborne by NGRI have been completed. Midterm review meeting was held and report submitted. Heliborne Survey completed in all six Pilot areas (Parts of Dausa district and Jaisalmer district, Rajasthan; Parts of Nagpur District, Maharashtra; Parts of Patna district, Bihar; Parts of Tumkur district, Karnataka and Parts of Cuddalore district, Tamil Nadu).

Publicity and Public Awareness

With a view to generate awareness among the masses, "Water Resources Day" was celebrated with CWC and other State Govt. Organizations. On these occasions, emphasis was laid on educating the rural population on various aspects of water resources in the country. Important technical achievements of the Board were brought to the knowledge of the public through radio talks, television interviews, and telecast of a short film on ground water pollution, newspaper reports, and release of district reports and Atlases at various public functions.

Central Ground Water Authority

During 2013-14, NOC was accorded to 129 industrial, infrastructural and mining projects. One meeting of Central Ground Water Authority was also held. Regulation of ground water development was continued in162 notified area.

IEC Activities

The Year-2013 was celebrated as “Water Conservation Year” under which various mass awareness activities were carried out with emphasis on sensitizing the masses on water related issues, encourage them to conserve and use it judiciously.

Central Ground Water Board organized the Fourth National level Painting Competition on Water Conservation to create awareness on water conservation. The school level competition 2013 was organized for the students of 6th, 7th, and 8th standards and about 20 lakh students from more than 26,000 schools had participated in the event. This was followed by the State level painting competition held on third week of November, 2013 in all States/ UTs. Finally a total of 90 students from all States/UTs the winners of the 1st, 2nd & 3rd prizes at the State Level Painting Competition participated in National Level competition held on 27.12.2013 in A.P. Shinde Symposium Hall, NASC Complex, PUSA, New Delhi. In the National Painting Competition, one first prize of` 1,00,000/-, four second prizes of` 50,000/- each and eight third prizes of`5,000/- each are awarded to the winners.

Apart from this, 20 workshops were organized by all the regional offices of CGWB on various water conservation issues.

Budget & Expenditure

During 2013-14, Expenditure of Rs. 12965.18 lakhs under Plan and Rs.11965.05 lakhs under non-plan was incurred by the Board to carry out various activities mentioned above.

1. INTRODUCTION

1.1 CENTRAL GROUND WATER BOARD

The Central Ground Water Board, the National apex organization dealing with Ground Water under the Ministry of Water Resources, Govt. of India is vested with the responsibilities to carried out ground water management studies, exploration, monitoring of development, management and regulation of country's vast ground water resources.

1.2 MANDATE AND OBJECTIVES

The mandate of the Central Ground Water Board is : "Develop and disseminate technologies, monitor and implement national policies for the scientific and sustainable development and management of India's ground water resources including their 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 develop aquifer management plan
- Periodic long term monitoring of ground water regime for creation of time series data base through existing and enhanced ground water observation wells.
- Capacity building in all aspects of ground water development and management through training, information dissemination, education and awareness
- To enhance ground water sustainability through artificial recharge and rainwater harvesting as a measure for checking the depleting trend of ground water.
- Regulation of ground water development and sustainable management of ground water resources in coordination with State Government Organizations.
- Promoting R&D programme in the field of ground water quality improvement.
- Technical assistance to defence and Govt. organizations for identification of ground water sources for their Water supply.

1.3 ORGANIZATIONAL SET UP

The Central Ground Water Board is headed by the Chairman and has five full time Members namely, Member (Exploratory Drilling & Material Management), Member (Sustainable Management & Liaison), Member (Survey Assessment & Monitoring), Member (RGI), Member (Water Quality & Technology Transfer)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:

1. The Joint Secretary (A), Ministry of Water Resources.
2. The Joint Secretary & Financial Adviser, Ministry of Water Resources
3. The Joint Secretary, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
4. The Chief Engineer, IMO (WP & P), CWC, Sewa Bhawan, New Delhi.
5. The General Manager, ONGC, Ministry of Petroleum & Natural Gas, Dehradun.

Central Ground Water Board has five main wings. Each wing is headed by a Member.

Survey, Assessment & Monitoring Wing(SAM)

The Survey, Assessment & Monitoring Wing looks after following work:-

- National Project on Aquifer Management.
- Preparation, implementation and progress monitoring of Annual Plan of Central Ground Water Board.
- Monitoring of Ground Water regime & development.
- Remote Sensing and GIS.
- Ground Water Modelling studies.
- Data information storage, retrieval, processing and dissemination (NDC & Web hosting).
- E-Governance and IT Plan.
- Preparation of EFC/SFC memo pertaining to activities of Ground Water Management and Regulation.
- Hydrology Project.
- Drawing and Map Section.
- Administrative & technical supervision of activities of the Regional Directorates and Divisional offices of MER/NCCR/SER/ER/NER.

Sustainable Management and Liaison Wing(SM&L)

The Sustainable Management and Liaison Wing looks

- Artificial recharge studies and water conservation.
- Project Appraisal and Perspective Planning for sustainability of ground water resources.

• Matters related to Parliamentary Committees, Parliament Questions and VIP references.

• Conjunctive use studies of surface and ground water.

• Liaison with Central and State Agencies including institutional financing agencies viz., NABARD, CAPART, NGOs and Panchayati Raj Institutions, etc. and other banks etc. for ground water development and management.

• Preparation of EFC/ SFC memo pertaining to respective activities.

• IEC Activities in the Central Ground Water Board.

• Administrative & technical supervision of activities of the Regional Directorates and Divisional offices of NWHR/ NHR/ NWR/ UR/ NR/ SUO, Delhi.

• Acts as Member Secretary, Central Ground Water Authority. The activities include:

a. Regulation of Ground Water Development and Management.

b. Policy, planning and implementation of regulatory activities.

c. Notification of areas for ground water development and management and monitoring of regulatory directions.

d. Issuance of NOC for ground water withdrawal to industrial/ infrastructural/ mining projects.

e. Legal matters pertaining to CGWA.

The Exploratory Drilling and Material Management wing(ED&MM)

The exploratory drilling and material management wing looks after the following:-

- Activities Related to Exploratory Drilling and its Monitoring.
- Preparation of EFC/SFC for their activities.
- Activities Related to Material Management.
- Activities Related to Stores, procurement of machinery & equipments etc. (including scientific instruments)
- Preparation of Tenders & EOI etc. for Outsourcing of work for scientific and engineering activities.
- Administrative & technical supervision of activities of the Regional Directorates and Divisional offices of SR/ SWR/ SECR/ KR.

Water Quality & Technology Transfer Wing(WQ&TT)

The Water quality and Technology Transfer Wing of the Board looks after the following:-

- All activities related to Water Quality & Technology Transfer.
- Assessment of ground water resources.
- Preparation of Hydrogeological atlases, maps etc.
- Plan and monitor Geophysical activities of the Board.
- Plan and monitor Hydrological and Hydrometeorological activities of the Board.
- Benchmarking and technological upgradation of CGWB.
- Special studies on various aspects.
- International & Bilateral cooperation, symposia, National/ International Trainings/ Awards/ Fellowships etc.
- Preparation and publication of Bhujal News
- Liaison with Water Quality Assessment Authority (WQAA)/Research Institutions/ Universities for R&D schemes.
- Preparation of EFC/ SFC memo pertaining to respective activities.
- Liaison with to Water Quality Assessment Authority.
- All chemical labs & accreditation of Chemical labs.
- Ground Water Pollution Studies, Isotope studies/Chemical cell planning and monitoring.
- Climate change studies under National water mission.
- Technology transfer to National & International institutions and various Central / State organizations
- Water Quality & Technology Transfer is responsible for administrative and technical supervision of activities related to water quality, assessment of water Resources.
- Administrative and technical supervision of activities of the Regional Directorates and Divisional offices of WR/ WCR/ CR/NCR.

Rajiv Gandhi National Ground Water Training and Research Institute (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 many Central and State Govt. Organizations, Academic Institutes, NGOs etc. During XII Plan, RGI under HRD and Capacity Building Scheme of MoWR is implementing a three tier training programme keeping in view the requirements of the National Project on Aquifer Management. These trainings will enable creation of a trained workforce for implementation of National Project on Aquifer Management

and overall sustainable development of ground water resources.

The administrative & financial matters of the Board are being dealt with by the Director (Administration) and Member (Finance).

Member (Finance) looks after the following works:-

- Compilation and submission of the Budget Estimates, Revised Estimates, Performance Budget, Notes for Demands for Grants, Supplementary Grants, Annual Plan, Five year Plan proposals of the Board to the Ministry.
- Allocation of budget to all the offices of the Board and to monitor and control the expenditure as per the sanctioned budget. Compilation and submission of the expenditure returns to the Ministry and Controller of Accounts etc.
- Scrutiny of the cases relating to procurement of stores, equipment, machinery etc. from financial angle.
- To attend and settle the audit paras, audit notes, audit objection etc and to prepare a disposal sheet of outstanding paras whenever so required.
- Advise and apprise Chairman and Members of the Board in respect of financial matters of the Board from time to time .

Central Ground Water Board had undertaken various studies through 18 Regional Directorates, supported by 17 engineering divisions, 11 State Unit Offices. The Board had a fleet of 85 rigs for taking up drilling operations during 2013-14.

1.4 ACTIVITIES OF THE BOARD DURING 2013-14

National Project on Aquifer Management (NAQUIM) is the major activity of CGWB during 2013-14 in XIIth Plan. CGWB has taken up National Project on Aquifer Management to formulate sustainable aquifer management plans with an objective of Delineation of Aquifer disposition in 3-D along with their characterization on 1:50,000 scale falling in the Over- Exploited, Critical and Semi-critical categories of assessment units as well as water quality and other problem/ vulnerable areas. The project also aims to formulate Aquifer Management Plan for facilitating sustainable management of ground water resources at regional and local level through participatory management approach with involvement of community and stakeholders.

Participatory ground water management(PGWM) is envisaged to take a significant step in ground water management at grass root level to enable the community and stake holders to monitor and manage the ground water as common pool resources themselves. This would require a coordinated effort involving state government departments, research institutes, PRIs, civil society organizations and the stakeholders at the village level who would guide collective sharing and use of groundwater based on a careful understanding of the storage and transmission characteristics of different aquifer units. Two levels of Programme implementation are envisaged, Programme facilitation and Participatory Outreach Programme for project delivery to the End Users.

The project is proposed to span over XII & XIII Plan periods. It is proposed to cover around 23.25 Lakh Km^2 mappable areas distributed over several States and Union Territories of the country. During the XII Plan an area of 8.89 lakh Km^2 is proposed to be covered under this project and remaining will be taken up during XIII Plan period.

In addition to National Aquifer Mapping Project other activities of CGWB during 2013-2014 period encompasses:

- Pilot Project on aquifer mapping
- Ground water exploration and construction of High Yielding Wells.
- Water Supply Investigations.
- Ground Water Regime Monitoring
- Hydrology Project II (HP-II).
- Demonstrative Artificial Recharge studies.
- Regulation of Ground Water Development (Central Ground Water Authority)
- Re-Estimation of Ground Water Resource.
- Technical Examination of Major /Medium Irrigation Schemes
- Organizing training of Central and State Government personnel through Rajiv Gandhi National Ground Water Training and Research Institute.
- Technical Documentation and Publication of Maps & Reports
- IEC activities.

2. NATIONAL PROJECT ON AQUIFER MANAGEMENT (NAQUIM)

The project is being implemented by Central Ground Water Board which is a subordinate office of Ministry of Water Resources, River Development and Ganga Rejuvenation Govt. of India.

A National Inter-Departmental Steering Committee (NISC) has been constituted as the apex body for overall guidance for the implementation of the Project at National level. Secretary, MoWR is the Chairman, with representatives from related Ministries like Science & Technology, Earth Sciences, Rural Development, Drinking Water & Sanitation, etc. The Principal Secretaries of the Nine States where ground water is substantially extracted are members of the NISC.

A Project Management Group (PMG) has been constituted to monitor and resolve implementation issues of NAQUIM within the Ministry under the Chairmanship of the Secretary (WR) which will be responsible for monitoring and guidance of the activities related to the Project implementation. The other members will be Special/Additional Secretary (WR), Joint Secretary (A), Joint Secretary & FA, MOWR and Chairman, CGWB. CGWB national program coordinator and project task manager will be supported by the Regional Offices.

Objective

Broad objectives of the scheme are:

- Aquifer Mapping for Delineation of Aquifer disposition in 3-D along with their characterization on1:50,000 scale in 8.89 lakh sq.km. and further detailing up to 1:10,000 scale in limited areas falling in the Over-Exploited, Critical and Semi-critical categories of Assessment units as well as water quality and other problem/ vulnerable areas.
- To formulate Aquifer Management Plan for facilitating sustainable management of ground water resources at regional and local level through participatory management approach with involvement of community and stakeholders.

Areas identified for aquifer mapping for delineation and disposition of 3-D along with their characterization on 1:50000 scale are given in table2.1 that include areas falling in over exploited, critical and semi critical categories of Assessment units as well as water quality and other vulnerable areas

Table 2.1: AREA IDENTIFIED FOR AQUIFER MAPPING DURING XIITH PLAN

S.No	State	Year wise Area (Sq. Km)					
		2013-14	2013-14	2014-`15	2015-16	2016-17	Total
1	ANDAMAN AND NICOBAR	1348	0	0	0	0	1348
2	ANDHRA PRADESH	2369	1923	10129	18813	28616	61850
3	ARUNACHAL PRADESH	1000	100	0	927	0	2027
4	ASSAM	1550	3900	185	0	0	5635
5	BIHAR	128	1236	2351	2046	1843	7604
6	CHANDIGARH	0	0	115	0	0	115
7	CHHATTISGARH	1252	1740	1604	3159	3968	11723
8	DADRA AND NAGAR HAVELI	0	0	0	490	0	490
9	DAMAN AND DIU	0	0	112	0	0	112
10	DELHI	0	1483	0	0	0	1483
11	GOA	0	0	516	507	427	1450
12	GUJARAT	3000	4500	11948	18122	44024	81594
13	HARYANA	1640	16224	6347	3235	14444	41890
14	HIMACHAL PRADESH	1952	1008	1517	1695	1488	7660

15	**JAMMU AND KASHMIR**	6058	4000	100	249	83	10490
16	**JHARKHAND**	1419	1473	1403	1369	701	6365
17	**KARNATAKA**	3635	4249	16195	21747	47483	93309
18	**KERALA**	1420	1547	827	1406	0	5200
19	**LAKSHADWEEP**	0	0	32	0	0	32
20	**MADHYA PRADESH**	4200	4813	6714	21289	32892	69908
21	**MAHARASHTRA**	1359	3850	5967	9172	22219	42567
22	**MANIPUR**	0	0	155	0	539	694
23	**MEGHALAYA**	600	1000	0	0	200	1800
24	**MIZORAM**	0	0	700	0	0	700
25	**NAGALAND**	400	0	0	394	0	794
26	**ORISSA**	238	1643	2411	3751	8457	16500
27	**PUDDUCHERY**	139	0	293	0	0	432
28	**PUNJAB**	2160	2160	7292	12270	24647	48529
29	**RAJASTHAN**	6405	4000	20925	34929	75386	141645
30	**SIKKIM**	750	0	0	0	0	750
31	**TAMIL NADU**	2195	4640	10576	15956	36303	69670
32	**TELANGANA**	2967	3082	4974	8647	18571	38241
33	**TRIPURA**	0	0	559	0	2975	3534
34	**UTTAR PRADESH**	2700	16425	13080	13087	45482	90774
35	**UTTRAKHAND**	4000	3000	811	0	0	7811
36	**WEST BENGAL**	1399	2551	2282	2293	5853	14378
	Grand Total (Sq. Km)	**56283**	**90547**	**130120**	**195553**	**416601**	**889104**
	Area Proposed for Aquifer Mapping as per EFC (Lakh sq km)	0.54	0.54	1.3	1.95	4.56	8.89

The major activities envisaged under Aquifer mapping and preparation of Aquifer Management Plans are compilation of existing data, Data Gap Analysis, Generation of additional data and Preparation of Aquifer Maps and Aquifer Management Plan. Each activity has numbers of sub-activities and tasks and is carried out as per detail protocol for implementation.

2.1 Data compilation

The procurement of digital toposheets from Survey of India was under process during the year 2013-14. Hard copy of topomaps for 154149 sq.km area, hard copy of geology map 43319 sq.km area, Soil Maps of 33943 Sq.Km area and Geomorphological maps for 24802 Sq.Km area have been procured.

In respect of data compilation, against a target of 1.40 lakh sq.km., Data base on Exploration wells – 165713 Sq.km against a target of 1.30 lakh km. , Analysis of Geological data- 89381 Sq.Km., Analysis of Geophysical Data-100276 Sq.Km., Analysis of Hydrological Data- 55526 Sq.Km., Analysis of Geochemical Data- 86586 Sq.Km., Analysis of Hydrogeological Data-120244 Sq.Km., Preparation of composite Lithologs - 69366 Sq.Km. was done. Delineation of principal aquifers(Vertical and Lateral) was covered for 94786 Sq.Km area, Aquifer Wise Water Level Data- 98597 Sq.Km was covered and Aquifer Wise Draft Data – 26543 Sq.Km. have been compiled. The details are shown in table 2.2

Table 2.2: Compilation of existing data

Sl.No.	**Activities**	**Target(Sqkm)**	**Achievements(Sqkm)**
1	**Compilation of Existing data (in sq.km.)**		
	Procurement of Hard copy (topographical, geological, soil, geomorphologic and other maps)	1,60,000	
	➢ Topographical		154149.
	➢ Geology		43319
	➢ Soil		33943
	➢ Geomorphological		24802

Sl.No.	Activities	Target(Sqkm)	Achievements(Sqkm)
2.	**Data base on Exploration wells**	1,40,000	165713
3.	**Compilation of information of Geology, Geophysics, Hydrogeology, Geochemical, Hydrology (area in sq.km)**		
	➢ Geology	1,30,000	89381
	➢ Geophysics		100276
	➢ Hydrogeology		120244
	➢ Geochemical		86586
	➢ Hydrology		55526
	➢ Composite Lithologs		69366
4.	**Delineation of principal aquifers-(Vertical and Lateral)**	1,70,000	94786
5.	**Aquifer Wise Water Level Data**	1,80,000	98597
6.	**Aquifer Wise Draft Data**	2,64,000	26543

2.2 Data gap Analysis

Against the target of 1.90 lakh sq.km. for Data Gap Analysis, in respect of Geology- 100042 sq.Km., in respect of Geophysics- 120306 Sq.Km., in respect of Hydrology-93741 Sq.Km., in respect of Geochemical Data 94756 Sq.Km., in respect of Hydrogeology-100042 sq.Km. has been completed. Delineation of principal aquifers was done for exploration-103141 Sq.Km. area, Aquifer Wise Water Level Data for 125988 Sq.Km area and Aquifer Wise Draft Data – 38591 Sq.Km area. as shown in table 2.3.

Table 2.3: Identification of Data Gap

SUB ACTIVITY	Target	Achievement
• Geology	1,90,000	100042
• Geophysics		120306
• Hydrology		93741
• Geochemical data		94756
• Hydrogeology		100042
• Delineation of Principal aquifer-Vertical and lateral	1,77,000	103141
• Aquifer wise water level data	1,60,000	125988
• Aquifer wise draft data	1,70,000	38591

2.3 Generation of Additional data

For generation of additional data, fieldwork is initiated in 65,000 Sq.Km area through in-house resources of CGWB. Activities of ground water studies viz; exploratory drilling, geophysical surveys, chemical quality studies and micro-level hydrogeological surveys are taken up during the year for value addition to aquifer maps. The achievement for additional data generation are given in table 2.4. In addition Aquifer Mapping in NCR area of approx 25,000 sqkm were also covered through outsourcing to WAPCOS.

Fig-2.1 Soil Infiltration test in progress in Micro level area of Tumkur district(Karnataka)

Table 2.4 Generation of additional data

Data generation (0.65 lakh Sq.Km.)	**Target**	**Achievement**
Exploratory drilling including pumping test (No of wells)	800	649
Vertical Electrical Sounding(VES)	2000	2383
Slug test	-	73
Micro-level subsurface hydro-geological data from existing wells	13440	Achieved
Aquifer Mapping in NCR through outsourcing (WAPCOS) – 25000 sq.km.		
Exploratory Wells(nos)	223 wells	188 wells
Water Samples analysis for major cations/anions, Heavy metals, pesticides, industrial pollution, bacteriological contamination etc (nos)	2000 samples	2167 samples
No of VES conducted	500	553 (409 in 2013-14)
Soil infiltration study (nos)	1000	1049
Slug test (nos)	200	204
2D Imaging (Line Km) (nos)	100	100.8

3. PILOT PROJECT ON AQUIFER MAPPING

Pilot Aquifer Mapping Project has been taken up with assistance of World Bank under Hydrology Project II in Six different Hydrogeological terrains covering parts of states of Bihar, Rajasthan, Maharashtra, Karnataka and Tamil Nadu as detailed below:

1. Alluvium overlying hard rocks in Baswa-Bandikui, Dausa District, Rajasthan (AQRAJ)
2. Part of Thar Desert Terrain in Jaisalmer District, Rajasthan (AQDRT)
3. Alluvial plains of Ganga basin in Watershed GNDK013, Patna District, Bihar (AQBHR)
4. Basaltic traps underlain by Gondwanas in Watershed WGKKC-2, Nagpur District, Maharashtra (AQMAH)
5. Crystalline rocks in Parts of Tumkur District, Karnataka (AQKAR)
6. Coastal sediments in Lower Vellar Watershed, Cuddalore District, Tamil Nadu (AQTND)

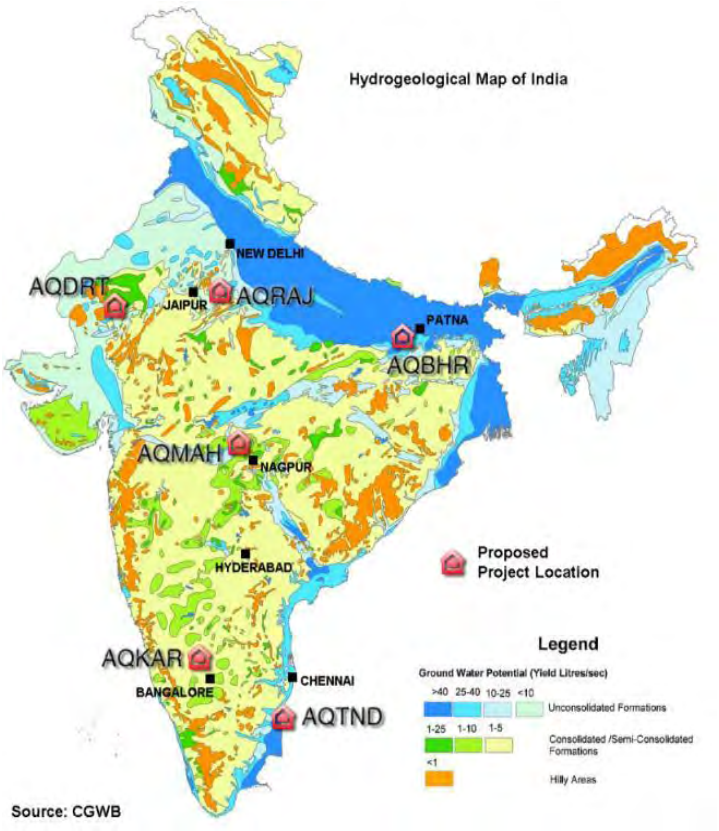


Fig 3.1: Proposed Project Location of Pilot Project of Aquifer Mapping

Contract agreement between CGWB and NGRI has been signed on 21-05-2012 for Aquifer Characterization using advanced geophysical techniques and to establish the efficacy of various geophysical techniques for different Hydrogeological terrains. The contract has been extended up to May 31, 2014. NGRI has to apply different advanced geophysical techniques with corroboration from existing borehole information to provide precise information about shallow and deep aquifers with their geometry at a reasonable scale (1: 50,000) in six pilot project areas including, latest state of art Aquifer mapping methods using Heliborne Transient Electromagnetic techniques.

In the Pilot Aquifer mapping project, the activities can be broadly grouped into compilation of existing data and identification of data gap; generation of data; preparation of Aquifer Maps; formulation and Implementation of Aquifer Management Plan.

The compilation of relevant data and identification of data gap has been completed. Various thematic layers have been prepared. Conceptualization of aquifer system with existing data has been completed. Refinement of Aquifer system is being done based on data generated so far. 74 wells have been constructed in five pilot areas for determination of various aquifer parameters. First phase of VES, Ground TEM and ERT geophysical survey and some ground survey post-Heliborne by NGRI have been completed. Agreement for Collaborative research has been signed between NGRI and Aarhus University, Denmark for carrying out Heliborne Transient electromagnetic Survey. Permission for heliborne survey has been obtained from DGCA & MOD. Heliborne Surveys was inaugurated on 27th September, 2013 by Hon'ble Minister of Water Resources from Pilot area in Dausa district, Rajasthan. Heliborne Survey has been completed in all six Pilot areas (Parts of Dausa district and Jaisalmer district, Rajasthan; Parts of Nagpur District, Maharashtra; Parts of Patna district, Bihar; Parts of Tumkur district, Karnataka and Parts of Cuddalore district, Tamil Nadu). Geophysical equipments viz Advance Resistivity Meter, Multi Electrode Multi Channel Resistivity System and software such as ISATIS and 1X1D were procured by NGRI.

4. 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.

It is being carried out by the Board through a fleet of 85 drilling rigs (31 Direct Rotary, 46 Down the Hole and 8 Percussion Combination types). During the year 2013- 14, 649 wells were constructed (EW-426, OW-137, PZ-786). Priority was accorded to tribal areas, drought affected areas, hard rock areas, pollution affected areas etc. Out of 649 bore wells constructed, 496 wells, 143 wells and 10 wells were constructed in hard rock area, alluvium and boundary formation respectively. 120 wells and 92 wells were constructed in tribal and drought prone areas respectively. The statement showing State and Division wise distribution of boreholes drilled/completed during 2013-14 is presented in Table 4.1 &4.2 & Fig 4.3 & 4.5. In addition to this 188 wells were also constructed through outsourcing to WAPCOS in NCR area.

The Board has drilled total of 32947 bore holes (Including 3090 bore holes through outsourcing) as on 31.03.2014 to identify areas for ground water development in the country. The statement showing State-wise distribution of boreholes drilled/completed till March, 2014 in the country is presented in Table 4.3

Fig 4.1 Ground Water Exploration at Devinagar Tanda EW, Parbhani district (Maharashtra)

Fig 4.2 Aquifer Performance Test of EW at Vadakarapathy Panchayat Office, Nallur, Palakkad district.

Table 4.1: State-wise wells constructed by Central Ground Water Board during the year 2013 -2014

Sr. No.	STATE/U.T	EW	OW	PZ	TOTAL
1.	Andhra Pradesh	36	16	18	70
2.	Arunachal Pradesh	1	0	0	1
3.	Assam	8	4	1	13
4.	Bihar	5	5	0	10
5.	Chhattishgarh	11	8	7	26
6.	Gujarat	24	10	0	34
7.	Haryana	1	0	7	8
8.	Himachal Pradesh	5	0	0	5
9.	Jammu & Kashmir	23	3	0	26
10.	Jharkhand	17	5	2	24
11.	Karnataka	20	3	0	23
12.	Kerala	21	10	0	31
13.	Madhya Pradesh	51	14	0	65
14.	Maharashtra	62	12	2	76
15.	Meghalaya	2	0	0	2
16.	Nagaland	2	1	1	4
17.	Orissa	30	5	4	39
18.	Punjab	4	2	6	12

19.	Rajasthan	28	19	21	68
20.	Tamil Naidu	37	8	5	50
21.	Uttarakhand	2	0	0	2
22.	Uttar Pradesh	22	11	11	44
23.	West Bengal	14	1	1	16
TOTAL		**426**	**137**	**86**	**649**

Table 4.2 Division wise wells constructed by central ground water board during the year 2013-2014

DIVISION	TARGET 2013-14				ACHIEVEMENT 2013-14 (01.04.13 to 31.03.2014)				% ACHIEVEMENT
	EW	OW	PZ	T	EW	OW	PZ	T	
I.Ahmedabad	45			**45**	24	10	0	**34**	**75.56%**
II.Ambala	5	3	24	**32**	5	2	13	**20**	**62.50%**
III.Varanasi	27	9		**36**	15	5	5	**25**	**69.44%**
IV.Chennai	31	16	16	**63**	48	13	5	**66**	**104.76%**
V.Ranchi	28	12		**40**	22	10	2	**34**	**85.00%**
VI.Nagpur	45	21		**66**	62	12	2	**76**	**115.15%**
VII.Guwahati	31	12		**43**	13	5	2	**20**	**46.51%**
VIII.Jammu	21	5		**26**	23	3	0	**26**	**100.00%**
IX.Hyderabad	29	21	30	**80**	36	16	18	**70**	**87.50%**
X. Bhubneshwar	56	13	20	**89**	30	5	4	**39**	**43.82%**
XI.Jodhpur	32	16	12	**60**	28	19	21	**68**	**113.33%**
XII.Bhopal	44	20		**64**	51	14	0	**65**	**101.56%**
XIII.Raipur	30	14	5	**49**	11	8	7	**26**	**53.06%**
XIV. Bangalore	34	18		**52**	30	8	0	**38**	**73.08%**
XV.Kolkata	21	3		**24**	14	1	1	**16**	66.67%
XVI.Bareilly	18	9		**27**	9	6	6	**21**	**77.78%**
XVII. Dharamshala	20			**20**	5	0	0	**5**	**25.00%**
TOTAL	**517**	**192**	**107**	**816**	**426**	**137**	**86**	**649**	**79.53%**

Table 4.3 STATUS OF BORE HOLES DRILLED BY C.G.W.B AS ON 31.03.2014

S No.	STATE/UT	(I) Through Outsourcing (Contractual)			(II) Through Departmental Rigs						TOTAL (I + II)
		EW	OW	PZ	EW	OW	PZ	SH	DW	Total	
A.	**STATES**										
1	Andhra Pradesh	90			719	368	263	9	4	1363	**1453**
2	Arunachal Pradesh				35	5	0	1	1	42	**42**
3	Assam				384	174	59	16	42	675	**675**
4	Bihar				297	185	74	10	514	1080	**1080**
5	Chhattisgarh	300		105	649	201	159	0	28	1037	**1442**
6	Goa				58	18	14	0	31	121	**121**
7	Gujarat	165			986	462	498	25	255	2226	**2391**
8	Haryana	21	2	80	380	257	224	23	170	1054	**1157**
9	Himachal Pradesh				203	12	3	1	0	219	**219**
10	Jammu & Kashmir	21			366	73	36	8	114	597	**618**
11	Jharkhand	82	8		343	164	37	4	71	619	**709**
12	Karnataka	134			1318	626	353	7	5	2309	**2443**
13	Kerala	10			486	173	231	16	13	919	**929**
14	Madhya Pradesh	364	8	80	1060	664	176	8	149	2057	**2509**
15	Maharashtra	92	2	88	1305	474	162	2	166	2109	**2291**
16	Manipur				25	11	0	0	2	38	**38**
17	Meghalaya				94	24	2	2	8	130	**130**

18	Mizoram				3	3	0	0	0	6	**6**
19	Nagaland				14	5	1	0	3	23	**23**
20	Orissa	439		67	1433	334	134	21	191	2113	**2619**
21	Punjab	19	3		186	198	91	20	14	509	**531**
22	Rajasthan	240			1184	431	544	93	591	2843	**3083**
23	Sikkim	0			31	9	0	0	0	40	**40**
24	Tamil Nadu	110		179	1001	377	253	13	93	1737	**2026**
25	Tripura				60	26	0	4	22	112	**112**
26	Telangana				627	461	420	5	27	1540	**1540**
27	Uttarakhand	20	4		61	6	1	1	129	198	**222**
28	Uttar Pradesh	245	12		893	594	180	40	501	2208	**2465**
29	West Bengal			100	471	219	171	12	82	955	**1055**
TOTAL(A)		**2352**	**39**	**699**	**14672**	**6554**	**4086**	**341**	**3226**	**28879**	**31969**
B.	**UNION TERRITORIES**										
1	Andaman & Nicobar				46	13		1		60	**60**
2	Chandigarh				7	17	14	2	15	55	**55**
3	Dadra & NagarHaveli				12	1				13	**13**
4	Delhi				149	64	160	13	380	766	**766**
5	Daman & Diu						7			7	**7**
6	Pondicherry				30	20	8	5	14	77	**77**
TOTAL(B)		**0**		**0**	**244**	**115**	**189**	**21**	**409**	**978**	**978**
GRAND TOTAL(A+B)		**2352**	**39**	**699**	**14916**	**6669**	**4275**	**362**	**3635**	**29857**	**32947**

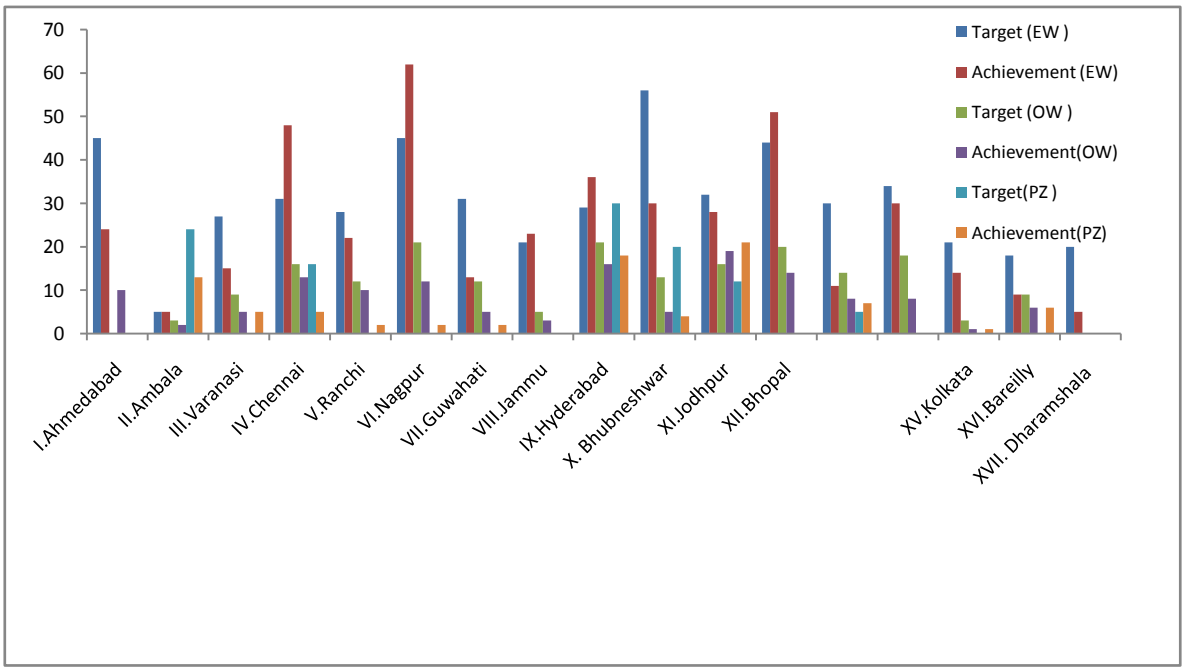


Fig 4.3 Showing Division wise status of Ground Water Exploration during 2013-14

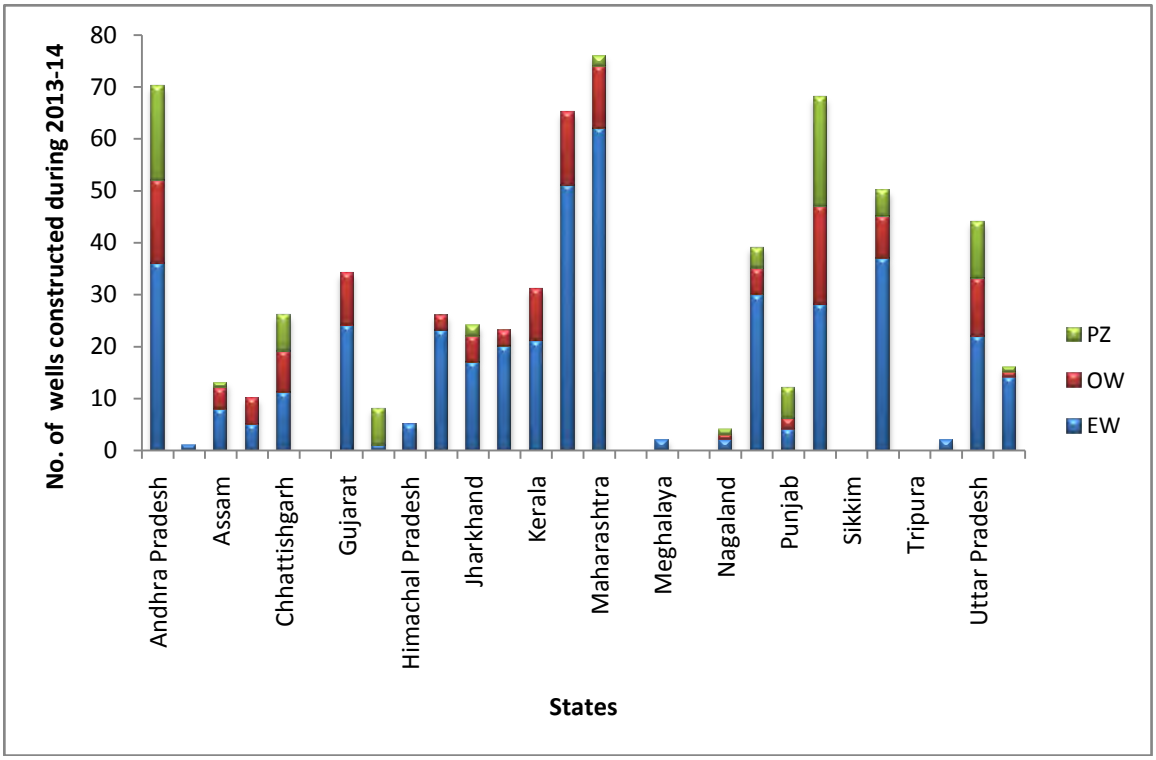


Fig 4.4 State-wise wells constructed by Central Ground Water Board during the year 2013 -2014

4.1. DEVELOPMENT AND TESTING OF WELLS

A tube well is developed during its construction 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 78 wells were developed and tested during the year 2013-14. Division wise and State wise achievement has been presented in Table 4.4

Table 4.4: Region wise/State wise Pumping Tests Conducted in the Year 2013 – 2014

DIVISION	STATE	No. of Wells constd. During the current year and tested	No. of Wells constd. During the earlier years and tested	Balance No. of wells to be tested (Backlog)
I.Ahmedabad	Gujarat	-	-	76
II.Ambala	Haryana	-	1	14
	Punjab	-	1	12
	Delhi	-	3	41
III.Varanasi	Utter Pradesh	2	4	12
IV.Chennai	Tamilnadu	-	7	7
	Kerla	2	-	5
V.Ranchi	Bihar	1	3	5
	Jharkhand	1	1	27
VI.Nagpur	Maharashtra	21	3	40
VII.Guwahati	Assam	-	-	4
	Meghalaya	-	-	11
	Nagaland	-	-	1
	Arunachal Pradesh	-	-	-
VIII.Jammu	Jammu&Kashmir	1	5	17
IX.Hyderabad	Andhra Pradesh	5	10	7
X. Bhubneshwar	Orissa	-	-	35
XI.Jodhpur	Rajasthan	10	5	27
XII.Bhopal	Madhya Pradesh	1	9	32
XIII.Raipur	Chhattisgarh	-	4	-
XIV. Bangalore	Karnataka	4	7	8
	Kerala	-	2	1
XV.Kolkata	West Bengal	4	9	30
XVI.Bareilly	Uttar Pradesh	1	1	36
	Uttaranchal	-	-	8
XVII. Dharamshala	Himachal Pradesh	3	3	8
	TOTAL	**56**	**78**	**464**

4.2 TAKING OVER OF EXPLORATORY WELLS BY STATES

The exploratory drilling sites are selected in consultation with the State Government Departments considering that, successful exploratory wells would be converted into production wells once taken over by States. Till March 2014, a total of 14916 wells have been drilled, out of which 11862 successful exploratory wells were offered for handed over and only 5892 wells have so far been accepted /taken over by State Governments while 4495 successful wells are yet to be accepted/ taken over by them and 1475 successful wells are yet to be handed over. The status of handing over of exploratory wells drilled by Central Ground Water Board to the State Government as on 31-03-2014 is presented in table 4.5.

Table 4.5: Handing over of wells drilled by CGWB (As On 31.03.2014)

S.No.	State	Total Wells drilled (EW)	No. of Successful Wells	No. of Wells Handed Over		No. of Wells yet to be handed over to state agencies
				No. of wells accepted by the state agencies	No. of wells offered to the state agencies but yet to be accepted	
1	Andhra Pradesh	1346	980	740	154	86
2	Arunachal Pradesh	35	31	14	3	14
3	Assam	384	331	124	100	107
4	Bihar	297	240	89	142	9
5	Chhattisgarh	649	579	163	349	67
6	Goa	58	49	0	49	0
7	Gujarat	986	663	431	104	128
8	Haryana	380	212	145	54	13
9	Himachal Pradesh	203	189	85	75	29
10	Jammu & Kashmir	366	288	169	85	34
11	Jharkhand	343	278	100	165	13
12	Karnataka	1318	1156	471	489	196
13	Kerala	486	359	262	50	47
14	Madhya Pradesh	1060	730	506	145	79
15	Maharashtra	1305	1098	794	214	90
16	Manipur	25	15	14	0	1
17	Meghalaya	94	86	15	26	45
18	Mizoram	3	3	3	0	0
19	Nagaland	14	9	5	1	3
20	Orissa	1433	1366	405	844	117
21	Punjab	186	161	79	74	8
22	Rajasthan	1184	877	258	544	75
23	Sikkim	31	10	6	0	4
24	Tamil Nadu	1001	726	513	169	44
25	Tripura	60	54	36	12	6
26	Uttarakhand	61	52	23	10	19
27	Uttar Pradesh	893	731	194	385	152
28	West Bengal	471	418	157	198	63
TOTAL(A)		**14672**	**11691**	**5801**	**4441**	**1449**
B. UNION TERRITORIES						
1	Andaman & Nicobar	46	12	0	10	2
2	Chandigarh	7	7	6	0	1
3	Dadra & NagarHaveli	12	8	8	0	0
4	Delhi	149	131	64	44	23
5	Pondicherry	30	13	13	0	0
Total(B)		**244**	**171**	**91**	**54**	**26**
GRAND TOTAL(A+B)		**14916**	**11862**	**5892**	**4495**	**1475**

4.3. HIGH YIELDING WELLS

During 2013-14, Board under its scientific exploratory drilling programme has explored high yielding aquifers in the various parts of the Country based on hydrogeological studies coupled with remote sensing and geophysical techniques. High yielding wells with discharge ranging from 185 litres per minute to 1920 litre per minute have been explored in the states of Chhattisgarh, Jharkhand, Karnataka, Kerala, Maharashtra, Andra Pradesh, Rajasthan, Tamilnadu and west Bengal. The study will help in identifying ground water sources and in guiding the States to adopt follow up action with regard to ground water development for drinking water supply and other demands. High Yielding Wells constructed during 2013-14 are presented in Table 4.6

Table 4.6 High Yielding Wells Explored During 2013- 14

Sl. No.	Name of States	Description
1.	Andhra Pradesh	• An exploratory well drilled at Ghatkesar village and Mandal, RR district, Hyderabad down to a depth of 86.50m bgl has yielded a high discharge of 570 liter per minute by encountering fractures at 86-86.5m. The formation encountered is granites. This well can cater to drinking water requirements of a population of about 5700 (@ 60 lpcd for ten hours of pumping a day) in the area. • Two wells drilled at Korremula and Thimmaipalli of Ranga Reddy district with high discharge of 210 liter per minute and 390 liter per minute in the granitic formation. These wells can cater to drinking water requirements of a population of about 2000 and 3900 (@ 60 lpcd for ten hours of pumping a day) in the area.
2.	Chhattisgarh	• An exploratory well drilled at Jilga, Korba District down to a depth of 200m bgl has yielded a high discharge of 210 liter per minute with draw down of 39.06 m in Barakar Sandstone (Carboniferous Semi Consolidated formation). This well can cater to drinking water requirements of a population of about 2100 (@ 60 lpcd for ten hours of pumping a day) in the area.
3.	Kerala	• An exploratory well drilled at Nallur, Vadakarapathy, Palakkad district district down to a depth of 200m bgl has yielded a high discharge of 336 liter per minute. The formation encountered is Hornblende Biotite gneiss. This well can cater to drinking water requirements of a population of about 3300 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Kunnamkattumpathy, Palakkad district down to a depth of 100m bgl has yielded a high discharge of 330 liter per minute. The formation encountered is Charnockite gneiss. This well can cater to drinking water requirements of a population of about 3300 (@ 60 lpcd for ten hours of pumping a day) in the area. • One Observation Well drilled at Kunnamkattumpathy, Palakkad district with depth 100m and high discharge of 300 liter per minute. The formation encountered is Hornblendeb-Biotite gneiss. This well can cater to drinking water requirements of a population of about 3000 (@ 60 lpcd for ten hours of pumping a day) in the area. • One Observation Well drilled at Kadukunnam OW, Palakkad district with depth 100m and high discharge of 504 liter per minute. The formation encountered is Hornblende-Biotite gneiss. This well can cater to drinking water requirements of a population of about 5000 (@ 60 lpcd for ten hours of pumping a day) in the area.

Sl. No.	Name of States	Description
		• One Observation Well drilled at Vannamada, Palakkad district with depth 200m and discharge of 198 liter per minute. The formation encountered is Hornblende-Biotite-Gneiss. This well can cater to drinking water requirements of a population of about 1900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Chullimada, Palakkad district with depth 100m and discharge of 552 liter per minute. The formation encountered is Hornblende-Biotite-Gneiss. This would mitigate the drinking water needs of about 4400 people @ 60 lpcd for 8 hrs pumping per day. • One Observation Well drilled at Chullimada, Palakkad district with depth 77m and discharge of 984 liter per minute. The formation encountered is Hornblende-Biotite-Gneiss. This would mitigate the drinking water needs of about 8000 people @ 60 lpcd for 8 hrs pumping per day. • An exploratory Well drilled at Muttikulangara, Palakkad district with depth 104 m bgl and yielded 600 liter per minute. The formation encountered is Hornblende-Biotite-Gneiss. This would meet the drinking water needs of about 4800 people @ 60 lpcd for 8 hrs pumping/day. • One Observation Well drilled at Muttikulangara, Palakkad district with depth 114m bgl and yielded 720 liter per minute. The formation encountered is Hornblende-Biotite-Gneiss. This would meet the drinking water needs of about 5800 people @ 60 lpcd for 8 hrs pumping/day. • An exploratory Well drilled at Dhoni, Palakkad district with depth 200m bgl and yielded 300 liter per minute. The formation encountered is Hornblende-Biotite-Gneiss. This would meet the drinking water needs of about 2400 people @ 60 lpcd for 8 hrs pumping/day.
4.	Rajasthan	• An exploratory well was constructed under National Aquifer Mapping Programme 2013-14 at Chachiwad Bada in Sikar district, where SWL was 35.20 mbgl, discharge was 440 lpm. This well can cater to drinking water requirements of a population of about 4400 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well was constructed at Batdanau in Sikar district under National Aquifer Mapping Programme 2013-14, where SWL was 40.20 mbgl, and discharge 540 lpm. This well can cater to drinking water requirements of a population of about 5400 (@ 60 lpcd for ten hours of pumping a day) in the area. • A Well was constructed at Rasulpur village, Sikar District with depth 90m bgl and discharge of 600 liter per minute under exploration for National Aquifer Mapping Programme. This well can cater to drinking water requirements of a population of about 6000 (@ 60 lpcd for ten hours of pumping a day) in the area.
5.	Tamil Nadu	• A well drilled at S.Pudupatti, Vadamadurai Block of Dindigul District down to a depth of 200m bgl has yielded a high discharge of 220 liter per minute in the formation of Fractured Granitic Gneiss. This well can cater to safe drinking water requirements of a population of about 2200 (@ 60 lpcd for ten hours of pumping a day) in the area which are ailing with arsenic menace in ground water.

Sl. No.	Name of States	Description
6.	West Bengal	• A well drilled at Bhabanipur, Bagda Block, N 24 Parganas District has yielded a high discharge of 1500 liter per minute. This well can cater to drinking water requirements of a population of about 15000 (@ 60 lpcd for ten hours of pumping a day) in the area. • A well drilled at Akal Poush, Kalna-II Block, Bardhaman District down to a depth of 155m bgl has yielded a high discharge of 1800 liter per minute . This well can cater to drinking water requirements of a population of about 18000 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory Well was constructed at Singur block, Hugli district, West Bengal with depth 185m bgl has yielded a high discharge of 1500 litres per minute in alluvial formation as per compressor Test. • A well drilled at Sutia, Bongaon Block, N 24 Parganas District down to a depth of 211m bgl has yielded a high discharge of 1450 liter per minute. SWL of well is 3.25 mbgl and productive aquifer zones tapped during drilling are 160-172, 178-190, 202-208 m bgl. This well can cater to safe drinking water requirements of a population of about 14500 (@ 60 lpcd for ten hours of pumping a day) in the area which are ailing with arsenic menace in ground water. • A well drilled at Bishnupur, Chakda Block, Nadia District down to a depth of 179m bgl has yielded a high discharge of 1920 liter per minute. SWL of well is 4.46 mbgl and productive aquifer zones tapped during drilling are 132-144, 164-176 m bgl. Cement Sealing 120-123 m bgl. This well can cater to safe drinking water requirements of a population of about 19200 (@ 60 lpcd for ten hours of pumping a day) in the area which are ailing with arsenic menace in ground water.
7.	Maharashtra	• An exploratory well drilled at Newasa Taluka, Ahmednagar District down to a depth of 200.00m bgl has yielded a high discharge of 720 liter per minute in the formation of Zeolitic Vesicular and Fractured Basalt. This well can cater to drinking water requirements of a population of about 7000 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Kalmeshwar Taluka, Nagpur District down to a depth of 200.00m bgl has yielded a high discharge of 466 liter per minute in the formation of Gondwana Sandstone. This well can cater to drinking water requirements of a population of about 4500 (@ 60 lpcd for ten hours of pumping a day) in the area. • An observation well drilled at Kalmeshwar Taluka, Nagpur District down to a depth of 200.00m bgl has yielded a high discharge of 600 liter per minute in the formation of Gondwana Sandstone. This well can cater to drinking water requirements of a population of about 6000 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Dawargaon, Amravati District down to a depth of 200m bgl has yielded a high discharge of 480 liter per minute in Fractured Basalt. This well can cater to drinking water requirements of a population of about 4800 (@ 60 lpcd for ten hours of pumping a day) in the area. • A well(piezometer) drilled at Newasa Phata, Newasa Taluka, Ahmednagar

Sl. No.	Name of States	Description
		District down to a depth of 40.00m bgl has yielded a high discharge of 864 liter per minute in the formation of Vesicular and Jointed Basalt. • An exploratory well drilled at Wadgaon, Amravati District down to a depth of 123.30m bgl has yielded a high discharge of 350 liter per minute in Fractured Basalt and Fractured Vesicular Basalt. This well can cater to drinking water requirements of a population of about 3500 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Newasa Taluka, Ahmednagar District down to a depth of 200.00m bgl has yielded a high discharge of 464 liter per minute in the formation of Vesicular and Jointed Fractured Basalt. • An exploratory well drilled at Kalmeshwar Taluka, Nagpur District down to a depth of 200.00m bgl has yielded a high discharge of 893 liter per minute in the formation of Gondwana Sandstone. This well can cater to drinking water requirements of a population of about 8900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Kalmeshwar Taluka, Nagpur District down to a depth of 200.00m bgl has yielded a high discharge of 355 liter per minute in the formation of Gondwana Sandstone. This well can cater to drinking water requirements of a population of about 3500 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Bodvad Taluka, Jalgaon District down to a depth of 84.00 m bgl (Drilling under progress) has yielded a high discharge of 720 liter per minute in the formation of Fractured Basalt. This well can cater to drinking water requirements of a population of about 7200 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Kurha Hardo, Buldhana District down to a depth of 124.00 m bgl has yielded a high discharge of 590 liter per minute in the formation of Fractured Basalt. SWL of well is 7.4 mbgl and fracture encountered at 33-34,74.70-77.70 m bgl. This well can cater to drinking water requirements of a population of about 5900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Newasa Taluka, Ahmednagar District down to a depth of 74.00 m bgl has yielded a high discharge of 1500 liter per minute in the formation of Fractured Basalt. SWL of well is 26.00 mbgl and fracture encountered at 73.00 to 74.00 m bgl. This well can cater to drinking water requirements of a population of about 15000 (@ 60 lpcd for ten hours of pumping a day) in the area. • An observation well drilled at Ahmednagar Taluka, Ahmednagar District down to a depth of 74.50 m bgl has yielded a high discharge of 190 liter per minute in the formation of Fractured Basalt. SWL of well is 2.50 mbgl and fracture encountered at 64.00 to 65.00 m bgl. This well can cater to drinking water requirements of a population of about 1900 (@ 60 lpcd for ten hours of pumping a day) in the area.

Fig 4.5: High Yielding Well at Chasnali EW, Kopargaon Taluka, Ahmednagar, Maharashtra

Fig 4.6 High yielding EW at H.Gollahalli, in Aquifer mapping area of Mulbagal taluk, Kolar district Karnataka

Fig 4.7. High yielding Well at Tamil Nadu

Fig 4.8 Discharge measurement of high yielding well at KOLAR DISTRICT Karnataka

5. GEOPHYSICAL STUDIES

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 as a practice are combined with the hydro geological investigations to place them on firm footing. The techniques have become an integral part of the ground water exploration programme.

The geophysical techniques in vogue have been used under all types of geological and geographical settings that the country is bestowed with, i.e., Archaean to Recent formation containing aquifers in the hilly terrain, piedmont areas, sprawling plains and plateau, deserts and coastal tracts. The techniques have been used to assess the disposition of capable aquifers under vulnerable conditions as interspersed with saline zones and the encroachment of saline and polluted water.

An effective and wide application has been made of the conventional surface electrical resistivity technique for source finding. These surveys were undertaken to support, supplement and corroborate the hydrogeological surveys, ground water exploration and short-term water supply investigations. Besides, geophysical surveys were also undertaken for demarcating saline-fresh water interface, Coastal aquifer management studies, estimation of overburden thickness and bedrock configuration, identifying favourable sites for artificial recharge structures as well as snow harvesting sites in Himachal Pradesh, flood plain studies and in farmer distress villages etc.

Central Geophysical Cell

The Central Geophysical Cell remain engaged in Planning & Programming of Geophysical surveys in CGWB, finalization of AAP of different Regions for geophysical investigation and monitoring of progress of geophysical work. Work was carried by the geophysical cell in the current year involved:

- Acquisition of geophysical equipments, drawing of Specifications and organizing performance testing of Geophysical equipments. Several meetings of the Technical Committee with the committee members from NGRI, GSI to formulate the specifications for the geophysical equipment Southern Region, and Hyderabad were convened.
- Repairs/servicing of logger stationed at Central Region, Nagpur was under taken and the calibration of the equipment was demonstrated to the local Geophysicists.
- Discussions with the ONGC officials at Rajahmundry and collected data pertaining to oil well logs so as to decipher the deep water bearing formations for the future exploration.

GEOPHYSICAL STUDIES AT A GLANCE

Geophysical studies are undertaken as an integral part of aquifer mapping and short-term water supply investigations. During 2013-14 up to 31st March, 2014, 2383 Vertical Electrical Soundings, 88.00 line kilometre resistively profiling and geophysical logging of 96 bore holes have been conducted in various parts of the country . Details of Geophysical surveys & bore hole logging as carried out in different regional offices are given in Table 5.1

Table 5.1 Geophysical Surveys & Bore Hole Logging during 2013-2014

Sl. No.	Region	No.of VES	Resistivity Profiles (line km)	No. of boreholes logged
1	NWHR,Jammu	70	14.0	3
2	NWR,Chandigarh	180	50.4	14
3	WR,Jaipur	150	-	-
4	WCR,Ahmedabad	40	-	4
5	NCR,Bhopal	150	-	-
6	NCCR,Raipur	75	-	-
7	CR,Nagpur	150	-	17
8	NR,Lucknow	116	-	18
9	MER,Patna	175	-	6
10	ER,Kolkata	225	-	-
11	NER,Guwahati	151	-	1
12	SER,Bhubaneswar	155	-	1
13	SR,Hyderabad	315	-	-
14	SWR,Bangalore	181	-	-
15	SECR,Chennai	139	-	10
16	UT ,Uttrakhand	29	-	22
17	KR,Trivendrum	82	23.6	-
	Total	2383	88.0	96

Fig-5.1 (a) Resistivity survey with the CRM – 500 instrument in the SFTI campus, Gaya (b) Resistivity survey in Aquifer mapping area, Kolar District (c) Arrangement for VES with Syscal R2 resistivity meter in deer (Mrig) park, Rajgir. (d) Demonstration of Geophysical survey to the trainees during Training Programme (March 2014)

6. WATER 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. Action has been initiated for getting accreditation of laboratories from National Accreditation Board for Testing and Calibration Laboratories (NABL) and ISO 9001:2008 certificate. The Chemical laboratories are well equipped to carry out Basic analysis & Trace metal and Toxic elements determinations using sophisticated instruments like Atomic Absorption Spectrophotometer (AAS), 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, 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 is 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 Kolkata. The chemical analysis data generated by these laboratories is utilized for monitoring and evaluating the groundwater quality in compliance with National Standards (BIS 2012) for its designated use, to study the impact of anthropogenic activities on ground water quality, to demarcate critical areas where there is water quality deterioration and to assess the point and non-point sources of ground water pollution so as to take necessary action for management of ground water resources.

During 2013-14, a total number of 21973 water samples were analyzed, out of which 18707 water samples for determination of basic constituents, 2598 for heavy metals abd 668 for organic and specific purposes. The details of water samples analyzed by different Chemical Laboratories during 2013- 14 are presented in table 6.1

Central Ground Water Board has also initiated industrial pollution cluster studies, which are identified by Central pollution Control Board throughout in India. A special training was organised at Rajiv Gandhi National Ground Water Training and Research Institute, (RGNGWTRI), Raipur, Chhattisgarh for training man power on chemical analysis, interpretation and validation of data on water chemistry.

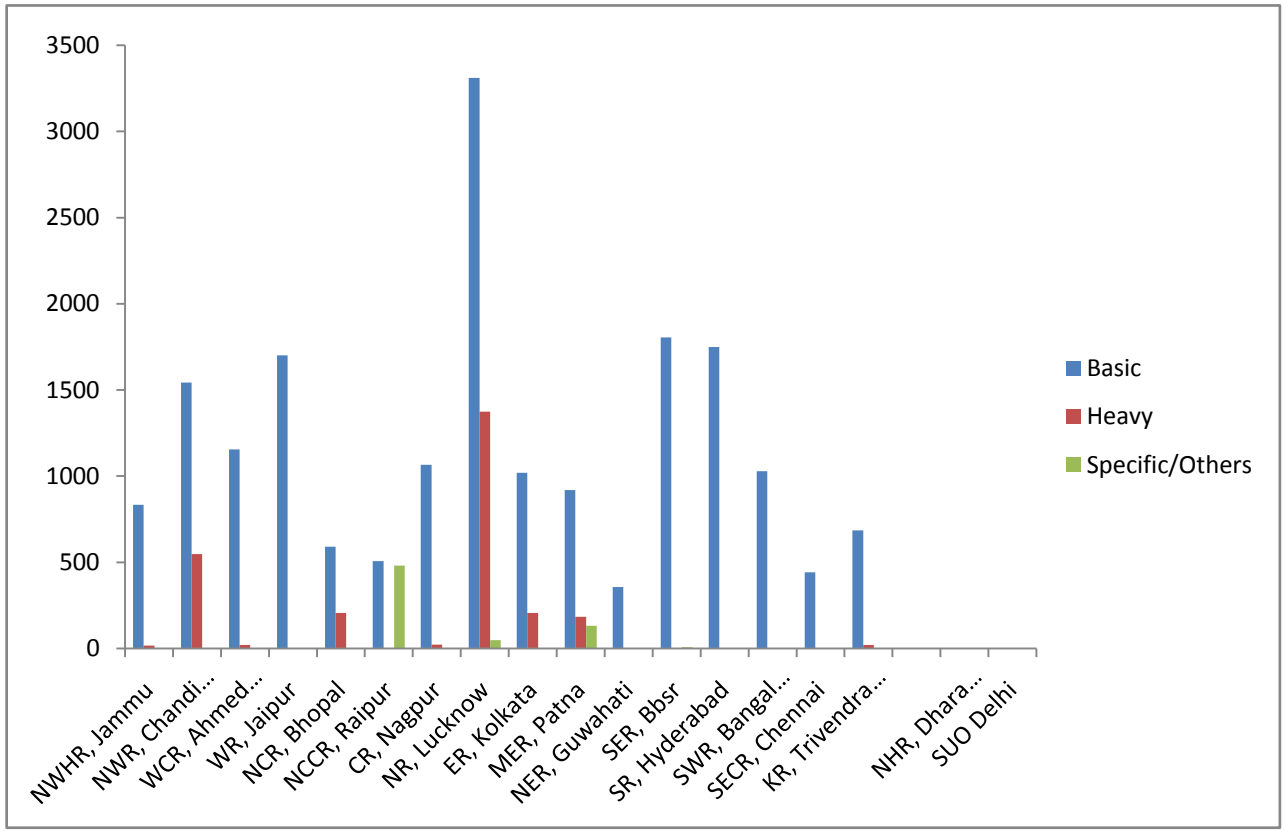
Besides the analytical work, chemists from the various laboratories have participated in mass awareness programmes and trade fairs and have prepared exhibits, posters, handouts diagrams, etc. on water quality, for display. They have demonstrated the testing of various chemical parameters present in water and their impact on human body. The importance of water quality for artificial recharge to ground water through rain water harvesting and impact of chemical quality of the water being used for drinking, agricultural and industrial purposes has also been explained to farmers, visitors and students.

Table 6.1 Region-wise Water Samples Analysis during 2013-2014

Regions	Number of Samples			Total sample analysed
	Basic analysis	Heavy	Specific/Others	
NWHR, Jammu	833	16	0	849
NWR, Chandigarh	1543	547	0	2090
WCR, Ahmedabad	1155	20	0	1175
WR, Jaipur	1700	0	0	1700
NCR, Bhopal	591	206	0	797
NCCR, Raipur	506	0	480	986
CR, Nagpur	1065	23	0	1088
NR, Lucknow	3310	1374	48	4732
ER, Kolkata	1019	207	0	1226
MER, Patna	919	184	132	1235
NER, Guwahati	356	0	0	356
SER, Bhwaneshwar	1804	0	8	1812
SR, Hyderabad	1750	0	0	1750
SWR, Bangalore	1028	0	0	1028
SECR, Chennai	442	0	0	442
KR, Trivendram	686	21	0	707
UR, Dehradun	0	0	0	0
NHR, Dharamsala	0	0	0	0
SUO Delhi	0	0	0	0
Total	**18707**	**2598**	**668**	**21973**

The samples of UR & SUO Delhi analysed by NWR Lab and samples of NHR analysed at NWHR Lab.

Fig 6.1 Region-wise Water Samples Analysis during 2013-2014



7. WATER SUPPLY INVESTIGATIONS

The Board provides assistance to defence and Govt. agencies establishments to solve their immediate water supply problems by selecting suitable sites for construction of ground water abstraction structures. During 2013-14, 179 Water Supply Investigations were carried out and region wise/state wise status is given in table 7.1 and fig. 7.1

Table 7.1: Region/State wise Water Supply Investigations taken up during 2013-2014

Sl. No	Regions	States	Number of Water Supply Investigations
1	**NORTH WESTERN HIMALAYAN REGION**	Jammu & Kashmir	6
2	**NORTHERN HIMALAYAN REGION**	Himachal Pradesh	7
3	**NORTH WESTERN REGION**	Punjab	18
		Haryana	
		Chandigarh	
4	**WESTERN REGION**	Rajasthan	2
6	**SOUTH EASTERN REGION**	Orissa	2
7	**EASTERN REGION**	West Bengal	19
8	**NORTH CENTRAL REGION**	Madhya Pradesh	1
9	**WEST CENTRAL REGION**	Gujarat	5
10	**NORTH EASTERN REGION**	Assam	41
		Arunachal Pradesh	3
		Tripura	27
		Meghalaya	9
11	**SOUTHERN REGION**	Andhra Pradesh	8
12	**SOUTH WESTERN REGION**	Karnataka	7
		Goa	3
13	**SOUTH EASTERN COASTAL REGION**	Chennai	4
14	**KERALA REGION**	Kerala	2
15	**CENTRAL REGION**	Maharashtra	1
16	**NORTH CENTRAL CHHATTISGARH REGION**	Chhattisgarh	1
17	**SUO, DELHI**	NCT,Delhi	13
		Total	179

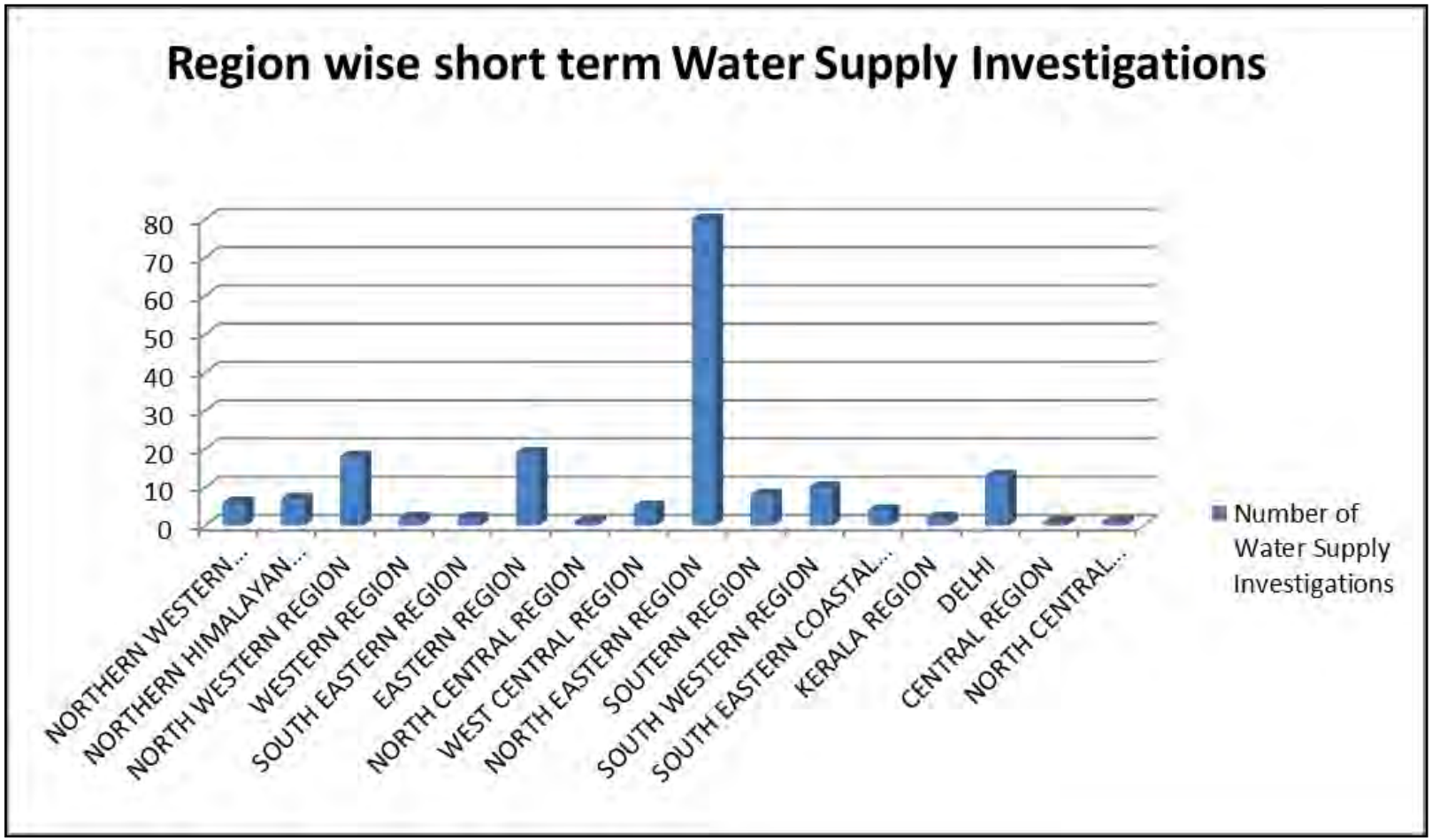


Fig 7.1 Showing Short term Water Supply Investigations during 2013-14

8. GROUND WATER REGIME MONITORING

Monitoring of ground water regime is an effort to obtain information on ground water level and chemical quality through representative sampling. The important attributes of ground water regime monitoring are ground water level, ground water quality and temperature. The primary objective of establishing the ground water monitoring network is to record the response of ground regime to the natural and anthropogenic stresses of recharge and discharge parameters with reference to geology, climate, physiography, land use pattern and hydrologic characteristics. The natural conditions affecting the regime involve climatic parameters like rainfall, evapotranspiration etc., whereas anthropogenic influences include pumpage from the aquifer, recharge due to irrigation systems and other practices like waste disposal etc.

Ground water levels are being monitored four times a year during January, April, May, August and November. At present a network of 20698 observation wells located all over the country is being monitored. Ground water samples are collected from these observation wells once a year during the month of January/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. The ground water level and quality monitoring is of particular importance in coastal as well inland saline environment to assess the changes in salt water/fresh water interface as also the gradual quality changes in the fresh ground water regime. This data is used for assessment of ground water resources and changes in the regime consequent to various development and management activities.

The State-wise distribution of the ground water observation wells is given in table 8.1 and Fig 8.1.

Table 8.1: The State-wise distribution of the Ground Water Observation Wells is given below.

Sl. No.	Name of the State	Total No. of Ground Water Monitoring Wells (as on 31.03.2014)		
	States	DW	PZ	Total
1	Andhra Pradesh	755	124	879
2	Arunachal Pradesh	29	1	30
3	Assam	398	62	460
4	Bihar	507	37	544
5	Chhattisgarh	759	248	1007
6	NCT,Delhi	20	100	120
7	Goa	96	49	145
8	Gujarat	807	390	1197
9	Haryana	472	394	866
10	Himachal Pradesh	106	0	106
11	Jammu & Kashmir	256	32	288
12	Jharkhand	326	18	344
13	Karnataka	900	373	1273
14	Kerala	1252	266	1518
15	Madhya Pradesh	1068	352	1420
16	Maharashtra	1414	237	1651
17	Manipur	13	10	23
18	Meghalaya	57	7	64
19	Nagaland	26	5	31
20	Orissa	1405	125	1530
21	Punjab	141	614	755
22	Rajasthan	734	377	1111
23	Tamil Nadu	767	584	1351
24	Telangana	345	354	699
25	Tripura	63	12	75
26	Uttar Pradesh	1011	298	1309
27	Uttarakhand	48	134	182
28	West Bengal	771	785	1556
	UT s			
1	Andaman & Nicobar	93	0	93
2	Chandigarh	1	24	25
3	Dadra & Nagar Haveli	12	0	12
4	Daman & Diu	11	5	16
5	Pondicherry	11	7	18
TOTAL		**14674**	**6024**	**20698**

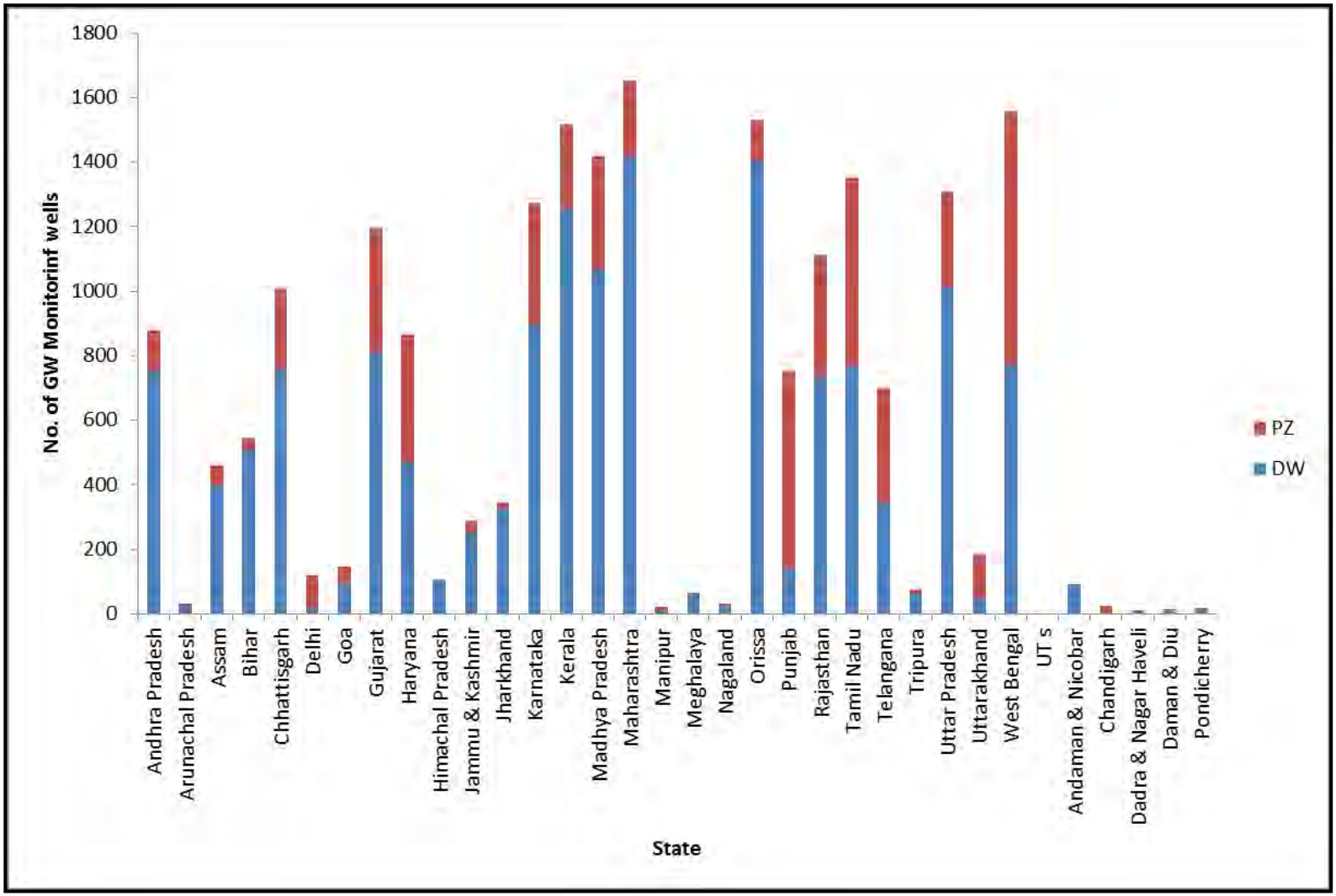


Fig 8.1: State-wise distribution of the Ground Water Observation Well

8.1 Ground Water Level Scenario

Depth to Water Level – Pre Monsoon 2013

Perusal of the ground water level data for Pre Monsoon 2013 indicates that in Sub-Himalayan areas, north of river Ganges and in north eastern part of the country in the Brahmaputra valley, eastern coast of Orissa, Andhra Pradesh and Tamil Nadu generally the depth to water level varies from 2-5 meter below ground level. Isolated pockets of shallow water level less than 2 m bgl have been observed in West Maharashtra and in parts of Orissa and Andhra Pradesh. In major parts of north-western states depth to water level generally ranges from 10-40 m bgl. In the western parts of the country deeper water level is recorded in the depth range of 20-40 m bgl. In North Gujarat, parts of Haryana and western Rajasthan water level of more than 40 m bgl is recorded. Along the eastern & western coast, water level is generally less than 10 m. Central part of West Bengal state recorded ground water levels in the range of 5-20 m bgl. In north central India water level generally varies between 10-20 m bgl, except in isolated pockets where water level less than 10 m bgl has been observed. The peninsular part of country generally recorded a water level in the range of 5 to 20 m bgl.

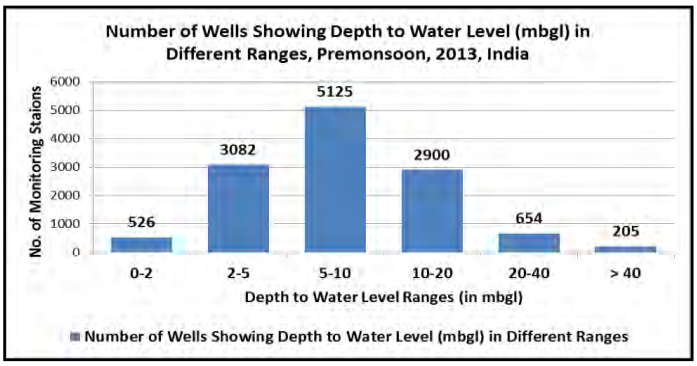


Figure 8.2 No. of wells showing depth to water level (mbgl) (premonsoon,2013)

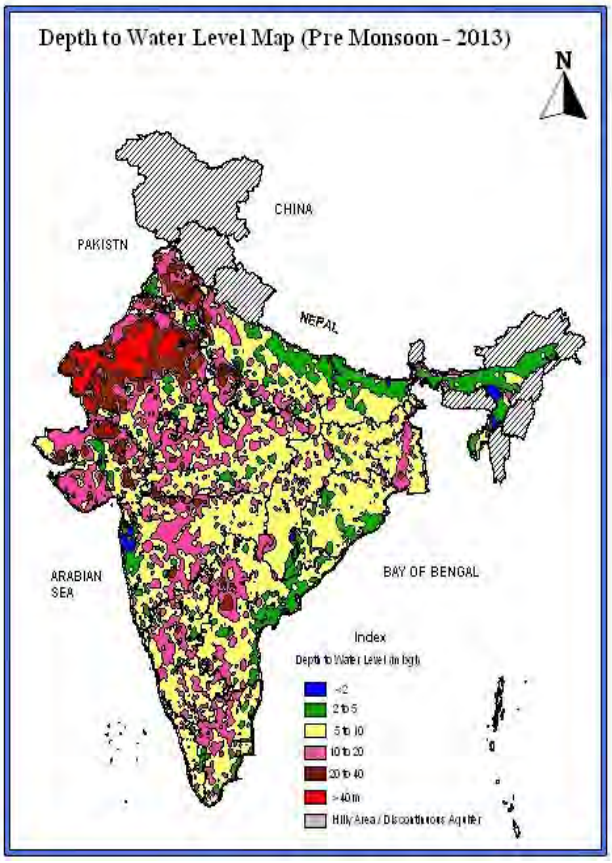


Figure:8.3 Depth to Water level Map (Premonsoon 2013)

Depth to Water Level – August 2013

Perusal of the ground water level data for August 2013 indicates that in Sub-Himalayan area, north of river Ganges, Orissa, Andhra Pradesh, Kerala, Gujarat, parts of Madhya Pradesh, Assam and Coastal Tamil Nadu generally the depth to water level varies from 2-5 meter below ground level. Shallow water level less than 2 m bgl have also been observed in West Maharashtra, Assam, North Uttar Pradesh, Jharkhand, Madhya Pradesh, Chhatishgarh and Orissa. In major parts of north-western states depth to water level generally ranges from 10-40 m bgl. In the western parts of the country, deeper water level is recorded in the depth range of 20-40 m bgl and more than 40 m bgl. In some parts of Delhi and Rajasthan water level more than 40 m bgl is recorded. Along the eastern & western coast water level is generally less than 10 m. Central part of West Bengal recorded water level in the range of 5-20 m bgl. In Central India water level generally varies between less than 2 m bgl to 5 m bgl, except in isolated pockets where water level less than 10 m bgl has been observed.

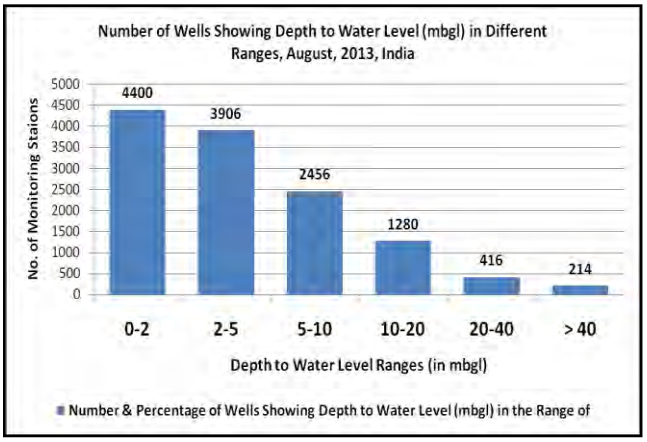


Figure 8.4 No. of wells showing depth to water level (mbgl) (August,2013)

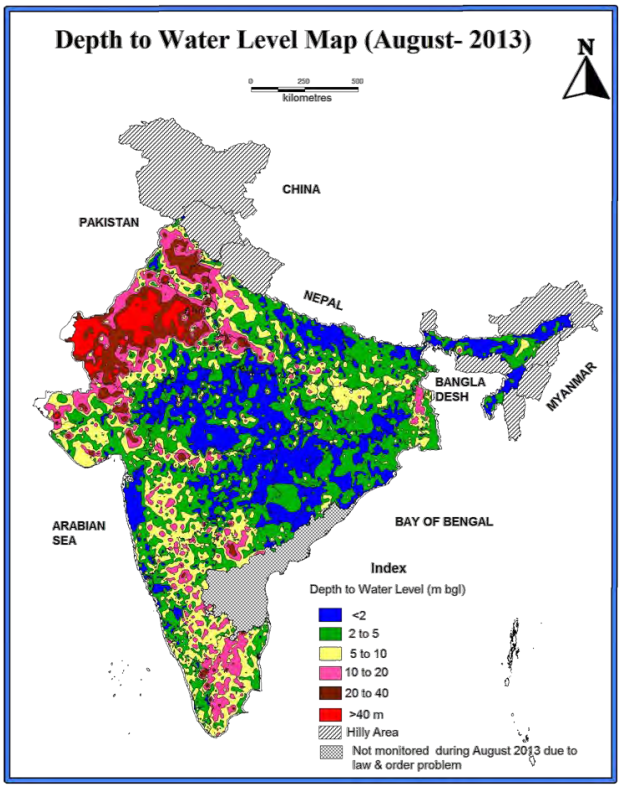


Figure:8.5 Depth to Water level Map (August 2013)

Depth to Water Level – Post Monsoon 2013

Perusal of the ground water level data for November, 2013 indicates that in Sub-Himalayan areas, north of river Ganges, Assam, Bihar, Chhattisgarh, Maharashtra, Jharkhand, Madhya Pradesh, Odisha, Bihar, Gujarat, Tripura and Coastal Tamil Nadu, generally the depth to water level varies from 2-5 mbgl. Shallow water level less than 2 m bgl have also been observed as patches in Maharashtra, Andhra Pradesh, Assam, Northern Uttar Pradesh, Jharkhand, Chhattisgarh and Odisha. In major parts of north-western states, depth to water level generally ranges from 10-40 m bgl. In the western parts of the country deeper water level is recorded in the depth range of 20-40 m bgl and more than 40 m bgl. In some parts of Delhi and Rajasthan, water level of more than 40 m bgl is recorded. Along the eastern & western coast water level is generally less than 10 m. Central part of West Bengal recorded water level in the range of 5-10 m bgl. In Central India, water level generally varies between less than 2 m bgl to 5 m bgl, except in isolated pockets where water level less than 10 m bgl.

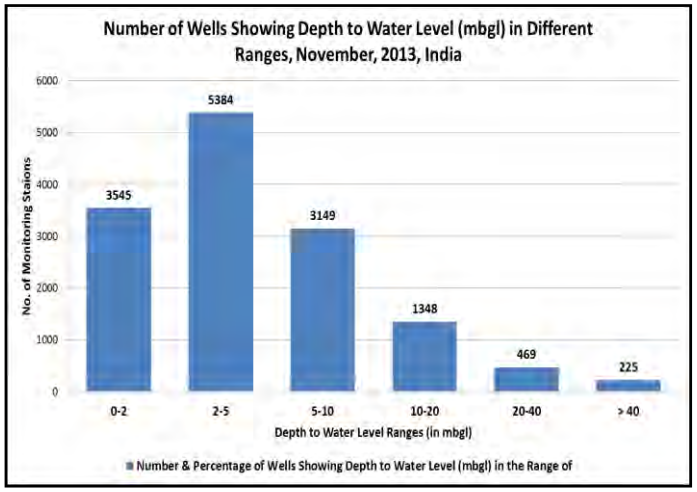


Figure 8.6 No. of wells showing depth to water level (mbgl) (Nov,2013)

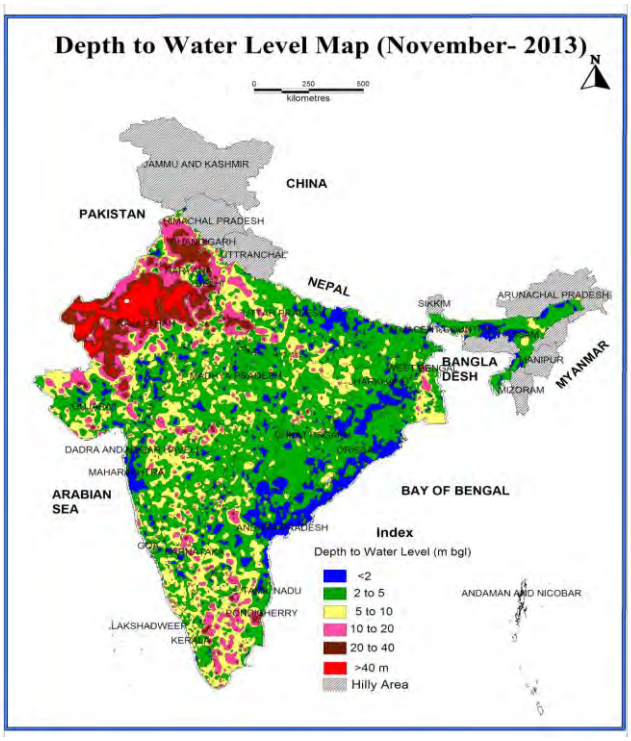


Figure:8.7 Depth to Water level Map (Nov- 2013)

Depth to Water Level – January 2014

Perusal of the depth to water level map for January 2014 indicates that in Sub-Himalayan area, north of river Ganges, Assam, Bihar, Chhattisgarh, Maharashtra, Jharkhand, Madhya Pradesh Odisha, Bihar, Gujarat, Tripura and Coastal Tamil Nadu generally the depth to water level varies from 2-5 meter below ground level. Shallow water level less than 2 m bgl have also been observed as isolated patches in Maharashtra, Andhra Pradesh, Assam, Northern Uttar Pradesh, Madhya Pradesh, Gujarat and Odisha. In major parts of north-western states depth to water level generally ranges from 10-40 m bgl. In the western parts of the country deeper water level is recorded in the depth range of 20-40 m bgl and also more than 40 m bgl. In some parts of NCT Delhi and Rajasthan water level of more than 40 m bgl is recorded. Along the eastern & western coast water level is generally less than 10 m. Central part of West Bengal state recorded water level in the range of 5-10 m bgl and also 10-20 m bgl. In Central India water level generally varies

9. ACTIVITIES IN NORTH EASTERN REGION

The Central Ground Water Board is conducting scientific and technical studies for ground water assessment, development and management in the North Eastern Region. Major achievements of the North Eastern Region in the year **2013-14** are given below in table 10.1.

Table 10.1- Major achievements of the North Eastern Region

Sl.No	Activities	Achievements
1.	Data Generation for Aquifer Mapping	
a	Identification of Aquifer on available 1:250K and Data gap assessment	The entire area was covered by establishing key observation wells & springs & water levels were monitored from the established key wells, springs & existing GWMW. Sub Surface data has been generated through VES in some parts of the area.
b	Ground water Exploration (No. of boreholes)	20 wells drilled in North Eastern Region
c	Geophysical Studies	151 Vertical Electrical Sounding and 1 bore hole logging completed.
d	Water Quality Analysis	338 samples analyzed
2	Ground Water Regime Monitoring	Monitoring of water level from GWMS for the month of April/May, August, November, 2013 and January 2014completed.
	Establishment of additional wells	42 wells
	Participatory Ground Water Monitoring	Participatory monitoring of 73 GWMW completed till date.
3	Short Term Water Supply Investigation.	58 nos.
4	Artificial Recharge Studies ongoing projects	i) Arunachal Pradesh: Work completed. Utilization Certificates have been submitted to CHQ. ii)Nagaland: Completed. Utilization Certificates & Completion Reports& Impact assessment reports prepared by Department of Geology & Mining, Nagaland have been submitted to CHQ.
5	Ground Water Resources Assessment (No of States/ UT) (As on 31-03-2012)	Data collection under progress.
6	Issuance of District Brochures	All District Brochures submitted to CHQ.
7	Ground Water Year Books	Ground Water Year Book of NE State Submitted & under issuance
8	State Level Painting Competition	4TH State Level Painting Competition successfully competed in the Region.
9	GW Regulation	50 nos received

10. RE-ASSESSMENT OF DYNAMIC GROUND WATER RESOURCES

As per the National Water Policy 2002, the ground water resource potential needs to be re-assessed periodically on scientific basis. Accordingly, the Ground Water Resource of the entire country is being re- assessed jointly by the Central Ground Water Board and the States based on the Ground water resources estimation methodology GEC–97.

The Total Annual Replenishable Ground Water Resources of the Country have been re assessed as 433 Billion Cubic Metres (bcm) and the Net Annual Ground Water Availability is estimated as 398 bcm. Annual Ground Water Draft as on March, 2011 for all uses is 245 bcm. The Stage of Ground Water Development is 62%. The state-wise availability of groundwater resources is given in Table 16.1. The development of ground water in different areas of the Country has not been uniform. Highly intensive development of groundwater in certain areas in the country has resulted in over-exploitation of Ground Water Resource. As per the latest assessment of ground water resources out of 6607 assessment units (Block / Mandals / Talukas/Firkas) in the country, 1071 units in various States have been categorized as 'Over-Exploited' i.e. the annual ground water draft exceeds the annual replenishable ground water resources and significant decline in long term ground water level trend has been observed in pre-monsoon & post-monsoon both. In addition 217 units are 'Critical' where the stage of ground water development is 100% of annual replenishable ground water resource and significant decline is observed in the long term water level trend in either in pre-monsoon or post-monsoon periods or both. There are 697 "Semi-Critical'' units, where the stage of ground water development is between 70-90% and significant decline in long term water level trend has been recorded in either Pre- monsoon or Post-monsoon. Apart from these, there are 92 blocks completely underlain by saline ground water. The state-wise status of over–exploited and critical and semi-critical areas is given in Table10.1.

Table 10.1 State-wise ground water resources availability, utilization and stage of development India (as on 31st march 2011) *(in bcm)*

Sl. No.	States / Union Territories	Annual Replenishable Ground Water Resource					Natural Discharge during non-monsoon season	Net Annual Ground Water Availability	Annual Ground Water Draft			Projected demand for Domestic and Industrial uses upto 2025	Ground Water Availability for future irrigation use	Stage of Ground Water Development (%)
		Monsoon Season		Non-monsoon Season		Total			Irrigation	Domestic and industrial uses	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
	States													
1	Andhra Pradesh	17.25	6.29	5.38	6.97	35.89	3.32	32.57	13.18	1.33	14.51	2.81	16.97	45
2	Arunachal Pradesh	3.36	0.00	1.15	0.00	4.51	0.45	4.06	0.002	0.001	0.003	0.01	4.05	0.08
3	Assam	17.90	1.64	8.64	0.34	28.52	2.73	25.79	2.86	0.64	3.49	0.78	22.14	14
4	Bihar	19.54	3.95	3.40	2.44	29.34	2.47	26.86	10.25	1.70	11.95	2.51	14.10	44
5	Chhattisgarh	9.90	0.70	0.87	0.94	12.42	0.79	11.63	3.43	0.62	4.05	0.76	7.44	35
6	Delhi	0.11	0.10	0.02	0.08	0.31	0.02	0.29	0.14	0.25	0.39	0.26	0.01	137
7	Goa	0.16	0.008	0.01	0.07	0.24	0.10	0.145	0.01	0.03	0.04	0.04	0.10	28
8	Gujarat	12.79	2.55	0.00	3.23	18.57	0.98	17.59	10.75	1.11	11.86	1.48	5.87	67
9	Haryana	3.65	2.77	1.01	3.35	10.78	0.99	9.79	12.35	0.71	13.06	0.76	-3.31	133
10	Himachal Pradesh	0.39	0.02	0.10	0.05	0.56	0.03	0.53	0.25	0.13	0.38	0.13	0.15	71
11	Jammu & Kashmir	1.45	2.06	0.36	0.37	4.25	0.43	3.83	0.20	0.61	0.81	0.76	2.87	21
12	Jharkhand	4.75	0.13	1.06	0.36	6.31	0.55	5.76	1.31	0.55	1.86	0.76	3.69	32
13	Karnataka	6.81	4.17	2.67	3.38	17.03	2.22	14.81	8.59	0.82	9.41	1.06	6.53	64
14	Kerala	4.85	0.06	0.63	1.15	6.69	0.61	6.07	1.30	1.53	2.84	1.71	3.07	47
15	Madhya Pradesh	28.22	1.17	0.79	4.87	35.04	1.75	33.29	17.48	1.35	18.83	1.91	13.90	57

16	Maharashtra	22.36	1.68	1.84	8.07	33.95	1.80	32.15	16.15	1.03	17.18	1.97	14.48	53
17	Manipur	0.23	0.01	0.19	0.01	0.44	0.04	0.40	0.0033	0.0007	0.004	0.05	0.35	1.02
18	Meghalaya	1.68	0.03	0.07	0.005	1.78	0.18	1.60	0.0015	0.0002	0.0017	0.232	1.37	0.08
19	Mizoram	0.0257	Negligible	0.005	Negligible	0.030	0.003	0.027	0.00	0.001	0.001	0.002	0.025	3.52
20	Nagaland	0.40	Negligible	0.21	Negligible	0.62	0.062	0.55	0.00	0.03	0.03	0.04	0.51	6.13
21	Odisha	11.29	2.53	1.33	2.63	17.78	1.09	16.69	3.81	0.92	4.73	1.24	11.64	28
22	Punjab	5.82	10.64	1.33	4.74	22.53	2.21	20.32	34.17	0.71	34.88	0.98	-14.83	172
23	Rajasthan	8.78	0.68	0.28	2.20	11.94	1.11	10.83	13.13	1.71	14.84	1.89	0.91	137
24	Sikkim		-	-	-	-	-	0.044	0.003	0.009	0.011	0.01	0.031	26
25	Tamil Nadu	7.38	10.28	1.69	2.18	21.53	2.15	19.38	13.17	1.76	14.93	1.82	4.39	77
26	Tripura	1.248	0.000	0.740	0.598	2.587	0.229	2.358	0.093	0.069	0.163	0.200	2.065	7
27	Uttar Pradesh	42.13	11.57	5.15	18.34	77.19	5.53	71.66	48.74	4.04	52.78	6.55	19.64	74
28	Uttarakhand	1.09	0.26	0.20	0.49	2.04	0.04	2.00	1.10	0.03	1.13	0.09	0.80	57
29	West Bengal	18.53	5.72	1.42	3.58	29.25	2.67	26.58	9.72	0.97	10.69	1.48	15.38	40
	Total States	**252.11**	**68.99**	**40.56**	**70.44**	**432.11**	**34.55**	**397.60**	**222.21**	**22.66**	**244.86**	**32.28**	**154.34**	**62**
	Union Territories													
1	Andaman & Nicobar	0.262	Nil	0.046	Nil	0.308	0.022	0.286	0.001	0.012	0.013	0.014	0.272	4.44
2	Chandigarh	0.015	0.001	0.005	0.001	0.022	0.002	0.019	0.000	0.000	0.000	0.000	0.000	0
3	Dadara & Nagar Haveli	0.043	0.003	0.009	0.007	0.062	0.003	0.059	0.007	0.006	0.013	0.010	0.042	22
4	Daman & Diu	0.014	0.002	0.000	0.002	0.018	0.001	0.017	0.014	0.002	0.016	0.003	0.000	97
5	Lakshdweep	0.000	0.000	0.000	0.000	0.011	0.007	0.0035	0.000	0.0023	0.0023	0.000	0.000	67
6	Puducherry	0.089	0.060	0.008	0.032	0.189	0.019	0.170	0.124	0.029	0.153	0.032	0.057	90
	Total Uts	**0.42**	**0.07**	**0.07**	**0.04**	**0.61**	**0.05**	**0.56**	**0.15**	**0.05**	**0.20**	**0.06**	**0.37**	**36**
	Grand Total	**252.53**	**69.06**	**40.63**	**70.48**	**432.72**	**34.60**	**398.16**	**222.36**	**22.71**	**245.06**	**32.34**	**154.71**	**62**

Blocks- Bihar, Chattisgarh, Haryana, Jharkhand, Kerala, M.P., Manipur, Mizoam, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, UP, UttaraKhand, WB,

Taluks (Command/Non-Command) –Karnataka, **Mandal** – Andhra Pradesh

Taluks – Goa, Gujarat, Maharashtra, NCT Delhi

Districts (Valley) – Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim, Tripura

Islands – Lakshdweep, Andaman & Nicobar Islands

Region – Puducherry

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

Table10.2 Categorization of blocks/ mandals/ talukas in India (as on 31st march 2011)

Sl.No.	States / Union Territories	Total No. of Assessed Units	Safe		Semi-critical		Critical		Over-exploited		Saline	
			Nos.	%	Nos.	%	Nos.	%	Nos.	%	Nos.	%
	States											
1	Andhra Pradesh	1110	877	79	97	9	15	1	83	7	38	3
2	Arunachal Pradesh	11	11	100	0	0	0	0	0	0	0	0
3	Assam	27	27	100	0	0	0	0	0	0	0	0
4	Bihar	533	522	98	11	2	0	0	0	0	0	0
5	Chattisgarh	146	125	86	18	12	2	1	1	1	0	0
6	Delhi	27	2	7	5	19	2	7	18	67	0	0
7	Goa	20	20	100	0	0	0	0	0	0	0	0
8	Gujarat	223	171	77	13	6	5	2	24	11	10	4
9	Haryana	116	23	20	7	6	15	13	71	61	0	0
10	Himachal Pradesh	8	5	63	0	0	2	25	1	13	0	0
11	Jammu & Kashmir	14	14	100	0	0	0	0	0	0	0	0
12	Jharkhand	210	199	95	5	2	0	0	6	3	0	0
13	Karnataka	270	152	56	34	13	21	8	63	23	0	0
14	Kerala	152	126	83	23	15	2	1	1	1	0	0
15	Madhya Pradesh	313	218	70	67	21	4	1	24	8	0	0
16	Maharashtra	353	325	92	16	5	2	1	10	3	0	0
17	Manipur	8	8	100	0	0	0	0	0	0	0	0
18	Meghalaya	7	7	100	0	0	0	0	0	0	0	0
19	Mizoram	22	22	100	0	0	0	0	0	0	0	0
20	Nagaland	8	8	100	0	0	0	0	0	0	0	0
21	Orissa	314	308	98	0	0	0	0	0	0	6	2
22	Punjab	138	22	16	2	1	4	3	110	80	0	0
23	Rajasthan	243	25	10	20	8	24	10	172	71	2	1
24	Sikkim	4	4	100	0	0	0	0	0	0	0	0
25	Tamil Nadu	1129	437	39	235	21	48	4	374	33	35	3
26	Tripura	39	39	100	0	0	0	0	0	0	0	0
27	Uttar Pradesh	820	559	68	82	10	68	8	111	14	0	0
28	Uttaranchal	18	11	61	5	28	2	11	0	0	0	0
29	West Bengal	271	217	80	53	20	1	0.37	0	0	0	0
	Total States	**6554**	**4484**	**68**	**693**	**11**	**217**	**3**	**1069**	**16**	**91**	**1**
	Union Territories											
1	Andaman & Nicobar	36	36	100	0	0	0	0	0	0	0	0
2	Chandigarh	1	1	100	0	0	0	0	0	0	0	0
3	Dadra & Nagar Haveli	1	1	100	0	0	0	0	0	0	0	0
4	Daman & Diu	2	0	0	1	50	0	0	1	50	0	0
5	Lakshdweep	9	6	67	3	33	0	0	0	0	0	0
6	Pondicherry	4	2	50	0	0	0	0	1	25	1	25
	Total Uts	**53**	**46**	**87**	**4**	**8**	**0**	**0**	**2**	**4**	**1**	**2**
	Grand Total	**6607**	**4530**	**69**	**697**	**11**	**217**	**3**	**1071**	**16**	**92**	**1**

Note

Blocks- Bihar, Chhattisgarh, Haryana, Jharkhand, Kerala, M.P., Manipur, Mizoram, Orissa, Punjab, Rajasthan, Tripura, UP, Uttarakhand, WB

Taluks (Command/Non-Command) –Karnataka

Mandal – Andhra Pradesh

Taluks – Goa, Gujarat, Maharashtra

Districts (Valley) – Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura

Islands – Lakshdweep, Andaman & Nicobar Islands

Firka-Tamil Nadu

Region – Puducherry

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

Tehsil-NCT Delhi

11. ARTIFICIAL RECHARGE STUDIES

11.1 Demonstrative Projects on "Artificial Recharge to Ground Water & Rain Water Harvesting"

CGWB has implemented demonstrative projects on artificial recharge to Groundwater and Rain Water Harvesting in the states of Andhra Pradesh, Arunachal Pradesh, Bihar, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharastra, Nagaland, Odisha, Punjab, Rajasthan, Tamil Nadu, Telengana, Uttar Pradesh, West Bengal and UT Chandigarh, (22 States/UT) during XI Plan. A total of 133 projects amounting to Rs. 99.87 Crore envisaging construction of 1661 recharge structures were approved during XI plan and funds of Rs. 85.03 Crore were released till March 31, 2014. During 2013-14, spillover balance funds of Rs. 7.34 Crore has been released as second installment for the ongoing projects in the states of Bihar, Chandigarh, Chhattisgarh, Delhi, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh & Rajasthan. A total of 310 Artificial recharge structures were constructed during 2013-14 and total structures constructed under the scheme are 1343 (as on March 2014).

11.2 Scheme on "Artificial Recharge to Ground Water Through Dug Wells"

The Ministry of Water Resources had implemented a scheme on "Artificial Recharge to Groundwater through Dug wells" in 7 states namely Andhra Pradesh, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Gujarat and Madhya Pradesh with the objective to recharge rain runoff generated in agriculture fields through existing dug wells in areas underlain by hard rock terrain and having majority of Over-exploited, Critical and Semi-critical assessment units. The approved cost of the scheme was Rs. 1798.71 Crore. Total subsidy of Rs. 257.5181 Crore had been released to 7,23,086 numbers of beneficiaries. A total 1,24,853 no of dug well recharge structures have been constructed in the participating states till 31st March,2014. Total expenditure incurred under various component of the scheme as on 31st March,2014 is Rs.277.5074 Crore. The scheme has been closed on 31.03.2010. The state wise progress made by the participating states is given in table 12.1:

Table 11.1: Details of funds released in the "Ground Water Management and Regulation" XI Plan as on 31st March, 2014

Sl No.	State	No. units for which subsidy released	Subsidy released (Rs. in crore)	Fund released under IEC (Rs. in crore)	Fund released to Ministry for awareness (Rs. in crore)	Operating cost availed by NABARD @ 1% of net subsidy released (Rs. In Cr.)	Number of dug well recharge structures completed.
1	Andhra Pradesh #	0	0.000	0			0
2	Gujarat	141381	47.1480	3.25	0.2224065 & 0.0192882	2.7475981	8974
3	Karnataka	65936	25.1797	2.00			21520
4	Madhya Pradesh	91883	39.2390	2.00			29851
5	Maharashtra	59857	14.0097	2.00			38393
6	Rajasthan	88476	29.6845	2.00			4619
7	Tamil Nadu	275553	102.2569	5.75			21496
	Total:	**723086**	**257.5181**	**17.00**	**0.2417**	**2.7475981**	**124853**

In Andhra Pradesh the scheme could not start since the designated nodal department had expressed inability to take up the scheme

12. HYDROLOGY PROJECT- II

The Hydrology Project - Phase –II (HP-II) is a follow up project of HP-I. Its major thrust is to use Hydrological Information System (HIS) data effectively and efficiently for water resources planning and management. A longer-term aim of the project is to assist the Governments at both Central and State levels to address the issues of intra-sectoral demands and overall resource planning and management through the establishment of core hydrological organizations serving all specialized water agencies.

The Project will further extend and promote the sustained and effective use of the HIS by all potential users concerned with water resources planning and management, including both public and private, thereby contributing to improved productivity and cost-effectiveness of water-related investments in the 13 states and eight Central agencies. The coverage of existing states under the project is to help these agencies from moving over from development of HIS (as in HP-I) towards use of HIS in water resources planning and management. The project objectives will be achieved by:

(a) Strengthening the capacity of hydrology departments to develop and sustain the use of the HIS for hydrological designs and decision tools thus creating enabling environment for improved integrated water resources planning and management;
(b) Improving the capabilities of implementing agencies at state/central level in using HIS for efficient water resource planning and management in reducing vulnerability to droughts and thereby meeting the country's poverty reduction objectives;
© Establishing and enhancing user-friendly, demand responsive and easily accessible HIS to improve shared vision and transparency of HIS between all users; and
(d) Improving access to the HIS by public agencies, civil society organizations and the private sector through awareness building supporting outreach services.

Greater use of an improved HIS is expected to have a broad but definite impact on the planning and design of water resources schemes, from which the rural and urban poor will have secure and sustainable access to water for multi-purpose livelihood uses.

The Hydrology Project- II initially has duration of 6 years staring from May 2006 to June, 2012. The project has been extended for a period of 2 years from June, 2012 to May, 2014. CGWB is participating agency in HP-II and has a revised cost provision of Rs 66.32 Crore. The Budget provision for the year 2013-14 is Rs 25.44 Crore and revised estimate is Rs 16.72 Crore. The expenditure incurred on the project in the FY 2013-14 is Rs 11.65 Crore.

H-P-II has three major components i.e. (A) Institutional Strengthening in the form of (i) consolidation of HP-I activities in the existing States; (ii) awareness raising, dissemination and knowledge sharing; and (iii) implementation support; (B) Horizontal Expansion in three new States covering Goa, Himachal Pradesh and Punjab and (C) Vertical Extension in the 9HP-I peninsular States.

In this year of the project, the implementation of Pilot Project on Aquifer Mapping under Purpose Driven Study component is under progress in six different Hydrogeological terrains of the country covering states of Bihar, Rajasthan, Tamil Nadu, Karnataka and Maharashtra. The activity of data generation to fill the data gap commenced, monthly monitoring of water level completed up to March, 2014; 74 wells have been constructed. First phase of VES, Ground TEM and ERT geophysical survey and some ground survey post-Heliborne by NGRI have been completed. Mid term review meeting completed and report submitted. All the necessary Permissions have been obtained from MOD & DGCA and other departments for Heliborne Survey. Heliborne Survey completed in all six Pilot areas (Parts of Dausa district and Jaisalmer district, Rajasthan; Parts of Nagpur District, Maharashtra; Parts of Patna district, Bihar; Parts of Tumkur district, Karnataka and Parts of Cuddalore district, Tamil Nadu).

Geophysical equipments viz Advance resistivity meter (2 nos), Multi Electrode Multi Channel Resistivity System (2 nos) and software such as Isatis and IX1D were procured by NGRI. "Development of e-GEMS", is under progress by M/S Tata Consultancy Services and with the approval of Members of HLTG, the proposal for time extension up to May 31, 2014 was sent to PCS. For procurement of software for e-GEMS, a proposal has been submitted to MoWR for administrative approval for procurement through direct contracting, for which approval received. For Hardware of e-GEMS, a proposal for Hiring of BSNL infrastructure for hosting of e-GEMS sent to PCS. Four domain specific training has been imparted through RGI under HP-II. Nominations have been sent to PCS, MoWR for 10 courses for International Training Calendar for 2013 & 2014.

13. 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 and issuing necessary directives for the purpose.

The Authority exercise the following powers and performs the following functions: -

To regulate and control, management and development of ground water in the country and to issue necessary regulatory directions for the purpose.

(i) 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.

(ii) To resort to penal provisions contained in sections 15 to 21 of the said Act.

(iii) Exercise of powers under section 4 of the Environment (Protection) Act, 1986 for the appointment of officers.

13.1 Regulation of Groundwater Development in Notified area

Central Ground Water Authority (CGWA) has notified 162 overexploited and critical areas for regulation of groundwater development and management. An advisory committee under administrative head of the district i.e District magistrate/ Deputy commissioner /district collector/Collector have been constituted under section 4 of the Environment (Protection) Act, 1986 to regulatory activities were continued.

13.2 Technical appraisal of project proposals for NOC for ground water withdrawal

CGWA carried out technical appraisal of Industrial, Infrastructure and Mining projects seeking ground water withdrawal. During the period,129projects were accorded NOC for ground water withdrawal and 29 projects were issued letter for exemption for ground water withdrawal. In addition 29 projects were accorded renewal of NOC for ground water withdrawal.

13.3 34th Meeting of Central Ground Water Authority

The 34th meeting of Central Ground Water Authority was held on 30.7.2013 under the chairmanship of Sh. Sushil Gupta, Chairman, CGWA at CGWB Jamnagar House, Mansingh Road, New Delhi.

14. TECHNICAL / EXAMINATION OF IRRIGATION SCHEMES / PROPOSALS

14.1 Major and Medium irrigation scheme / proposals

As per the directives of Planning Commission, the CGWB is scrutinizing the Major and Medium Irrigation project reports/proposals sent by the State Government / Central Water Commission/ Command Area Development & Water Management Wing of Ministry of Water Resources from the point of view of their impact on groundwater regime. Specific recommendations are being made on the projects and submitted to the concerned for compliance. 12 (Twelve) projects were examined during 2013-14 and are listed table 14.1:

The observations on Six Irrigation Projects are under scrutiny at Regional offices of Board.

Table14.1 List of projects examined during 2013-14

Sl. No	Project
1	Jihe Kathapur Lift Irrigation, Maharashtra.
2	Sonthi lift Irrigation Scheme, Karnataka
3	Barna Project (Major-ERM), Madhya Pradesh
4	Lower Tapi Major project in Tapi Basin, Maharashtra.
5	ERM of Narayanapur Left Bank Canal System(2013-14P.L), Karnataka
6	ERM of Loktak Lift Irrigation, Manipur
7	Mahi Irrigation project, Madhya Pradesh
8	Sip-Kolar link Project, Madhya Pradesh
9	Arpa Bhaisajhar Barrage Project on Arpa River in Mahanadi Basin Chhattisgarh
10.	Pench Diversion Project, Madhya Pradesh
11.	Flood Carrier Canal from Kannadian channel to Drought prone areas by interlinking, Tamil Nadu
12.	Shiggaon Lift irrigation scheme, Karnataka

15. HUMAN RESOURCE DEVELOPMENT & RAJIV GANDHI NATIONAL GROUND WATER TRAINING AND RESEARCH INSTITUTE (RGNGWT &RI)

It is the earnest endeavour of Central Ground Water Board to keep its technical personnel apprised with the latest development in all aspects related to ground water management and drilling techniques. The Board also includes trainees from State Departments and candidates from abroad for different training programmes.

15.1 Rajiv Gandhi National Ground Water Training and Research Institute

Rajiv Gandhi National Ground Water Training and Research Institute (RGNGWTRI) located at Raipur, Chhattisgarh caters to the training requirements of Central Ground Water Board and other Central and State Government Organizations, Academic Institutes, NGOs etc. in the field of ground water.

During XII Plan, RGNGWTRI under HRD and Capacity Building Scheme of MoWR,RD&GR is implementing a three-tiered training programme keeping in view the requirements of the National Project on Aquifer Management (NAQUIM). These trainings will enable creation of a trained workforce for implementation of National Project on Aquifer Management and overall sustainable development of ground water resources. Total outlay for RGNGWTRI component for XII Plan is Rs 90.00 Crores.

As a part of this three-tiered training programme, during the entire plan period (2012-17) a total of 174 Tier I (National Level) training courses are proposed in which professionals from Central/State Government departments, Academic Institutions etc. are to be trained. Under Tier II (State Level) training programme, a total of 222 courses are proposed in which ground Water professionals, NGOs, VOs, PRIs etc are proposed to be trained. Similarly, 1250 Tier III (Block Level) training programme are proposed in which NGOs, PRIs, Progressive Farmers and other stakeholders at grassroots level are to be trained.

Fig 15.1 Mapping of Red bole beds at village - Rohinkheda – Dharamgaonbade, taluka Taluka- Motala, Jalgaon district by trainee officers as a part of training on accelerated data generation for Aquifer mapping in Hard Rocks Terrain (6th to 31st January 2014)

During 2013-14, RGNGWTRI had conducted 165 training programme including 32 tier I, 36 tier II and 100 tier III training programme. A total of 14284 persons were trained as part of these trainings. While the National Level training programmes were conducted at RGNGWTRI, Raipur, the State and Block Level training programmes were organized by the respective Region Offices of CGWB. Summary details of the training programmes are given in table 16.1.

Table 15.1: Summary of training programmes conducted and persons trained in RGNGWTRI

Training Programme	Target (Nos.)	Achievement	Total No. of persons Trained	Participants from CGWB	Women participants
TIER – I (National Level)	32	32	486	125	52
TIER – II (State Level)	36	36	1112	0	234
TIER – III (Block Level)	100	97	12686	0	3360
Total	**168**	**165**	**14284**	**125**	**3646**

Out of a total 486 professionals trained as a part of Tier I training programme, 125 were from CGWB and the remaining 361 professionals were from other organizations like State Govt. organization, academic institutes, NGOs etc. Tier II and Tier III training programmes were targeted at State Govt. organizations, NGOs, PRIs and other stakeholders at grassroots level.

Participation of women in the training prgrammes during 2013-14 has been noteworthy. Nearly 26% of all the persons imparted training through RGNGWTRI were women. Total expenditure incurred for all the activities of RGNGWTRI during 2013-14 was INR 510.54 lakhs.

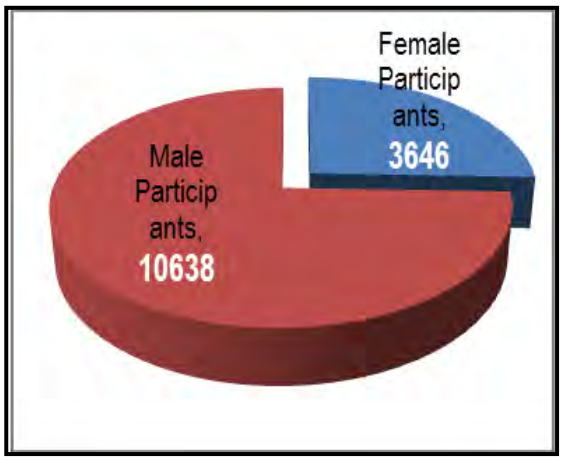


Fig15.2. Comparison of male and female participation in trainings conducted by RGNGWTRI, Raipur during 2013-14

15.2 Training Programmes under Hydrology Project

A one day awareness raising Training programme on "Hydrology Project" was success fully organized at Ahmedabad Management Association Hall, Ahmedabad on 27th March 2014. Participants from various state Govt. departments (GWSSB, GWRDC Ltd.), IMD, Academic Institutes, etc. were present in the workshop. Dr Jayanta Sarkar, Director, IMD, Ahmedabad graced the occasion as the Chief Guest of the inaugural session. Dr R G Shah, Professor and Head of Department of Geology, M.G.Science College, Ahmedabad, Shri Anoop Nagar, Regional Director, CGWB, WCR, and Shri Babu Nair, Senior Scientist, CGWB, WCR, Shri Ashok Kumar, Senior Scientist, CGWB, WCR, Ahmedabad were the other dignitaries present on the dais.

16. IEC ACTIVITIES

16.1 ACTIVITIES UNDER WATER CONSERVATION YEAR-2013

The Year-2013 is being celebrated as "Water Conservation Year" under which various mass awareness activities are being carried out with emphasis on sensitizing the masses on water related issues, encourage them to conserve and use it judiciously. The activities are being organized throughout the country through different organizations of Ministry of Water Resources. Four regional offices of Central Ground Water Board namely- Eastern Region - Kolkata (covering state of West Bengal, & UT of Andaman & Nicobar Islands), South Eastern Coastal Region-Chennai (covering State of Tamil Nadu & UT of Puducherry), North Central Chhattisgarh Region-Raipur (covering State of Chhattisgarh) & Kerala Region-Trivandrum (covering State of Kerala) have been identified as the Nodal offices to organize Mass awareness programme under Water Conservation Year-2013. The achievements made in this regard are as under:

- **North Central Chhattisgarh Region- Raipur**: has successfully conducted flag-off event on 26th June, 2013 at Dongargarh, Rajnandgaon district, Chhattisgarh. About 180 persons including farmers, villagers, social workers, etc participated in the event.
- **Eastern Region -Kolkata:** A Painting Competition on the theme "Water Conservation Year, 2013" was organized on 28th June, 2013 with 50 school children of Birati Mahajati Balika Vidyamandir, Mahajatinagar, Birati, Kolkata. Officers of CGWB, ER, Kolkata attended the Regional Workshop on "Security of Ground Water based water supplies- perspectives, challenges and beyond" organized by Centre for Ground Water Studies, Kolkata in collaboration with Indian Institute of Social Welfare and Business Management, Kolkata, held on 31.7.2013.
- **South Eastern Coastal Region -Chennai**: The officers from Central Ground Water Board, SECR-Chennai participated in the Integrated Educational Exhibition (IEE) organized by the Vyasa Vidyalaya Matriculation Higher Secondary School, Pujuthivakkam, Velacherry (Chennai) from 21st -23rd June, 2013.
- **Release of third Coffee Table Book "Boond"**
  The Third Coffee Table Book titled "Boond" containing paintings of winners of National/State level painting competition was released in the curtain raiser function of "Water Conservation Year-2013" during first week of April, 2013 at New Delhi.

16.2 4th NATIONAL PAINTING COMPETITION ON WATER CONSERVATION – 2013

Central Ground Water Board organized the Fourth National level Painting Competition held in the country to create awareness on water conservation. The school level competition 2013 for the students of 6th, 7th, and 8th standards was launched in all the States/UT's through an advertisement in the print media starting from September, 2013. About 20 lakh students from more than 26,000 schools had participated in the event. This was followed by the State level painting competition held in third week of November, 2013. 50 students were selected from each state for competing in the State Level Painting Competition. Finally a total of 90 students from all States/UTs, the winners of the 1st, 2nd & 3rd prizes at the State Level Painting Competition participated in National Level competition held on 27.12.2013 in A.P. Shinde Symposium Hall, NASC Complex, PUSA, New Delhi. The awards were distributed by Hon'ble Minister of Water Resources Sh. Harish Rawat. The 1st prize amounting to Rs. 1,00,000/- was bagged by Unnimaya D.P. from Kerala. There were Four 2nd prizes of Rs. 50,000/- which went to K. Rahul Selvan – Tamilnadu, Rohit- Chandigarh, Sorokhaibam Rodison Meitei - Manipur and Sucharita Ray-Tripura. Eight 3rd prizes amounting to Rs.25,000 each went to Amit Jha - New Delhi, Anvesha Jain - Karnataka, Deeptam Das – Jharkhand, Neha Harish – Karnataka, Rajasree Sarkar – Tripura, S.P. Sneha- Tamil Nadu, Samikshya Satpathy – Odisha and Subhra Sinha- Bihar.

16.3 PUBLICITY AND PUBLIC AWARENESS

Central Ground Water Board/ Ministry of Water Resources participated in following Exhibition/Trade Fair during 2013-14.

World Environment Day celebrated at Nagpur District

- The World Environment Day was celebrated on 5th June 2013 at NTPC, Mouda, Nagpur District. On request of NTPC, Shri Pradeep Dube, Regional Director of Central Ground water Board, Central Region graced the occasion as Chief Guest and addressed the gathering on how simple ways in our daily life go a long way in conserving water. Dr. P.K. Jain delivered a technical talk on methods of artificial recharge and water conservation. The programme was attended by officers/officials of NTPC along with their families.
- As a part of 'Water Conservation Year – 2013' an awareness Programme on Water conservation was held on 24.07.2013 in Gottipura Research Station of Institute of Wood Science and Technology, Bangalore (MOEF), Hoskote taluk, Bangalore Rural district. Employees of the Research Station and farmers from adjacent area participated. Shri S.S.Hegde, Scientist 'C' and G. Krishnamurty, Scientist 'C' of CGWB gave talks on the importance of water resource and its conservation.
- **Kerala Region:** Central Ground Water Board, Kerala Region organized an inter-collegiate quiz competition to promote awareness on Water Conservation on 24.07.2013 at University College, Thiruvananthapuram. Teams from 7 colleges participated. The team from Geology Department, University College were the winners of the event.

Water Conservation Year 2013:

- The article regarding MoWR and CGWB observing 2013 as the water conservation year was published in the supplementary "CNX City News" of widely circulated local Marathi daily "Lokmat" on 20TH August,2013. It was emphasised in the article that, how an individual can save water up to 100 litres in urban areas and 15,000 litres of precious water can be stopped from going waste annually if we stop the leaking drop from the tap. The article was reported by Shri Chandrashekhar Bobde, Senior Sub Editor and Lokamt Reporter.
- A mass awareness programme was conducted in collaboration with CWC at Govt. Middle School, Anand, Gujarat during 26-27th August 2013. A total number of 120 participants comprising of school children of standard 1st to 8th, teachers and other staff of the School. Local village farmers, staff of Anagnwadi, Gram Panchayat, Officers/officials of CWC and CGWB participated in the programme. Exhibition and demonstration on water conservation was done by CGWB in the first day of the programme i.e. on 26th August, 2013. IEC material on water conservation was exhibited in the school premises to sensitize the participants on water conservation and its importance. IEC materials comprising of booklets, posters and stickers displaying slogans of water conservation, other materials on rain water harvesting and Artificial Recharge etc were distributed to the participants during the programme. Short films conveying message on water conservation and its importance in day to day life were shown to the participants.

Vigilance awareness week 2013

- Vigilance awareness week 2013 was celebrated in Central Ground Water Board, CHQ Faridabad from 28th to 2nd November 2013. "Vigilance awareness week 2013" were also celebrated in Regional, Divisional and State Unit offices of Central Ground Water Board.

Communal Harmony Campaign

- Communal Harmony Campaign has been organized in the Central Ground Water Board, Bhujal Bhawan, Faridabad during 20th August to 3rd September 2013 and various activities on the theme were organized for the officers & staff members.
- Communal Harmony Campaign has been organized in the Central Ground Water Board, Bhujal Bhawan, Faridabad during 19 to 25 November 2013 and various activities on the theme were organized for the officers & staff members. On this occasion, donation have been collected from the officers & staff members of Central Ground Water Board, Faridabad .
- "Hindi Pakhwara" 2013 was celebrated in Central Ground Water Board, CHQ Faridabad from 14th to 28th September 2013. During the function various competitions relating to official language Hindi were organized viz. Hindi Noting, Hindi Essay writing, Quiz, Translation, Hindi Typing, debate etc. In addition to this two competitions namely Hindi Language Knowledge and Quiz were also organized for multitasking staff. All the officers and staff showed keen interest in the above competition. On this occasion the school children of Kendriya Vidhyalaya 2, Faridabad demonstrated small dance/natak on the theme of conserve water. The prize distribution ceremony was organized on 1st October 2013. The winners of the competition were awarded by Shri Sushil Gupta, Chairman CGWB. Senior officers were also present during prize distribution ceremony. Shri U.V. Singh, OL welcome all the distinguished guest and briefed the activities during the Pakhwara. Vote of thanks was given by Shri Rakesh Gupta, AD(OL).

Table 16.1 4th State Level Painting Competition – 2013 at various places

Sl. no.	State	Schools covered	No. of Participants	Date of Organization
1	Tamilnadu	9062	498534	18.11.2013
2	Puducherry UT	96	6515	13.11.2013
3	Kerala	513	50480	23.11.2013
4	Lakshadweep UT	19	783	28.11.2013
5	Karnataka	269	27092	18.11.2013
6	Goa	115	7566	26.11.2013
7	Andhra Pradesh	1650	148094	18.11.2013
8	Chhattisgarh	1320	107031	25.11.2013
9	Uttar Pradesh	482	48820	21.11.2013
10	Maharashtra & UT Dadra Nagar Haveli	239	27714	18.11.2013
11	Madhya Pradesh	710	86063	18.11.2013
12	Uttarakhand	223	7822	18.11.2013
13	Jammu & Kashmir	188	11299	24.11.2013
14	Himachal Pradesh	484	16859	18.11.2013
15	Chandigarh	70	5994	18.11.2013
16	Haryana	307	14307	18.11.2013
17	Punjab	4362	350051	18.11.2013
18	Gujarat, UT of Daman & Diu	1400	69247	18.11.2013
19	Rajasthan	423	16078	18.11.2013
20	Odisha	188	28200	18.11.2013
21	Bihar	2490	234557	18.11.2013
22	Jharkhand	227	30203	18.11.2013
23	West Bengal	310	90372	18.11.2013
24	Sikkim	84	4501	18.11.2013
25	A&N Islands	83	3199	20.11.2013
26	Assam, Nagaland, Manipur & Mizoram	174	35627	18.11.2013
27	Meghalaya	84	3407	18.11.2013
28	Tripura	200	4057	18.11.2013
29	Arunachal Pradesh	34	2000	18.11.2013
30	Delhi	476	45115	18.11.2013
	TOTAL	26282	1981587	

Fig. 16.1 (a) , (b) & (c) State Level Painting Competition 2013, SR Hyderabad (d) Participate delivering their views regarding water conservation and its importance to media (e) Media Coverage during Certificate Distribution (f) 13 Winners (First, Second, Third and 10 Consolation Winners) State Level Painting Competition 2013 (g) & (h) Chief Guest presenting certificate to the First Prize Winner-Shimoli Rupesn Pater, Gujarat

Fig 16.1: Hon'ble Minister of Water Resources Sh. Harish Rawat presenting the first Prize to Ms. Unnimaya D.P. from Kerala

Fig 16.2: First Prize Painting of 4th National Painting Competition

16.4 ORGANISATION OF WORKSHOPS

During the year, 20 workshops were organized by regional offices of CGWB on various water conservation issues Details given in Table 17.2

Tables 16.2: Details of workshops organized under IEC activity during the year 2013-14

Sl No	*Region*	*State / UT*	*Date*	*Place*	*Theme of Workshop*
1	*WCR, Ahmedabad*	*Gujarat*	*12-03-14*	*Ahmedabad*	*GW Conservation and Management*
2	*SWR, Bengaluru*	*Karnataka*	*20-03-14*	*Bangalore*	*Trends in water conservation-retrospect and prospects*
3	*NCR, Bhopal*	*Madhya Pradesh*	*14-03-14*	*Bhopal*	*Ground water conservation and management with people's participation in MP.*
4	*SER, Bhubaneswar*	*Odisha*	*21-03-14*	*Bhubaneshwar*	*Augmentation and conservation of ground water resources of Odisha.*
5	*NWR, Chandigarh*	*Chandigrah*	*21-03-14*	*Chandigarh*	*Water conservation*
6	*SECR, Chennai*	*Tamilnadu*	*10-03-14*	*Chennai*	*Water conservation*
7	*UR, Dehradun*	*Uttrakhand*	*25-03-14*	*Dehradun*	*GW management for food security.*
8	*SUO, Delhi*	*Delhi*	*25-03-14*	*New Delhi*	*Water conservation*
9	*NHR, Dharamsala*	*Himachal Pradesh*	*21-03-14*	*Dharamshala*	*Water conservation & management issues in Himalayas*
10	*NER, Guwahati*	*Assam*	*14-03-14*	*Guwahati*	*Work shop on Water Conservation*
11	*SR, Hyderabad*	*Andhra Pradesh*	*20-03-14*	*Hyderabad*	*Challenges and perspectives in conservation of water in urban areas of Andhra Pradesh.*
12	*WR, Jaipur*	*Rajasthan*	*21-03-14*	*Jodhpur*	*Challenges of indiscriminate ground water over-exploitation in Rajasthan state and water conservation strategies.*
13	*NWHR, Jammu*	*Jammu & Kashmir*	*20-03-14*	*Jammu*	*Impact of climate change on ground water resources in Karewas of Kashmir Valley.*
14	*ER, Kolkata*	*West Bengal*	*24-03-14*	*Kolkata*	*Ground water resources, development and management strategies in West Bengal.*
15	*ER, Kolkata*	*West Bengal*	*27-04-14*	*Portblair, Andaman*	*Conservation of water resources in Anadman & Nicobar Islands - Issues and Challenges.*
16	*NR, Lucknow*	*Uttar Pradesh*	*24-03-14*	*Lucknow*	*Water Conservation*
17	*CR, Nagpur*	*Mahrashtra*	*04-03-14*	*Nagpur*	*Work shop on Water Conservation in hard rock areas*
18	*MER, Patna*	*Bihar*	*25-03-14*	*Patna*	*Ground Water conservation techniques and artificial recharge issues*
19	*NCCR, Raipur*	*Jharkhand*	*24-03-14*	*Raipur*	*Water conservation practices in Chhattisgarh-A futuristic vision.*
20	*KR, Trivendrum*	*Kerala*	*21-03-14*	*Trivandrum*	*Work shop on issues related to Water Conservation*

17. TECHNICAL DOCUMENTATION AND PUBLICATION

Results of investigations carried out by the Central Ground Water Board were suitably documented in the form of reports and maps. All the field offices have been provided with report processing sections which are responsible for the scrutiny and issuance of reports of various assignments carried out by its officers.

17.1 Reports

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

State/UT Ground Water Reports

State Reports containing complete details of ground water surveys, exploration and other ground water related information are compiled and prepared for latest the status of ground water development in the State. Based upon reports, ground water development perspectives are worked out and future strategies are planned. During 2013- 14, total 13 state reports{3 state Hydrogeological report (UT of Daman and Diu, Chhattisgarh and Andra Pradesh), 6 state chemical reports (Bihar, Jharkhand, Gujarat, Andra Pradesh, Uttarakhand and Jammu) and 4 state Ground Water Exploration Reports (Bihar, Jharkhand, Himachal Pradesh, Jammu, and Odisha)}have been completed / submitted.

District Brochures

The Central Ground Water Board is compiling and issuing district brochures of each district from time to time containing all the results of ground water surveys, exploration and other related studies. Further, groundwater development perspectives are also worked out for the benefit of State and other user's agencies. The reports have been found very useful for planning their strategies for future ground water development project . During 2013-14, 491 district brochures were prepared and submitted/issued.

Ground Water Year Book

The Central Ground Water Board is compiling 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 2013-14, 23 reports were prepared. Region wise status of preparation of ground water year book are presented in Table 18.1

17.2 Bhujal News

Bhujal News is a quarterly journal being published by Central Ground Water Board highlighting the latest advances in ground water research. Besides scientific papers, the journal also contains technical notes, news items, and regular columns. The journal has more than 1500 readers from all over the country. During the year 2013-14, the Vol. No 27, 1-4, Jan- Dec 2012 issue was published.

Table 17.1 Status of Ground Water Year Books completed during 2013-14

Sl. No	Region	Ground Water Year Book prepared	
		Nos.	**State**
1	North West Himalayan Region	1	Jammu & Kashmir
2.	North Himalayan Region	1	Himachal Pradesh
3	North Western Region	3	Punjab, Haryana & Chandigarh
4	Western Region	1	Rajasthan
5	West Central Region	1	Gujarat
6.	North Central Region	1	Madhya Pradesh
7.	North central Chhattisgarh Region	1	Chhattisgarh
8.	Central Region	1	Maharashtra
9.	Northern Region	1	Uttar Pradesh
10.	Mid Eastern Region	2	Bihar, Jharkhand
11.	Eastern Region	1	West Bengal
12	North Eastern Region	1	North Eastern States
13	South Eastern region	1	Orissa
14	Southern Region	1	Andhra Pradesh
15	South Western Region	2	Karnataka, Goa
16	South Eastern Coastal Region	1	Tamilnadu, Puducherry
17	Kerala Region	1	Kerala
18.	Uttaranchal Region	1	Uttarakhand
19.	SUO, Delhi	1	NCT, Delhi
	Total	23	

18. CONSTRUCTION/ACQUISITION OF OFFICE BUILDINGS

Infrastructure Development Scheme (IDS) viz. Land & Building (CGWB) has been approved with an outlay of Rs.101.26 Crore for the 10 Offices of CGWB namely:-

- Regional and Divisional office at Guwahati.
- Store and Workshop buildings at Bangalore.
- Store & Workshop for Division XII at Bhopal.
- Regional and Divisional office at Ahmedabad.
- Building for Divisional, Workshop & Store Division II at Ambala.
- Boundary Wall, Building for office, Workshop & Store for Region & Division at Jammu.
- Boundary Wall and Building for RGNGWT&RI (RGI) at New Raipur.
- Building for Divisional Workshop & Store at Chennai.
- Building for Divisional, Workshop & Store at Jodhpur.
- Staff Quarter at Bhubaneswar.

Out of the 10, three projects are ongoing & seven are new projects. The projects are likely to be completed within the 12th Five year Plan. The objective of the scheme is to provide better working environment in the offices, creation of assets and savings on payment of monthly rent. To achieve this, construction of offices at various locations & provision of construction of staff quarters at Bhubaneswar has been proposed.

During the financial year 2013-14, an amount of Rs.25.00 Crore was provided under BE which has been subsequently reduced to Rs.7.20 Crore at RE state. Construction of building at Guwahati & Bangalore was completed. Construction of building at Bhopal was in progress. Final finishing of buildings is likely to be completed shortly works in Work of other 7 projects will be taken up after receipt of approval/ sanction from Ministry.

19. DISSEMINATION AND SHARING OF TECHNICAL KNOWLEDGE

19.1 Presentation of Technical Papers /Publication of Paper in National International Journal

- A technical Paper on "Chemical Evaluation of ground water in Coral islands of Lakshadweep with special reference to Kavaratti island" by Dr K.Md.Najeeb and Shri N.Vinayachandran was published in International Scientific Journal- Nature, Environment & Pollution Technology.
- Dr. Dipankar Saha, Regional Director, Central Ground Water Board, Mid Eastern Region, Patna presented a paper in the international workshop organized by IWMI on "Moving from water Problems to water Solutions- an assessment of the research needs for the Eastern Gangetic Plains" at New Delhi on May 7-8, 2013.
- A paper on "Status of ground water resources in West Bengal-steps to be taken for its sustainability and security" is presented by Shri G.C.Pati, Regional Director of Central Ground Water Board, Eastern Region, Kolkata in the Workshop arranged by Centre for Ground Water Studies, Kolkata in collaboration with IISWBM, Kolkata held on 31.07.2013.
- Dr S K Srivastava, Sc C of Central Ground Water Board, Northern Region, Lucknow presented a technical paper on "Status of Water Quality in UP" in the above workshop on "Convergent Action for Sustainable Ground Water Management & Safe Drinking Water in Urban Area" on 20th July 2013 on 20th July 2013.
- A technical paper on " Data Gap analysis in Aquifer mapping by Dr S.S.Vittala AHG , G.R.C.Reddy Sc-D & Dr K. Md. Najeeb Regional Director of CGWB, SWR, Bangalore was published in JGSI journal during October 2013.
- Sri G. Sudarshan, Regional Director, Central Ground Water Boar, Southern Region, Hyderabad delivered a key note address on "Ground Water Challenges and Viable Options for Sustainable Development" at A.P. Science Congress-2013 organized by University of Hyderabad on 15.11.2013.
- Two papers were published in Volume of Abstract EPP 2014 on "Environment – Pollution and Protection" of National Conference held w.e.f. 30.01.2014 to 1.02.2014 at Department of Earth & Environmental Studies, National Institute of Technology, Durgapur, Sponsored by NIT Durgapur(TEQIP II), Department of Science and Technology- SERB and DST-WB.
- Dr. E. Sampath Kumar, Regional Director, Central Ground water board, South East Coastal Region, Chennai presented a paper on "Groundwater Scenario of Coastal Tamil Nadu and U.T of Puducherry" at the 2 day National Seminar on "Development of Fisheries in Water Deficient Regions" organised by The Fisheries Technocrats Forum on 25.02.2014 at Central Institute of Brackishwater Aquaculture, Chennai.
- Dr. Dipankar Saha, Regional Director, MER, Patna, presented a paper on "Participatory groundwater management for advancing water-based Rural Livelihoods" on 25th February, 2014, hosted by the Planning Commission under the auspices of Food and Agriculture Organization (FAO) of the United Nations at Planning Commission, Government of India, Yojana Bhawan, Sansad Marg, New Delhi.
- Dr. B. Umapathi, Scientist`C' of Central Ground Water Board, south East Coastal Region, Chennai delivered key note address on "Importance of groundwater and need for protection and conservation" during the Word Water Day Celebrations organised by M/S Parle Agro Ltd, Mevallurkuppam, Kancheepuram district on 22.03.2014.
- S/Shri. Dr. M. Senthil Kumar, Scientist`C', M. Panneer, AHG and N. Ramesh Kumar, AHG of Central Ground Water Board, south East Coastal Region, Chennai presented papers titled 1) "Impact of Climate Change on Coastal Aquifer : A case study from Northern Tamil Nadu, Southern India" 2) "Fluoride contamination in fractured aquifers in and Morappur area, Dharmapuri District, Tamil Nadu" and 3) "Hydrogeological setup and delineation of aquifer system in Parts of Cuddalore district, Tamil Nadu" respectively in International Conference on Environmental Earth Sciences organized by University of Madras, Chennai during March 19-22, 2014. Dr. K. Ravichandran, Scientist`C' and Dr. M. Senthil Kumar, Scientist`C' performed as rapporteur during the technical sessions of the conference.
- The following papers by Sh. A. Kar, Supdtg. Hydrogeologist, CGWB, Faridabad were published in the proceedings of

Ground Water Resources, Development and Management strategies in West Bengal on 24th March, 2014 as also in the proceeding of the Workshop on Conservation of

- Water in A&N Islands issues and challenges, held on 27th March, 2014.

1) Rainwater Harvesting in Victoria Memorial Hall: a case study by A.Kar, S. Chakraborty and A Gayen.
2) Ground Water Hydrogeology of Andaman & Nicobar Islands by A.Kar and I. Roy, S. Chakraborty and G.C. Pati as co-authors.
3) Impact assessment of integrated Water Development and Management through Farmers Participatory Action Research Programme (FPARP) in A&N Islands. A.Kar and A. Gayen, A. Zaman, S.K. Ambast and N. Ravi Shankar as co-authors.
4) Ground Water Quality change Andaman & Nicobar Islands in post tsunami : An appraisal . A. Kar and K.K. Srivastava.

- The Regional Director of Central Ground Water Board, South East Coastal Region, Chennai attended the Hydrology Project-II Workshop on Purpose Driven Studies of Implementing Agencies during 22.05.2013 and 23.05.2013 at New Delhi and presented a paper and made power point presentation on "Specific Yield Study for Planning and designing artificial recharge structures in Sub-urban Areas of Chennai, Tamil Nadu".
- Regional Director, Mid Eastern Region, Patna, Dr. Dipankar Saha delivered key note address in topic entitled 'Ground water resources of Jharkhand state and its development potential' in the workshop at Ranchi on "Ensuring Water Availability in Jharkhand through Comprehensive Rain Water Harvesting and Ground Water Recharge", organized by Water Resources Department, Govt. of Jharkhand. He was also a key speaker in the plenary session.
- Shri K B Biswas, Regional Director, CGWB, Lucknow, Shri S. Marwaha, Suptdg. Hg. & Shri Upendra Srivastava, Sc C submitted a scientific paper on ''Need for management of Blue-Green water resource for sustaining agricultural growth in Uttar Pradesh, India' for International Seminar Proposed to be held at Chandigarh, which has been accepted.
- Dr. M.A. Farooqi, Scientist B of CGWB, Shillong and Dr. S. Shekhar, Scientist B, CGWB, Faridabad attended and presented Scientific papers in 40th International Association of Hydrogeologists Congress (IAH-2013) at Perth, Australia during September 15-20, 2013. The Title of the papers presented are:- 1. Semi-consolidated aquifer systems of Gondwana Supergroup in India: Prospects and challenges
- towards mitigating inequity by Dr Sudhanshu Shekhar ,Arunangshu Mukherjee & Anita Gupta 2. Groundwater potential in virgin areas of western Meghalaya, India by Dr M.A.Farooqi
- OIC, SUO, Shillong attended the Workshop on Judicious Development and Conservation of Ground water conducted by the Directorate of Geology & Mining, Dimapur, Nagaland on 25th September 2013 at Kohima, Nagaland and presented a paper entitled "Judicious Development of Ground Water" .
- Scientist-D of Central Ground Water Board, Southern Region, Hyderabad participated in the Conference on Advances of Water Resources Management at Chandigarh from 22.10.2013 to 27.10.2013 and presented two papers titled: 1."Aquifer Systems and their characteristics in West Godavari District, AP, India". 2. "Artificial Recharge for sustainable management of ground water resources in over-exploited hard rock aquifers – A Case Study from drought pone region of Andhra Pradesh, India".
- Shri. G.C.Pati, Regional Director and other officers of Central Ground Water Board, Eastern Region, Kolkata participated and presented 5 nos. of papers in the 'National Seminar on Ground Water Management, Governance and Sustainability' organized by Department of Geological Sciences, Jadavpur University, held on 7th & 8th Nov'13.
- Dr. Pandit Madhnure, Scientist-C presented a paper titled "Ground Water Scenario, Issues and Management Practices – A case Study from Cherlapally Watershed, Nalgonda District, Andhra Pradesh".
- Sri J.SivaramaKrishnan, Scientist of Central Ground Water Board, SWR, Bangalore presented a technical paper on "Heterogeneity in Hard rock Aquifers of Karnataka – A case study" in the International Conference On " Environment & Earth Science – Accomplishments, Plans and Challenges" organized by Department of Geology & applied Geology, University of Madras, at Chennai from 19th-22nd March 2014.

- National Workshop on " Water and Energy" on 21.3.2014 organised by Department of Civil Engineering, Dayananda Sagar College of Engineering, Bangalore. Sri G. Sudarshan, Regional Director Chaired Technical session-II and Dr K.R. Sooryanarayana, presented a technical paper on "Framework of Hard Rock aquifers.
- Indo-Mexican Workshop on Sustainable Water and Wastewater Management" on 25th July 2013 organised by CSIR, NEERI. An abstract on "Emerging Trends in Ground

- Water Management with reference to Current Ground Water Scenario" by Dr. P.K. Jain, Scientist-D and Rahul R. Shende, Assistant Hydrogeologist was published in Abstract volume.
- Dr K. Md. Najeeb, Regional Director presented a paper on "Ground water studies and research in Karnataka" in GSI Seminar on "50 years of GSI's contribution to Geo Science of Karnataka and Goa" on 20.9.2013 and 21.9.2013.

19.2 Participation in Workshop/Seminars/ Conference/Mela/Fair

Officers of Central Ground Water Board also attended following workshops, seminars , conferences, Fair etc organized by various organizations and contributed through technical presentation and discussions on ground water management aspects.

- Technical workshop on "GIS and its application" organized Dr Ambedkar Institute of Technology, Bangalore University on 22.4.2013.
- Workshop on "Promotiong Water Use Effiency in Industry and Buildings to Address Climate Change"organised by CII,Nothern Region,Jaipur on 26.04.2013 at Jaipur.
- Regional workshop on "Energy and Resource Efficiency in Urban Water Management" on 20.06.2013 in Kolkata organized by Centre for Science and Environment and National Urban Renewal Mission.
- Workshop organized by Asian Development Bank on 05.06.2013
- Seminar on Mapping as tool for Environmental Management and Planning on 24.6.2013 at CESS, Thiruvananthapuram.
- National workshop on "A Decade on National Geochemical Mapping- retrospect and prospect" organized by GSI on 11.6.2013 at Bangalore.
- Workshop on "Constrains and Requirements for implementation of the National Water Mission and 12th Five Year Plan Reform Process for Improving Water Use Efficiency of Major and Medium Irrigation" at Hyderabad on 25.06.2013.
- Seminar on Water Conservation in National Capital Territory of Delhi organized by Central Soil and Materials Research Station (CSMRS) at CSMRS auditorium, New Delhi on 28th June, 2013.
- State Level Workshop on Integrated Watershed Management Programme (IWMP) on 26th July, 2013, organized by Haryana Institute of Rural Development
- Workshop on "ANR-VMCS 2018 Shiva Project" held at NGRI on 2.07.2013.

- Workshop on "India-WRIS" held at CWC, Hyderabad on 24th July, 2013.
- Workshop on "Benchmarking of Watersheds in Tami Nadu" sponsored by the State Planning Commission, Government of Tamil Nadu and organized by the Centre for Water Resources, Anna University, Chennai on 11&12th July, 2013.
- Workshop on "Rainwater Harvesting and Water Conservation" conducted by CWPRS at Pune on 9th July 2013.
- Workshop on "Rainwater Harvesting and Water Conservation" conducted by NWA at Pune on 10th July 2013 in connection with the Silver Jubilee celebrations of NWA.
- "Workshop on "Convergent Action for Sustainable Ground Water Management & Safe Drinking Water in Urban Area" on 20th July 2013.
- The Stakeholder Workshop on Project on "Natural Water Systems and Treatment Technologies to cope with Shortages in Urbanised Areas of India" conducted by Anna University on 20.08.13
- Workshop on "ANR-VMCS 2018 Shiva Project" held at NGRI on 2.07.2013.
- Brain storming workshop on "Pollution mechanism in Urban aquifers of BBMP area by Integrated Geophysical, Remote sensing & GIS techniques" on 23.8.2013 at Bangalore which was organized by Department of Civil Engineering & Dayanand Sagar College of Engineering in association with DRDO and ISRO.

- Workshop on Web Based Water Resources Information System-INDIA-WRIS Project organized by CWC/ISRO at Chandigarh.
- Workshop on CSR & Social Entrepreneurship, organized by PHD Chamber of Commerce and Industries on 23.08.2013 at Hotel GT Star, VIP, Road Raipur.
- Workshop on "Awareness for India WRIS web Portal" Organized by CWC, MoWR, Government of India at Irrigation Office Conference Hall, Cantonment Road, Lucknow.
- Workshop on purpose driven studies on "Urban Hydrogeology of Hussain Sagar Watershed" held on 17.09.2013 at Jalsoudha, Hyderabad.
- Workshop on "Enhancing Water Use Efficiency in Yamuna Basin at New Delhi on 30.08.2013.
- Officers & officials of CGWB, Eastern Region, Kolkata actively participated in 17th National Exhibition on the theme of 'India Advancing towards a World Power' w.e.f. 21st to 25th September 2013 at Ramakrishna Mission

- Vidyamandir Ground, Belur Math, Howrah, West Bengal, organized by Central Calcutta Science & Culture Organization for Youth, Kolkata. Various active models, posters etc were displayed and technical matters were explained to visitors.
- CGWB, SWR, Bangalore participated during the Krishi Mela organized by University of Agricultural Science, Dharwad through an exhibition cum awareness stall from 21.09.2013 to 24.09.2013. The Mela was inaugurated by Honorable Chief Minister of Karnataka. Dr K. Md. Najeeb, Regional Director participated as Guest of Honour during the function held on 23.9.2013. Dr K.R. Sooryanarayana, Sc-D, A. Suresha, Sc-B, Dr J. Davithuraj, Sc-B, Sri P.S. Narahari, Sr. Surveyor participated as a resource person during the Mela. Working models on rain water harvesting, artificial recharge models were displayed in the CGWB stall which was visited by dignitaries like Dr Rajendra Singh, Vice Chancellor, UAS, Dharwad and large numbers of farmers.
- National Conference on "Frontiers of India and Inter Regional Disputes" organized by Geography Department of Vasantrao Naik Govt. Institute of Arts and Social Sciences, Nagpur on 21st October 2013.

- Workshop on launching of web-GIS based web site named 'India-WRIS' on 23.10.2013 at RRSC-East, Kolkata organized by CWC, Kolkata & ISRO.
- Kerala Environment Congress 2013 organized by Centre for Environment and Development on 9th October 2013.
- "WaterEx South 2013" International Conference held on 10th and 11th October 2013.
- Seminar on "Water Audit" organized by the State Water resources Management Agency, PWD(WRD) as special invitee on 30.09.2013.
- Workshop on "Groundwater Laws" organized by Dr Ambedkar Law University on 24.10.2013.
- Workshop on Tackling Gurgaon Water Crisis held at Gurgaon on 10th October, 2013.
- International Conference on " Climate Change and Implications for Water Resources and Nutrition Security" on 15th and 16th November 2013 at Bangalore organized by International Life Sciences Institute, India and Center for Integrated modeling of Sustainable Agriculture and Nutrition Security(CIMHSANS, USA).
- Round Table conference of HUDCO, IIHS on " Urban Water Supply and Sanitation: The Regional Water Resources and Pollution questions", organized on 11.11.2013 at Bangalore by Indian Institute for Human Settlements.

- Brain Storming Workshop on National Drinking Water Security Pilot project at Bangalore on 8.11.2013 which was organized by Ministry of Drinking water and Sanitation, Government of India.
- The Workshop on Technologies for Transfer and Adaptation in Kerala organized by Kerala State Council For Science, Technology and Environment on 4th November, 2013 at Thiruvanthapuram.
- Seminar on "Role of Isotope in Ground Water Management in India" from 12-14 November, 2013 held at NIH, Roorkee organized by National Institute of Hydrology.
- Participation in India International Trade Fair(IITF)-2013 Central Ground Water Board participated in the MOWR pavilion of IITF-2013 at Pragati Maidan, New Delhi during 14-27th November 2013. The exhibition demonstrated various live models on rainwater harvesting, artificial recharge to ground water, ground water development models. Various ground water related features and issues requiring awareness and public attention were displayed and

literature was distributed to the visitors. The pavilion attracted the attention of large number of people.

- National Seminar on "Watershed Management Strategies under changing Climate" organized by Andhra Pradesh Agricultural University, Hyderabad on 18th & 19th December, 2013.
- "Water Exposition 2013 - Save Water, Save Life: Reserve, Reuse, Regulate" organized by Confederation of Indian Industry; Eastern Region along with CII-Triveni Water Institute, Jaipur and West Bengal Pollution Control Board (WBPCB) on 19th December 2013 at ITC Sonar, Kolkata.
- 2nd INDANCE WORKSHOP -organized by NGRI, Hyderabad on 02.12.2013 and 03.12.2013.
- The conference on " Public Sector Urban Water supply Sanitation" at Bangalore which was organized by Indian Institute of Human Settlement(IIHS) at Bangalore on 17.1.2014.
- Seminar entitled "Waste Dump Sites of Chennai – Present Scenario and Future Work Plan" on 22.01.2014 organised by University of Madras and sponsored by the Tamil Nadu State Planning Commission through the State Land Use Board.
- National Workshop on "Water Resources and Environmental Engineering" (WREE 2014) conducted under TEQIP-II by NITTE, Meenakshi Institute of Technology, Bangalore on 3.2.2014 and 4.2.2014.
- Workshop on aquifer Mapping on 25.02.2014 & 26.02.2014 at Bhopal.
- Modeling Workshop at CGWB, CHQ Faridabad organised by CGWB on 27.01.2014.
- Workshop on "Integrated water resources management application developed under Hydrology Project-II" at New Delhi organised by World Bank & Hydrology Project, MoWR, GOI during 28.01.2014 to 29.01.2014.
- "State Credit Seminar 2014-15" organized by National Bank of Agriculture and Rural Development at Chennai on 04.02.2014.
- Workshop on Action Plan for Green Budget for Punjab hosted by the Punjab State Council for Science & Technology (PSCST) with technical support from The Energy and Resources Institute (TERI), New Delhi on 30.01.2014.
- Result Framework Document (RFD) Evaluation Methodology held at Indian Institute of Foreign Trade(IIFT), Katwaria Sarai, New Delhi on 18.02.2014 .
- Talkshow on the theme of the World Water Day, 2014 organized by Victer Channel, an education channel of the Govt of Kerala. The show was aired on the World Water Day, 22 March 2014.
- Conference on "Science for World peace and Development" on 5.3.2014 organized by Dayananada Sagar College of Engineering, Bangalore.
- Workshop on "Ground Water Application Software-an approach for effective Ground Water Management" organized by Gujarat Water Resources and Development Corporation Limited at WALMI, Anand on 28/03/2014.
- Workshop and seminar on Aquifer Mapping and Management was organized by CGWB, NER Guwahati, NWR Chandigarh, NR Lucknow, WCR Ahemdabad and SR Hyderbad.

20. PROPAGATION AND PROGRESSIVE USE OF HINDI LANGUAGE

- During the above period the provision relating to Section 3(3) of the Official Language Act, 1963 has been complied with.
- Under Rule 5 of the Official Language Rule 1976 all the letters received in Hindi were invariably replied in Hindi.
- Hindi Quarterly Progress report has been sent regularly to the Ministry of Water Resources, Town Official Language Implementation Committee, Faridabad and Official Language Department (Regional Implementation Office)
- Quarterly meeting of the Departmental O.L. implementation Committee are organized regularly and necessary action is taken as per the decisions taken in the meeting.
- Check points has been set up for the compliance of O.L. Act 1963 & O.L. Rule 1976.
- Incentive Scheme for original Noting & drafting in Hindi is being implemented. Ten officials were awarded cash prize under this scheme.
- Ten sections of the Office have been specified to work cent-percent in Hindi.
- 'Bhumijal News Letter', the quarterly magazine of the Board is being published regularly.
- "Hindi Pakhwara" was celebrated in CHQ, Faridabad during 14.9.2013 to 28.9.2013. Various competitions relating to official language were organized during the Pakhwara and prizes were awarded to the participants. Hindi Pakhwara ws celebrated in all the offices of the Board.
- Hindi Workshop is being organized regularly in CGWB.
- The Second Sub-Committee of Parliamentary Committee on Official Language conducted inspection of Central Ground Water Board, Division-IV, Chennai on 21.1.2014. The Committee expressed its satisfaction on the implementation of Official Language and propagation of Hindi in these Offices.
- The Website of the Board is available in bilingual form.
- Hindi Books are being purchased as per the prescribed target.
- Advertisements of all India level are being published as per rules in bilingual/trilingual form and the inspections of the subordinate Offices are being made as per the stipulated target. The Board is committed towards the progress and implementation of Hindi and determined for its progressive use as per the Annual Programme issued by Official Language Department.

The Board is committed towards the progressive use and implementation of Hindi. Sustained efforts are being made to achieve the targets stipulated under the Annual Programme

21. VIGILANCE ACTIVITIES

During the year 2013-14, 21 complaints cases were brought forward w.e.f 1.4.2013 and 10 new complaint cases were received during the year. Out of these 31 complaints, 7 were closed and 4 complaints cases were taken up as disciplinary proceedings. Therefore, 20 complaint cases were carried forward w.e.f 1.4.2013.

DISCIPLINARY PROCEEDINGS

10 cases of disciplinary proceeding were brought forward w.e.f 1.4.2012 and 2 cases of disciplinary proceeding were received during the year and 2 cases were disposed off. Thus total 12 cases of disciplinary proceeding were carried forward w.e.f 1.4.2013.

22. RTI INFORMATION

Total 567 RTI applications were received and out of 567, 85 Number of cases transferred to other Public Authorities and 7 no. of cases was rejected. 444 No. applications have been disposed off.

An amount of Rs 2248/- was received towards application fee and Rs.8395/- as Additional fee& any other Charge. Details are given below in table 23.1

Table 22.1: RTI Information for year 2013-2014

RTI Received	Opening Balance as on 01-04-2012	No. of application Received	Number of cases transferred to other Public Authorities	Decisions where Requests /Appeals Rejected	Decisions where Requests/ Appeals Accepted	Registration fee collected (in Rs.)	Addl. Fee collected (in Rs.)	Number of CAPIOs Designed ted	Number of CPIOs designed ted	Number of AAs Designated
Requests	567	567	85	7	444	2248	8395	8	20	1
First Appeal		50	-		49					

23. PERSONNEL MANAGEMENT

The sanctioned strength, filled up, vacancy position and category-wise personnel deployed in the Board are presented in table 23.1 .

Table 23.1 Personnel Deployment in Central Ground Water Board during 2013-2014 (Up to 31st March, 2013)

GROUP "A"							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	403	315	88	31	4	50	14
Ministrial	7	4	3		-		
Engineering	56	44	12	10	-	9	6
Total	**466**	**363**	**103**	**41**	**4**	**59**	**20**
GROUP "B"(Gazetted)							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	219	127	92	23	1	20	8
Ministrial	36	25	11			-	2
Engineering	110	45	65	4		13	6
Total	**365**	**197**	**168**	**27**	**1**	**33**	**16**
GROUP "B"(Non-Gazetted)							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	179	99	80	20		18	9
Ministrial	203	176	27	4	6	34	11
Engineering	265	171	94	12	1	50	20
Total	**647**	**446**	**201**	**36**	**7**	**102**	**40**
GROUP "C"							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	83	41	42	3		10	4
Ministrial	1136	825	311	138	12	193	79
Engineering	1462	1176	286	146		263	95
Total	**2681**	**2042**	**639**	**287**	12	**466**	**178**
GRAND TOTAL							
Groups	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
GROUP "A"	**466**	**363**	**103**	**41**	**4**	**59**	**20**
GROUP "B"(Gazetted)	**365**	**197**	**168**	**27**	**1**	**33**	**16**
GROUP "B"(Non-Gazetted)	**647**	**446**	**201**	**36**	**7**	**102**	**40**
GROUP "C"	**2681**	**2042**	**639**	**287**	12	**466**	**178**
TOTAL	**4159**	**3048**	**1111**	**391**	**24**	**660**	**254**

24. BUDGET AND EXPENDITURE

Statement showing actual expenditure incurred by the Board during 2013-2014 has been shown in Table 24a, Table 24b, Table 24c, Table 24d and Table 24e.

Table 24a: Statement showing actual expenditure incurred by the Board during 2013-14

		PLAN (Rs. in Lakhs)		NON-PLAN (Rs.in Lakhs	
Unit Code	**Unit Name**	**Budget**	**Expenditure**	**Budget**	**Expenditure**
16.02.01	Salary	1210.00	1660.28	10364.18	11652.71
16.02.02	Wages	27.00	26.66	0.47	0.34
16.02.03	O.T.A.	11.00	5.82	7.00	5.53
16.02.06	M/Treatment	77.00	98.83	90.00	86.95
16.02.11	D.T.E.	1000.00	987.41	120.00	109.19
16.02.12	F.T.E.	25.00	1.96	0.40	0.00
16.02.13	Office Expenses	1100.00	758.48	5.50	4.68
16.02.14	R.R.T.	215.00	148.30	2.75	1.30
16.02.16	Publications	310.00	148.16	2.00	1.68
16.02.17	Advert/Public.	0.00	0.00	0.75	0.28
16.02.20	O.A.E.	100.00	9.06	0.10	0.00
16.02.24	P.O.L.	1600.00	1332.94	2.50	1.67
16.02.27	Minor Works	200.00	165.14	0.00	0.00
16.02.28	P.S.	106.00	23.63	0.50	0.05
16.02.33	Subsidies	0.50	0.02	0.00	0.00
16.02.43	S/Stock	2350.00	1021.91	0.00	0.00
16.02.50	Other Charges	15.00	49.64	0.25	0.00
16.02.51	Motor Vehicle	205.00	81.93	1.10	0.67
16.02.52	M &E	7773.00	1584.56	0.00	0.00
16.02.53	M/Works	16660.50	4848.65	0.00	0.00
16.02.64	W.O.L.	15.00	11.80	0.00	0.00
Total:		**33000.00**	**12965.18**	**10597.50**	**11865.05**

Table 24b: Rajiv Gandhi National Training & Research Institute for Ground Water

Unit Code	**Unit Name**	**Budget**	**Expenditure**
06.01.01	Salary	300.00	235.93
06.01.02	Wages	0.00	0.00
06.01.06	M/Treatment	5.00	2.27
06.01.11	D.T.E.	50.00	31.38
06.01.12	F.T.E.	150.00	0.00
06.01.13	O.E.	215.00	196.18
06.01.14	R.R.T.	10.00	5.92
06.01.16	Publication	1.00	1.00
06.01.24	P.O.L.	5.00	4.47
06.01.28	P.S.	100.00	30.70
06.01.51	M.V.	2.00	1.75
06.01.52	M & E	62.00	0.94
Total		**900.00**	**510.54**

Table 24c: Major Head: 2701-.80.004.08 Hydrology Project-Phase-II (PLAN)

Unit Code	Unit Name	Budget	Expenditure
08.01.01	Salary	**150.00**	176.62
08.01.06	M/Treatment	**0.00**	0.00
08.01.11	D.T.E.	**22.50**	15.09
08.01.12	F.T.E.	**45.00**	0.00
08.01.13	O.E.	**15.00**	5.39
08.01.20	O.A.E.	**0.00**	0.00
08.01.28	P.S.	**1500.00**	567.21
08.01.51	M.V.	**0.00**	0.00
08.01.52	M & E	**700.00**	401.80
08.01.53	M/Works	**360.00**	1.12
08.02.01	Salary	**50.00**	50.89
08.02.06	M/Treatment	**0.00**	0.00
08.02.11	D.T.E	**7.50**	3.60
08.02.12	F.T.E.	**0.00**	0.00
08.02.13	O.E.	**5.00**	1.52
08.02.20	O.A.E.	**0.00**	0.00
08.02.28	P.S.	**0.00**	0.00
08.02.51	M.V.	**0.00**	0.00
08.02.52	M & E	**0.00**	0.00
08.02.53	M/Works	**40.00**	0.00
Total 01 Ext.Supp.& 02 Dom.Supp.		**2895.00**	**1223.24**

Table 24d: Central Ground Water Board building for offices

		BUILDING FOR OFFICE	
Unit Code	**Unit Name**	**Budget**	**Expenditure**
03.00.51	Motor Vehi.	**0.00**	0.00
03.00.52	M. & E.	**300.00**	25.29
03.00.53	Major Works	**2500.00**	475.00
Total		**2800.00**	**500.29**

Table 24e: Deduct Recoveries

Unit Code	Unit Name	Budget	Expenditure
17.01.70	Issue to Work	**1100.00**	1066.35
17.02.70	Oth.Sus/Char.	**100.00**	0.00
Total		**1200.00**	**1066.35**

Annexure -1

LOCATION AND JURISDICTION OF REGIONAL AND OTHER OFFICES OF CENTRAL GROUND WATER BOARD

REGIONS	HEADQUARTERS	JURISDICTION
i) NORTH WESTERN HIMALAYAN REGION		
Regional Office	Jammu	J&K
Division Office	Div. VIII, Jammu	
ii) NORTH HIMALAYAN REGION		
Regional Office	Dharamshala	Himachal Pradesh
Division Office	Div. XVII, Dharamshala	Himachal Pradesh
iii) NORTH WESTERN REGION		
Regional Office	Chandigarh	Punjab, Haryana & UT of Chandigarh
Division Office	Div. II, Ambala	Punjab, Haryana & UT of Chandigarh
iv) WESTERN REGION		
Regional Office	Jaipur	Rajasthan
State Unit Office	Jodhpur	Western Rajasthan
Division Office	Div. XI, Jodhpur	Rajasthan
v) WEST CENTRAL REGION		
Regional Office	Ahmedabad	Gujarat, UT of Daman & Diu
Division Office	Div.I, Ahmedabad	Gujarat, UT of Daman & Diu
vi) NORTH CENTRAL REGION		
Regional Office	Bhopal	Madhya Pradesh
Division Office	Div.XII, Bhopal	Madhya Pradesh
vii) NORTH CENTRAL CHATTISGARH		
Regional Office	Raipur	Chattisgarh
Division Office	Div.XIII, Raipur	Chattisgarh
viii) CENTRAL REGION		
Regional Office	Nagpur	Maharashtra, UT of D & N. Haveli
State Unit Office	Pune	West Maharashtra
Division Office	Div. VI, Nagpur	Maharashtra, UT of D & N. Haveli
ix) NOTHERN REGION		
Regional Office	Lucknow	Uttar Pradesh
State Unit Office	Allahabad Div.III,	Uttar Pradesh
Division Office	Varanasi	Uttar Pradesh
x) UTTARAKHAND REGION		
Regional Office	Dehradun	Uttarakhand
Division Office	Div.XVI, Bareilly	Uttarakhand
xi) MID EASTERN REGION		
Regional Office	Patna	Bihar, Jharkhand
State Unit Office	Ranchi	Jharkhand
Division Office	Div. V, Ranchi	Bihar, Jharkhand
xii) EASTERN REGION		
Regional Office	Kolkata	West Bengal, Sikkim, UT of
Division Office	Div. XV, Kolkata	A & Nicobar Islands
		-
		d
		o
		-

xiii) NORTH EASTERN REGION		
Regional Office	Guwahati	Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Tripura
State Unit Office	Naharlugan Shillong Agartala	Arunachal Pradesh Meghalaya Tripura
Division Office	Div.VII, Guwahati	Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Tripura
xiv) SOUTH EASTERN REGION		
Regional Office	Bhubaneshwar	Orissa
Division Office	Div. X, Bhubaneshwar	Orissa
xv) SOUTHERN REGION		
Regional Office	Hyderabad	Andhra Pradesh &Telangana
State Unit Office	Vishakhapatanam	N-Coastal Andhra Pradesh
Division Office	Div. IX, Hyderabad	Andhra Pradesh & Telangana
xvi) SOUTH WESTERN REGION		
Regional Office	Bangalore	Karnataka & Goa
State Unit Office		
Division Office	Belgaum	NW. Karnataka & Goa
	Div. XIV, Bangalore	Karnataka & Goa
xvii) SOUTH EASTERN COASTAL REGION		
Regional Office	Chennai	Tamil Nadu, UT of Pondicherry
Division Office	Div. IV, Chennai	Tamil Nadu, UT of Pondicherry
xviii) KERALA REGION		
Regional Office	Trivendrum	Kerala & UT of Lakshadweep
Division Office	Div. IV, Chennai	Kerala & UT of Lakshadweep
State Unit Office	NCT, Delhi	NCT, Delhi

ANNUAL GENERAL REPORT
2013 - 2014

COMPILED BY

Miss Shilpi Gupta, Scientist- B, CGWB, CHQ, Faridabad.

GUIDANCE BY

Shri. Y.B. Kaushik, Suptdg. Hydrogeologist,CGWB, CHQ, Faridabad.

Shri. Amlanjyoti Kar, Suptdg. Hydrogeologist,CGWB, CHQ, Faridabad.

Shri Sujit Kumar Sinha, Scientist–D, CGWB, CHQ, Faridabad.

Dr. Sudhanshu Shekhar, Scientist-D,CGWB, CHQ, Faridabad.

Shri S. C. Gupta, Sr Hydrologist, CGWB, CHQ, Faridabad