



# ANNUAL REPORT 2014-15



**GOVERNMENT OF INDIA  
CENTRAL GROUND WATER BOARD  
MINISTRY OF WATER RESOURCES, RIVER  
DEVELOPMENT AND GANGA REJUVENATION  
FARIDABAD  
2016**

Govt. of India  
**CENTRAL GROUND WATER BOARD**  
Ministry of Water Resources, River Development and  
Ganga Rejuvenation

**ANNUAL REPORT**  
**2014-15**

**FARIDABAD**

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## **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, digital toposheets for an area of about 3.00 lakh sq.km., were procured. Database for exploratory wells was compiled for 5.63 lakh sq.km area, hydrogeology, geophysics, geochemical and hydrology for 6.29 lakh sq.km. area was completed. Data gap analysis was done for an area of approx 6.3 lakh sq.km.

### **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 2014-15, Central Ground Water Board under their Ground Water Exploration programme, constructed 664 wells consisting Exploratory Wells (EW) -414, Observation Wells (OW) -148, Piezometers (PZ) -100, Slim Hole (SH)-02 including 35 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 and areas affected with ground water pollution etc. Out of 664 exploratory wells constructed, 527 wells were constructed in hard rock, 130 wells in alluvium and 7 wells bouldary formation. Out of 664 wells, 80 wells were

constructed in the tribal and 104 wells in drought prone areas.

### **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 22694 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 2014 & January 2015 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 2014-15, 2124 Vertical Electrical Soundings (VES), 291.27 line kilometre resistivity profiling and 143 nos of borehole logging have been conducted in various parts of the country.

### **Water Quality Analysis**

During 2014-15, a total number of 22017 water samples have been analyzed. Out of which, 18963 water samples have been analyzed for determination of basic constituents, analysis of 674 no. of water samples was carried out under specific studies while analysis of 2380 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 2014-15, 16 State Reports were submitted, 122 updated District Ground Water Brochures 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 177 investigations during this year.

### **Dissemination and Sharing of Technical Know-how**

Central Ground Water Board has organized 6 workshops in Arsenic affected areas at Kolkata, Patna, Chandigarh, Raipur, Lucknow and Guwahati under IEC program. 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%. Re-assessment of Dynamic Ground Water Resources base year 2013 is under progress.

### **Artificial Recharge Studies**

During 2014-15, total of 48 artificial recharge structures have been constructed. Spill over balance funds of Rs. 7.66 crores were released as second installment for on-going projects.

### **Technical Examination of Major/Medium Irrigation project proposals**

During 2014-15, 10 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 2014-15, 118 training programmes (33- Tier I, 50-Tier II and 35 Tier-III) were conducted by RGI and a total of 7126 trainees (581- Tier I, 1615-Tier II and 4930- Tier-III) were trained including 1186 female participants.

### **Hydrology Project II**

During 2014-15, under the Hydrology Project-II, 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 gaps has been completed. Various ground geophysical survey viz. VES, Ground TEM and ERT and Heliborne Survey by CSIR-NGRI have been completed in all six pilot areas. Reports have been submitted by CSIR-NGRI. Geophysical techniques of VES, TEM, ERT and Advanced Heliborne TEM have been used in the project and on the basis of results, efficacy of different geophysical techniques have been ascertained and protocol for use of geophysical techniques for aquifer mapping in different hydrogeological terrains has been prepared. Preparation of aquifer maps and formulation of aquifer management plan are under finalisation.

### **Publicity and Public Awareness**

With a view to generate awareness among the masses, "Water Resources Day" and "India Water Week 2015" were 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 2014-15, the Beta Version of “Web Based Application of Receipt and Issue of NOC for Abstraction of Ground Water (www.cgwa-noc.gov.in)” has been launched by Hon’ble Minister of Water Resources, River Development & Ganga Rejuvenation on 28<sup>th</sup> January, 2015. Regulation of ground water development was continued in 162 notified area.

### **IEC Activities**

The Year-2014 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 5<sup>th</sup> National Level Painting Competition on 16<sup>th</sup> February, 2015 at A.P. Shinde Symposium Hall, NASC Complex, PUSA, New Delhi. Sh. Sanwar Lal Jat, Hon’ble Minister of State for Water Resources, River Development and Ganga Rejuvenation was the Chief Guest on the occasion. The 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> prize winners of the State Level Painting Competition totaling 92 students from all States / UTs have participated in the National Level Painting Competition.

More than 18,500 schools and over 17.50 lakh students in all over the country have participated at School Level on the theme “Save Water, Live Better”. Out of these, 50 students

selected by the Jury in each State, were invited to participate in the State Level Painting Competition which was organized in the last week of November, 2014 on the theme “Save a Drop, Save the Future”.

The 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> prize winners of the State Level Painting Competitions were invited to participate in the National Level Painting Competition at New Delhi. The theme of competition this year was “Save Water for the Future”.

In the National Level Painting Competition, a total numbers of 13 students were declared winners. Master Abhayam Rathod of Class VIII of Bridge Ford School, Ranchi of Jharkhand state won the first prize worth Rs 1,00,000/- (One Lakh). Besides this, four second prizes of Rs. 50,000 each, eight third prizes of Rs 25,000/- each were given away Consolation prizes of Rs. 5000/- each were given to the remaining participants.

Apart from this, 6 workshops were organized by regional offices of CGWB on various water conservation issues.

### **Budget & Expenditure**

During 2014-15, Expenditure of Rs. 13781.86 lakhs under Plan and Rs. 14508.70 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, River Development and Ganga Rejuvenation, Govt. of India is vested with the responsibilities to carry 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, River Development and Ganga Rejuvenation.
2. The Joint Secretary & Financial Adviser, Ministry of Water Resources, River Development and Ganga Rejuvenation.
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 after the following work:-

- 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, and other banks etc. for ground water development and management.
- Preparation of EFC/ SFC memo pertaining to respective activities.
- IEC activities in 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
- 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 Ministry of Water Resources, River Development and Ganga Rejuvenation 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 2014-15.

#### **1.4 ACTIVITIES OF THE BOARD DURING 2014-15**

National Project on Aquifer Management (NAQUIM) is the major activity of CGWB during 2014-15 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 NAQUIM is proposed to span over XII & XIII Plan periods. It is proposed to cover around 23.25 Lakh Km<sup>2</sup> mappable areas distributed over several States and Union Territories of the country. During the XII Plan an area of 8.89 lakh Km<sup>2</sup> 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 2014-2015 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 Ministry of Water Resources, River Development and Ganga Rejuvenation and Chairman, CGWB.

### Objective

Broad objectives of the scheme are:

- Aquifer Mapping for Delineation of Aquifer disposition in 3-D along with their characterization on 1:50,000 scale in 8.89 lakh sq.km. falling in the Over-Exploited, Critical and Semi-critical categories of Assessment units as well as water quality and other problem/ vulnerable areas.
- Quantify water availability and water quality parameters 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 table 2.1 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**

Sl. No	State/UTs	Year wise Area (Sq. Km)					
		2012-13	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
	<b>Grand Total (Sq. Km)</b>	<b>56283</b>	<b>90547</b>	<b>130120</b>	<b>195553</b>	<b>416601</b>	<b>889104</b>
	Area Proposed for Aquifer Mapping as per EFC (Lakh sq km)	<b>0.54</b>	<b>0.54</b>	<b>1.3</b>	<b>1.95</b>	<b>4.56</b>	<b>8.89</b>

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 completed for an area about 295203 sq.km. during the

year 2014-15. Hard copy of topomaps for 594098 sq.km area, hard copy of geology map 602881 sq.km area, Soil Maps of 712953 Sq.Km area and Geomorphological maps for 723583 Sq.Km area have also been procured.

During 2014-15, database for exploratory wells was compiled for 563485 sq.km area, analysis of Geology, Geophysics, Hydrogeology, Geochemical, Hydrology completed for an area of 628322 sq.km. Delineation of principal aquifers (Vertical and Lateral) was covered for 662556 Sq.Km area, Aquifer Wise Water Level Data- 669549 Sq.Km was covered and Aquifer Wise Draft Data – 824684 Sq.Km. have been compiled. The details are shown in table 2.2

**Table 2.2:** Compilation of existing data

<b>1. Compilation of Existing Data</b>		
<b>Item</b>	<b>Target (in sq. Km.)</b>	<b>Achievement (in sq. Km.)</b>
<b>1a) Procurement of Digital Toposheets (1:50,000 scale) from Survey of India</b>	0	295203
<b>1b) Procurement of Hard Copy</b>		
(i) Procurement of Hard copy (Topographical from SOI)	587697	594098
(ii) Procurement of Hard copy (Geological) from GSI	587697	602881
(iii) Procurement of Hard copy ( Soil from NBSS/NRSC/RRSC)	587697	712953
(iv) Procurement of Hard copy (Geomorphological from NRSC/RRSC )	589105	723583
<b>1c) Data base on Exploration wells</b>	588744	563485
<b>1d) Compilation of information of Geology, Geophysics, Hydrogeology, Geochemical, Hydrology</b>	588051	628322
<b>1e) Delineation of principal aquifers (Vertical &amp; Lateral)</b>	588007	662556
<b>1f) Compilation of Aquifer wise Water Level data</b>	588567	669549
<b>1g) Compilation of Aquifer wise Draft Data</b>	589208	824684

### 2.2 Data gap Analysis

During 2014-15, Data Gap Analysis in respect of Geology, Geophysics, , Hydrology, Geochemical , Hydrogeology has been completed for an area of 619940 sq.Km. Delineation of principal aquifers was done for exploration-662556 Sq.Km. area, Aquifer Wise Water Level Data for 570065 Sq.Km area and Aquifer Wise Draft Data – 658374 Sq.Km area. as shown in table 2.3.

**Table 2.3:** Identification of Data Gap

<b>Item</b>	<b>Target (in sq. Km.)</b>	<b>Achievement (in sq. Km.)</b>
<b>2a) Thematic layer</b>	588383	675430
<b>2b) Information on Geology, Geophysics, Hydrogeology, Geochemical, Hydrology</b>	589085	619940
<b>2c) Delineation of aquifers by Exploration</b>	590002	623126
<b>2d) Aquifer wise Water Level data</b>	589701	570065
<b>2e) Aquifer wise Draft Data</b>	591600	658374

### 2.3 Generation of Additional data

For generation of additional data, fieldwork is initiated in 130000 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 achievements for additional data generation are given in table 2.4. Data Generation for Aquifer Mapping in NCR area of approx 25,000 sqkm was completed and report was submitted by WAPCOS. The pilot projects on Aquifer Mapping covering an area of 3006 sq.km. in the states of Bihar, Rajasthan, Maharashtra, Karnataka and Tamilnadu has been completed. A MOA signed between CGWB & WAPCOS on Data Generation in Lalitpur & Jhansi district, U.P, Bundelkhand on 27<sup>th</sup> May 2015.

**Table 2.4** Generation of additional data

<b>Data generation (0.65 lakh Sq.Km.)</b>	<b>Target</b>	<b>Achievement</b>
Exploratory drilling including pumping test (Nos)	800	664
Vertical Electrical Sounding( VES)	2000	2124
Hydrochemical Analysis (nos)	20000	22017
Water Level Monitoring( No of stations* frequency)	15202	15202
Micro level sub-surface hydrogeological data from existing wells	9644	9644

### 3. PILOT PROJECT ON AQUIFER MAPPING

CGWB under Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD&GR), Government of India, with assistance from the World Bank had undertaken Pilot Project on Aquifer Mapping in Six different Hydrogeological terrains covering parts of states of Bihar, Rajasthan, Maharashtra, Karnataka and Tamil Nadu.

Six different hydrogeological environs of the country in which the project is being implemented are as given below:

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

For Aquifer Characterization using advanced geophysical techniques and to establish the efficacy of various geophysical techniques for different Hydrogeological terrains, CSIR-NGRI was engaged as a consultant and contract agreement between CGWB and CSIR-NGRI was signed on 21-05-12. The contract was subsequently extended up to 25 March, 2015. CSIR-NGRI applied 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 gaps have been completed. Various thematic layers have been prepared & conceptualization of aquifer system with existing data has been completed. The activity of data generation to fill the data gap has also been completed and refinement of Aquifer system is being done based on data generated. Various ground geophysical survey viz., VES, Ground TEM and ERT and Heliborne Survey by CSIR-NGRI have been completed in all six pilot areas. Reports have been submitted by CSIR-NGRI. Geophysical techniques of VES, TEM, ERT and Advanced Heliborne TEM have been used in the project and on the basis of results, efficacy of different geophysical technique have been ascertained and protocol for use of geophysical techniques for aquifer mapping in different hydrogeological terrains has been prepared. Preparation of aquifer maps and formulation of aquifer management plan are under finalization.

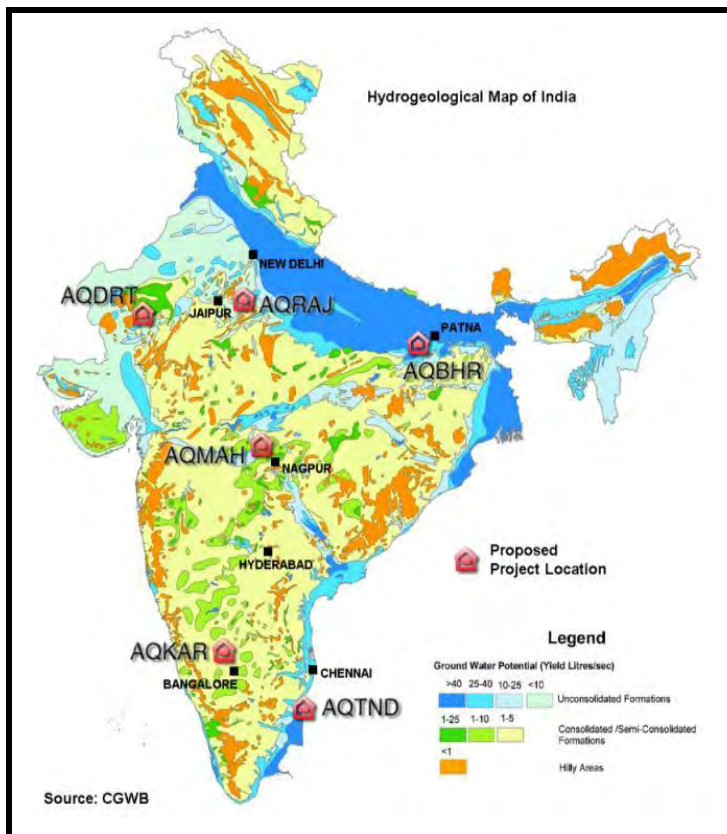
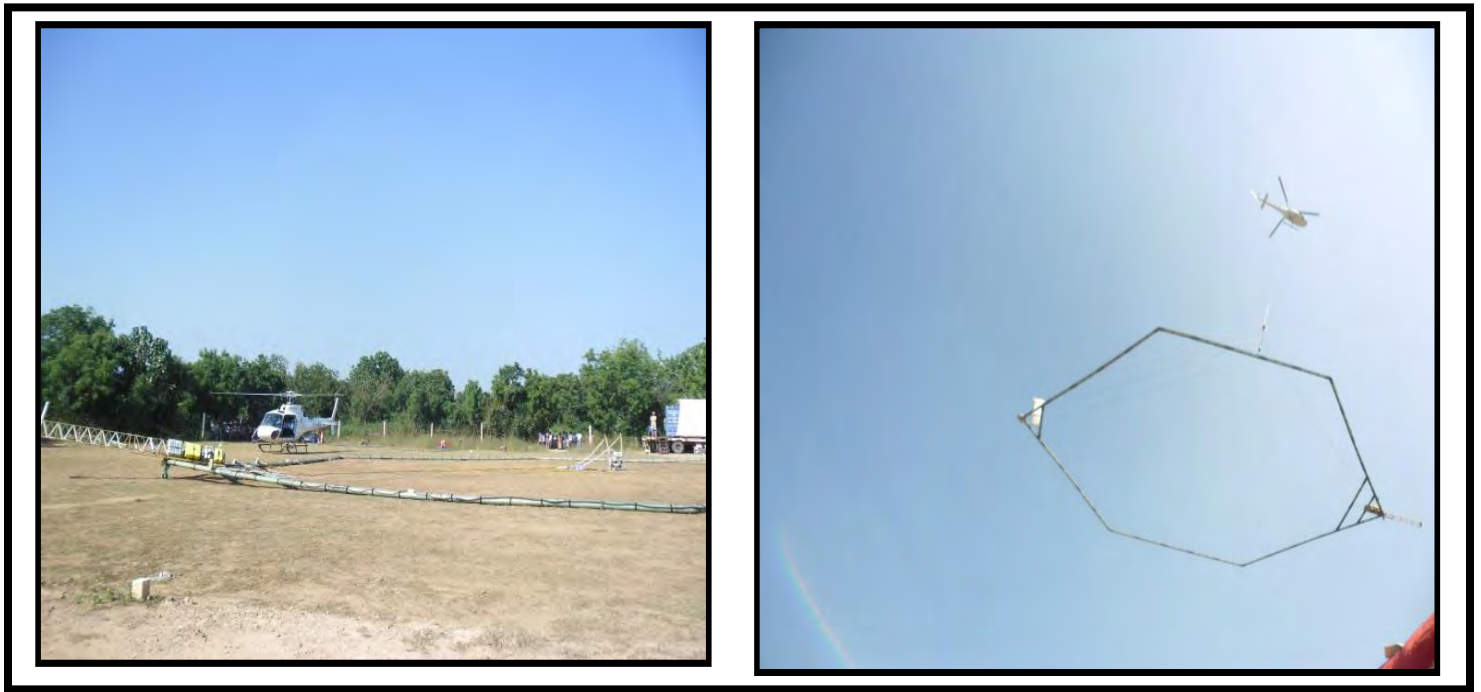


Fig 3.1: Proposed Project Location of Pilot Project of Aquifer Mapping



**Fig. 3.2 Heliborne Survey carried out in Aquifer Mapping Area.**

**Area: Cuddalore, Tamil Nadu**

#### **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 2014-15, Central Ground Water Board under their Ground

Water Exploration programme, 664 wells were constructed (EW-414, OW-148, PZ-100, SH-02) including 35 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, pollution affected areas etc. Out of 664 exploratory wells 527 wells were constructed in hard rock, 130 wells in alluvium and 7 wells in bouldary formations (Table 4.4). 80 wells were constructed in Tribal areas and 104 wells were constructed in drought prone areas (Table4.5). The statement showing State and Division & Region wise distribution of boreholes drilled/completed during 2014-15 is presented in Table 4.1 & 4.2(a) &(b) & Fig 4.3, Fig. 4.4 & Fig. 4.5.

The Board has drilled total of 33611 bore holes (Including 3090 bore holes through outsourcing) as on 31.03.2015 to identify areas for ground water development in the country. The statement showing State-wise distribution of boreholes drilled/completed till March, 2015 in the country is presented in Table 4.3



Fig 4.1 Exploratory well at Pezhakapilly, Ernakulam district, Kerala



Fig 4.2 Aquifer Performance test at Exploratory well , Kothamangalam, Ernakulam district, Kerala.



**Table 4.1: State-wise wells constructed by Central Ground Water Board during the year 2014 -2015**

Sr. No.	STATE/U.T	EW	OW	PZ	SH	TOTAL
1.	Andhra Pradesh	0	0	0	0	0
2.	Arunachal Pradesh	1	0	0	0	1
3.	Assam	16	6	0	0	22
4.	Bihar	1	0	0	0	1
5.	Chhattishgarh	19	15	2	0	36
6.	Goa	0	0	0	0	0
7.	Gujarat	25	3	0	2	30
8.	Haryana	4	2	0	0	6
9.	Himachal Pradesh	7	3	2	0	12
10.	Jammu & Kashmir	21	5	0	0	26
11.	Jharkhand	5	6	3	0	14
12.	Karnataka	27	7	0	0	34
13.	Kerala	11	5	0	0	16
14.	Madhya Pradesh	57	8	0	0	65
15.	Maharashtra	65	11	0	0	76
16.	Manipur	0	0	0	0	0
17.	Meghalaya	0	0	0	0	0
18.	Mizoram	0	0	0	0	0
19.	Nagaland	1	1	0	0	2
20.	Orissa	26	10	5	0	41
21.	Punjab	10	5	0	0	15
22.	Rajasthan	35	22	8	0	65
23.	Sikkim	0	0	0	0	0
24.	Tamil Naidu	29	3	25	0	57
25.	Tripura	0	0	0	0	0
26.	Telengana	20	15	47	0	82
27.	Uttarakhand	4	0	1	0	5
28.	Uttar Pradesh	22	17	7	0	46
29.	West Bengal	8	4	0	0	12
<b>TOTAL</b>		<b>414</b>	<b>148</b>	<b>100</b>	<b>02</b>	<b>664</b>

**Table 4.2(a) Division wise wells constructed by Central Ground Water Board during the year 2014-2015**

DIVISION	TARGET 2014-15				ACHIEVEMENT 2014-15 ( 01.04.14 TO 31.03.2015)					ACHIEVEMENT %
	EW	OW	PZ	T	EW	OW	PZ	SH	T	
I.Ahmedabad	21	21	0	42	25	3	0	2	30	71.43%
II.Ambala	17	15	0	32	14	7	0	-	21	65.63%
III.Varanasi	22	6	8	36	15	10	0	-	25	69.44%
IV.Chennai	23	18	17	58	39	8	25	-	72	124.14%
V.Ranchi	21	7	0	28	6	6	3	-	15	53.57%
VI.Nagpur	48	21	0	69	65	11	0	-	76	110.14%

VII.Guwahati	19	10	0	29	18	7	0	-	25	86.21%
VIII.Jammu	20	5	0	25	21	5	0	-	26	104.00%
IX.Hyderabad	32	24	25	81	20	15	47	-	82	101.23%
X. Bhubneshwar	25	12	13	50	26	10	5	-	41	82.00%
XI.Jodhpur	28	22	14	64	35	22	8	-	65	101.56%
XII.Bhopal	39	25	0	64	57	8	0	-	65	101.56%
XIII.Raipur	30	13	5	48	19	15	2	-	36	75.00%
XIV. Bangalore	34	18	0	52	28	7	0	-	35	67.31%
XV.Kolkata	21	3	0	24	8	4	0	-	12	50.00%
XVI.Bareilly	12	6	6	24	11	7	8	-	26	108.33%
XVII. Dharamshala	8	0	8	16	7	3	2	-	12	75.00%
<b>TOTAL</b>	<b>420</b>	<b>226</b>	<b>96</b>	<b>742</b>	<b>414</b>	<b>148</b>	<b>100</b>	<b>02</b>	<b>664</b>	<b>89.49%</b>

Table 4.2(b) Region wise wells constructed by Central Ground Water Board during the year 2014-2015

Regions	TARGET 2014-15				ACHIEVEMENT 2014-15 ( 01.04.14 TO 31.03.2015)					% ACHIEVEMENT
	EW	OW	PZ	T	EW	OW	PZ	SH	T	
NWHR, Jammu	20	5	0	25	21	5	0	-	26	104.00%
NWR, Chandigarh	17	15	0	32	14	7	0	-	21	65.63%
WR,Jaipur	28	22	14	64	35	22	8	-	65	101.56%
WCR,Ahmedabad	21	21	0	42	25	3	0	2	30	71.43%
NCR, Bhopal	39	25	0	64	57	8	0	-	65	101.56%
NCCR,Raipur	30	13	5	48	19	15	2	-	36	75.00%
CR,Nagpur	48	21	0	69	65	11	0	-	76	110.14%
NR,Lucknow	28	12	14	54	22	17	7		46	85.19%
MER,Patna	21	7	0	28	6	6	3	-	15	53.57%
ER, Kolkata	21	3	0	24	8	4	0	-	12	50.00%
NER,Guwahati	19	10	0	29	18	7	0	-	25	86.21%
SER,Bhubaneswar	25	12	13	50	26	10	5	-	41	82.00%
SR,Hyderabad	32	24	25	81	20	15	47	-	82	101.23%
SWR,Bangalore	25	15	0	40	27	7	0		34	85.00%
SECR, Chennai	13	13	17	43	29	3	25		57	132.56%
KR,Trivendrum	19	8	0	27	11	5	0		16	59.26%
UR,Dehradun	6	0	0	6	4	0	1	-	5	83.33%
NHR, Dharamshala	8	0	8	16	7	3	2	-	12	75.00%
<b>TOTAL</b>	<b>420</b>	<b>226</b>	<b>96</b>	<b>742</b>	<b>414</b>	<b>148</b>	<b>100</b>	<b>2</b>	<b>664</b>	<b>89.49%</b>

**Table 4.3 STATUS OF BORE HOLES DRILLED BY C.G.W.B AS ON 31.03.2015**

S No.	STATE/UT	EW	OW	PZ	EW	OW	PZ	SH	DW	Total	TOTAL (I + II)
		(I) Through Outsourcing (Contractual)			(II) Through Departmental Rigs						
<b>A.</b>	<b>STATES</b>										
1	Andhra Pradesh	90			719	368	263	9	4	1363	<b>1453</b>
2	Arunachal Pradesh				36	5	0	1	1	43	<b>43</b>
3	Assam				400	180	59	16	42	697	<b>697</b>
4	Bihar				298	185	74	10	514	1081	<b>1081</b>
5	Chhattisgarh	300		105	668	216	161	0	28	1073	<b>1478</b>
6	Goa				58	18	14	0	31	121	<b>121</b>
7	Gujarat	165			1011	465	498	27	255	2256	<b>2421</b>
8	Haryana	21	2	80	384	259	224	23	170	1060	<b>1163</b>
9	Himachal Pradesh				210	15	5	1	0	231	<b>231</b>
10	Jammu & Kashmir	21			387	78	36	8	114	623	<b>644</b>
11	Jharkhand	82	8		348	170	40	4	71	633	<b>723</b>
12	Karnataka	134			1345	633	353	7	5	2343	<b>2477</b>
13	Kerala	10			497	178	231	16	13	935	<b>945</b>
14	Madhya Pradesh	364	8	80	1117	672	176	8	149	2122	<b>2574</b>
15	Maharashtra	92	2	88	1370	485	162	2	166	2185	<b>2367</b>
16	Manipur				25	11	0	0	2	38	<b>38</b>
17	Meghalaya				94	24	2	2	8	130	<b>130</b>
18	Mizoram				3	3	0	0	0	6	<b>6</b>
19	Nagaland				15	6	1	0	3	25	<b>25</b>
20	Orissa	439		67	1459	344	139	21	191	2154	<b>2660</b>
21	Punjab	19	3		196	203	91	20	14	524	<b>546</b>
22	Rajasthan	240			1219	453	552	93	591	2908	<b>3148</b>
23	Sikkim	0			31	9	0	0	0	40	<b>40</b>
24	Tamil Nadu	110		179	1030	380	278	13	93	1794	<b>2083</b>
25	Tripura				60	26	0	4	22	112	<b>112</b>
26	Telangana				647	476	467	5	27	1622	<b>1622</b>
27	Uttarakhand	20	4		65	6	2	1	129	203	<b>227</b>
28	Uttar Pradesh	245	12		915	611	187	40	501	2254	<b>2511</b>
29	West Bengal			100	479	223	171	12	82	967	<b>1067</b>
<b>TOTAL(A)</b>		<b>2352</b>	<b>39</b>	<b>699</b>	<b>15086</b>	<b>6702</b>	<b>4186</b>	<b>343</b>	<b>3226</b>	<b>29543</b>	<b>32633</b>
<b>B.</b>	<b>UNION TERRITORIES</b>										
1	Andaman & Nicobar				46	13		1		60	<b>60</b>
2	Chandigarh				7	17	14	2	15	55	<b>55</b>
3	Dadra & NagarHaveli				12	1				13	<b>13</b>
4	Delhi				149	64	160	13	380	766	<b>766</b>
5	Daman & Diu						7			7	<b>7</b>
6	Pondicherry				30	20	8	5	14	77	<b>77</b>
<b>TOTAL(B)</b>		<b>0</b>		<b>0</b>	<b>244</b>	<b>115</b>	<b>189</b>	<b>21</b>	<b>409</b>	<b>978</b>	<b>978</b>
<b>GRAND TOTAL(A+B)</b>		<b>2352</b>	<b>39</b>	<b>699</b>	<b>15330</b>	<b>6817</b>	<b>4375</b>	<b>364</b>	<b>3635</b>	<b>30521</b>	<b>33611</b>

Table 4.4: DIVISION/ STATE/ FORMATION WISE ACHIEVEMENT DURING 2014-15 (As on 31.03.2015)

DIVISION	STATE/ UT	HARD ROCK				ALLUVIUM				BOULDRY				TOTAL			
		EW	OW	PZ	T	EW	OW	PZ	T	EW	OW	PZ	T	EW	OW	PZ	T
I.AHMEDABAD	Gujarat	18		1	19	7	3	1	11				0	25	3	2	30
II.AMBALA	Haryana				0	7	3		10				0	7	3	0	10
	Punjab				0	5	4		9	2			2	7	4	0	11
	Delhi				0				0				0	0	0	0	0
III.VARANASI	Uttar Pradesh	8	5		13	7	5		12				0	15	10	0	25
IV.CHENNAI	Tamil Nadu	27	1	24	52	2	2	1	5				0	29	3	25	57
	Kerala	10	5		15				0				0	10	5	0	15
V.RANCHI	Bihar				0	1			1				0	1	0	0	1
	Jharkhand	5	6	3	14				0				0	5	6	3	14
VI.NAGPUR	Maharashtra	65	11		76				0				0	65	11	0	76
VII.GUWAHATI	Assam	5	1		6	1	1		2	1			1	7	2	0	9
	Manipur				0	3	2		5				0	3	2	0	5
	Meghalaya	6	2		8				0				0	6	2	0	8
	Tripura				0	2	1		3				0	2	1	0	3
VIII.JAMMU	Jammu & Kashmir	19	4		23				0	2	1		3	21	5	0	26
IX.HYDERABAD	Andhra Pradesh	20	15	47	82				0				0	20	15	47	82
X.BHUBANESWAR	Orissa	25	10	5	40	1			1				0	26	10	5	41
XI.JODHPUR	Rajasthan	18	10		28	17	12	8	37				0	35	22	8	65
XII.BHOPAL	Madhya Pradesh	57	8		65				0				0	57	8	0	65
XIII.RAIPUR	Chattisgarh	19	15	1	35			1	1				0	19	15	2	36
XIV.BANGALORE	Karnataka	27	7		34				0				0	27	7	0	34
	Kerala	1			1				0				0	1	0	0	1
XV.KOLKATTA	West Bengal				0	8	4		12				0	8	4	0	12
XVI.BAREILLY	Uttarkhand	4		1	5				0				0	4	0	1	5
	Uttar Pradesh				0	7	7	7	21				0	7	7	7	21
XVII.DHARAMSHALA	Himachal Pradesh	6	3	2	11				0	1			1	7	3	2	12
<b>TOTAL</b>		<b>340</b>	<b>103</b>	<b>84</b>	<b>527</b>	<b>68</b>	<b>44</b>	<b>18</b>	<b>130</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>7</b>	<b>414</b>	<b>148</b>	<b>102</b>	<b>664</b>

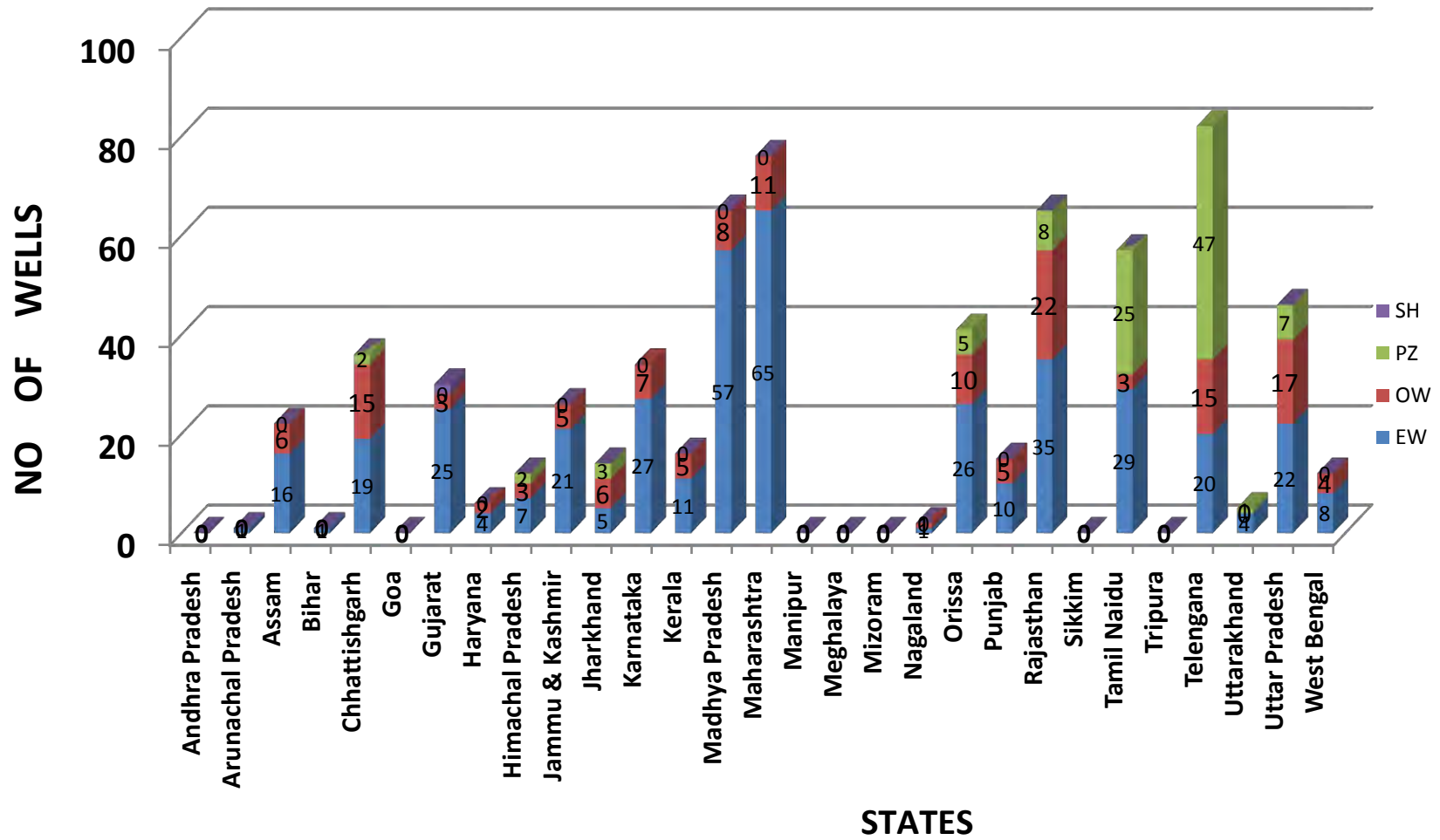
2 PZ converted into SH in Division I,Ahmedabad

Table 4.5: DIVISION/ STATE/ HEAD WISE ACHIEVEMENT DURING 2014-15 (As on 31.03.2015)

DIVISION	STATE/ UT	NORMAL				TRIBAL				DROUGHT				TOTAL			
		EW	OW	PZ	T	EW	OW	PZ	T	EW	OW	PZ	T	EW	OW	PZ	T
I.AHMEDABAD	Gujarat	25	3	2	30				0				0	25	3	2	30
II.AMBALA	Haryana	7	3		10				0				0	7	3	0	10
	Punjab	7	4		11				0				0	7	4	0	11
	Delhi				0				0				0	0	0	0	0
III.VARANASI	Uttar Pradesh	7	5		12				0	8	5		13	15	10	0	25
IV.CHENNAI	Tamil Nadu	2	2	25	29	27	1		28				0	29	3	25	57
	Kerala	10	5		15				0				0	10	5	0	15
V.RANCHI	Bihar	1			1				0				0	1	0	0	1
	Jharkhand	5	6	3	14				0				0	5	6	3	14
VI.NAGPUR	Maharashtra	35	5		40				0	30	6		36	65	11	0	76
VII.GUWAHATI	Assam	1			1	6	2		8				0	7	2	0	9
	Manipur	3	2		5				0				0	3	2	0	5
	Meghalaya				0	6	2		8				0	6	2	0	8
	Tripura	2	1		3				0				0	2	1	0	3
VIII.JAMMU	Jammu & Kashmir	21	5		26				0				0	21	5	0	26
IX.HYDERABAD	Telangana	20	15	47	82				0				0	20	15	47	82
X.BHUBANESWAR	Orissa	15	5	3	23				0	11	5	2	18	26	10	5	41
XI.JODHPUR	Rajasthan	18	10		28				0	17	12	8	37	35	22	8	65
XII.BHOPAL	Madhya Pradesh	57	8		65				0				0	57	8	0	65
XIII.RAIPUR	Chattisgarh				0	19	15	2	36				0	19	15	2	36
XIV.BANGALORE	Karnataka	27	7		34				0				0	27	7	0	34
	Kerala	1			1				0				0	1	0	0	1
XV.KOLKATTA	West Bengal	8	4		12				0				0	8	4	0	12
XVI.BAREILLY	Uttarkhand	4		1	5				0				0	4	0	1	5
	Uttar Pradesh	7	7	7	21				0				0	7	7	7	21
XVII.DHARAMSHALA	Himachal Pradesh	7	3	2	12				0				0	7	3	2	12
<b>TOTAL</b>		<b>290</b>	<b>100</b>	<b>90</b>	<b>480</b>	<b>58</b>	<b>20</b>	<b>2</b>	<b>80</b>	<b>66</b>	<b>28</b>	<b>10</b>	<b>104</b>	<b>414</b>	<b>148</b>	<b>102</b>	<b>664</b>

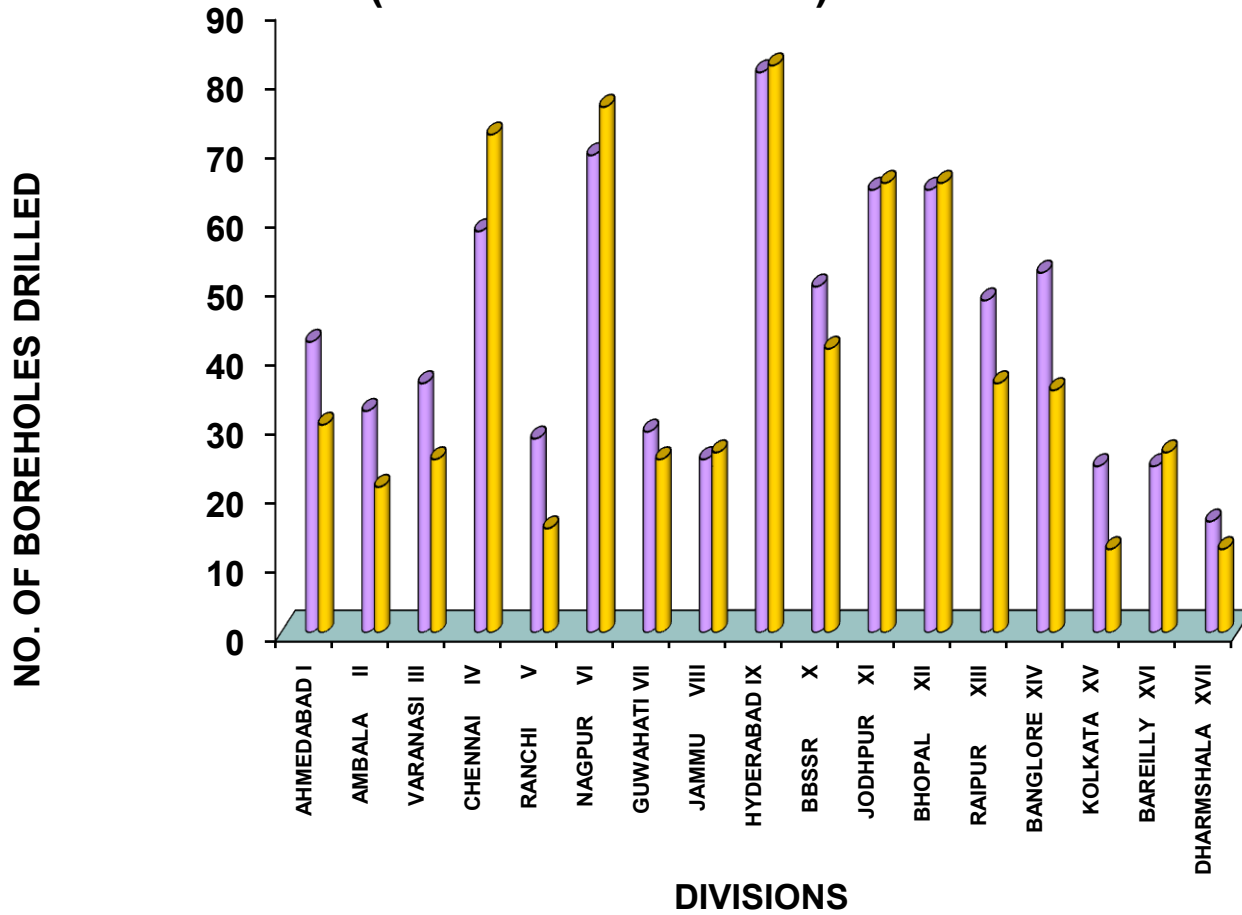
STATE WISE GROUND WATER EXPLORATION DURING 2014-15

Fig. 4.3



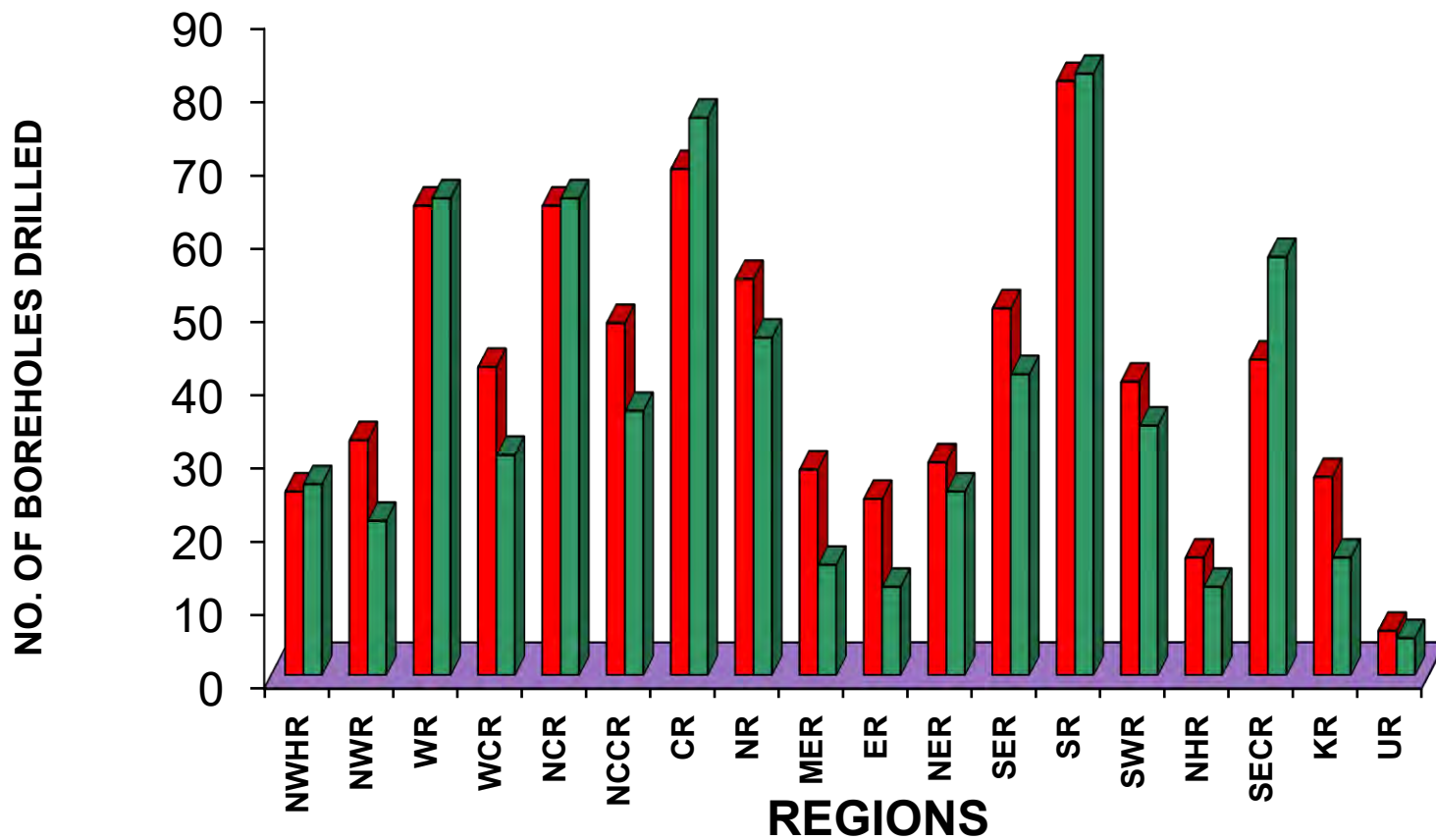
## DIVISION WISE GROUND WATER EXPLORATION (DURING 2014-2015)

Fig 4.4



# REGION WISE STATUS OF GROUND WATER EXPLORATION (DURING 2014-2015)

Fig. 4.5





#### 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 150 wells were developed and tested during the year 2014-15. 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 2014 – 2015**

DIVISION	STATE	No. of Wells constd. During the current year and tested	No. of Wells constd. During the earlier years and tested	Total	Balance No. of wells to be tested (Backlog)
I.Ahmedabad	Gujarat	-	-	-	25
II.Ambala	Haryana	2	6	8	11
	Punjab	-	5	5	17
	Delhi	-	-	-	-
III.Varanasi	Utter Pradesh	-	5	5	48
IV.Chennai	Tamilnadu	1	2	3	11
	Kerla	1	3	4	7
V.Ranchi	Bihar	-	3	3	5
	Jharkhand	-	3	3	10
VI.Nagpur	Maharashtra	4	11	15	27
VII.Guwahati	Assam	1	7	8	34
	Arunachal Pradesh	-	-	-	6
	Manipur	-	-	-	2
	Meghalaya	-	-	-	23
	Nagaland	-	-	-	2
	Tripura	-	-	-	2
VIII.Jammu	Jammu&Kashmir	2	7	9	13
IX.Hyderabad	Andhra Pradesh	-	-	-	-
	Telangana	12	13	25	9
X. Bhubneshwar	Orissa	4	6	10	35
XI.Jodhpur	Rajasthan	6	16	22	62
XII.Bhopal	Madhya Pradesh	-	-	-	34
XIII.Raipur	Chhattisgarh	4	1	5	21
XIV. Bangalore	Karnataka	-	8	8	8
	Kerala	-	-	-	-
XV.Kolkata	West Bengal	1	6	7	33
XVI.Bareilly	Uttar Pradesh	-	2	2	37
	Uttaranchal	-	2	2	16
XVII. Dharamshala	Himachal Pradesh	2	4	6	18
<b>TOTAL</b>		<b>40</b>	<b>110</b>	<b>150</b>	<b>516</b>

## 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 2015, a total of 15330 wells have been drilled, out of which 12229 successful exploratory wells were offered for handed over and only 5898 wells have so far been

accepted /taken over by State Governments while 4579 successful wells are yet to be accepted/ taken over by them and 1752 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 31.03.2015)

Sl. No.	State/UTs	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	719	514	391	105	18
2	Arunachal Pradesh	36	32	14	4	14
3	Assam	400	334	124	133	77
4	Bihar	298	241	89	142	10
5	Chhattisgarh	668	598	163	349	86
6	Goa	58	49	0	49	0
7	Gujarat	1011	688	431	104	153
8	Haryana	384	217	145	60	12
9	Himachal Pradesh	210	196	85	78	33
10	Jammu & Kashmir	387	300	169	85	46
11	Jharkhand	348	283	100	165	18
12	Karnataka	1345	1183	471	489	223
13	Kerala	497	365	262	50	53
14	Madhya Pradesh	1117	778	507	151	120
15	Maharashtra	1370	1163	794	214	155
16	Manipur	25	17	14	0	3
17	Meghalaya	94	95	15	26	54
18	Mizoram	3	3	3	0	0
19	Nagaland	15	9	5	1	3
20	Orissa	1459	1391	405	844	142
21	Punjab	196	170	79	79	12
22	Rajasthan	1219	911	258	544	109
23	Sikkim	31	10	6	0	4
24	Tamil Nadu	1030	736	513	169	54
25	Telangana	60	486	349	63	74
26	Tripura	647	56	36	12	8
27	Uttarakhand	65	55	23	10	22
28	Uttar Pradesh	915	752	194	398	160
29	West Bengal	479	426	162	201	63
<b>TOTAL(A)</b>		<b>15086</b>	<b>12058</b>	<b>5807</b>	<b>4525</b>	<b>1726</b>
<b>B. UNION TERRITORIES</b>						
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
<b>Total(B)</b>		<b>244</b>	<b>171</b>	<b>91</b>	<b>54</b>	<b>26</b>
<b>GRAND TOTAL(A+B)</b>		<b>15330</b>	<b>12229</b>	<b>5898</b>	<b>4579</b>	<b>1752</b>

### 4.3. HIGH YIELDING WELLS

During 2014-15, 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 90 litres per minute to 8400 litre per minute have been explored in the states of Andhra Pradesh, Chhattisgarh, Jharkhand, Kerala, Karnataka,

Rajasthan, Madhya Pradesh, West Bengal, Maharashtra and Uttarakhand. 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 2014-15 are presented in Table 4.6

**Table 4.6 High Yielding Wells Explored During 2014- 15**

Sl. No.	Name of States	Description
1.	Andhra Pradesh	<ul style="list-style-type: none"> <li>• An exploratory well drilled at Jainapalli village, Bibinagar Mandal, Nalgonda District in granitic terrain formation encountered deep fractures at 132 m, which has yielded 240 liter per minute.</li> <li>• A well was drilled at Velcherla village, Tirumalagiri Mandal, Nalgonda district down to a depth of 179 m bgl in granites with a high discharge of 450 liter per minute.</li> <li>• A high yielding well was drilled at Varadapuram village, Mathanapalli Mandal, Nalgonda district in granites with a discharge of 330 liter per minute.</li> </ul>
2.	Chhattisgarh	<ul style="list-style-type: none"> <li>• A well drilled at Amora of Bemetara district down to a depth of 96.0m.bgl has yielded a high discharge of 660 liter per minute in the formation of Maniyari Shale of Chhattisgarh super group with draw down 25 m and Zones encountered at 90.0m-96.0m bgl.</li> <li>• A well drilled at Dhara of Bemetara district down to a depth of 114.0m.bgl has yielded a high discharge of 960 liter per minute in the formation of Maniyari Shale of Chhattisgarh super group with draw down 39.06 m and Zones encountered at 58.0m-64.0m bgl.</li> <li>• A well drilled at Khurusdod of Bemetara district down to a depth of 200.0m bgl has yielded a high discharge of 300 liter per minute in the formation of Maniyari Shale of Chhattisgarh and Zones encountered at 90.0m-96.0m bgl.</li> <li>• A high discharge well at Barga, District- Bemetara, Chhattisgarh down to a depth of 56 m.bgl has been constructed in Maniyari Shale of Chhattisgarh super group having discharge of 1080 liter per minute at Barga with drawdown of 7 m.</li> </ul>
3.	Jharkhand	<ul style="list-style-type: none"> <li>• A well drilled at Gangupara Village, Ranchi district down to depth of 135.00 mbgl has yielded a discharge of 262 liter per minute in the formation of Chhotanagpur Granite gneises.</li> <li>• A well drilled at Buddakur village, Ramgarh Block, Ramgarh, Jharkhand down to depth of 68.65 m bgl has yielded a discharge of 504 liter per minute in hard rock formation.</li> <li>• A well has been drilled at location Potar dagga, Dulmi Block, Ramgarh- Jharkhand up to depth of 172 m bgl in hard rock area with a discharge of 187 liter per minute.</li> </ul>

Sl. No.	Name of States	Description
4.	Kerala	<ul style="list-style-type: none"> <li>• An exploratory well drilled at Pezikkattapalli, Ernakulam district down to depth of 136.20 mbgl has encountered two fractures at depth of 55.3m and 79.80 m in the Charnockitic gneiss formation and has yielded a discharge of 600 liter per minute.</li> <li>• An exploratory well drilled at Okkal, Ernakulam district down to depth of 153.70 mbgl has encountered four fractures at depth of 22 -22.50, 104-105, 129-130, and 152-153m in the Charnockitic gneiss formation and has yielded a discharge of 261 liter per minute.</li> <li>• An exploratory well drilled at Koovapady, Ernakulam district down to depth of 171.00 mbgl has encountered two fractures at depth of 167 m and 168 m in the Biotite gneiss formation and has yielded a discharge of 420 liter per minute.</li> <li>• An exploratory well drilled at Koovapady, Ernakulam district down to depth of 125.00 mbgl has encountered two fractures at depth of 28.50 and 30.00 in the Charnockite gneiss formation and has yielded a discharge of 258 liter per minute.</li> <li>• An exploratory well drilled at Parapuram, Ernakulam district down to depth of 200.00 mbgl has encountered two fractures at depth of 32-33, 81.60-83.00, 124-125 m bgl in the Charnockite gneiss formation and has yielded a discharge of 228 liter per minute.</li> </ul>
5.	Karnataka	<ul style="list-style-type: none"> <li>• An exploratory well constructed at Somenahalli, Gudibanda taluk, Chikballapura district down to a depth of 302.0m bgl has yielded a discharge of 90 liter per minute. Fractures were encountered at depth of 55m, 123m and 225m bgl.</li> <li>• A high yielding well has been drilled at Halehalli at Gauribidanur taluk of Chikballapur district under NAQUIM to a depth of 193 m bgl with a discharge of 240 liter per minute.</li> <li>• A high yielding well was drilled at Namgodlu in Gauribidanur taluk of Chikballapur district under NAQUIM to a depth of 211.70m.bgl with a discharge of 256 liter per minute. Fracture zones are obtained at depths of 160,162,172 &amp; 188mbgl.</li> </ul>
6.	Rajasthan	<ul style="list-style-type: none"> <li>• A well constructed at Narsas &amp; Hudera village, District Sikar under NAQUIM down to a depth of 87.0m and 78.0m bgl has yielded a high discharge of 290 liter per minute.</li> </ul>
7.	Madhya Pradesh	<ul style="list-style-type: none"> <li>• A well drilled at Bhim Kund (Bajna) of Chhattarpur, M.P. down to a depth of 67.20 m bgl has yielded a high discharge of 8400 liter per minute in the formation of Cavernous Limestone of Bijawar Group.</li> </ul>
8.	Maharashtra	<ul style="list-style-type: none"> <li>• An exploratory well constructed at Newasa Taluka, Ahmednagar District down to a depth of 200.0m.bgl has yielded a high discharge of 190 liter per minute in the formation of Fractured Basalt and Zones encountered at 32.0m-84.0m bgl.</li> <li>• An exploratory well constructed at Newasa Taluka, Ahmednagar District down to a depth of 200.0m.bgl has yielded a high discharge of 190 liter per minute in the formation of Fractured Basalt and Zones encountered at 92.80-121 m bgl.</li> <li>• An exploratory well constructed at Ganjur Taluka, Latur District down to a depth of 200.0m.bgl has yielded a high discharge of 360 liter per minute in the formation of Highly Fractured Basalt and Zones encountered at 144m bgl.</li> <li>• An exploratory well constructed at Akharwahi Taluka, Latur District down to a</li> </ul>

Sl. No.	Name of States	Description
		<p>depth of 200.0m.bgl has yielded a high discharge of 210 liter per minute in the formation of Fractured Basalt and Zones encountered at 169 m bgl.</p> <ul style="list-style-type: none"> <li>• An exploratory well drilled at Kopargaon Taluka, Ahmednagar District down to depth of 170.00 mbgl has encountered in depth zone 84-86 m bgl in the Vesicular Fractured Basalt formation and has yielded a discharge of 240 liter per minute.</li> <li>• An exploratory well drilled at Kopargaon Taluka, Ahmednagar District down to depth of 200.00 mbgl has encountered in depth zone 50.30-56.40 m bgl in the Vesicular Fractured Basalt formation and has yielded a discharge of 180 liter per minute.</li> <li>• An observation well drilled at Kopargaon Taluka, Ahmednagar District down to a depth of 99.10 m bgl has yielded a high discharge of 240 liter per minute in the formation of Vesicular Basalt &amp; Fractured Basalt.</li> <li>• An exploratory well drilled at Rahata Taluka, Ahmednagar District down to a depth of 123.00 m bgl has yielded a high discharge of 720 liter per minute in the zone occurring at 56 m bgl. The formation is weathered and fractured basalt.</li> <li>• An exploratory well drilled at Kopargaon Taluka, Ahmednagar District down to a depth of 200.00 m bgl and it has yielded a high discharge of 186 liter per minute in the zone 35 and 43 m bgl in the formation of Fractured Basalt.</li> <li>• An observation well drilled at Kopargaon Taluka, Ahmednagar District down to a depth of 63.00 m bgl has yielded a high discharge of 588 liter per minute in the zone 36 and 45 m bgl in the formation of Fractured Basalt.</li> <li>• A well drilled at Rahata Taluka, Ahmednagar District down to a depth of 160.00m bgl has yielded a high discharge of 707 liter per minute in the formation of Vesicular Basalt.</li> <li>• A well drilled at Rahata Taluka, Ahmednagar District down to a depth of 160.00m bgl has yielded a high discharge of 306 liter per minute in the formation of Vesicular Basalt.</li> <li>• A well drilled at Kopargaon Taluka, Ahmednagar District down to a depth of 200.00m bgl has yielded a high discharge of 360 liter per minute in the formation of Vesicular Basalt.</li> <li>• A well drilled at Kopargaon Taluka, Ahmednagar District down to a depth of 200.00m bgl has yielded a high discharge of 450 liter per minute in the formation of Fractured Basalt.</li> </ul>
10.	Uttarakhand	<ul style="list-style-type: none"> <li>• An exploratory well was drilled in the hard rock area at Bhikiyasain of Almora district, which is the first EW in the Himalayan Terrain. The well was successful with a discharge of 5.5" at V-Notch (590 liter per minute). Total depth of drilled was 130 m, the water struck at 33 m, 66m and 92 m. This will help to meet the drinking water purposes of a population of 5900 persons (@ 60 lpcd for ten hours of pumping a day).</li> </ul>



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



**Fig 4.6** High yielding well at Harhadkander, Dulmi block, Ramgarh district



**Fig 4.7** High Discharge Exploratory Bore Hole at Umling Village, Umling Block, Ri-Bhoi District, Meghalaya



**Fig 4.8** High Discharge Exploratory Bore Hole at Nongladew Village, Zirang Block, Ri-Bhoi District, Meghalaya

## **5. GEOPHYSICAL STUDIES**

The Board has made extensive use of both the Surface and Subsurface (well logging) Geophysical techniques for investigations of ground water and proper construction of water wells. The findings as a practice are combined with the hydrogeological 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.

### **5.1 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. In addition geophysical cell in the current year was also involved for acquisition of geophysical equipments, drawing of Specifications and organizing performance testing of Geophysical equipments, several meetings of the Technical Committee with NGRI, WAPCOS etc.

### **5.2 Geophysical Studies at a Glance**

Geophysical studies are undertaken as an integral part of aquifer mapping and short-term water supply investigations. During 2014-15 up to 31st March, 2015, 2124 Vertical Electrical Soundings (VES), 291.27 line kilometre resistivity profiling and 143 no's of borehole logging 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 2014-2015**

<b>Sl. No.</b>	<b>Region</b>	<b>No.of VES</b>	<b>Resistivity Profiles (line km)</b>	<b>No. of boreholes logged</b>
1	NWHR,Jammu	63	0.49	7
2	NWR,Chandigarh	190	0	13
3	WR,Jaipur	150	60	1
4	WCR,Ahmedabad	107	0	5
5	NCR,Bhopal	107	12.32	0
6	NCCR,Raipur	47	0.30	0
7	CR, Nagpur	118	0.40	19
8	NR, Lucknow	152	0	15
9	MER,Patna	167	96.80	20
10	ER,Kolkata	160	0	0
11	NER,Guwahati	78	0	1
12	SER,Bhubaneswar	150	0	4
13	SR,Hyderabad	232	0	20
14	SWR,Bangalore	181	92.8	30
15	SECR,Chennai	159	11	4
16	KR, Trivendrum	51	14.86	4
17	UR,Dehradun	12	2.30	0
18	NHR,Dharamshala	0	0	0
	<b>Total</b>	<b>2124</b>	<b>291.27</b>	<b>143</b>



**Fig. 5.1** Conducting Resistivity survey near Din Dayal Dham, Farah, Mathura (U.P.)



**Fig. 5.1** Conducting Resistivity survey in Chhattarpur distt. (M.P.)

## 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  $\mu\text{g/l}$  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 2014-15, a total number of 22017 water samples have been analyzed, out of which 18963 water samples have been analyzed for determination of basic constituents, 674 water samples was carried out under specific studies while analysis of 2380 No. of water samples has been done for the Trace elements like As, Cd, Co, Cr, Cu Fe, Mn, Ni, Pb and Zn etc. The details of water samples analyzed by different Chemical Laboratories during 2014- 15 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.

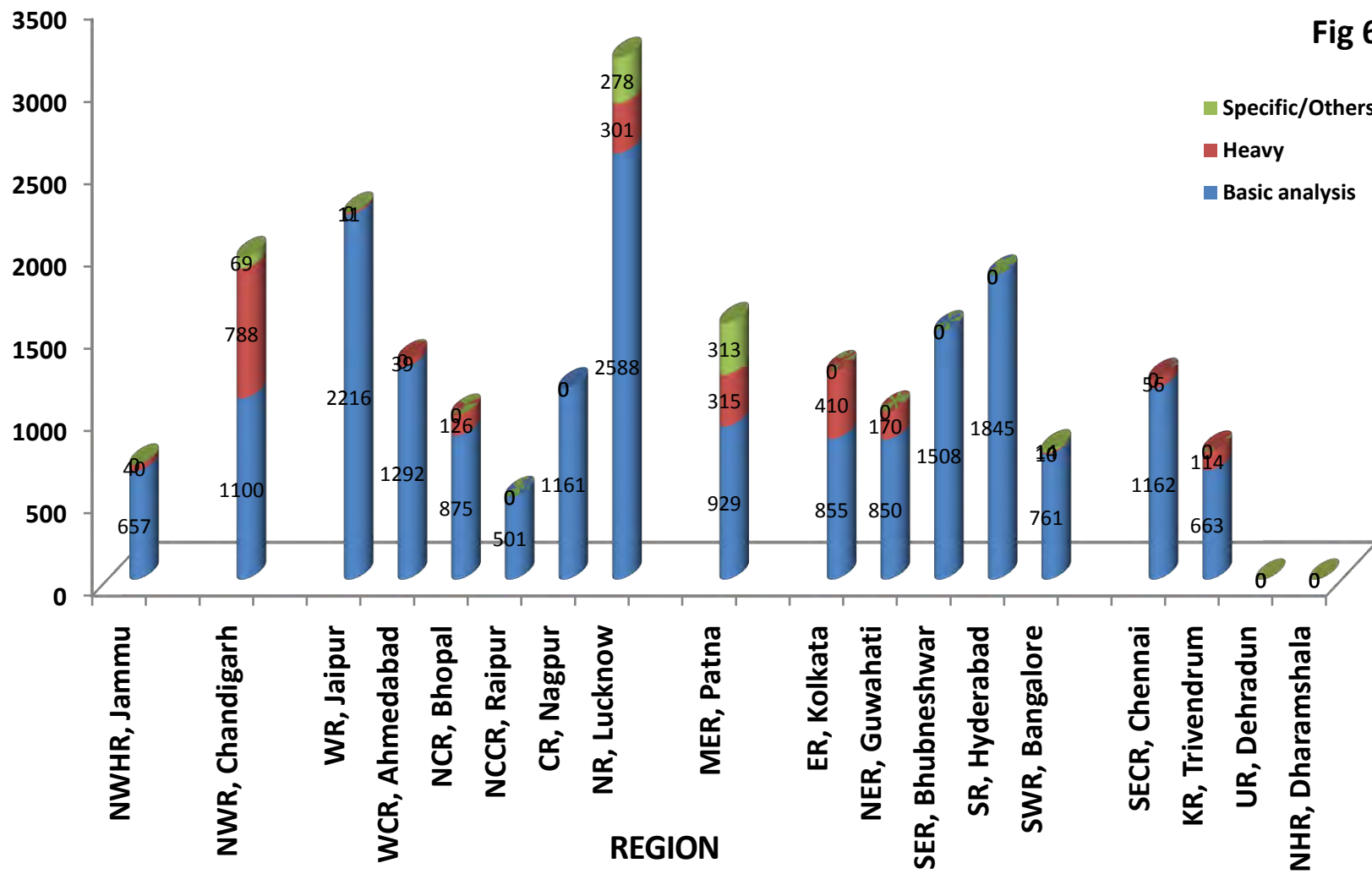
**Table 6.1** Region-wise Water Samples Analysis during 2014-2015

Regions	Number of Samples			Total sample analysed
	Basic analysis	Heavy	Specific/Others	
NWHR, Jammu	657	40	0	697
NWR, Chandigarh	1100	788	69	1957
WR, Jaipur	2216	11	0	2227
WCR, Ahmedabad	1292	39	0	1331
NCR, Bhopal	875	126	0	1001
NCCR, Raipur	501	0	0	501
CR, Nagpur	1161	0	0	1161
NR, Lucknow	2588	301	278	3167
MER, Patna	929	315	313	1557
ER, Kolkata	855	410	0	1265
NER, Guwahati	850	170	0	1020
SER, Bhubneshwar	1508	0	0	1508
SR, Hyderabad	1845	0	0	1845
SWR, Bangalore	761	10	14	785
SECR, Chennai	1162	56	0	1218
KR, Trivendrum	663	114	0	777
UR, Dehradun	0	0	0	0
NHR, Dharamshala	0	0	0	0
SUO Delhi	0	0	0	0
<b>Total</b>	<b>18963</b>	<b>2380</b>	<b>674</b>	<b>22017</b>

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

### REGION-WISE WATER SAMPLES ANALYSIS DURING 2014-2015

Fig 6.1



sites for construction of ground water abstraction structures. During 2014-15, 177 Water Supply Investigations were carried out and region wise/state wise status is given in table 7.1 and fig. 7.1

## 7. WATER SUPPLY INVESTIGATIONS

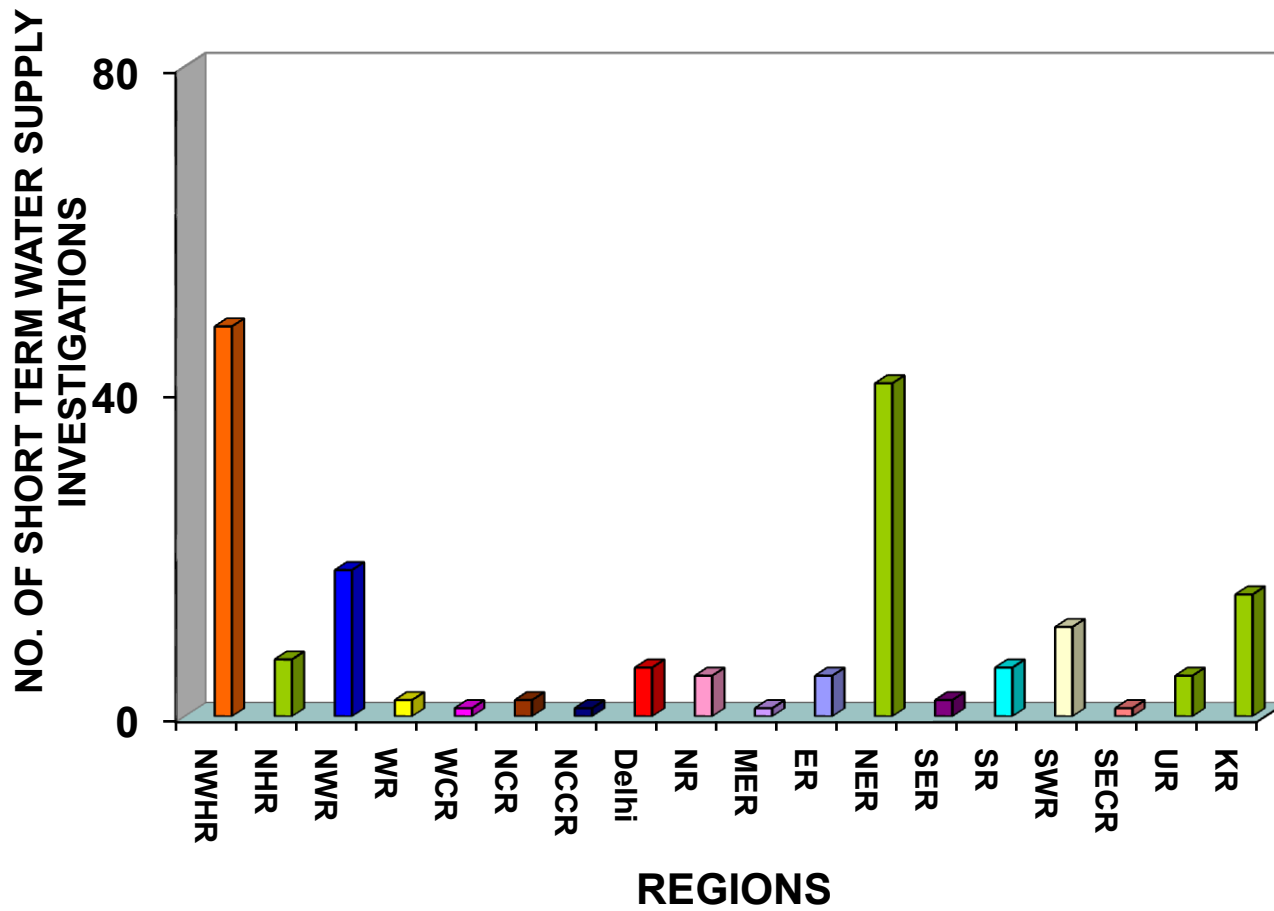
The Board provides assistance to defence and Government agencies / establishments to solve their immediate water supply problems by selecting suitable

**Table 7.1: Region/State wise Water Supply Investigations taken up during 2014-2015**

Sl. No	Regions	States	Number of Water Supply Investigations
1	<b>NORTH WESTERN HIMALAYAN REGION</b>	Jammu & Kashmir	48
2	<b>NORTH WESTERN REGION</b>	Punjab	18
		Haryana	
		Chandigarh	
3	<b>WEST CENTRAL REGION</b>	Gujarat	1
4	<b>WESTERN REGION</b>	Rajasthan	2
5	<b>NORTH CENTRAL REGION</b>	Madhya Pradesh	2
6	<b>NORTH CENTRAL CHHATTISGARH REGION</b>	Chhattisgarh	1
7	<b>CENTRAL REGION</b>	Maharashtra	0
8	<b>NORTHERN REGION</b>	Uttar Pradesh	5
9	<b>EASTERN REGION</b>	West Bengal	5
10	<b>NORTH EASTERN REGION</b>	Assam	41
		Arunachal Pradesh	
		Tripura	
		Meghalaya	
		Nagaland	
11	<b>MID EASTERN REGION</b>	Bihar	1
12	<b>SOUTH EASTERN REGION</b>	Orissa	2
13	<b>SOUTHERN REGION</b>	Andhra Pradesh	6
14	<b>SOUTH WESTERN REGION</b>	Karnataka	11
15	<b>SOUTH EASTERN COASTAL REGION</b>	Chennai	1
16	<b>KERALA REGION</b>	Kerala	15
17	<b>UR, DEHRADUN</b>	Uttaranchal	5
18	<b>NHR, DHARAMSHALA</b>	Himachal Pradesh	7
19	<b>SUO, DELHI</b>	NCT, Delhi	6
<b>Total</b>			<b>177</b>

**REGION WISE STATUS OF SHORT TERM WATER SUPPLY INVESTIGATIONS  
(DURING 2014-2015)**

**Fig 7.1**



## 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 stations 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 measured four times a year during January, March/April/ May, August and November. The regime monitoring started in the year 1969 by Central Ground Water Board. At present a network of **22,339** 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 April/ May to obtain background information of ground water quality changes on regional scale. The database thus generated forms the basis for planning the ground water development and management programme. This data is used for assessment of ground water resources and changes in the regime consequent to various development and management activities.

The State-wise distribution of the ground water observation wells is given in table 8.1 and Fig 8.3.

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

Sl. No.	Name of the State	Status of Ground Water Monitoring Stations (March 2015)		
		DW	PZ	Total
1	Andhra Pradesh	772	109	881
2	Arunachal Pradesh	29	0	29
3	Assam	402	60	462
4	Bihar	631	33	664
5	Chhattisgarh	843	268	1111
6	Delhi	20	96	116
7	Goa	102	49	151

8	Gujarat	809	390	1199
9	Haryana	481	483	964
10	Himachal Pradesh	112	0	112
11	Jammu & Kashmir	256	32	288
12	Jharkhand	407	20	427
13	Karnataka	1483	383	1866
14	Kerala	1369	269	1638
15	Madhya Pradesh	1134	348	1482
16	Maharashtra	1541	219	1760
17	Manipur	13	10	23
18	Meghalaya	56	4	60
19	Nagaland	26	5	31
20	Odisha	1583	98	1681
21	Punjab	169	744	913
22	Rajasthan	734	377	1111
23	Tamil Nadu	819	532	1351
24	Telangana	360	376	736
25	Tripura	58	9	67
26	Uttar Pradesh	940	185	1125
27	Uttarakhand	43	126	169
28	West Bengal	855	886	1741
	UT s			
1	Andaman & Nicobar	108	2	110
2	Chandigarh	1	24	25
3	Dadra & Nagar Haveli	12	0	12
4	Daman & Diu	11	5	16
5	Pondicherry	11	7	18
<b>TOTAL</b>		<b>16190</b>	<b>6149</b>	<b>22339</b>

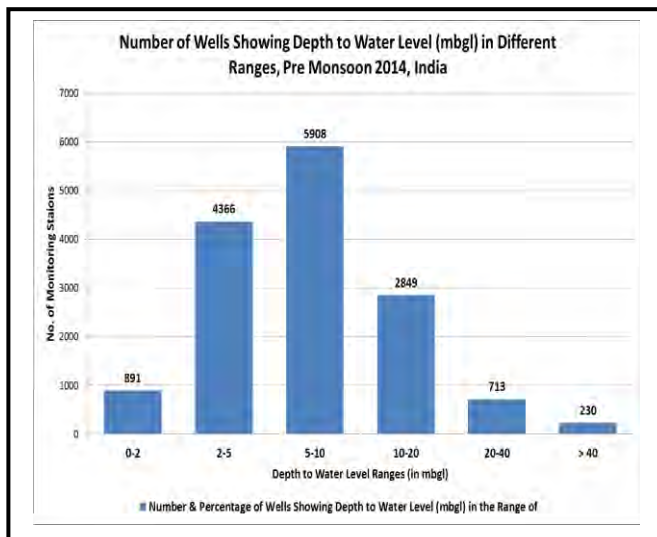
### 8.1 Ground Water Level Scenario

#### Depth to Water Level – Pre Monsoon 2014

Perusal of the ground water level data for Pre Monsoon 2014 indicates (Fig. 8.1) that in Sub-Himalayan area i.e. in the northern parts of river Ganges, Uttar Pradesh, Bihar, Odisha, Assam, Andhra Pradesh and Tripura generally the depth to water level varies from 2-5 meter below ground level. In the states of Madhya Pradesh, Jharkhand, Maharashtra, Karnataka, Telangana, Kerala and West Bengal water level generally varies from 5 to 10 m bgl with small patches showing depth to water level between 2 to 5 m bgl. In most of the 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 state recorded water level in the range of 10-20 m bgl. In Central India water level generally varies between 2 m bgl to 10 m bgl, except



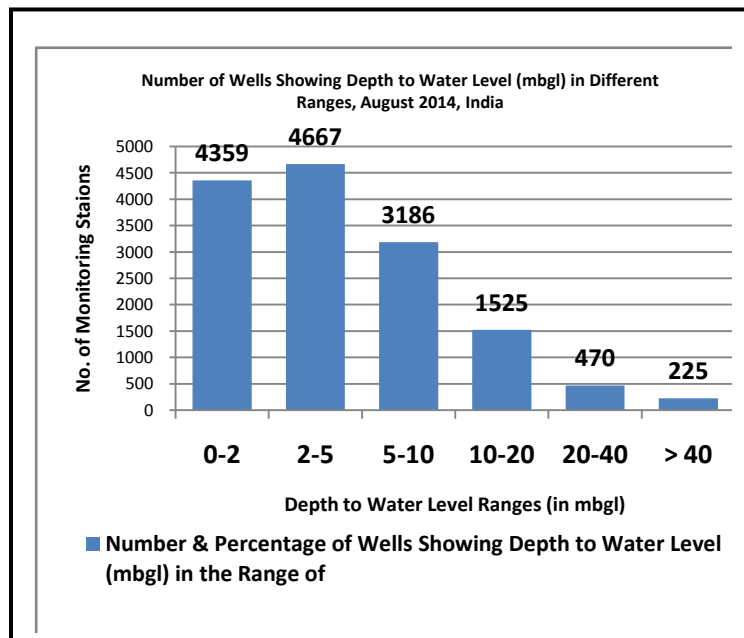
in isolated pockets where water level more than 10 m bgl has been observed. The peninsular part of country generally recorded a water level in the range of 5 to 20 m bgl depth range. Shallow water levels less than 2 m bgl have also been observed as isolated patches in Assam, Maharashtra and Andhra Pradesh.



**Fig. 8.1 . Depth to Water Level – Pre Monsoon 2014**

#### **Depth to Water Level – August 2014**

Perusal of the ground water level data for August 2014 indicates (fig 8.2) Sub-Himalayan areas, Uttar Pradesh, Bihar, Odisha, Assam, Andhra Pradesh generally the depth to water level varies from 2-5 meter below ground level. Shallow water level of less than 2 m bgl is observed in the states of Assam, Chhatisgarh, Maharashtra, Orissa and Uttar Pradesh and also in isolated pockets in Madhya Pradesh. In the states of Madhya Pradesh, Jharkhand, Maharashtra, Karnataka, Telangana, Kerala and West Bengal water level generally varies from 5 to 10 m bgl with small patches showing depth to water level between 2 to 5 m bgl. 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. In Central India water level generally varies between 2 m bgl to 10 m bgl, except in isolated pockets where water level more 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 depth range.



**Fig. 8.2 . Depth to Water Level – August 2014**

#### **Depth to Water Level – Post Monsoon 2014**

Perusal of the ground water level data for Post Monsoon 2014 indicates (fig 8.4) that Sub-Himalayan area, north of river Ganges, Uttar Pradesh, Bihar, Odisha, Chhatisgarh, Assam, Andhra Pradesh, Maharashtra, and Tripura generally the depth to water level varies from 2-5 meter below ground level. Shallow water level of less than 2 m bgl is observed in the states of Assam, Andhra Pradesh, Chhatisgarh, Himachal Pradesh, Maharashtra, Odisha, Tripura and Uttar Pradesh and also in isolated pockets in Madhya Pradesh, Gujarat and Tamil Nadu. In the states of Madhya Pradesh, Jharkhand, Maharashtra, Karnataka, Tamil Nadu, Telangana, Kerala and West Bengal water level generally varies from 5 to 10 m bgl with small patches showing depth to water level between 2 to 5 m bgl. 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 Haryana, and Delhi and almost major parts of Rajasthan, water level of more than 40 m bgl is recorded. Along the eastern & western coast water level is generally upto 10 mbgl. In Central India water level generally varies between 5 m bgl to 10 m bgl, except in isolated pockets where water level more 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 depth range.

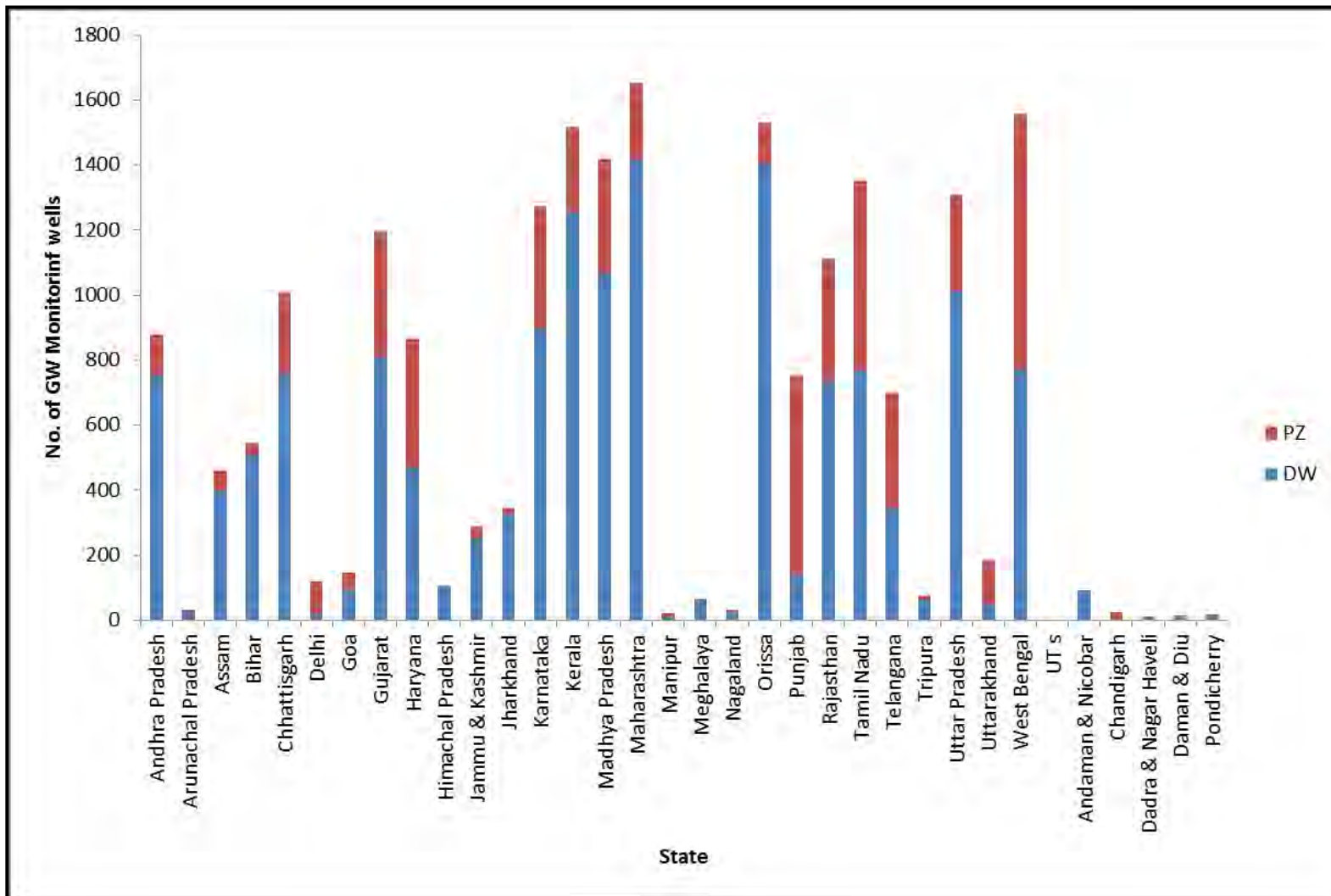
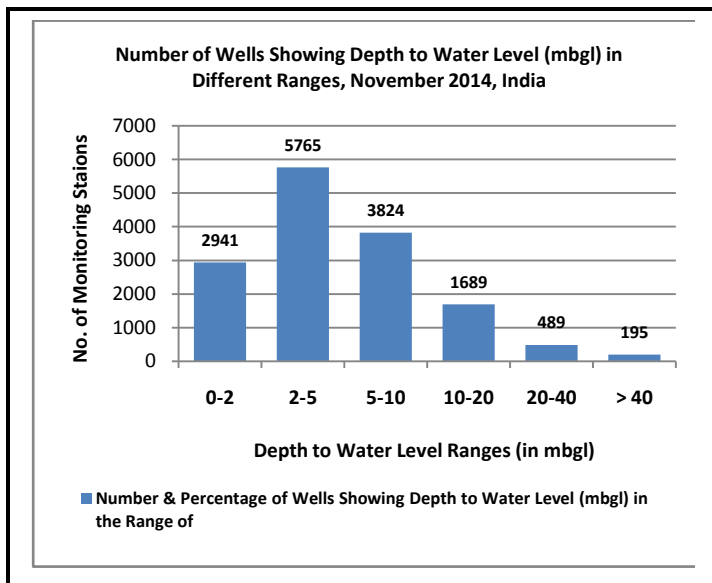
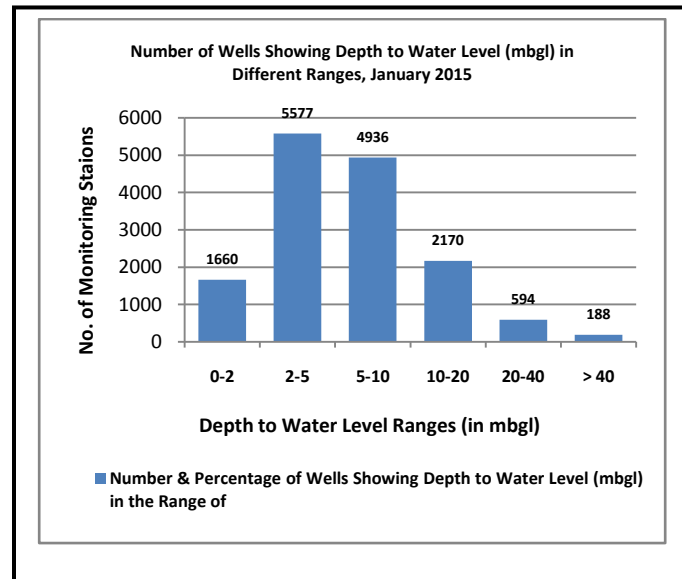


Fig 8.3: State-wise distribution of the Ground Water Observation Well



**Fig 8.4 Depth to Water Level – Post Monsoon 2014**

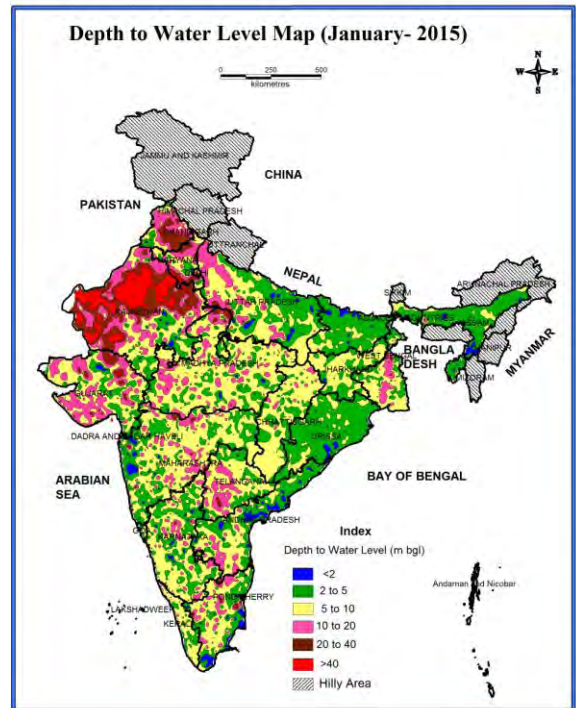
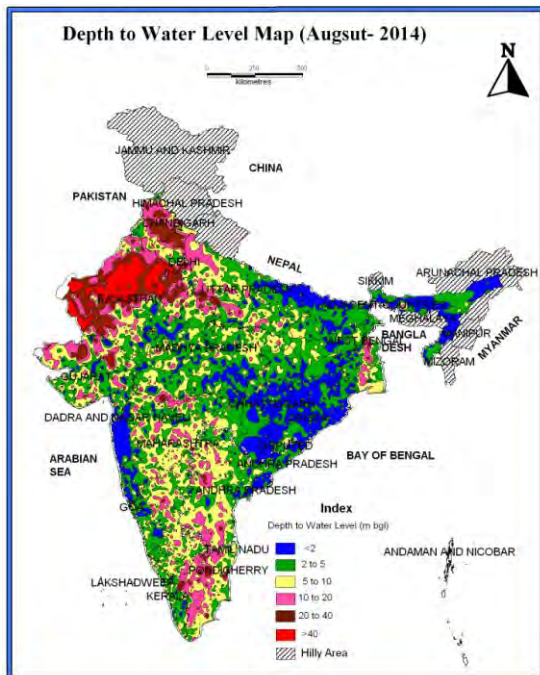
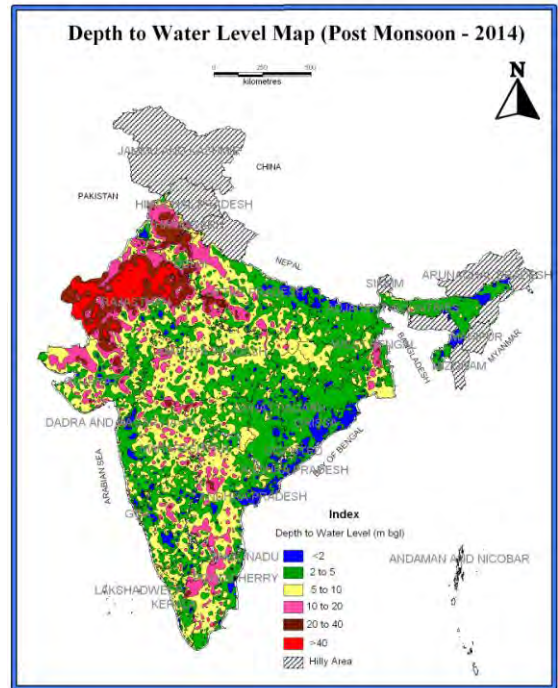
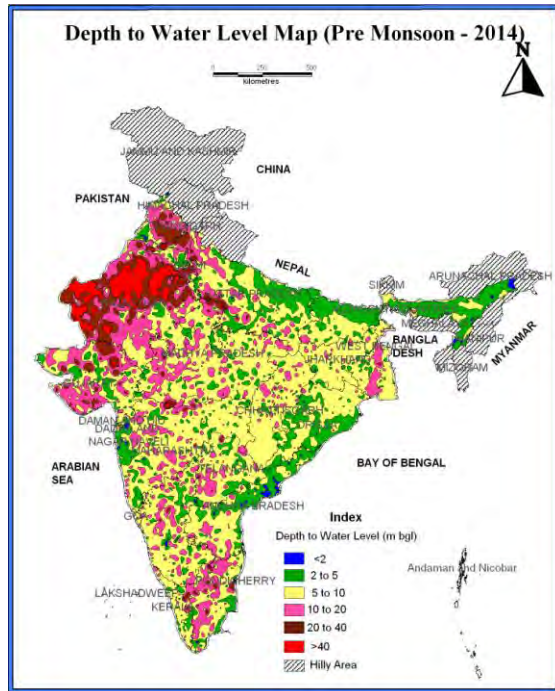


**Fig 8.5 Depth to Water Level – January 2015**

**Depth to Water Level – January 2015**

Perusal of the depth to water level map for January 2015 indicates (Fig 8.5) that in Sub-Himalayan area, north of river Ganges in Uttar Pradesh, Assam, Bihar, Odisha 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 patches in Maharashtra, Andhra Pradesh, Assam, Northern Uttar 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 more than 40 m bgl. In parts of Delhi and major parts of 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 10-20 m bgl. In Central India water level generally varies from 2 to 10 m bgl, and in few isolated pockets water level ranges from 10 to 20 m bgl. The peninsular part of country generally recorded a water level in the range of 5 to 20 m bgl depth range.

## DEPTH TO WATER LEVEL MAPS AT A GLANCE



## 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 **2014-15** are given below in table 10.1.

**Table 10.1- Major achievements of the North Eastern Region during 2014-15**

Sl. No	Activities	Achievements
1.	Compilation of Existing ground water Data	The targets of various activities envisaged in the programme such as data collection & compilation have been completed for the entire area NER.
2.	Data Generation for Aquifer Mapping	
a	Ground water Exploration (No. of boreholes)	25 wells drilled in North Eastern Region
b	Geophysical Studies	78 Vertical Electrical Sounding and 1 bore hole logging completed.
c	Water Quality Analysis	1020 samples analyzed
2	Ground Water Regime Monitoring	Monitoring of water level from GWMS for the month of April/May, August, November, 2014 and January 2015 completed.
	Establishment of additional wells	29 wells
3	Short Term Water Supply Investigation.	41 nos.
4	Ground Water Resources Assessment (No of States/ UT) (As on 31-03-2013)	4 states computation completed
5	Issuance of District Brochures	All District Brochures submitted to CHQ.
6	Ground Water Year Books	Ground Water Year Book of NE State Submitted & under issuance
7	State Level Painting Competition	5 <sup>TH</sup> State Level Painting Competition successfully competed in the Region.
8	Organizing National Ground Water Congress, Workshops, Seminars etc	1 workshop organized on arsenic mitigation at Guwahati
9	Awareness for ground water conservation & rainwater harvesting etc	55 programmes completed under Hamara Jal hamara Jeevan in Assam, Manipur, Tripura & Nagaland

## 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 10.1. 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 Table 10.1.

**Table 10.1** State-wise ground water resources availability, utilization and stage of development India (as on 31<sup>st</sup> 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			Project ed 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
	<b>States</b>													
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
	<b>Total States</b>	<b>252.11</b>	<b>68.99</b>	<b>40.56</b>	<b>70.44</b>	<b>432.11</b>	<b>34.55</b>	<b>397.60</b>	<b>222.21</b>	<b>22.66</b>	<b>244.86</b>	<b>32.28</b>	<b>154.34</b>	<b>62</b>
	<b>Union Territories</b>													
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
	<b>Total Uts</b>	<b>0.42</b>	<b>0.07</b>	<b>0.07</b>	<b>0.04</b>	<b>0.61</b>	<b>0.05</b>	<b>0.56</b>	<b>0.15</b>	<b>0.05</b>	<b>0.20</b>	<b>0.06</b>	<b>0.37</b>	<b>36</b>
	<b>Grand Total</b>	<b>252.53</b>	<b>69.06</b>	<b>40.63</b>	<b>70.48</b>	<b>432.72</b>	<b>34.60</b>	<b>398.16</b>	<b>222.36</b>	<b>22.71</b>	<b>245.06</b>	<b>32.34</b>	<b>154.71</b>	<b>62</b>

**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**

Sl.No.	States / Union Territories	Total No. of Assessed Units	Safe		Semi-critical		Critical		Over-exploited		Saline	
			Nos.	%	Nos.	%	No s.	%	Nos.	%	Nos.	%
	<b>States</b>											
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
	<b>Total States</b>	<b>6554</b>	<b>4484</b>	<b>68</b>	<b>693</b>	<b>11</b>	<b>217</b>	<b>3</b>	<b>1069</b>	<b>16</b>	<b>91</b>	<b>1</b>
	<b>Union Territories</b>											
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
	<b>Total Uts</b>	<b>53</b>	<b>46</b>	<b>87</b>	<b>4</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>2</b>
	<b>Grand Total</b>	<b>6607</b>	<b>4530</b>	<b>69</b>	<b>697</b>	<b>11</b>	<b>217</b>	<b>3</b>	<b>1071</b>	<b>16</b>	<b>92</b>	<b>1</b>
<b>Note</b>												
<b>Blocks-</b> Bihar, Chhattisgarh, Haryana, Jharkhand, Kerala, M.P., Manipur, Mizoram, Orissa, Punjab, Rajasthan, Tripura, UP, Uttarakhand, WB												
<b>Taluks (Command/Non-Command) –Karnataka</b>												
<b>Mandal – Andhra Pradesh</b>												
<b>Taluks – Goa, Gujarat, Maharashtra</b>												
<b>Districts (Valley) – Arunachal Pradesh, Assam, Himachal Pradesh, Jammu &amp; Kashmir, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura</b>												
<b>Islands – Lakshdweep, Andaman &amp; Nicobar Islands</b>												
<b>Firka-Tamil Nadu</b>												
<b>Region – Puducherry</b>												
<b>UT – Chandigarh, Dadar &amp; Nagar Haveli, Daman &amp; Diu</b>												
<b>Tehsil-NCT Delhi</b>												



## 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, Maharashtra, Nagaland, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal and UT Chandigarh, (21 States/UT) during XI Plan. A total of 133 projects amounting to Rs. 99.87 Crore envisaging construction of 1661 recharge structures were approved and funds of Rs. 77.70 Crore were released till March 31, 2014. During 2014-15, spillover balance funds of Rs. 7.66 Crore has been released as second installment for the ongoing projects in the states of Andhra Pradesh, Arunachal Pradesh, Gujarat, Karnataka, Kerala, Nagaland, Rajasthan and Tamil Nadu. 48 Artificial recharge structures were constructed during 2014-15 and total structures constructed under the scheme are 1391 (as on March 2015).

### 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 31<sup>st</sup> March, 2015. Total expenditure incurred under various component of the scheme as on 31<sup>st</sup> 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 11.1:

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	0.2224065 & 0.0192882	2.7475981	0
2	Gujarat	141381	47.1480	3.25			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
	<b>Total:</b>	<b>723086</b>	<b>257.5181</b>	<b>17.00</b>	<b>0.2417</b>	<b>2.7475981</b>	<b>124853</b>

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



**Fig. 11.1:** Construction of Recharge Pit near New Petroleum Engg. Building, ISM campus Dhanbad (Side View)



**Fig 11.2:** Recharge Shaft, PWS well and Under Ground Bundhara(UGB) (submerged in water) at Menkhat(Maharashtra)

## **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 long-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;
- (c) 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 starting 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 2014-15 is Rs 9.80 Crore. The expenditure incurred on the project in the FY 2014-15 is Rs 8.82 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 gaps has been completed. Various ground geophysical survey viz. VES, Ground TEM and ERT and Heliborne Survey by CSIR-NGRI have been completed in all six pilot areas. Reports have been submitted by CSIR-NGRI. Geophysical techniques of VES, TEM, ERT and Advanced Heliborne TEM have been used in the project and on the basis of results, efficacy of different geophysical technique have been ascertained and protocol for use of geophysical techniques for aquifer mapping in different hydrogeological terrains has been prepared. Preparation of aquifer maps and formulation of aquifer management plan are under finalisation.

“Development of e-GEMS”, is in progress by M/S Tata Consultancy Services and Pilot testing of software in LAN environment has been completed. For procurement of software for e-GEMS, complete proposal has been submitted to Ministry under GWM&R Scheme; expenditure sanction received from Ministry and supply order placed for Oracle, Arc GIS and SAP during the year 2014-15. For Hardware of e-GEMS, a proposal for Hiring of BSNL infrastructure for hosting of e-GEMS submitted to Ministry and reply for subsequent queries from Ministry submitted.

### **13. CENTRAL GROUND WATER AUTHORITY (CGWA)**

In pursuance of the order passed by the Hon'ble Supreme Court of India, Central Ground Water Board has been constituted as Central Ground Water Authority (CGWA) under sub-section(3) of Section 3 of the Environment (Protection) Act, 1986 vide notification No. S.O. 38 (E) dated 14.1.1997 for the purpose of regulation and control of ground water management and development in the country.

The Central Ground Water Authority was re-constituted vide S. O. 1121(E) dated 13<sup>th</sup> May, 2010. As per the Notification issued the Authority consists of Chairman & 14 members with Member (SML), CGWB as Member Secretary.

The Authority performs the following functions:-

- 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. To regulate and control, management and development of ground water in the country and to issue necessary regulatory directions for the purpose.
- iv. Exercise of powers under section 4 of the Environment (Protection) Act, 1986 of the appointment of the officers.

#### **13.1 e-GOVERNANCE WEB BASED SYSTEM FOR RECEIPT AND ISSUANCE OF NOC TO ABSTRACT GROUND WATER**

- At present the applications for NOC to abstract ground water ([www.cgwa.noc.in](http://www.cgwa.noc.in)) are processed manually on the prescribed proforma. In order to make the process more user friendly, transparent and fast, a web based application for the receipt and processing of applications for issuing of NOC to abstract Ground Water has been developed through NIC and launched by Hon'ble Minister of WR, RD & GR on 28.01.2015.



**Fig 13.1: Hon'ble Minister of MoWR, RD & GR launching beta version of "Web Based Application of Receipt and Issue of NOC for Abstraction of Ground Water ([www.cgwa-noc.gov.in](http://www.cgwa-noc.gov.in))**

## **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. 10 (Ten) projects were examined during 2014-15 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 2014-15

<b>Sl. No</b>	<b>Project</b>
1	Lower Penganga Project in Godavari Basin, Maharashtra.
2	Chinki Multipurpose project in Narmada basin, Madhya Pradesh
3	Bansujara Dam (Major), Tikamgarh dist, Madhya Pradesh
4	Punasa Lift Irrigation scheme, Dist. Khandwa, Madhya Pradesh.
5	Badaun Lift Canal Irrigation Project, Uttar Pradesh
6	BRR Vamsadhara Project, Andhra Pradesh.
7	Kosi-Mechi Intra State Link Project, Bihar.
8	Yettinahole Project, Karnataka for JICA Assistance
9	Sip-Kolar link Project in District-Sehore, Madhya Pradesh
10.	Shiggaon Lift Irrigation scheme with Sprinkler and Drip Irrigation system, Dharwad, 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

**Fig 15.1** Demonstration of Pumping test to the trainees during tier II Training Programme (village Bandhea, Nagri block, Ranchi district).

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. 15.2:** Trainees attending Aquifer Performance Test at Narangarh, Khurda District, Odisha as a part of Induction Level Training Programme

During 2014-15, RGNGWTRI had conducted 118 training programme including 33 tier I, 50 tier II and 35 tier III training programme. A total of 7126 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 during 2014-15

Training Programme	Target (Nos.)	Achievement	Total No. of persons Trained	Participants from CGWB	Women participants
TIER – I (National Level)	32	33	581	277	84
TIER – II (State Level)	50	50	1615	0	272
TIER – III (Block Level)	35	35	4930	0	830
<b>Total</b>	<b>117</b>	<b>118</b>	<b>7126</b>	<b>277</b>	<b>1186</b>

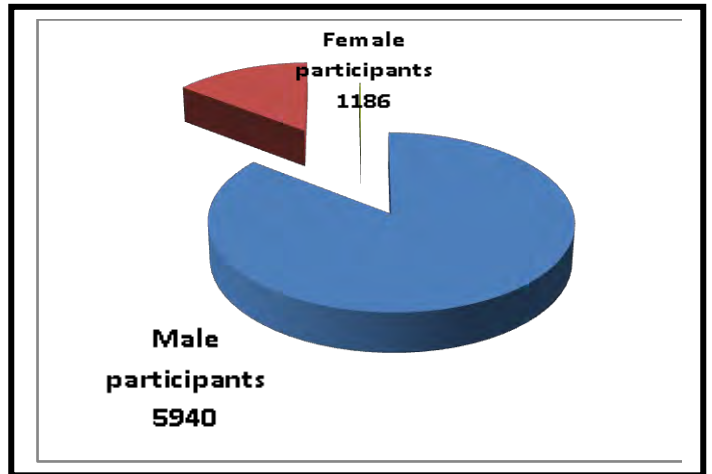


Out of a total 581 professionals trained as a part of Tier I training programme, 277 were from CGWB and the remaining 304 professionals were from other organizations like State Govt. organization, academic institutes, NGOs etc. Tier II and Tier III training programmes were targeted at State Govt. organizations, NGOs, PRIs and other stakeholders at grassroots level.



**fig 15.2: field demonstration in tier-ii training programme**

Participation of women in the training programmes during 2014-15 has been noteworthy. Nearly 17% of all the persons imparted training through RGNGWTRI were women. Total expenditure incurred for all the activities of RGNGWTRI during 2014-15 was INR 547.58 lakhs.



**Fig15.3.** Comparison of male and female participation in trainings conducted by RGNGWTRI, Raipur during 2014-15



**Fig. 15.4: Lectures in tier-II training programme**



**Fig 15.5: Preparation of Flip Chart by Participants at RGI, ILTC-2014-15.**

### **15.2 TRAINING AT NIFM, FARIDABAD**

A training programme on 'Procurement, Tendering & Contracting with Public Fund' was organised during 23<sup>rd</sup> June 2014 to 27<sup>th</sup> June 2014 at National Institute of Financial Management (NIFM), Faridabad. The training was custom made for CGWB officers and was sponsored by CGWB. A total of 25 senior officers of the Board including one officer each from 18 regions, one officer from RGNGWTRI, Raipur and six officers from Faridabad Office attended the training programme.

### **15.3 TRAINING & PILOT TESTING OF E-GEMS CONDUCTED AT CGWB, FARIDABAD**

Scientists of CGWB and other faculties have attended the training and pilot testing of E-Gems at CGWB, Faridabad w.e.f. 04.08.2014 to 12.08.2014. The work involved detailed testing of E-Gems software currently under development by TCS and to check the feasibility of deployment of the same on web platform.

### **15.3 VOCATIONAL TRAINING FOR STUDENTS OF GOVERNMENT POLYTECHNIC MINING INSTITUTE, KODERMA, JHARKHAND**

On the request of Principal, Government Polytechnic Mining Institute, Koderma, Jharkhand a one month vocational training for the students of Drilling Technology is being conducted by RGNGWTRI, Raipur with effect from 21-4-2014. Five students of Drilling Technology are participating in the course. The training has been designed to cover both theoretical and practical aspects of ground water exploration and water well construction technology.



## 16. IEC ACTIVITIES

### 16.1 5<sup>th</sup> NATIONAL PAINTING COMPETITION ON WATER CONSERVATION – 2014

Central Ground Water Board, Ministry of Water Resources, River Development and Ganga Rejuvenation has organized 5<sup>th</sup> National Level Painting Competition on 16<sup>th</sup> February, 2015 at A.P. Shinde Symposium Hall, NASC Complex, PUSA, New Delhi. Sh. Sanwar Lal Jat, Minister of State for Water Resources, River Development and Ganga Rejuvenation was the Chief Guest on the occasion. The 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> prize winners of the State Level Painting Competition totaling 92 students from all States / UT's have participated in the National Level Painting Competition.

Hon'ble Minister of State for Water Resources, River Development and Ganga Rejuvenation Prof. Sanwar Lal Jat emphasized the role of children in conservation and protection of water resources. He said that the beautiful ideas presented by the children in their paintings will motivate others for conservation and judicious utilization of water. He gave the message that children are at an age where we can imbibe them with all good habits. Conservation of water which is important to all of us has to come in their habit and mind so that they turn into a water conscious human being. He called upon the students, their parents as well as teachers to join hands in creating awareness about water conservation and protection of water resources.

Dr. Amarjit Singh, Additional Secretary emphasized that children are the water ambassador for the Ministry of Water Resources, River Development and Ganga Rejuvenation. He told them to carry the message of water conservation to their parts of states. He said that water use efficiency has to be increased in order to assure maximum yield per unit of irrigated area.

The painting competition was conducted throughout the country by Central Ground Water Board, Ministry of Water Resources, River Development and Ganga Rejuvenation, Govt. of India with the theme on **Water Conservation** at School Level. More than 18,500 schools and over 17.50 lakh students in all over the country have participated at School Level. Out of these, 50 students selected by the Jury in each State, were invited to participate in the State Level Painting Competition which was organized in the last week of November, 2014 on the theme "SAVE A DROP, SAVE THE FUTURE". The 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> prize winners of the State Level Painting Competitions were invited to participate in the National Level Painting Competition at New Delhi. The theme of competition this year was "**Save Water for the Future**".

In the National Level Painting Competition, in all 13 students were declared winners. Master / Abhayam Rathod of class VIII of Bridge Ford School, Ranchi of Jharkhand state won the first prize of Rs 1,00,000/- (One Lakh). Besides this, four second prizes of Rs. 50,000 each, eight third prizes of Rs 25,000/- each and consolation prizes of Rs. 5000/- each to the remaining participants were awarded. The list of winners is as follows:-

Prize	Student Name	State
First	Master Abhayam Rathod	Jharkhand
Second	Kumari Sharmistha Parida	Odisha
Second	Kumari Sudhruti Padhiary	Odisha
Second	Kumari Swosti Shree Mohanty	Odisha
Second	Master Utkarsh Bankar	Karnataka
Third	Kumari Anjana L.	Kerala
Third	Master Sathwik D. Amin	Karnataka
Third	Kumari Shibalika Narayan Bhowmik	Tripura
Third	Kumari Shreshtha Shrivastava	Rajasthan
Third	Kumari Shreya Narwal	Haryana
Third	Kumari Tribedi Tanaya Das	Assam
Third	Kumari K. M. Vinisha	Tamil Nadu
Third	Master Zone Zeneith Das	Delhi

Central Ground Water Board, South Eastern Coastal Region, Chennai has won the trophy for registering the participation of more than 4.70 lakh students.

The programme was organized under guidance of Shri. K.B. Biswas, Chairman, Central Ground Water Board, The function was attended by the students and their parents/teachers, senior officers of Ministry of Water Resources, River Development and Ganga Rejuvenation, Govt. of India, Central Water Commission, Central Soil and Material Research Station, WAPCOS and other Central and State Government Organizations and NGOs.

## 16.2 ACTIVITIES UNDER WATER CONSERVATION YEAR-2014

The Year-2014 is being celebrated as “Water Conservation Year” with ‘Save a drop, Save the Future’ under which various mass awareness activities and painting completion has been carried out with emphasis on sensitizing the masses on water related issues, encourage them to conserve and use it judiciously. The activities has been organized throughout the country through different organizations of Ministry of Water Resources, River Development and Ganga Rejuvenation.

### ER, Kolkata

- School Level Competition on the theme ‘Save a drop, Save the Future’ was conducted amongst the school students in West Bengal on 26th November, 2014 at Rabindra Niketan, Salt Lake, Kolkata. 47 students took part in this State Level competition. The Engineer-in-Chief, WRIDD & Project Director, WBADMIP, Govt. of West Bengal, and the Joint Director (Secondary Education), Education Department, Govt. of West Bengal, were present in the prize giving ceremony. The Painting Competition was telecasted by the Door Darshan Kendra, Kolkata.
- School Level Competition on the theme ‘Save a drop, Save the Future’ was conducted amongst the school students in Sikkim on 22<sup>nd</sup> November, 2014 at Gangtok, 50 students took part in this State Level competition. The Principal Secretary, HRDD, Govt. of Sikkim & the Director, Secondary Education, Govt. of Sikkim, were present in the prize giving ceremony. The Painting Competition was covered by the Door Darshan, Gangtok and the print media like Sikkim Express, Dainik Jagaran, etc.
- School Level Competition on the theme ‘Save a drop, Save the Future’ has been conducted amongst the school students of VI<sup>th</sup>, VII<sup>th</sup> and VIII<sup>th</sup> standards in A & N Islands on 27th November, 2014 at Port Blair.

### NCCR, Raipur

- The State level Painting Competition conducted on 26.11.2014 at Raipur under IEC activity. The programme successfully completed with participation at school Level of 103076 students of Class Sixth, Seventh, and Eighth from 1267 schools of different part of tribal state Chhattisgarh. The best 13 paintings out of 50 has been selected by Jury for Nation Level Painting competition.

### NWR, Chandigarh

- State Level Painting Competition on Water Conservation with the theme of ‘Save A Drop, Save the Future’ was held on 26.11.14 at Baba Makhan Shah Lubana Bhawan, Chandigarh. Sh. V. P. Singh, Commissioner, Municipal Corporation, Chandigarh UT graced the prize distribution function of State Level Painting on Water Conservation as the Chief Guest. Total of 147 students participated (Punjab- 48, Haryana- 49, Chandigarh- 50) in the State level Painting Competition.

### SECR, Chennai

- State Level Painting Competition for school children of UT Pondicherry was conducted on 19<sup>th</sup> November, 2014 at Puducherry. Dr. R. Murali, MBBS, DCH, Dean, Mother Theresa Post Graduate & Research Institute of Health Sciences, Puducherry was the Chief Guest and distributed prizes and certificates to the winners.
- State Level Painting Competition for school children of Tamilnadu was conducted on 26<sup>th</sup> November, 2014 at Chennai. Dr. V.C. Rameswara Murugan, Director of School Education, Govt. of Tamil Nadu was the Chief Guest and distributed prizes and certificates to winners.

### SWR, Bangalore

- State Level Painting Competition on Water Conservation with the theme of ‘Save A Drop, Save the Future’ were held on 18.11.2014 at Goa and on 26.11.14 at Karnataka respectively. Total of 99 students participated (Goa- 49, Karnataka- 50) in the State level Painting Competition.

### WCR, Ahmedabad

- More than 24000 students from 245 schools have participated in the School level painting competition as on date. 1032 paintings have been received. The best 50 entries have been selected by the jury members for participation in the State Level Painting Competition scheduled to be held on 2<sup>nd</sup> December 2014, at Gujarat Science City, Ahmedabad.

### SR, Hyderabad

- 5<sup>th</sup> State Level Painting Competition was successfully conducted at Ravindra Bharathi, Hyderabad on 24.11.2014 and 25.11.14 for the States of Telengana and Andhra Pradesh respectively.

### WR, Jaipur

- State Level Painting Competition-2014 on “ Save A Drop-Save The Future” for the State of Rajasthan was organized on 26<sup>th</sup> November ,2014 at CGWB,WR, Jaipur. Out of ‘50’ best School Level Participant Students invited, ‘49’ Students had Participated in the State Level Competition. Dr. I.R. Kirmani, Former, Addl. Director General, Geological Survey of India, Western Region graced the OCCASION OF Prize Distribution Ceremony as Chief Guest, Sh. Mahendra Mehta, Former Commissioner (Groundwater), Ministry of Water Resources , Sh. R. P. Mathur, Former Member, CGWB graced the occasion as Guests of Honour and Sh. P. K .Parchure, Regional Director, CGWB, WR, Jaipur Presided over the function.

### NER, Guwahati

- 5<sup>th</sup> State level Painting Competition successfully completed on 26.11.2014 at Guwahati, Naharlagun and Agartala and on 29.11.2014 at Shillong.

### 16.3 PUBLICITY AND PUBLIC AWARENESS

Central Ground Water Board/ Ministry of Water Resources participated in following Exhibition/Trade Fair during 2014-15.

#### Vibrant Gujarat Summit-2015

An exhibition was arranged in 100 Sq m stall area at the Vibrant Gujarat Summit-January 2015 at Gandhinagar, Gujarat during 7<sup>th</sup> to 13<sup>th</sup> January 2015 showcasing the various activities and achievements of Central Ground Water Board. The stall was visited by large no. of visitors which included, officers from different Govt./Semi Govt. organizations, NGOs, Academic and Research Institutes and students from various organizations and general public. Overwhelming response was received from visitors during the summit. Exhibits and the print materials distributed during the summit were highly appreciated from all sections of visitors and positive feedbacks were also received from the visitors.

#### Mass Awareness Campaign on Water Conservation

As a part of 'Water Conservation Year – 2014' an awareness campaign on Water Conservation was organized in Union Territory of Lakshadweep during March, 2015 in Kavarati Island under the Tribal sub plan of IEC activity.

#### Vigilance awareness week 2014

Vigilance awareness week 2014 has been celebrated in Central Ground Water Board, CHQ Faridabad from 27<sup>th</sup> to 1<sup>st</sup> November 2014. "Vigilance awareness week 2014" 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 19 to 25 November 2014 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 2014

"Hindi Pakhwara" 2014 was celebrated in Central Ground Water Board, CHQ Faridabad from 14<sup>th</sup> to 28<sup>th</sup> September 2014. 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 1<sup>st</sup> October 2014.

#### HAMARA JAL-HAMARA JEEVAN

Ministry of Water Resources, River Development and Ganga Rejuvenation is organizing programme entitled "Hamara Jal-Hamara Jeevan" in association with State Governments. The main objective of organizing the programme is to engage Scientists, Engineers, Water communities, PRIs, Other stakeholders and NGOs to address the issues of water resources planning at the local level and to generate awareness regarding need for water conservation. It is also proposed to select at least one "Jal Gram" in each district for taking up water conservation and water security schemes through convergence of existing programmes such as Integrated Watershed Management Programme (IWMP), Repair, Renovation & Restoration (RRR) of Water Bodies, National Rural Drinking Water Programme (NRDWP), National Rural Health Mission (NRHM) on aspects of water quality, Rural Water Supply Programme etc. The proposal may be taken up as a pilot project under National Water Mission whose main objective is "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management". CGWB is organizing the programme in 248 districts falling in 15 States of the country. Sanction of Rs 1,10,60,800/- (@ Rs 44,600/- per programme ) has been issued to the concerned Regional Directors. A total of 203 programmes have been organized by the Central Ground Water Board.



Fig 16.1:Hamara Jal-Hamara Jeevan programme organized by CGWB at Ludhiana, Punjab

### **Video conference on Hamara Jal - Hamara jeevan**

Regional Directors of Central Ground Water Board attended Video Conference held by the Hon'ble Union Minister of Water Resources, River Development and Ganga Rejuvenation on 31<sup>st</sup> December, 2014 regarding the organizing of the event "Hamara Jal-Hamara Jeevan".

### **Participation in India International Trade Fair(IITF)-2014**

Central Ground Water Board participated in the MOWR pavilion of **IITF-2014** at Pragati Maidan, New Delhi during 14-27<sup>th</sup> November 2014. 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.

### **Momentous journey of Water Conservation Bioscope titled "Jal Chitra"**

The momentous journey of Water Conservation Bioscope titled "Jal Chitra" which is not only first of its kind in Chhattisgarh, but also first in this country was inaugurated through the gracious hands of Padmashri Smt. Phulbasan Yadav, Maa Bamleshwari Janhitkari Samiti, Rajnandgaon on 4<sup>th</sup> April, 2014 at 1200 hrs. at the office of Central Ground Water Board, Raipur.

On this occasion, she released the pamphlet Jal Chitra which gives the brief of the journey of bioscope and its genesis in this country. While interacting with the media people, she accolade the unique efforts made by CGWB, Raipur and emphasized upon the dire need of the same in all corners of Chhattisgarh.

She also reiterated that such initiatives must be taken by all the industries of Chhattisgarh State under their CSR and villages adjoining to their industries must have such bioscope prepared and donated by them. She also emphasized that even Department of Education, Govt. of Chhattisgarh can also take lead in this respect to ascertain that such water conservation bioscope to be launched at all the blocks of Chhattisgarh State.

### **Cleanliness & Sanitation programme organized during October, 2014 in CGWB offices in connection with launching of 'Swachh Bharat Mission'**

In connection with launching of 'Swachh Bharat Mission' by the Hon'ble Prime Minister for Cleanliness and Sanitation drive, the Mission was successfully implemented in all the Regional, Divisional and State Unit Offices of CGWB including the CHQ office at Faridabad on 2<sup>nd</sup> October, 2014. In this regard, Dr. R.C. Jain, Member(SAM) administered the 'Cleanliness Pledge' in Hindi during the inauguration of the programme at Bhujal Bhawan, CHQ office, Faridabad. Thereafter, in support of the onerous task of cleaning and sanitation, the officers and officials voluntarily carried out cleaning of the office premises. Number of trees were planted in the garden. The officers and officials of CGWB led by Dr. R.C. Jain, Member(SAM) had organized a procession in the local areas of Faridabad with banners and platters to create awareness amongst the local population and to promulgate the ideas of 'Swachh Bharat Mission'. Drives were also taken to make the office rooms and nook and corners of the office highly neat and clean. The focus of all these activities was also discussed to bring behavioral changes for making offices as well as residences of all the officers and staff members neat and clean which was dreamt by our Father of the Nation, Mahatma Gandhi. To commemorate his 150<sup>th</sup> birth anniversary, the Mission will continue up to 02.10.2019.



Fig 16.1: State Level Painting Competition held on 27.11.2014 at Bangalore



Fig 16.2: Hamara Jal Hamara Jeevan programme, Goa on 16.01.2015

Fig 16.3: PHOTOGRAPHS OF VIBRANT GUJARAT SUMMIT





**Fig 16.4: Winners of 5<sup>th</sup> National Painting Competition 2014-15 with Chief Guest Hon'ble Minister of State for Water Resources, River Development & Ganga Rejuvenation, Additional Secretary(WR, RD&GR), Chairman, CGWB, Joint Secretary (WR, RD & GR), Member (Finance), CGWB, Member (SML), CGWB along with Regional Directors of CGWB**



**Fig. 16.5: Group Photo of Participating Students**



**Fig. 16.6: Participating children in 5th Painting Competition, 2015**



**Fig. 16.7: Hon'ble Minister of Water Resources, RD & GR & chief guest on the occasion admiring paintings done by students**



## 16.4 ORGANISATION OF WORKSHOPS

Central Ground Water board organized 06 workshops under IEC activities in Arsenic affected areas for sharing of knowledge in the domain of ground water at Kolkata, Patna, Chandigarh, Raipur, Lucknow and Guwahati during the year 2014-15. The dates as given in Table 16.2.

**Table 16.2: Details of workshops organized under IEC activity during the year 2014-15**

Sl. No.	Place	Date
1	Kolkata	24.03.2015
2	Patna	25.03.2015
3	Chandigarh	26.03.2015
4	Raipur	28.03.2015
5	Lucknow	30.03.2015
6	Guwahati	30.03.2015

- Workshop on “**Incident of high Arsenic in Ground water in West Bengal and its Remedial Measures**” held at Indismart Hotel salt lake, Kolkata on 24.03.2015. The Chief Guest of the function was Shri K.K. Nag Chowdhury, Project Director & Ex-Officio Secretary, ADMIP, Govt. of West Bengal.



Among other Shri P.K. Bhowmik, Engineer-in-Chief, PHED, Govt. of West Bengal, Prof. K.J. Nath, Chairman, Arsenic Task Force, Govt. of West Bengal, and Dr. S.P. Sinha Roy, President, CGWS, Ex-Member, CGWB & Chairman, Fluoride Task Force, Govt. of West Bengal were present.

Release of workshop volume at CGWB, ER, Kolkata

- Workshop on Arsenic Contamination of Groundwater in Middle Ganga Plain of Bihar held on “**Issues, Concerns and Remedial Measures**” at A.N.Sinha Institute of Social Studies, Gandhi Maidan, Patna, Bihar on 25.03.2015. Dr.Yameen Mazumdar, Chief Bihar Field Officer, UNICEF, Patna, Bihar was the **Chief Guest**. A workshop volume has been released during the function.



Release of Workshop volume at CGWB, MER, Patna

- Workshop on “**Arsenic contamination in ground water of Chandigarh**” held on 26.03.2015 at Conference Hall of Institute of Engineers (India). Sh.A. K. Khetrpal, Engineer-in-Chief, PHED, Government of Haryana inaugurated the function as **Chief Guest**.



Sh. H. C. S. Berry, Council Member, IEI, Sh. A. K. Khetrpal, Engineer-in-Chief, PHED, Government of Haryana released the workshop volume at CGWB, NWR, Chandigarh

- Workshop on “**Geogenic Contamination of Ground Water in Chhattisgarh with special reference to Arsenic**” at Hotel Corbiz Tower, Raipur, Chhattisgarh held on 28.03.2015. **Shri Brijmohan Agrawal**, Hon’ble Minister of Agriculture, Animal Husbandry, Fish Rearing and Water Resources was the **Chief Guest**. **Shri K.B.Biswas**, Chairman, CGWB also graced the occasion



Workshop volume released at CGWB, NCCR, Raipur

- Workshop on “**Arsenic Pollution in Ground Water of Uttar Pradesh**” held on 30-03-2015 at De Global Park Hotel ,Nirala Nagar, Lucknow. Where **Chief Guest** was Sh. C. K. Tyagi, Chief Engineer (Rural), Jal Nigam, UP.A Workshop volume was also released on this occasion.



- Workshop on “**Arsenic in groundwater and mitigation measures in Assam**” held at Nedfi House Dispur, Guwahati on 30.03.2015. **Dr. R. M. Dubey**, IFS, Chairman, Pollution Control Board, Assam was the **Chief Guest**



Workshop volume released at CGWB,NER,ASSAM

## 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 2014-15, total 16 state reports (UT of A & N Island, Kerala, Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh, Jammu & Kashmir, Haryana, Andhra Pradesh, Telangana, Karnataka, Himachal Pradesh, Uttarakhand, Maharashtra, Rajasthan and Tamilnadu) 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 2014-15, 122 updated district brochures were prepared and submitted/issued. State wise details are given below:

**Table 17.1: Updated District Ground Brochures**

Sl .No	States/ UTs	No	Ground Water Brochures
1	Arunachal Pradesh	16	Lower Subansiri, West Kameng, Upper Subansiri, Upper Siang, Tirap, Tawang, Papum Pare, Lr Dibang Valley, Lohit, Kurung Kumey, East Siang, East Kameng, Dibang Valley, Changlang, West Siang, Anjaw

2	Assam	26	Baksa, Barpeta, Bongaigoan, Cachar, Chirang, Darrang, Dhemaji, Dhubari, Dibrugarh, Goalpara, Golaghat, Hailakandi, Jorhat, Kamrup, Karbi Angalong, Karmganj, Kokrajhar, Lakhimpur, Morigoan, Nagaon, Nalbari, NC Hills, Sibsagar, Sonitpur, Tinsukia, Udalgiri
3	Chandigarh	1	Chandigarh
4	Haryana	18	Ambala, Bhiwani, Faridabad, Fatehabad, Hissar, Jhajjar, Jind, Kanithal, Karnal, Kurukshetra, Rewat, Panchkula, Panipat, Rewadi, Rohtak, Sirsa, Sonapat, Yamunanagar
5	Kerala	5	Kozikode, Mallapuram, Pathanamthitta, Trivendrum, Wayanad
6	Manipur	9	Bishnupur, Chandel, Churachandpur, Imphal East, Imphal West, Senapati, Temenglong, Thoubal, Ukhrul
7	Meghalaya	7	East Garo Hills, East Khasi Hills, Jaintia Hills, Rai Bhoi, South Garo Hills, West Garo Hills, West Khasi Hills
8	Mizoram	8	Aizwal, Champhai, Kolasib, Lawangtlai, Lunglei, Mamit, Saiha, Serchhip
9	Nagaland	8	Dimapur, Kohima, Mokok, Mon, Phek, Tuensang, Wokha, Zunebeto
10	Punjab	20	Amritsar, Barnala, Bhatinda, Faridkot, Faehgarh, Ferozpur, Gurudaspur, Hoshiarpur, Jalandhar, Kapurthalam, Ludhiana, Mansa, Monga, Muktsar, Nawanshahar, Patiala, Ropar, Sangrur, SAS Nagar, Taran Taran.
11	Tripura	4	Dhalai, N Tripura, S Tripura, W Tripura

#### 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 2014-15, 24 reports were prepared. Region wise status of preparation of ground water year book are presented in Table 18.1

**Table 18.1** Status of Ground Water Year Books completed during 2014-15

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	2	Andhra Pradesh, Telengana
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
	<b>Total</b>	24	

## **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.

- 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.
- Boundary wall and 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 12<sup>th</sup> 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 2014-15, an amount of Rs.44.60 Crore was provided under BE -2014-15, which has been subsequently reduce and allocated to Rs.5.00 Crore under RE-2014-15. Under the Scheme, RGI, Raipur building plans (DPR) have been prepared & are under approval. The three building at Bhopal, Guwahati & Bangalore have been completed during this financial year. MoA for remaining five building is under process of approval.

## **19. DISSEMINATION AND SHARING OF TECHNICAL KNOWLEDGE**

### **19.1 Publication of Paper in National/ International Journal**

- A technical Paper on Radon in ground water in Tumkur district of Karnataka with special reference to sampling sensitivity by N. Vinaychandran, Sc C was published in National, Journal of Geological Survey of India.
- A technical Paper on Conceptual Model of Groundwater Flow Dynamics and Recharge in Laterite Aquifer Systems of Humid Tropical regions: A case Study from the State of Kerala, India by Kunhambu. V, Sc-D, N.Vinayachandran, Sc-C, K.Balakrishnan, Sc-C, Anitha Shyam.T.S, Sc-C was published in National Indian Ground Water, Journal of Centre for Ground Water Studies..
- A paper on the overall assessment of quality and quantity of drinking water with focus on fluoride in the areas of extreme western parts of Jharkhand by Neeta Kumari, Gopal Pathak, (BIT Mesra) &, Thakur Brahmanand Singh, Scientist C CGWB, Ranchi was published in INTERNATIONAL JOURNAL OF ENVIRONMENTAL SCIENCES Volume 5, No 4, 2015.
- A paper on Role of shallow alluvial stratigraphy and Holocene geomorphology on groundwater arsenic contamination in Middle Ganga Plain, India by Sahu S, Saha D, CGWB was published in Environmental Earth Science. Vol 73.
- A paper on Sone megafan: A non-Himalayan megafan of craton origin on the southern margin of the middle Ganga Basin, India by Sahu S, Saha D, Dayal S was published in Geomorphology 250.
- A paper on Geology as a predictive tool in delineating groundwater arsenic contaminated areas- An approach from Middle Ganga Plain, India by Dr.Saha D, Sahu S was published in GSA Annual Meeting in Baltimore, Maryland, USA.
- A paper on Genesis of arsenic –rich ground water and alternative safe aquifers in the gangatic Plain by Dr. D.Saha ,R.R.Shukla was published in Water Environment Research.
- A paper on determining the recharging capacity of an injection well in semi- confined aquifer by S.N. Dwivedi, R. R. Shukla, Rakesh Singh, S. K. Adhikari, K. A. Nambi, S. S. Purty and G. K. Roy was published in Current Science.
- A paper on Inter-aquifer water transfer through combination well for artificial recharging of the deeper aquifer system in Patna urban area by S.N.Dwivedi & R/K.Singh was published in Current Science.
- A paper on assessment of water quality of lakes for drinking and irrigation purpose in Raipur city, CG, India by Sh.M.M.Sonkusare was published in International Journal Eng. of research application ISSN 2248-9622, vol 5.
- A paper on Variation & Evaluation of Ground Water Levels & Quality in Kandi and Sirowal Belts of Jammu District, J&K, India by Priya Kanwar, Nelofar Khan & Kanwar was published in International Journal of Scientific Research. ISSN No. 2277-8179. Journal DOI.
- A technical Paper on Groundwater Exploration and Drilling Problems Encountered in Basaltic Terrain of Nanded District, Maharashtra by Dr. Pandith Madhnure, Sc-D was published in National Journal- Geological Society of India Vol. 84, pp. 341-351.
- A paper on Groundwater Management Studies in Overexploited Watersheds of Purna River Sub-Basin Buldhana District, Maharashtra by Dr. Pandith Madhnure, Sc-D was published in National Journal- Gondwana Geological Magazine, Vol. 27(2), December, 2012, pp. 223-228).
- A paper on Regional appraisal of fluoride occurrence in ground water of Andhra Pradesh by Dr.P.N.Rao, Sc-D, et.al was published in National Journal- Geological Society of India, Vol 84, Oct 2014 PP 483-493 .
- A technical paper on Establishing Strategies for Sustainable Ground Water Management Plan for Typical Granitic Aquifer – A Pilot Study near Hyderabad, India by Dr. Pandith Madhnure, Sc-D et.al was published in International Journal - Aquatic Procedia of Elsevier, published on 17/03/2015, Vol-4, pp. 1307 -1314.
- A technical paper on Regional Appraisal of Fluoride Occurrence in ground waters of Andhra Pradesh by P.N.Rao, A.D.Rao, J.S.Bhargav, K.Sivasankar and G.Sudarshan was published in International Journal of Geological Society of India, Vol.84, October 2014,pp 483-493.
- A paper on Occurrence of Ground water in Hard rocks under distinct hydrogeological setup by Sivaramakrishnan.J, Asokan.A, Sooryanarayana K.R, Hegde S.S and Benjamin .J. was published in Elsevier - Aquatic Procedia Journal, March 2015.
- An article on National workshop organized by Central Ground Water Board, South Western Region, Bangalore on “Water Conservation-Retrospect & Prospects” was published in Journal of Geological Society of India Volume No.83 of May 2014.

- Technical paper was published in Elsevier Journal. , Aquatic Procedia Journal. The paper was submitted for in the International Conference on “Water Resources, Coastal and Ocean engineering” organized by NITK, Suratkal from 12-14<sup>th</sup> March 2015 at Suratkal, Karnataka.
- Hydro-environmental assessment of a regional ground water aquifer: HiraKud command area (India)(2014): A.Dhar, S.Sahoo, U.Mandal, S.Dey N.Bishi & A.Kar. Env.earth. Sci, Springer-verlag. Berlin Heidelberg, Sept.,2014.
- Springs, a Supplementary Source of Water Supply: A Study from Raigarh District, Chhattisgarh, Peninsular India by A Mukherjee, R K Ray And D Tewari, Central Ground Water Board, NH-IV, Faridabad, 121001-Haryana&Central Ground Water Board, Chandigarh In- International Journal on Earth Sciences and Engineering Volume 07, No. 02(April,2014)
- Aquifer based water security of cities of Eastern India by Arunangshu Mukherjee & Sudhanshu Shekhar International Journal of Engineering Development and Research ( www.ijedr.org)2014 In- IJEDR Volume 2, Issue 1
- Revisiting the stratigraphy of the Mesoproterozoic Chhattisgarh Supergroup, Bastarcraton, India based on subsurface lithoinformation. By Arunangshu Mukherjee, Ranjan Kumar Ray, Dinesh Tewari, Vijay Kumar Ingle, Bikram Kumar Sahoo and M W Y Khan, J. Earth Syst. Sci. 123, No. 3, April 2014, pp. 617–632
- Petrogenesis of 1000 Ma Felsic Tuffs, Chhattisgarh and Indravati Basins, BastarCraton, India: Geochemical and Hf Isotope Constraints by M. E. Bickford, AbhijitBasu, George D. Kamenov, P. A. Mueller, S. Patranabis-Deb, and A. Mukherjee. In-The Journal of Geology, 2014, volume 122, p. 43–54
- Estimation of Specific Yields of Individual Litho-units in a Terrain with Multiple Litho-units: A Water Balance Approach by Ranjan Kumar Ray, Arunangshu Mukherjee and Rumi Mukherjee, In- Journal Geological Society of India Vol.84, August 2014, pp.221-226

## 19.2. Delivered lectures/presentations

- Sri S.S.Hegde Sc-C of Central Ground Water Board, SWR, Bangalore gave a presentation on “Ground Water Conservation and Management” on 22.4.2014 during Earth Day Celebration in Bangalore organized by Geological Society of India and Ministry of Earth Science, Govt.of India.
- .Sh. P. K.Parchure, Regional Director, CGWB, WR, Jaipur delivered a lecture on" Policy Guidelines for Regulation of Groundwater Development and Management." on 08.5.2014 and Dr. Rakesh Kumar Kushwaha, Sc.-D( Sr. Hg.) delivered lecture on "Criteria for Evaluation of proposal for Groundwater Abstraction for Industries and Infrastructure Projects- A case study of Development of Industrial Area by RIICO" on 9.05.2014 in the Two Days 'Training Programmae for RIICO Engineers' organized by Malviya National Institute of Technology (MNIT), Jaipur at MNIT, Jaipur .
- Sh. S. K. Saigal, Scientist C of CGWB, NWR, Chandigarh on 21.05.2014 delivered lecture on ‘Ground water condition and Conservation’ in Seminar on Water Conservation conducted by District Administration, Moga at Moga.
- Dr. Shailendra Singh, Assistant Hydrogeologist of CGWB, NWR, Chandigarh on 19.05.2014 delivered lecture on ‘Geohydrological & Ground Water characteristics of Watershed and Techniques of Rain Water Harvesting / recharging, at Haryana Institute of Rural Development, Nilokheri, Karnal.
- Presentation on Policies and Procedures adopted under NABL Accreditation by Smt. Balinder P. Singh, Scientist C (Chemist) and Smt. Roop Rekha on 13.05.2014 at Bhujal Bhawan, Chandigarh to all the officers of CGWB, NWR, Chandigarh.
- Dr. Shailendra Singh, Assistant Hydrogeologist of CGWB, NWR, Chandigarh on 02.06.2014 delivered lecture on ‘Geohydrological & Ground water characteristics of Watershed and Techniques of RWH/ recharging, at Haryana Institute of Rural Development, Nilokheri, Karnal.
- Sh.V.Kunhambu, Suptdg. Hydrogeologist , Central Ground Water Board, Kerala Region, Trivendrum delivered a lecture on “Water Conservation Practices” at IMG, Trivandrum on 5.07.2013.
- Dr. S. K. Jain, Regional Director of CGWB, NWR, Chandigarh on 02/07/14 delivered presentation to the officers of NWR, Chandigarh regarding Procurement, Tendering & Contracting with Public Fund.
- Sri G.Sudarshan Regional Director, Central Ground Water Board, South Western Region, Bangalore delivered a guest lecture on “ Ground Water Management” at Administrative Training Centre, Mysore on 17.7. 2014.
- Shri B. Mohapatra Scientist-C, Central Ground Water Board, Wes Central Region, Ahmedabad made presentation on Activities of CGWB, WCR, Ahmedabad on 24<sup>th</sup> July 2014 in connection with Potential Linked Credit Plan 2014-15 of NABARD held at NABARD, Ahmedabad.
- Dr. K. Ravichandran, Scientist`C` , CGWB, SECR, Chennai delivered a lecture on “Groundwater Quality” during the



- Overseas Training Program organised by National Institute of Technical Teachers Training & Research (NITTTR) on 21.08.2014 and also participated as Chief Guest in the National Level Technical Symposium organised by Sairam Engineering College, Chennai on 22.08.2014.
- Shri P.K.Parchure, Regional Director, CGWB, WR, Jaipur made a presentation in Geo club in GSI,WR,Jaipur on the NAQUIM programme being implemented in Rajasthan State by CGWB on 12.08.2014.
  - Sh. G. P. Singh, Scientist 'C' of CGWB, NWR, Chandigarh delivered lecture on Ground Water and Rain Water Harvesting at BBMB on 17<sup>th</sup> September, 2014.
  - Dr. D. Gnanasundar, Scientist-C, Dr. K. Ravichandran, Scientist-C & Dr. M. Senthil Kumar, Scientist-C of CGWB, SECR, Chennai delivered lectures to Post Graduate and Research Students of Applied Geology, University of Madras on the topics of Hydrogeology and Water Quality Analysis on 01.09.2014 and 02.09.2014.
  - Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai delivered a lecture on "Water Security and water Conservation Measures for Urban and Rural areas" during the Training on "Water Security, Sustainability and Geospatial Technology" conducted by Tamil Nadu Water Supply and Drainage Board from 27.10.14 to 29.10.14 .
  - Shri P.K.Parchure, Regional Director, CGWB, WR, Jaipur delivered a lecture titled" Ground water basics and ground water hydraulics" for the students of UG/PG/PhD in Civil Engineering Department at MNIT,Jaipur on 17.10.2014.
  - Dr. Arijit Dey, Scientist-D, CGWB, WR, Jaipur delivered a lecture titled" Planning , design, construction and development of water wells" for the students of UG/PG/PhD in Civil Engineering Department at MNIT,Jaipur on 20.10.2014.
  - Dr.R.K.Kushwaha, Scientist-C, CGWB, WR, Jaipur delivered a lecture titled" Determination of aquifer parameters: Pumping test analysis" for the students of UG/PG/PhD in Civil Engineering Department at MNIT,Jaipur on 18.10.2014.
  - Dr. D.V.Lazarus, Scientist, CGWB, WR, Jaipur delivered a lecture titled "Surface investigation of GW using electrical resistivity(geophysical) method" for the students of UG/PG/PhD in Civil Engineering Department at MNIT,Jaipur 18.10.2014.
  - Sri G. Sudarshan, Regional Director, CGWB, SWR, Bangalore delivered a lecture on "Ground water Exploration" in the Special three days lecture series programme for PG students of Department of Studies in Earth Science, Mysore University, Mysore on 29.10.2014.
  - Sri S.S Hegde Sc-C, CGWB, SWR, Bangalore delivered lecture on " Efficient Water Management: Achieving sustainable solutions for water scarcity" at the workshop on " Sustainable solutions for access to safe water, promoting innovation & Collaboration" organized by TERI at Bangalore on 17.11.2014.
  - Regional Director, CGWB, SWR, Bangalore delivered K.R. Karanth Endowment lecture on "Efficacy of artificial recharge for sustainable development –success stories from hard rock terrain of Andhra Pradesh organized by Geological Society of India, Bangalore on 29.12.2014.
  - Shri. A. Subburaj, Scientist-D, CGWB, SECR, Chennai delivered a lecture on "Ground Water Management in Over Exploited zones of Tamil Nadu: Technological options and Challenges" on 10.12.2014 during the Tamil Nadu Water Week 2014 hosted by Dhan Foundation, Madurai and jointly organised by Tamil Nadu Agricultural University and Anna University, Chennai.
  - Shri Sourabh Gupta, Scientist-D, CGWB, SUO, Pune delivered a lecture "Conjunctive Use of Surface Water and Ground Water" at NWA, Pune on 6<sup>th</sup> January 2015 during the training conducted for Freshly recruited Engineers of NWA/CWC.
  - Shri D. Venkateswaran, Scientist-C, CGWB, CR, Nagpur delivered a lecture on "Introduction to GEC – 1997 Methodology and expectations of CGWB" on 29<sup>th</sup> January 2015 during the training organized by GSDA on Maharashtra Groundwater (Development & Management) Regulation Act-2009 and Ground Water Resource Assessment. The lecture was followed by exercise for watershed on 30<sup>th</sup> January 2015. The training was organized at Maharashtra Environmental Engineering Training & Research Academy MEETRA, Nasik.
  - Four lectures were delivered by Dr. Dipankar Saha, Member(RGI), Sh. Alok Kumar Dube, Regional Director, Sh. A.K. Agrawal, Supdtg. Hydrogeologist and Sh. Ranjan Ray, Sr. Hydrogeologist in the training programme on "Capacity building for newly recruited Assistant Engineers of the State of Haryana" at Kurukshetra organized by National Water Academy. Also three lectures were delivered by sh. B.K. Saahoo, Sr. Hydrogeologist, RGNGWTRI in TOT at Chhattisgarh Academy of Administration, Nimora, Raipur.
  - Smt. Anitha Shyam, Sc C delivered a lecture on "Water Related Issues of Coastal Region, Kerala" in connection with

the mass awareness programme organized by St Michaels college, cherthala in co-ordination with Science & Technology, Govt. of Kerala.

- Regional Director delivered a lecture on “Water Security & Sustainability, Key issues & Challenges” during the World Water day celebrations at Police Training College, Thycad, Trivandrum on 24.03.2015.
- Dr. B. Umapathi , Scientist-C (Sr.Hg) delivered a lecture on RWH Techniques and its implementation in and around Chennai for the trainees of Indo-German Centre for Sustainability (IGCS) Winter School of Indian Institute of Technology, Madras and also made field demonstrations to the students at the artificial recharge sites in Chennai on 11.03.2015.

### 19.3 Participation in Workshop/Seminars/ Conference.

- A paper on Mapping of aquifer- an essential input for ground water management by R.R.Shukla and P.K.Das was published in Abstract Volume of national seminar on Recent Approaches to Water Resources Management, organized by Department of Environment Science & Engineering ,Indian School of Mines , Dhanbad
- One paper was published on “Exigency of Managing Coal Mining in Meghalaya for sustainability of water resources in the area” by Anuradha Bhatia and Sangita.P.Bhattacharjee in the Proceeding of 19th Conference on Hydraulic, Water Resources and Environmental Engineering (HYDRO 2014 INTERNATIONAL) organized by Maulana Azad National Institute of Technology, Bhopal during 18-20th December, 2014.
- Six papers were published in the Proceeding of 4<sup>th</sup> International Conference on “Hydrology and Watershed Management with a focal theme on Ecosystem Resilience – Rural and Urban water Requirement (ICHWAH-2014) held at JNTU, Hyderabad which was organized by Centre for Water Resource, Institute of Science and Technology, Hyderabad from 29<sup>th</sup> October, 2014 to 1<sup>st</sup> November, 2014.
- Shri S. Sahu, Sc-C presented a paper in the third INDIA WATER WEEK 2015 “Water Management for sustainable development” during 13-17 January 2015.
- Dr. S. K. Jain, Regional Director, CGWB, NWR, Chandigarh presented paper on ‘Hydrogeology of Punjab and Usage of Ground Water Prospect Maps in Aquifer Mapping’ on 15/10/14 in the Workshop on ‘Usage of Remote Sensing & GIS Based Ground water Prospect Maps’ organized by Punjab Remote Sensing Centre (PRSC), Ludhiana held at Panjab University, Chandigarh.
- A paper on locating safe shallow aquifers in groundwater arsenic contaminated areas of Middle Ganga Plain, India: A geomorphic and stratigraphic approach. by Sahu S, Dr. Saha D was published in Abstract Volume. India Water Week, Pragati Maidan, New Delhi.
- A paper on Geo-electrical resistivity method as a tool for delineating the patches of arsenic contamination area in the affected areas Bihar in Middle Ganga Plain, India by Adhikari S K, Sahu S, Raghavendra P was published in proceeding of workshop organized by CGWB, Ministry of Water Resources, RD & GR, Govt. of India on 25th March 2015.
- A paper on Ground water arsenic contamination in Sahibganj district of Jharkhand State and availability of alternate safe aquifers for community drinking supply; a study based on geophysical survey by Adhikari S K, Roy G K, Sahu S, Singh T B N, Shukla R R, Raghavendra P was published in proceeding of workshop organized by CGWB, Ministry of Water Resources, RD & GR, Govt. of India on 25th March 2015.
- A presentation on “Groundwater Scenario of Rajasthan: Challenges for Management was made by Sh.P.K.Parchure, Regional Director of Western Region, Jaipur in the National Conference on “Ecologically Sustainable Development and Limitations of Growth: Future Prospects & Challenges
- Sri H.P.Jayaprakash Sc-C and Smt Rakhi U.R Sc-B of Central Ground Water Board, SWR, Bangalore attended workshop on “ System thinking and adaptive Governance-Context of urban flooding and Water Stress in Bangalore” on 24.4.2014, which was organized by The Energy & Resource Institute(TERI) an NGO at Bangalore.
- Smt Sangita P.Bhattcharjee AHG & Smt Bijimol Jose AHG of Central Ground Water Board, SWR, Bangalore attended one day workshop on “Consultation on Ground water-Sanitation Intersect” organized by ARGHYAM, an NGO at Bangalore on 9.5.2014.
- Dr. P.Nandakumaran, Regional Director and Sh. V.Kunhambu, Suptdg Hg of Central Ground Water Board, Kerala Region, Trivendrum attended the State level workshop on Water Safety Plan for Kerala organized by UNICEF and CWRDM, Kozhikode, Kerala at Trivandrum on 20.06.2014 and participated in the deliberations.

- Sh.V.Kunhambu, Suptdg. Hg of Central Ground Water Board, Kerala Region, Trivendrum attended the one day program organized as a part of World Environment Day 2014 celebrations by Kerala State Council for Science Technology and Environment at Trivandrum on 5.06.2014. The program was inaugurated by Her Excellency Smt.Sheila Diksit, H'ble Governor of Kerala.
- Eight officers/officials from CGWB, SWR and Division XIV attended Hindi workshop organized by Hindi Training Institute at Bangalore on 5.6.2014.
- Dr. S.K.Jain, Regional Director and Sh. S. K. Saigal, Scientist 'C' of CGWB, NWR, Chandigarh attended workshop on 'Development of Manesar Bawal Investment Region (MBIP) in Haryana' held at Panchkula on 12.06.2014.
- Dr K.R.Soorynarayana, Central Ground Water Board, South Western Region, Bangalore participated in one day workshop on "Protection of Water Services" organized by Chickballapur district Press Club and Department of Information and Publicity, Govt.of Karnataka on 26.7.2014 and presented technical talk on "Present scenario of water availability and related issues in Maidan region districts of Karnataka"
- S/Shri. Dr. K. Rajarajan, AHG, N. Ramesh Kumar, AHG and A. Sakthivel, AHG of CGWB, SECR, Chennai participated in the Groundwater Policy Workshop conducted by Anna University on 12<sup>th</sup> July 2014.
- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated in Dissemination Workshop of Experts organised by Sathyabama University at Chennai on 16<sup>th</sup> July 2014 under the DST Project on "Strategy for Increasing per Capita Availability of Water for Gingee Town, Tamil Nadu".
- Sri G.Sudarshan Regional Director, Central Ground Water Board, South Western Region, Bangalore was Guest of Honour for both inaugural and valedictory session of one day National Workshop on "Isotope Application in Water Resources Development and Management" organized by Dept.Of Civil Engineering, Bangalore University., held on 21.8.2014. Dr K.R.Soorynarayana Suptd.Hg , Sri G.R.C.Reddy Sc-D and Dr M.A.Farooqi Sc-C participated in the workshop.
- The Regional Director, Central Ground Water Board, Kerala Region, Trivendrum Offered felicitations at the inaugural function of the State level Hindi Fortnight Celebrations organized by Hindi Prachar Sabha at Trivandrum on 16.09.2014. The Kerala Region also secured the third prize in the State Level Official Language exhibition held as part of Hindi Fortnight Celebrations.
- Dr. P. K. Naik, Suptd. Hydrogeologist of CGWB, NWR, Chandigarh on 19<sup>th</sup> September, 2014 attended round table conference on 'e-Gov Vision-Towards Future Ready Government'.
- Sh. S. K. Saigal, Scientist 'C' of CGWB, NWR, Chandigarh delivered lecture on Ground Water at MGSIPA, Patiala, Punjab for the training batch of newly recruited SDO of PHED, Government of Punjab on 23/09/14.
- Sri H.P.Jayparakash Sc-C, Dr S.S.Vittala AHG and Sri J.Sivaramakrishnana AHG of CGWB, SWR, Bangalore attended one day workshop on 10.9.2014 at Bangalore on "INDIA-WRIS project portal".
- Shri. S.S.Hegde, Scientist 'C' presented a technical topic on 'Ground Water Management' during the Workshop organized by by NIH, Belgaum in co-ordination with Vishveshwaraya Technological University, Belgaum on 25.09.2014.
- Shri P.K.Parchure, Regional Director, Dr.Arijit Dey, Scientist-D, Shri Rana Chatterjee, Scientist-D and Dr.R.K.Kushwaha, Scientist-C, CGWB,WR,Jaipur attended the State Level Workshop "*IWRM: A solution to Water Scarcity Problem in Rajasthan*" at Jaipur on 02.09.2014 at Hotel Clarks Amer, Jaipur organized by Indira Gandhi Panchayati Raj & Gramin Vikas Sansthan (State Institute of Rural Development). Principal participants were District Collectors, Zila Pramukh, Various Stakeholders & Implementing Agencies Representatives"
- Dr.Arijit Dey, Scientist-D CGWB, WR, Jaipur attended and participated in the conference "*2nd India E-Governance Forum*" held on 24.09.2014 at the Hilton Hotel, Jaipur organized by Dun & Bradstreet Services India Pvt. Ltd.
- Two days workshop on 'Usage of Remote Sensing & GIS Based Ground water Prospect Maps' organized by Punjab Remote Sensing Centre (PRSC), Ludhiana in collaboration with NRSC, Hyderabad and Ministry of Drinking Water & Sanitation was held at Panjab University, Chandigarh on 15/10/14 & 16/10/14 and was attended by Dr. Poonam Sharma, Scientist 'D', Sh. Dinesh Tewari, Scientist 'C', Sh. M. L. Angurala, Scientist 'C', Sh. Rakesh Rana, Scientist 'C', Sh. Roopesh G. Krishnan, Scientist 'B' and Anantha Rao, STA(Hg).
- Sh. S. K. Saigal, Scientist 'C', NWR, Chandigarh attended Workshop on 'Combating Desertification, Land Degradation

- & Draught ' held on 19/02/15 under National Environment Awareness Campaign (NEAC) 2014-15 organized by Institute for Spatial Planning & Environment Research, India at Panchkula.
- Smt. B. P. Singh, Scientist 'C', Smt. Roop Rekha, Scientist 'C' and Sh. Rishi Raj, Asst. Chemist attended Video Conference on 'Fluoride Toxicity in Water & management of Fluorosis in India' on 20/02/15 organized by Centre for Innovations in Public System (CIPS), Hyderabad held at NIC, Chandigarh.
  - Video Conference on Fluoride Toxicity in Water and Management of Fluorosis in India organized by Centre for Innovations in Public Systems held at Trivandrum on 20<sup>th</sup> February 2015. The conference was attended by Shri. N. Vinaychandran, Sc C and Smt. V.N. Sreelatha, Sc C (Chemist).
  - Dr.P. K. Naik, Superintending Hydrogeologist, NWR, Chandigarh attended State Credit Seminar 2015-16 for Punjab State chaired by Sh. Sarvesh Kaushal, Chief Secretary, Government of Punjab organized by NABARD at Chandigarh on 30/01/15.
  - One day workshop on "Water management for Sustainable Development" under the Hamara Jal Hamara Jeevan programme of MoWR,RD&GR, Govt. of India was conducted in 17 districts of Tamil Nadu and UT of Puducherry. For the remaining districts , the matter is being pursued by SECR with district authorities to conduct the one-day workshop.
  - Regional Director, CGWB, SR, Hyderabad participated in the video conference on "Fluoride Toxicity in Water and Management of Fluoride in India" held at Hyderabad on 20.02.2015 organized by CIMP.
  - Regional Director, CGWB, SR, Hyderabad attended a Workshop on "Heliborne geophysical investigation-Multi disciplinary applications" on 27.02.2015 at NGRI, Hyderabad.
  - S/Sh. D. Subba Rao, Regional Director, Dr. P. K. Jain, Suptdg. Hg. and Rahul R. Shende, AHG attended the workshop on 17<sup>th</sup> March 2015 at Nagpur. The workshop was final workshop for finalization of the City Development Plan of Nagpur city. The data on water level, water quality and ground water resources of the area was provided by CGWB. The workshop was inaugurated by Hon'ble Mayor Shri Pravin Datke and Shri Shravan Hardikar, Municipal Commissioner, NMC, Nagpur. During the workshop Shri D. Subba Rao and Dr. P.K. Jain raised the issues regarding the absence of RWH component in the plan.
  - Sh. Amlanjyoti Kar, Supdtg. Hydrogeologist, CGWB, Bhujal Bhawan, Faridabad has attended workshop on " Incidence of High Arsenic in ground water in West Bengal and its remedial measures " on 24.03.2015 organized by CGWB, ER, Kolkata held at salt lake city Kolkata and presented a paper on the topic " Contamination of Arsenic in ground water in India with special reference to West Bengal: Remedies .and initiatives of Govt. of India". authored by A. Kar, B.C. Joshi, and Rumi Mukharji, CGWB, HQ, Faridabad
  - Sh. P. Narendra, Scientist -C (GP), CGWB, CR, Nagpur attended the National Seminar on Environmental, Geological and Geophysical Aspects of South Eastern Deccan Volcanic Province, organized by SRTM University, Nanded, Maharashtra on 27<sup>th</sup> March 2015. He presented paper entitled "Geophysical Techniques for Ground Water Prospecting in Basaltic Terrain" during the seminar and the same was published in the Seminar Volume.
  - Shri. A. Subburaj, Scientist-D & H.O.O and Shri. V. Elanchelian, Scientist-C participated in the one day seminar on "Sustainable Futures for our cities" at Chennai as part of the multi days event organised by Auroville on 11.03.2015.
  - Shri. A. Subburaj, Scientist-D & H.O.O and Shri. M. Sivakumar, Scientist-C participated in the 17<sup>th</sup> International Hydrological Decade Endowment Lecture organised by Centre for Water resources, Anna University, Chennai during the one day seminar on "Water and Sustainable Development" on 23.03.2015.
  - Sri G.Sudarshan, Regional Director Regional Director, SWR, Bangalore Chaired the technical session and Dr K.R.Sooryanarayana presented a technical paper on " Aquifer Mapping for Ground Water Management" in the National Workshop on " Water and Sustainable Development held at Dayananda Sagar College of Engineering, Bangalore on 26.3.2014. The workshop was organized by Dayananda Sagar College of Engineering in association with DRDO and RD&PR department, Govt.of Karnataka on the occasion of World Water Day.
  - The Regional Director along with Shri Ashok Kumar, Scientist-C, WCR, Ahmedabad attended the State Level Seminar on Preservation of Rivers by reusing Waste Water under National Environment Awareness Campaign 2014-15 at Vadodara on 15/03/2015.
  - Regional Director, CGWB, SR, Hyderabad delivered key note address in a Workshop on "Prospects and

Perspectives of Mineral Resources at Telengana” at Kakatiya University, Warangal on 30.03.2015.

- Sri S.S.Hegde Sc-C delivered keynote address in one day workshop at Karwar on “ Water Management for Sustainable Development” on 10.3.2015 organized under Hamara Jal -Hamara Jeevan as a part of India Water Week-2015.The workshop was organized by District Administration, Uttarakannada. CGWB, SWR coordinated with CWC, Nodal Department in organizing the programme.
- Following three technical papers submitted by Scientists of this region were published in the Seminar volume of National Seminar on “ Mining Environment and Water Development” organized on 22-23<sup>rd</sup> March 2015 at Hulkoti, Gadag, Karnataka by Mining Engineers, Chapter I, Belgaum in association with Karnataka Science College, Dharwad and NIH, Belgaum.
- Water Quality Studies In And Around Salauli Irrigation Project, South Goa District, Goa by Dr K.R.Soorjanarayana, Davithuraj.J, RahulVasista
- IWRM in Mining areas- Policy to Practice by Bijimol Jose, Dr K.R.Soorjanarayana, G.Sudarshan
- Electrical Resistivity Surveys- a reliable scientific tool in ground water exploration by Veena R.Achutha, Sangita P.B , G.Sudarshan & Dr K.R.Soorjanaraya.
- Occurrence of Ground water in Hard rocks under distinct hydrogeological setup by J.Sivaramakrishnan, Asokan.A, Soorjanarayana K.R, Hegde S.S and Benjamin .J. J.Sivaramakrishnan presented the paper in the International Conference.
- Shri Sourabh Gupta, Scientist-D, CGWB, SUO, Pune attended the Water EX Conference organized by Chemtech Foundation during 29th and 30th January 2015 at Bombay Convention Centre & Exhibition Centre, Goregaon (East), Mumbai.
- National Workshop on Ground Water Governance and Regulation on 19<sup>th</sup> August 2014, was organised by .Indian National Committee of International Association of Hydrogeologist, , New Delhi. In which following papers were presented/Published in Abstract Volume:-
  - Aquifer Management for sustainable Irrigation to ensure food security in Eastern India by S.Shekhar, M.K.Garg & A.Mukherjee , CGWB, Faridabad
  - Prioritization of artificial recharge zones using GIS techniques in crystallines of Kolar district, Karnataka, India by Dr.K.R.Soorjanarayana, SWR, Bangalore
  - Irrigation efficiency through Water Conservation by drip irrigation-A case study by G.R.C.Reddy and Dr S.S.Vittala, SWR, Bangalore
  - Significance of Ground water Governance in hilly terrain of Meghalaya by Dr M.A.Farooqi & others SWR, Bangalore
  - *Ground Water Quality Assessment and Management – a case study in Jhunjhunu Urban Agglomerate, Rajasthan*” by Shri D.D.Sharma, Scientist-C, CGWB, WR, Jaipur
  - Two papers by Shri Amlanjyoti Kar, Suptdg HG, HQ, Faridabad on i) Impact of mega earthquake and tsunami of 26th December,2004 on groundwater resources of Andaman and Nicobar islands and its relevance to climatic change and sea level rise.” li) “Formulation of a strategy for conservation of spring water in and around Pasighat, East Siang District, Arunachal Pradesh”
  - An Innovative approach to classify Aquifer: Based on its character and not on Lithology-By Dr A.Mukherjee & Mrs Anita Gupta, CGWB, Faridabad .
  - Adaptive Ground Water Management – A Tool for Ensuring Water Sustainability by D. Chakraborty and K.C. Naik, CGWB, Faridabad.
  - Challenges in Ground Water Development And Governance in Hilly States of North East India by V. Kezo, Anu Radha Bhatia and Biplab Ray, CGWB, Shillong.
  - Challenges for Hydro Geophysics in Hard Rock Aquifer Demarcation – Geophysical Logging is A Better Option by Subhash C. Singh, CGWB, NCR, Bhopal.
  - Challenges for Rural Drinking Water Security in India by Prabir Kumar Naik, Scientist of CGWB, Raipur.
  - Participatory Water Management in Chhattisgarh State, Central India: Selected success stories and a proposed model for country wide replication by Anita Gupta and Rumi Mukharjee, CGWB, Faridabad.
  - Relevance of Ground Water Resource Assessment in Water Management: Indian Context by Prahlad Ram, Rumi Mukharjee and A.K. Madhukar, CGWB, Faridabad.
  - Tweaking cropping patterns and irrigation practices for groundwater management: A study from Central India by Rumi Mukharjee and R. K. Ray, CGWB, Faridabad.

## 20. PROPAGATION AND PROGRESSIVE USE OF HINDI LANGUAGE

- During the 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 14.9.2014 to 28.9.2014. 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, Chennai, Bhubaneswar and Jammu.. 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



Hindi workshop of SWR, Bangalore on 05.06.2014



Celebration of Hindi Week/2014 atNHWR, Jammu

## 21. IMPORTANT MEETINGS

The following important meetings were held during the year 2014-15

### 21.1 Visit of Hon'ble Union Minister of Water Resources, River Development and Ganga Rejuvenation Sushri Uma Bharti:

Hon'ble Union Minister of Water Resources, River Development and Ganga Rejuvenation Sushri Uma Bharti visited Nagpur on 25<sup>th</sup> & 26<sup>th</sup> Oct 2014. Regional Director, CR, Nagpur along with senior officers accompanied the Hon'ble Union Minister during her visit to Nagpur and to appraise the activities of the Board in the State of Maharashtra. During the two days visit to Nagpur Hon'ble Union Minister held a number of meetings with the various Central and State departments. She also visited the Sewerage treatment plant Municipal Corporation located at Bhandewadi, Nagpur. During the visit, Hon'ble Union Minister had stressed on the rejuvenation of river system.

### 21.2 Visit of Additional Secretary, Joint Secretary (MoWR,RD&GR)

- Dr. Amarjit Singh, Additional Secretary, Ministry of Water Resources, River Development & Ganga Rejuvenation, Govt. of India, visited CGWB, Eastern Region Office, Kolkata on 18th November 2014. Additional Secretary, MoWR, RD&GR visited all sections and had meeting with Regional Director and Senior Officers of CGWB.
- Dr Amita Prasad, Joint Secretary(A&GW) visited CGWB, WR, Jaipur office on 28.02.2015 and discussed about main issues with Regional Director and Senior Officers and also inspected Office Building and Chemical Laboratory.
- Dr Amita Prasad, Joint Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation, Govt.of India visited CGWB, SWR, Bangalore on 14.3.2015 for inspection. Regional Director gave a presentation on the progress of Annual Action Plan activities taken up in SWR. Joint Secretary reviewed the progress and visited Regional Chemical Laboratory, SWR and appreciated the laboratory and cleanliness of Bhujal Bhavan, Bangaolre.

### 21.3 Visit of the Chairman, CGWB

- Shri K.B.Biswas, Chairman, CGWB visited Gujarat in connection with Vibrant Gujarat Summit as an invitee during 11-13 January 2015. He visited the exhibition stall of CGWB and other stalls of Ministry of water Resources,

River Development & Ganga Rejuvenation. He also attended the seminar on " Water Security, Climate Change and Sustainable Development" held on 12.01.2015 along with the Regional Director, CGWB, WCR, Ahmedabad and other senior officers of the region.

- Shri K.B.Biswas, Chairman CGWB along with the Regional Director, CGWB, WCR, Ahmedabad attended a meeting with the Director, Physical Research Laboratory, Ahmedabad regarding Coordination with prestigious Central Laboratory for participation in NAQUIM through isotopic analysis of ground water samples..
- Shri K.B.Biswas, Chairman, CGWB, alongwith Deputy Secretary (MoWR,RD&&GR) and Director(Admn.), CGWB visited Hyderabad on 3rd and 4th February, 2015 and inspected the SR office and Division IX offices and had a meeting with the Regional Director, CGWB, SR, Hyderabad and other senior officers of the Region.
- Shri Sushil Gupta, Chairman CGWB visited State Unit and Division-XI offices at Jodhpur on 12<sup>th</sup> June, 2014 to lay the foundation stone of Divisional and Workshop buildings of Central Ground Water Board. He also chaired the function at Jodhpur attended by Regional Director, Executive Engineer and Senior officers of CGWB, Western Region. He reviewed the progress of aquifer mapping activities in the state.
- Sh. Sushil Gupta, Chairman CGWB and Sh. Amlanjyoti Kar Suptdg. Hydrogeologist, CGWB Faridabad attended a meeting convened by MoWR on Work Plan 2014-15 at Ministry of Water Resources on 23<sup>rd</sup> June, 2014.
- Dr. R.C. Jain, Chairman CGWB visited Northern Region, Lucknow along with team of parliamentary standing committee during 29-30<sup>th</sup> October, 2014. Chairman CGWB visited all sections and had meeting with officers of the Region and reviewed the progress of Northern Region, Lucknow .

### 21.4 Visit of the Member, CGWB

- Dr. R.C.Jain, Member(SAM), CGWB visited Southern Region, Hyderabad and had a meeting with Regional Directors of four Regions on 14.04.2014 and reviewed the progress under pilot Aquifer Mapping studies being taken up in collaboration with NGRI, Hyderabad. He also interacted with Officers of Southern Region on 16.04.2014 in a meeting on NAQUIM.
- Dr. K. M. Najeeb, Member (SML) , CGWB, visited NWR, Chandigarh on 17 and 18<sup>th</sup> October, 2014. He inspected the activities of the sections and had meeting with officers of Region. He also unveiled the Certificate of Accreditation of Chemical lab, NWR received from NABL. Member (SML) and Regional Director inspected the site of Artificial

Recharge Project under Central Scheme in Panjab University, Chandigarh. Member (SML) and Regional Director also held a meeting with Er. P. S. Bhogal, Director, Water Resources & Environment Directorate, Punjab during 17.10.2014 to 18.10.2014 regarding Artificial Recharge Project under Central Scheme at Amritsar and Tarn Taran district and Ground Water Resources Assessment(As on March, 2013).

- Dr. Dipankar Saha, Member (RGI), Dr. S. K. Jain, Regional Director along with officers of Regional office Chandigarh attended a meeting on “Development of fresh water along the Paleo Channels of Saraswati river in Haryana State” held under the Chairmanship of Sh. Om Prakash Dhankkar, Hon’ble Minister of Agriculture, Haryana State.
- The second sub committee of the Parliamentary Committee on Official Language visited Chennai on 13<sup>th</sup> – 14<sup>th</sup> February, 2015. Shri. K.C. Naik, Member (TT&WQ), CGWB, Faridabad, Dr. E. Sampath Kumar, Regional Director, CGWB, SECR and Shri. Sunil Kumar, Director(Admin) along with other senior officers of SECR attended the meeting on 13<sup>th</sup> February, 2015.

### **21.5 Review Meeting of Regional Directors**

- A Review meeting for Regional Directors was held during 25-26<sup>th</sup> July, 2014 at Central Ground Water Board, Faridabad under the Chairmanship of Chairman CGWB. During the Regional Directors meeting the various items like review of progress of Regional offices, issues pertaining to NISC decisions and action regarding formation of State Ground Water Coordination Committee (SGWCC), Nodal Department and prioritization of area for NAQUIM, Implementation of NAQUIM in-house and Outsourcing and Discussion on Annual Action Plan 2014-15, Procurement of equipments for 2014-15, Collaborative study with National and International Agencies, matter pertaining to RGI, Issues pertaining to Artificial Recharge and CGWA, administrative and financial matters has been discussed. Members of CGWB, Director (Admn.), Regional Directors and Senior Officers of the Board have attended the Meeting.
- A Review meeting for Regional Directors was held on 5<sup>th</sup> September, 2014 at Central Ground Water Board, Faridabad under the Chairmanship of Chairperson CGWB. During the Regional Directors meeting the various items like firming up requirement for outsourcing of activities for Aquifer Mapping for 2014-15 and Bundelkhand including cost and time line, review of progress of data compilation and data gap analysis, latest equipments position and its condition, nomination to RGI, progress of data compilation in 12 prescribed formats, issues

regarding Artificial Recharge and Central Ground Water Authority, administrative and financial matters has been discussed. Members of CGWB, Director (Admn.), Regional Directors and Senior Officers of the Board have attended the Meeting.

- A Review meeting for Regional Directors was held on 20<sup>th</sup> and 21<sup>st</sup> December, 2014 at Central Ground Water Board, Faridabad under the Chairmanship of Shri K.B.Biswas, Chairman CGWB. Dr Amarjit Singh, Additional Secretary(WR,RD&GR) and Dr Amita Prasad, JS(A&GW) were present during the inaugural session and interacted with Regional Directors and Executive Engineers. In his address the Additional Secretary(WR,RD&GR) urged for intensive initiative by the officers of the Board to achieve the goals and targets. During Regional Directors meeting the various items Geo-referencing of data obtained from States/UTs, outsourcing work for NAQUIM by State agencies, procurement of Geomorphological maps, timelines for implementation of Aquifer Mapping in Bundelkhand, review of progress of data compilation and data gap analysis, issues related to Regional offices, proposal for outsourcing of data entry work etc. has been discussed. Members of CGWB, Director (Admn.), and Senior Officers of the Board have attended the Meeting.

### **21.6 Second Meeting of National Inter-departmental Steering Committee(NISC)**

Second meeting of National Inter-departmental Steering Committee(NISC) for monitoring the National Project on Aquifer Mapping and Management(NAQUIM) held under the Chairmanship of Secretary of Ministry of Water Resources at MoWR, Shram Shakti Bhawan, New Delhi on 16th May, 2014. The agenda items like Approval of the prioritization of areas for NAQUIM for XII Plan, broad consensus on the approach for implementation of aquifer mapping 2014-15 through a continuation of in house activities of CGWB, Constitution of State Ground Water Coordination Committee (SGWCC), Coordination and participation of State agencies for the purpose of implementing Aquifer Mapping, Review of physical and financial progress and extension of the term of NISC were discussed during the NISC meeting. Additional Secretary(WR), Chairman CGWB, Advisor (RD/WR), Planning Commission, Joint Secretary & Financial Advisor(WR), Commissioner (SP), Member (WP&P), Central Water Commission, Chief Engineer, Central Water Commission, Deputy Advisor (WQ), Ministry of Drinking Water & Sanitation, Scientist-‘F’, Ministry of Earth



Sciences, Director (GW), Director (GW Estt.), Under Secretary (GW), representatives of MoDWS, State representatives, Members of CGWB and Senior Officers of Ministry of Water Resources and Central Ground Water Board have attended the meeting

#### **21.7 Meetings of Project Management Group (PMG)**

During 2014-15, three (Second, Third and Fourth) Meetings of Project Management Group (PMG) were held on 28th July, 2014, 20th September, 2014 and 24th February, 2015 respectively at the Ministry under the Chairmanship of Secretary (MoWR, RD&GR). During Project Management Group (PMG) meeting the various items like Implementation of Aquifer Mapping, Progress of Scheme of ground water management & regulation and Procurement under Technological Up-gradation etc. has been discussed. Senior officers of the Ministry and CGWB, have attended the Meeting.

#### **21.8 Task Force Meeting of Mega Recharge Scheme:**

- The first meeting of Task Force, constituted by MoWR, RD & GR to formulate the proposal for Mega Recharge of Groundwater in Tapi Basin was held on 21st January 2015 at Khadakvasla, Pune. The agenda points discussed during the meeting were comments by GSDA on the feasibility of Mega Recharge in the area, Comments by CWC, NWDA and State Water Resources Department on the availability surplus runoff as source water, requirement and availability of data and Sharing of responsibility by different organizations on various aspects of Mega Recharge Scheme.
- The field visit of the task force was organized in Mega Recharge Area of Jalgaon district on 24/02/2015. During the field visit, Borkheda, Vadri, Mor dam site, Mangrul dam, Suki nala bed, Suki pick up weir were visited. The well inventory of dugwells located in Bazada at Haripura and Vadri was also carried out. Besides this geological traverse across the Bazaada was taken up. The second meeting of Task Force was held on 25/02/2015 at meeting hall of Executive Director, Tapi Irrigation Development Corporation (TIDC), Jalgaon, Maharashtra under the Chairmanship of Director, National Institute of Hydrology, Roorkee. The following agenda items discussed during the meeting were action taken by

various organizations on the minutes and Identification of agency for preparation of feasibility report. The field visit and meeting was attended by Dr. Dipankar Saha, Member (SML), CGWB, New Delhi, Sh. D. Subba Rao, Regional Director, Dr. P.K. Jain, Suptdg. Hg. and Sh. Rahul R. Shende, AHG, CGWB, CR, Nagpur.

#### **21.9 Coordinators Level AQUIM Meeting held at NGRI Hyderabad:**

Member (SAM), CGWB, Faridabad reviewed Pilot Project on Aquifer Mapping during the Co-coordinator Level meeting at NGRI Hyderabad on 15-04-2014. He reviewed the progress of the 6 Pilot Project areas and the issue of CHQ assistance for modeling studies was also discussed. The discussions during the meeting centered around submission of the final report by NGRI including the heliborne geophysical findings and payments to be made to NGRI prior to the completion of the project.

#### **21.10 Meeting of the committee to discuss and formulate the guidelines and methodology in cases for remediation/reinstitution of the contaminated sites**

The first meeting of the committee to discuss and formulate the guidelines and methodology in cases for remediation/reinstitution of the contaminated sites was held on 6<sup>th</sup> June 2014 at MPCB, Mumbai as a follow up of the Action Plan suggested by CGWB in Pollution cases referred by Hon'ble NGT, Pune. The committee was chaired by Shri P.K. Mirashe, Asst. Secretary (Technical), MPCB, Mumbai. Shri D. Subbarao, Regional Director, CGWB, CR, Nagpur, attended the meeting. During the meeting action plan submitted by CGWB to tackle industrial pollution in Waluj, Aurangabad based CGWB study and Jubilant Industries, Nira-Nibut, Baramati taluka, Pune district based on NEERI and MPCB reports were discussed. It was informed that CGWB has given the action plan as per the directions of the Hon'ble NGT. The actual implementation of the action plan involves many aspects and one of the aspects suggested by CGWB was aquifer remediation which is to be done by Industry/MPCB through consultants/experts/group of experts. During the meeting it was suggested by Dr. Rakesh Kumar, Head & Chief Scientist, NEERI, Mumbai that the task can be

outsourced/entrusted to IIT, Bombay on pilot project basis, the same was approved by committee. The pollution reports prepared by CGWB on 8 CPCB identified pollution clusters were also discussed and Member Secretary appreciated the reports but indicated that the future course of action should also be suggested by CGWB.

#### 21.11 Other Important Meetings

- A meeting was convened on 4th July 2014 at Directorate, Groundwater Surveys and Development Agency, Pune, to study and approve the technical design of groundwater recharge measure “Aquifer Recharge Shaft System (ARSS)” devised by GSDA. CGWB was approached to give technical approval to the designs of artificial recharge structures proposed by GSDA to be taken up under ARSS. During the meeting, presentation on Artificial recharge structures similar to those proposed in ARSS was MADE. Shri D. Joshi, Scientist-C, CGWB, Nagpur also presented the work of Recharge Shaft implemented by CGWB in Kshipra watershed Ujjain, Madhya Pradesh. Dr. P.K. Jain, Superintending Hydrogeologist proposed certain site selection criteria's. It was decided that detailed guidelines shall be coined jointly by GSDA and CGWB.
- A meeting was held with Maharashtra State Remote Sensing Agency Centre (MRSAC), Nagpur on 28/04/2014 at MRSAC, Nagpur for procurement of thematic layers for NAQUIM areas. It was also decided to explore the possibility of MoU between MRSAC and CGWB for preparation of georeferenced layer of AR/WC structures in NAQUIM areas. The meeting was attended by S/Shri S.N. Das, Director, D.M. Kolte, Sr. Resource Scientist, MRSAC, Nagpur and Dr. P.K. Jain, Superintending Hydrogeologist, CGWB,CR, Nagpur.
- The First Meeting of the State Level Committee (SLC) for Ground Water Resource Estimation as on March 2013 was held under the Chairmanship of Shri Rajesh Kumar, Principal Secretary to Govt. of Maharashtra, Water Supply and Sanitation Department (WSSD), Mumbai on 5<sup>th</sup> August 2014. The meeting was held for working out the modalities and to initiate the

resource assessment as also regarding the requirement of data from various State Agencies and to finalise timelines for submission of the draft report. A presentation was made by CGWB on data requirement from State Govt. agencies.

- The First Meeting of the State Level Committee (SLC) for Ground Water Resource Estimation as on March 2013 was held under the Chairmanship of Shri G.S. Meena, IAS, Collector UT of DNH, at Silvassa on 27<sup>th</sup> September 2014. The meeting was held for working out the modalities, initiate the resource assessment, data requirement from various State Agencies and to finalize timelines for submission of the draft report.
- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated in the 77<sup>th</sup> meeting of Tamil Nadu State Coastal Zone Management Authority on 05.05.2014 convened by the Director of Environment at Secretariat, Chennai.
- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai, participated in the 7<sup>th</sup> State Level Nodal Agency (SLNA) meeting organised by Tamil Nadu Water Shed Development Agency on 15.05.2014 at Chennai.
- Shri. V. Kunhambu, Suptg. Hydrogeologist, CGWB, Kerala Region, Trivendrum attended the 20<sup>th</sup> meeting of the State Level Scheme Sanctioning Committee (NRDWP) under Rajiv Gandhi National Drinking Water Mission organized by Kerala Water Authority on 14.05.2014 at Trivandrum.
- Sri N.Vinayachandran, Sc-C & Nodal Officer of Central Ground Water Board, Kerala Region, Trivendrum attended the DLEC meeting on 10.06.2014 at the District Collectorate, Ernakulam for granting permission to proposals of 4 Packaged Drinking Water Units.
- Regional Director of Central Ground Water Board, Southern Region Hyderabad met Smt. C. Survarna, I.F.S., Special Commissioner (Watersheds), Rural Development Department, Government of Andhra Pradesh, Hyderabad on 23.06.2014 regarding Training Programme on “Increasing Water Use Efficiency in Water Sector under National Water Mission” on 23.06.2014 at Hyderabad.
- Regional Director of Central Ground Water Board, Southern Region Hyderabad met the Superintending Engineer, I&CAD, Govt. of Telanagana State on

23.06.2014 and reviewed the status of completion of ongoing Artificial Recharge Projects in Medak District under Central Sector Scheme. He advised to make all out efforts for completing the same at the earliest,

- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated as a Member in the State Level Scheme Sanctioning Committee Meeting on 17.06.2014 to clear the proposal under NRDWP convened by Managing Director, Tamil Nadu Water Supply and Drainage Board at Chennai on 17.06.2014.
- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated as a Member in the first meeting of the State Level Working Committee for conduct of 5<sup>th</sup> Minor Irrigation Census in Tamil Nadu convened by the Minor Irrigation Census Commissioner and Additional Chief Secretary & Commissioner of Land Administration at Chennai on 18.06.2014.
- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated as a Member in the first meeting of the State Technical Advisory Committee for scrutinizing and clearance for project proposals under Repair, Renovation and Restoration of Water Bodies with domestic support. The meeting was held on 25.06.2014 at public works department(WRO), Chennai.
- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated as a special invitee in the member of Review Committee for examination and suggestion on the preliminary report and interim report of the Consultancy Study on Audit of Rainwater Harvesting System implementation in Chennai Metropolitan Area. The meeting was held by Chennai Metropolitan Development Authority at Chennai on 2.06.2014.
- Sri G. Sudarshan Regional Director, Central Ground Water Board, South Western Region, Bangalore Chaired 19<sup>th</sup> STA meeting for clearance of Rural water supply schemes of RDPR, Govt. of Karnataka convened on 4.6.2014. Dr K.R. Sooryanarayana Suptd. Hg & TS to Regional Director accompanied Regional Director.
- Sri G. Sudarshan Regional Director and Dr K.R. Sooryanarayana Suptd. Hg & TS to Regional Director of Central Ground Water Board, South Western Region, Bangalore attended SLSSC meeting convened by RDPR on 16.6.2014 for approving the Rural Water Supply schemes which are technically cleared by STA.
- Regional Director and Shri Tarun Mishra, Asstt. Hydrogeologist,, Central Ground Water Board, Eastern Region, Kolkata attended CLA Meeting on 17.06.2014 convened by the Commissioner, Kolkata Municipal Corporation, Kolkata for clearance of 109 permits for construction of tube wells.
- 23rd SLSSC meeting held on 25.06.2014 at New Secretariat Building, Kolkata convened by Shri Saurabh Das, Principal Secretary, PHED by Dr. S.K. Samanta, Suptdg. Hydrogeologist, CGWB, ER for clearance of 60 PWSS in West Bengal.
- Meeting convened by the Engineer in Chief, PHED, Govt. of West Bengal, Kolkata attended by Shri G.C.Pati, Regional Director & Dr. S.K. Samanta, Suptdg. HG, CGWB, ER on 15.07.2014. Discussion was held for preparation of action plan for Artificial Recharge Study in West Bengal.
- Dr. S. K. Jain, Regional Director of CGWB, NWR, Chandigarh attended 35<sup>th</sup> Meeting of Central Ground Water Authority held on 24<sup>th</sup> July, 2014 at Jamnagar House, New Delhi, as a special invitee.
- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated as a member in the 11<sup>th</sup> meeting of Executive Committee of Centre for Research, Anna University at Chennai on 03.07.2014.
- Dr. S. Subramanian, Scientist`C`, CGWB, SECR, Chennai participated in the meeting of State Level Technical Advisory Committee for scrutinising and giving clearance for project proposals under Repair, Renovation and Restoration of Water Bodies with domestic support. The meeting was held on 04.07.2014 at Public Works Department (WRO), Chennai.
- Dr. E. Sampath Kumar, Regional Director and Dr. B. Umapathi, Scientist`C`, CGWB, SECR, Chennai participated in the Town Official Language Implementation Committee (TOLIC) meeting at Chennai on 07.07.2014.
- Dr. S. Subramanian, Scientist`C`, CGWB, SECR, Chennai participated in the 78<sup>th</sup> meeting of Tamil Nadu Coastal Zone Management Authority at Secretariat, Chennai on 21.07.2014.
- Sri G. Sudarshan Regional Director and Dr K.R. Sooryanarayana Suptd. HG, Central Ground Water Board, South Western Region, Bangalore had a meeting with Secretary (M.I), Govt. of Karnataka on 11.7.2014 regarding NISC to deliberate on Aquifer mapping and SGWCC issues.
- Dr. O.N. Tiwari, Superintending Hydrologist` Central Ground Water Board, North Central Chhattisgarh Region, Raipur has attended the State Level Scheme

- Sectioning Committee (SLSSC) meeting on 30.06.2014 at Mahanadi Bhawan, Mantralaya, New Raipur.
- The Regional Director, Central Ground Water Board, West Central Region, Ahmedabad as a member of the interview committee attended the interview for the recruitment of Geologist in Water and Sanitation Management Organization (WASMO), held at Gujarat Jalseva Training Institute, Gandhinagar on 19/07/2014.
  - Sh.P.Kalita, Sci-D of Central Ground Water Board, NER, Guwahati attended the 2nd meeting of Assam State Ground Water Authority at Guwahati on 5th July 2014.
  - Sh. Anurag Khanna, Senior Hydrogeologist & Head of Office and Sh. Ravikalyan Bussa, Scientist-C, Central Ground Water Board, Uttarakhand Region, Dehradun attended State Level Scheme Sanctioning Committee (SLSSC) for sanctioning of various state proposals at Secretariat, Government of Uttarakhand, Dehradun.
  - Sh.V.Kunhambu, Suptdg. Hydrogeologist of CGWB, Kerala Region, Tribvendrum attended 1<sup>0th</sup> State level steering Committee Meeting on Hydrology project organized by the Chief Engineer, Irrigation Department Kerala State in the chamber of the Additional Chief Secretary, Water Resources Department, Government of Kerala at Trivandrum on 22/7/2014.
  - Dr.P.Nandakumaran, Regional Director of CGWB, Kerala Region, Tribvendrum attended the meeting organized by the Deputy Director, State Planning Board on 23.07.2014 about the "Drinking Water and Related issues in the State at Trivandrum on 23.07.2014 and delivered a lecture on the "Sustainability of Ground Water."
  - The Regional Director, CGWB, WCR, Ahmedabad as a member of the interview committee attended the interview for the recruitment of Geologist in Water and Sanitation Management Organization (WASMO), held at Gujarat Jalseva Training Institute, Gandhinagar on 19/07/2014.
  - The 51<sup>st</sup> Meeting of the State Geological Programming Board Meeting was held at Trivandrum on 20.09.2014. The meeting was attended by The Regional Director alongwith Sh.V.Kunhambu, Superintending Hydrogeologist, Central Ground Water Board, Kerala Region, Trivendrum .
  - Dr. P. K. Naik, Suptd. Hydrogeologist and Smt. Roop Rekha, Scientist 'C' of NWR, Chandigarh attended a meeting regarding Water Quality Issues on the New Water Quality Project under World Bank held on 10/09/14 at Department of Water Supply and Sanitation, Mohali, Punjab.
  - Dr. P. K. Naik, Suptd. Hydrogeologist of CGWB, NWR, Chandigarh on 24<sup>th</sup> September, 2014 attended meeting of State Level Scheme Sanctioning Committee (SLSSC) held under the Chairmanship of Principal Secretary to Government of Punjab, Department of Water Supply & Sanitation.
  - Sh. R. S. Chatterjee, Sr. Scientist, Geosciences & Geohazards Dept. Indian Institute of Remote Sensing (Indian Space Research Organization), Dehradun and his team of Officers visited the office of CGWB, NWR, Chandigarh on 25<sup>th</sup> - 26<sup>th</sup> September, 2014 for field investigation for site selection. for the IIRS-CGWB collaborative project on "Mapping, Modeling and Impact Assessment of Land Subsidence in Northern India".
  - Dr. M. Senthil Kumar, Scientist-C , CGWB, SECR, Chennai participated in the first meeting of the Expert Committee of the R&D proposal on "Assessment of Aquifer System of Tamiraparani River Basin, Tamil Nadu for achieving Drinking Water Security through Groundwater Modeling and 3D characterisation of aquifer" on 17.09.2014 convened by Managing Director, Tamil Nadu Water Supply and Drainage Board, Chennai.
  - Sh.V.Kunhambu, Superintending Hydrogeologist, CGWB, Kerala Region, Trivendrum attended the District Level Evaluation Committee meeting held at Collectorate, Trichur on 9.10.2014 as Nodal officer, CGWB for evaluation of proposal for three packaged mineral drinking water industries in the district.
  - Dr. Nandakumaran.P, Regional Director, CGWB, Kerala Region, Trivendrum, attended the Scientist Interface Meet 2014, organised by KSCSTE at Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram. for evaluation of scientific work undertaken by the scientist working in the institutes under the Kerala State Council for Science, Technology and Environment as panel member on 17.10.2014 .
  - Dr. Nandakumaran.P, Regional Director, CGWB, Kerala Region, Trivendrum attended the first meeting of the State Level Steering Committee for 5<sup>th</sup> Minor Irrigation Census convened by the Additional Chief Secretary, Govt of Kerala & Chairman of the committee at Thiruvananthapuram on 24.10.2014.
  - Dr. S. K. Jain, Regional Director, CGWB, NWR, Chandigarh on 14/10/14 had a meeting with Ex. Vice President of BAIF Development Research Foundation and representatives from Hindustan Unilever

Foundation regarding a program on ground water recharging using injection Bore wells conceptualized by BAIF in collaboration with Hindustan Unilever Foundation.

- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated in the third meeting of Review Committee for "Audit of Rain Water harvesting System in Chennai Metropolitan Area" convened by Chennai Metropolitan Authority, Chennai on 07.10.2014.
- Dr. E. Sampath Kumar, Regional Director, CGWB, SECR, Chennai participated in the 80<sup>th</sup> meeting of Tamil Nadu Coastal Zone Management Authority at Secretariat, Chennai on 27.10.2014.
- Sh. D. Subba Rao, Regional Director, Dr. P. K. Jain, Suptd Hg and Sh. Rahul Shende, AHG, CGWB, Central Region, Nagpur attended meeting on 28.11.2014 with Director, GSDA, Pune on "Aquifer Recharge Shaft System (ARSS)" a groundwater recharge measure devised by GSDA, Pune.
- Sh.V.Kunhambu, Superintending Hydrogeologist CGWB, Kerala Region, Trivendrum attended the second meeting of the-Expert Committee constituted by the District Collector, Kasargod to assess the functioning of disputed Chooripara- Pondi Packaged Drinking Water Unit- at kinnanur-karinthalam Gramapanchayath, Kasargod district on 01.11.2014 and participated in the joint field inspection of the site.
- Regional Director, Central Ground Water Board, Southern Region, Hyderabad attended SLSSC Meeting on 6<sup>th</sup> and 7<sup>th</sup> November, 2014 at Secretariat for approval of Drinking Water Schemes in respect of Andhra Pradesh and Telengana States.
- Scientist C, SUO, Shillong attended the meeting of State Geological Programming Board and Central Geological Programming Board at Shillong, Meghalaya on 27.11.2014 and 21.11.2014 respectively.
- First State Level Meeting was organized under the Chairmanship of Shri D. Kadmeil, I.A.S. and Secretary, I&CAD, Govt. of Andhra Pradesh, Hyderabad on 12.12.2014 for Estimation of Ground Water Resources as on 2013-14 in the office of Commissioner, CADA, Govt. of Andhra Pradesh, Hyderabad. Members/ Representatives of the committee, officers from CGWB and GWD attended the meeting.
- First State Level Meeting was organized under the Chairmanship of Dr. S.K. Joshi, I.A.S, Principal Secretary, CAD, Govt. of Telengana, Hyderabad on

16.12.2014 for Estimation of Ground Water Resources as on 2013-14 in the Telengana Secretariat, Hyderabad. Members/ Representatives of the committee, officers from CGWB and GWD attended the meeting.

- A Special meeting of the Core Committee on Water Quality, Safety & Security, under Joint Plan of Action, Phase-IV, was attended by Dr. S.K.Samanta, Suptdg. Hydrogeologist, on 19th December, 2014, at Kolkata. Prof. Arup K. Sengupta, Dept. of Civil, Environmental and Chemical Engineering of Lehigh University, U.S.A and his team have presented on the HIX-Nanotechnology - remediation of fluoride from ground water in West Bengal.
- SWR, Bangalore convened the 1st State Ground Water Coordination Committee meeting (SGWCC) of NAQUIM on 5.12.14 at Bangalore. Sri G. Sudarshana, Regional Director as Member Secretary of SGWCC presented an overview and objectives of NAQUIM. In house activities of NAQUIM and pilot project studies carried out in Tumkur district were presented. It was decided during the meeting that Groundwater Directorate, Govt. of Karnataka is the Nodal department and a nodal officer was nominated from the said department. All the departments have been requested to share the data useful for NAQUIM.
- Regional Director and Shri I.K.Sharma, Scientist-D, CGWB, WR, Jaipur attended and participated in the meeting regarding the discussions on modalities of preparations of Detailed Project Report for "*The study of revival of Saraswati River palaeo channel in Rajasthan*" convened by Ms. Kiran Maheshwari, Hon'ble Minister of PHED and GWD, Govt. of Rajasthan on 02.12.2014. Officials from PHED & GWD, Govt. of Rajasthan, Regional Remote Sensing Centre(RRSC),Govt. of India, Jodhpur and a NGO named Saraswati Sodh Sansthan, Jodhpur, participated in the said meeting.
- Scientist-D, CGWB, WR, Jaipur attended and participated in the meeting regarding the discussions on modalities of preparations of Detailed Project Report for "*The study of revival of Saraswati River palaeo channel in Rajasthan*" convened by the Chief Engineer, GWD,Govt. of Rajasthan at Jaipur on 19.12.2014.
- Dr. E. Sampath Kumar, Regional Director, SECR, Chennai participated in the 57<sup>th</sup> State Geological Programming Board Meeting at the Department of Geology and Mining, Chennai on 23.01.2015.
- The HOO, CGWB, ER , Kolkata attended meeting of Kolkata Corporation Level Groundwater Resources

Development Authority held on 25.02.2015 at KMC. Discussion was held regarding issuance of Permit for installation of New Tube Well in KMC.

- The HOO, CGWB, ER, Kolkata attended 26<sup>th</sup> SLSSC meeting convened by PHED, Govt. of West Bengal on 27.02.2015 for clearance of ground water sources for drinking water supply.
- Dr. S. K. Jain, Regional Director, NWR, Chandigarh had a meeting on 'Review of some parameters of methodology of Dynamic Ground water Resources' at Bhujal Bhawan on 12/02/15 with the Officers of Water Resources & Environment Directorate, Punjab and Department of Agriculture, Punjab. S/Sh. R. K. Bhandari, Atul Sood of WRE&D; Rajesh Vasishtha and Sh. N. K. Pandit of Agriculture Department along with Senior officers of CGWB of NWR, Chandigarh were present in the meeting.
- Dr. Poonam Sharma, Scientist 'D' CGWB, NWR, Chandigarh represented CGWB, NWR in Study Visit of the Parliamentary Standing Committee on Science & Technology, Environment and Forest to Ludhiana and Amritsar districts of Punjab state, from 13<sup>th</sup> to 15<sup>th</sup> February, 2015.
- Dr. Poonam Sharma, Scientist 'D', CGWB, NWR, Chandigarh attended a meeting to carry out a

comprehensive study including study with emphasis on quality of the water in the water logged areas in Punjab State held on 23/02/15 under the Chairmanship of Director, Dept. of Agriculture, Punjab at Mohali.

- Sri G.Sudarshan, Regional Director, SWR, Bangalore Chaired the STA meeting on 6<sup>th</sup> and 7<sup>th</sup> of March 2015 organized by Rural Water Supply and Sanitation Department, Government of Karnataka for clearance of multivillage water supply schemes. Dr K.R. Sooryanarayana Superintending Hydrogeologist has also accompanied the Regional Director.
- The First Meeting of the Working Group for Ground Water Resource Estimation of Maharashtra as on March 2013 was held under the Chairmanship of Mr. Rupinder Singh, IAS, Director, GSDA, Pune, on 9th March 2015. The meeting was called to review the status of Ground Water Resource Estimation (GWRE) of Maharashtra as on March 2013 and to expedite the progress so as to complete the draft report by March 2015. The meeting was attended by D. Venkateswaran, Sc-C and he reiterated that this being the time bound programme, all the districts may be advised to complete the assessment by March 2015.

## 22. VIGILANCE ACTIVITIES

During the year 2014-15, 20 complaints cases were brought forward w.e.f 1.4.2014 and 26 new complaint cases were received during the year 2014-15. Out of these 46 complaints, 17 were closed and 4 complaints cases were taken up as disciplinary proceedings. Therefore, 26 complaint cases were carried forward w.e.f 1.4.2015.

### DISCIPLINARY PROCEEDINGS

12 cases of disciplinary proceeding were brought forward w.e.f 1.4.2015 and 3 cases of disciplinary proceeding were received during the year 2014-15 and and 1 case was disposed off. Thus total 14 cases of disciplinary proceeding were carried forward w.e.f 1.4.2015.

## 23. RTI INFORMATION

The opening balance of RTI applications as on 1.04.2014 were 205 and 92 RTI applications were received during the year 2014-15. Out of 297, 92 Number of cases transferred to other Public Authorities. 11 applications have been disposed off.

An amount of Rs 2882/- was received towards application fee. Details are given below in table 23.1

Table 23.1: RTI Information for year 2014-2015

Opening Balance as on 01.04.2014 to 31.03.2015	Received during the year(including cases transferred from other public Authorities)	Number of cases transferred to other public Authorities	Decisions where Requests/Appeals Rejected	Decisions where Requests/Appeals Accepted	Amount of Charges collected in
205	92	100	0	11	Rs. 2,882/-

## 24. PERSONNEL MANAGEMENT

The sanctioned strength, filled up, vacancy position and category-wise personnel deployed in the Board are presented in table 24.1 .

**Table 24.1** Personnel Deployment in Central Ground Water Board during 2014-2015 (Up to 31<sup>st</sup> March, 2015)

<b>GROUP "A"</b>							
<b>Section</b>	<b>Sanctioned</b>	<b>Filled</b>	<b>Vacant</b>	<b>OBC</b>	<b>Handicapped</b>	<b>SC</b>	<b>ST</b>
Scientific	403	313	90	26	0	50	12
Ministrial	8	3	5	0	0	0	0
Engineering	56	42	14	10	0	8	6
<b>Total</b>	<b>467</b>	<b>358</b>	<b>109</b>	<b>36</b>	<b>0</b>	<b>58</b>	<b>18</b>
<b>GROUP "B"(Gazetted)</b>							
<b>Section</b>	<b>Sanctioned</b>	<b>Filled</b>	<b>Vacant</b>	<b>OBC</b>	<b>Handicapped</b>	<b>SC</b>	<b>ST</b>
Scientific	219	120	99	20	1	21	9
Ministrial	36	20	16	0	0	0	2
Engineering	110	37	73	4	0	11	4
<b>Total</b>	<b>365</b>	<b>177</b>	<b>188</b>	<b>24</b>	<b>1</b>	<b>32</b>	<b>15</b>
<b>GROUP "B"(Non-Gazetted)</b>							
<b>Section</b>	<b>Sanctioned</b>	<b>Filled</b>	<b>Vacant</b>	<b>OBC</b>	<b>Handicapped</b>	<b>SC</b>	<b>ST</b>
Scientific	179	100	79	19	0	18	9
Ministrial	203	180	23	5	0	28	12
Engineering	265	148	117	11	1	46	20
<b>Total</b>	<b>647</b>	<b>428</b>	<b>219</b>	<b>35</b>	<b>1</b>	<b>92</b>	<b>41</b>
<b>GROUP "C"</b>							
<b>Section</b>	<b>Sanctioned</b>	<b>Filled</b>	<b>Vacant</b>	<b>OBC</b>	<b>Handicapped</b>	<b>SC</b>	<b>ST</b>
Scientific	83	34	49	2	0	10	04
Ministrial	1136	758	378	45	0	183	76
Engineering	1462	1181	281	169	4	259	103
<b>Total</b>	<b>2681</b>	<b>1973</b>	<b>708</b>	<b>216</b>	<b>4</b>	<b>452</b>	<b>183</b>
<b>GRAND TOTAL</b>							
<b>Groups</b>	<b>Sanctioned</b>	<b>Filled</b>	<b>Vacant</b>	<b>OBC</b>	<b>Handicapped</b>	<b>SC</b>	<b>ST</b>
<b>GROUP "A"</b>	<b>467</b>	<b>358</b>	<b>109</b>	<b>36</b>	<b>0</b>	<b>58</b>	<b>18</b>
<b>GROUP "B"(Gazetted)</b>	<b>365</b>	<b>177</b>	<b>188</b>	<b>24</b>	<b>1</b>	<b>32</b>	<b>15</b>
<b>GROUP "B"(Non-Gazetted)</b>	<b>647</b>	<b>428</b>	<b>219</b>	<b>35</b>	<b>1</b>	<b>92</b>	<b>41</b>
<b>GROUP "C"</b>	<b>2681</b>	<b>1973</b>	<b>708</b>	<b>216</b>	<b>4</b>	<b>452</b>	<b>183</b>
<b>TOTAL</b>	<b>4160</b>	<b>2936</b>	<b>1224</b>	<b>311</b>	<b>6</b>	<b>634</b>	<b>257</b>



## 25. BUDGET AND EXPENDITURE

Statement showing actual expenditure incurred by the Board during 2014-2015 has been shown in Table 25a, Table 25b, Table 25c, Table 25d and Table 25e.

**Table 25a: Statement showing actual expenditure incurred by the Board during 2014-15**

Unit Code	Unit Name	PLAN (Rs. in Lakhs)		NON-PLAN (Rs.in Lakhs)	
		Budget	Expenditure	Budget	Expenditure
16.02.01	Salary	2250.00	2123.04.	13427.00	14331.34
16.02.02	Wages	43.00	40.77	0.40	0.10
16.02.03	O.T.A.	9.00	6.44	4.00	2.92
16.02.06	M/Treatment	180.00	151.02	112.00	96.81
16.02.11	D.T.E.	1500.00	915.04	80.00	69.86
16.02.12	F.T.E.	15.00	0.50	0.20	0.00
16.02.13	Office Expenses	950.00	910.02	5.00	4.28
16.02.14	R.R.T.	222.00	216.50	1.70	0.00
16.02.16	Publications	334.00	104.71	1.60	1.39
16.02.17	Advert/Public.	0.00	0.00	0.30	0.00
16.02.20	O.A.E.	115.00	39.60	0.15	0.04
16.02.24	P.O.L.	1550.00	1330.05	1.85	1.58
16.02.27	Minor Works	220.00	140.59	0.00	0.00
16.02.28	P.S.	705.00	103.83	0.20	0.00
16.02.33	Subsidies	0.10	0.00	0.00	0.00
16.02.43	S/Stock	1900.00	1771.83	0.00	0.00
16.02.50	Other Charges	15.00	9.34	0.10	0.00
16.02.51	Motor Vehicle	150.00	214.44	0.50	0.38
16.02.52	M &E	9500.00	1930.01	0.00	0.00
16.02.53	M/Works	15331.90	3774.13	0.00	0.00
16.02.64	W.O.L.	10.00	0.00	0.00	0.00
<b>Total:</b>		<b>35000.00</b>	<b>13781.86</b>	<b>13635.00</b>	<b>14508.7</b>

**Table 25b: Rajiv Gandhi National Training & Research Institute for Ground Water**

Unit Code	Unit Name	Budget	Expenditure
06.01.01	Salary	300.00	247.84
06.01.02	Wages	0.00	0.00
06.01.06	M/Treatment	5.00	1.90
06.01.11	D.T.E.	70.00	53.82
06.01.12	F.T.E.	50.00	0.00
06.01.13	O.E.	90.00	46.38
06.01.14	R.R.T.	15.00	26.98
06.01.16	Publication	1.00	0.99
06.01.24	P.O.L.	5.00	6.88
06.01.28	P.S.	125.00	158.23
06.01.51	M.V.	2.00	2.50
06.01.52	M & E	37.00	0.70
<b>Total</b>		<b>700.00</b>	<b>546.22</b>

**Table 25c:** Major Head: 2701-.80.004.08 Hydrology Project-Phase-II (PLAN)

Unit Code	Unit Name	Budget	Expenditure
08.01.01	Salary	0.00	0.00
08.01.06	M/Treatment	0.00	0.00
08.01.11	D.T.E.	0.00	0.00
08.01.12	F.T.E.	0.00	0.00
08.01.13	O.E.	0.00	0.00
08.01.20	O.A.E.	0.00	0.00
08.01.28	P.S.	574.25	561.57
08.01.51	M.V.	0.00	0.00
08.01.52	M & E	240.58	216.99
08.01.53	M/Works	14.17	0.00
08.02.01	Salary	0.00	0.00
08.02.06	M/Treatment	0.00	0.00
08.02.11	D.T.E	0.00	0.00
08.02.12	F.T.E.	0.00	0.00
08.02.13	O.E.	0.00	0.00
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	141.00	112.12
<b>Total 01 Ext.Supp.&amp; 02 Dom.Supp.</b>		<b>970.00</b>	<b>890.68</b>

**Table 25d:** 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.	400.00	50.14
03.00.53	Major Works	4460.00	0.00
<b>Total</b>		<b>48600</b>	<b>50.14</b>

**Table 25e:** Deduct Recoveries

Unit Code	Unit Name	Budget	Expenditure
17.01.70	Issue to Work	2500.00	1293.37
17.02.70	Oth.Sus/Char.	0.00	0.00
<b>Total</b>		<b>2500.00</b>	<b>1293.37</b>

## Annexure -1

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

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

<b>xiii) NORTH EASTERN REGION</b>		
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
<b>xiv) SOUTH EASTERN REGION</b>		
Regional Office	Bhubaneshwar	Orissa
Division Office	Div. X, Bhubaneshwar	Orissa
<b>xv) SOUTHERN REGION</b>		
Regional Office	Hyderabad	Andhra Pradesh &Telangana
State Unit Office	Vishakhapatanam	N-Coastal Andhra Pradesh
Division Office	Div. IX, Hyderabad	Andhra Pradesh & Telangana
<b>xvi) SOUTH WESTERN REGION</b>		
Regional Office	Bangalore	Karnataka & Goa
State Unit Office	Belgaum	NW. Karnataka & Goa
Division Office	Div. XIV, Bangalore	Karnataka & Goa
<b>xvii) SOUTH EASTERN COASTAL REGION</b>		
Regional Office	Chennai	Tamil Nadu, UT of Pondicherry
Division Office	Div. IV, Chennai	Tamil Nadu, UT of Pondicherry
<b>xviii) KERALA REGION</b>		
Regional Office	Trivendrum	Kerala & UT of Lakshadweep
Division Office	Div. IV, Chennai	Kerala & UT of Lakshadweep
<b>State Unit Office</b>	NCT, Delhi	NCT, Delhi

# **ANNUAL REPORT 2014 - 2015**

**Prepared under the Guidance of**

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This Report has been compiled based on Information provided by All Regional Offices/Divisional offices/HQ

