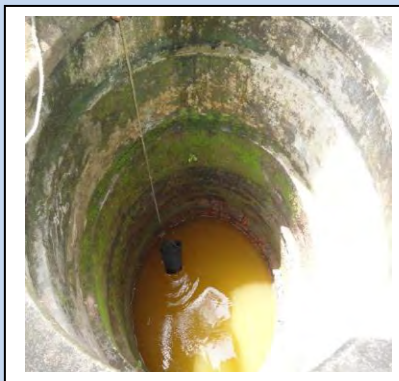
Annual Report 2011-2012



CENTRAL GROUND WATER BOARD
MINISTRY OF WATER RESOURCES
GOVERNMENT OF INDIA
FARIDABAD

CENTRAL GROUND WATER BOARD
Ministry of Water Resources
Govt. of India

ANNUAL REPORT
2011-12

FARIDABAD

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EXECUTIVE SUMMARY

Ground water plays a key role in meeting the water needs of various sectors in India. With growing awareness, dependability on ground water as a sustainable resource in nation building reasserts the need for an organization like Central Ground Water Board which is vested with the responsibilities of assessing and managing the ground water resources of the country through ground water management studies, exploration, evaluation and monitoring of ground water regime.

Central Ground Water Board was constituted as a National apex organization in 1972 by the merger of the Ground Water Wing of Geological Survey of India with the erstwhile Exploratory Tube wells Organization (ETO). The main activities of the Board include macro level Hydrogeological investigations, exploratory drilling coupled with remote sensing studies, geophysical studies and pumping tests to study the subsurface Hydrogeological features and nation-wide monitoring of the behavior of water table and water quality through a network of ground water observation wells. The data generated from these investigations provide the scientific base for preparation of ground water development schemes by the State Governments. Besides advising the States on planning, financing and administration of ground water development schemes, the Board undertakes research & development schemes, ground water assessment, conjunctive use studies and artificial recharge studies. The Board also organizes training of personnel of different disciplines of Central and State Government Organisations in ground water related activities.

OBJECTIVES

Under the mandate given to CGWB, based on principles of economic, ecological efficiency and equity, the major activities of Central Ground Water Board are to ;

- Periodically assess the country's ground water resources.
- Monitor and the ground water development to promote its sustainable management.
- Develop, refine and disseminate basin specific technologies for sustainable ground water development and management.
- Plan augmentation, conservation and regulation of ground water resources.
- Establish a National Information System to collect, store, process and disseminate ground water data.
- Promote the economic and efficient use of manpower, energy and equipment employed in ground water sector.
- Support and co-ordinate the efforts of State Government for planned development and management of ground water.
- Foster International co-operation to promote scientific exchanges, acquisition of useful technology.
- Promote environmental awareness and water quality consciousness.
- Impart training and promote applied research.

ORGANISATIONAL SETUP

The Central Ground Water Board is headed by the Chairman and has four main wings namely 1) Exploratory Drilling & Material Management 2) Sustainable Management & Liaison 3) Survey, Assessment & Monitoring and 4) Technology Transfer & Water Quality. Each wing is headed by a Member. The administrative and financial matters of the Board are being dealt with by the Director (Administration) and Finance & Accounts Officer (FAO) respectively.

The Exploratory Drilling & Materials Management wing is responsible for the drilling and construction of Exploratory and other type of boreholes required for ground water exploration including monitoring of stores, consumption and inventory for efficient and economic machine utilization, purchase action in respect of drilling equipment, vehicles, instruments etc.

The Sustainable Management and Liaison wing looks after sustainable management of ground water related policies, issues etc., work related to monitoring of ground water regime and development, conjunctive use of surface and ground water, urban ground water management, drought management, data collection, storage and retrieval etc.

The Survey, Assessment & Monitoring Wing of Central Ground Water Board is vested with the responsibilities for undertaking Ground Water Management Studies, Aquifer mapping and assessment of aquifer characteristics based on exploration and surveys, Hydro- chemical analyses and studies, pollution studies, short term water supply investigations, special studies, preparation of various Hydrogeological maps, Atlases, Master plans, State reports, District reports, etc.

The Technology Transfer & Water Quality Wing is vested with the responsibility of for Technology Transfer and Quality related subjects of Ground Water domain.

Rajiv Gandhi National Ground Water Training and Research Institute located in Raipur which is headed by Director (RGI). The wing is responsible for conducting various training programme for in-house and other ground water professionals and also for formulation of overall training policy, assessment of training needs, conceptualization of the training modules and the programme implementation strategy etc for the organization.

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 14.01.1997 for the purpose of regulation and control of ground water in the country.

The Central Ground Water Authority is functioning under the Administrative control of the Government of India in the Ministry of Water Resources with its Headquarters at Delhi. CGWA is headed by the Chairman and 14 other members from different Ministries/ Department/ Organisations/ institutions of Government of India including all the 4 Members of CGWB. 5 additional members, one each member from Department of Legislative, Department of Legal Affairs, Central Public Health & Environmental Engineering Organization under Ministry of Urban Development, National Commission for Women and Department of Drinking Water Supply under Ministry of Rural Development have been approved recently for inclusion in the composition of CGWA.

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 Central Ground Water Authority has been entrusted with the responsibility of regulating and controlling ground water development and management in the country and issuing necessary directives for the purpose. CGWA has notified 43 areas for regulation of ground water development.

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

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

(iv) To resort to penal provisions contained in sections 15 to 21 of the said Act. The matters referred to in sub-section(2) of section 3 of the said Act.

The Chairman of CGWB is also the Chairman of CGWA and Member(SML) is the Member Secretary.

For undertaking the activities in field, 18 Regional Offices, each headed by a Regional Director, have been established in the country. 11 State Unit Offices have also been established in those states having large geographical area for better management of field activities. 17 Divisional offices handle the exploratory drilling and related activities, each headed by an Executive Engineer. Both the State Unit offices and Divisional Offices work under the overall administrative control of the respective Regional offices. The details of Regional office wise field formations and their jurisdiction are given in Annexure- 1. The Board has about 500 Scientists, 200 Engineers; and about 3500 technical & administrative/ministerial supporting staff. The Board has a fleet of 88 drilling rigs (34 Direct Rotary, 41 Down the Hole and 13 Percussion Combination types) for taking up drilling operations.

ACTIVITIES & ACHIEVEMENTS

Ground Water Management Studies

Ground Water Management Studies are being carried out to have first hand information on the changes in the ground water scenario with reference to time, due to changes in various inputs and output parameter and due to human interference. This forms the base for developmental activities and policy making. Special priority is being taken for such studies in hilly areas, valley fill areas, tribal areas, drought areas, urban areas, over- exploited areas, low ground water development areas, mining areas, industrial areas, farmers distress areas, coastal areas, canal command areas, water logged areas and areas having problems of water quality due to geogenic sources and contamination. An annual target of 1.5 Lakh sq.km. is earmarked under this item of study. During the year 2011-12, an area of 1.69 Lakh Sq.km. have been covered by the Board under Ground Water Management studies. State/District wise target vis-a-vis achievements during the year 2011-12

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. The entire exercise is aimed at quantitative & qualitative evaluation of ground water in the area. It is being carried out by the Board through a fleet of 88 drilling rigs (34 Direct Rotary, 41 Down the Hole and 13 Percussion Combination types). During the year 2011- 12 (up to 31st March, 2012), the Central Ground Water Board under their Ground water Exploration programme, constructed 734 wells (EW-388, OW-151, PZ- 194, SH-1) including 58 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 734 bore wells constructed, 562 wells, 162 wells and 10 wells were constricted in hard rock, alluvium and bouldary formation respectively. 142 wells and 214 wells were constructed for exploration in tribal and drought prone areas respectively. The Board has so far has drilled a total of 31389 (including 2845 bore holes through outsourcing) bore holes to identify areas worthy for ground water development in the country till March, 2012. 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.

Monitoring of Ground Water Observation Wells

The Board is monitoring the ground water levels in the country four times a year (Jan/May/Aug/Nov) through a network of around 15600 Ground Water Observation Wells. The ground water samples collected during the pre- monsoon monitoring are analysed for the purpose of ascertaining the changes in chemical quality of ground water. Monitoring of Ground Water Observation Wells for May, August, November 2011 & January 2012 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 have detailed information regarding short term and long term changes in the ground water regime.

Geophysical Studies

The Board undertakes geophysical studies as an integral part of its activities to support and supplement ground water management studies, ground water exploration and short-term water supply investigations to demarcate bedrock configuration and thickness of overburden, saline fresh water interface etc. During 2011-12 up to 31st March,2012, 2136 Vertical Electrical Soundings, 15.305 line kilometre resistively profiling and geophysical logging of 53 bore holes have been conducted in various parts of the country.

Hydrochemical Analysis

During 2011-2012, 15620 No. water samples have been analyzed for determination of basic constituents. Analysis of 751 No. water samples including the determination of 85 No. of organic parameters was carried out under specific studies and analysis 3829 No. water samples for involving the determination of Trace elements like As, Cd, Co, Cr, Cu Fe, Mn, Ni, Pb and Zn has been carried out.

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 , survey reports and basic data reports. During 2011-12 up to 31st March, 2012, 9 State Reports, 6 State Chemical Quality Reports, 23 District Reports, 7 Ground Water Exploration Reports and 23 Ground Water Year Books issued /completed. Bhopal News is a quarterly journal being published by Central Ground Water Board highlighting the latest advances in ground water research. Besides scientific papers, the journal also contains technical notes, news items and regular columns. The journal has more than 1500 readers from all over the country. During the year 2011-12 up to 31st March 2012, the Vol. No 25, 1 & 2, 2010 Special issue on Transboundary Aquifer System was published.

Water Supply Investigations

The Board carries out short-term water supply investigations for Government Agencies and helps them in augmenting their water supply. Normally minimum financial implications are charged from all other departments except Defence. The Board has carried out a total of 169 investigations during this year .

Dissemination and Sharing of Technical Know-how

Central Ground Water Board, organized / participated in various Seminars/symposia/workshop/conference with a view to share its expertise in Ground Water field and also for getting exposure to new ideas / technological developments in 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 area.

Re-Assessment of Dynamic Ground Water Resource

The Total Annual Replenishable Ground Water Resources of the Country have been reassessed as 431 Billion Cubic Metres (bcm) and the Net Annual Ground Water Availability is estimated as 396 bcm. Annual Ground Water Draft as on March, 2009 for all uses is 243 bcm. The Stage of Ground Water Development is 61%.

Artificial Recharge Studies

During 2011-12, 109 demonstrative recharge projects on "Artificial Recharge to Ground Water and Rain Water Harvesting" have been approved. The approved cost of 109 projects is Rs. 51.24 crores for implementation by the departments of states under overall technical guidance of Central Ground Water Board for construction of 586 recharge structures.

R&D Studies

During the 2011-12, two R&D meetings were held. Fifth meeting of INCGW, Seven revised proposals were considered, out of which 5 proposals were approved subject to minor modifications and remaining PI's were advised to submit the revised proposals. In addition to this, 9 new proposals were also considered, out of which 6 were approved subject to modifications, two were rejected and PI of remaining one was advised to submit the revised proposal. Reports of three ongoing schemes were also accepted during the meeting & approved for onward transmission to the Ministry for release of Overheads. Sixth meeting of INCGW, ten (10) new R&D proposals were considered, out of which 6 were approved subject to modifications, one was rejected and PI's of remaining three were advised to submit the revised proposal. During the meeting of Standing Advisory committee of MoWR held on 5-11-2012, seven (7) proposals of INCGW were considered. Out of seven (7), following two (2) proposals were approved and funded by Ministry, two (2) proposals were conditionally approved for funding subject to submission of clarifications and remaining three (3) proposals were rejected by Ministry.

Technical Examination of Major/Medium Irrigation Project proposals

As per the directives of the Planning Commission, the Board scrutinizes the major and medium irrigation project reports/proposals from State Govt. , Central Water Commission, Command Area Development and Water Management from the point of view of their impact on ground water regime and specific recommendations are being made to protect quality and quantity of groundwater. During 2011-12 (up to 31st March, 2012), 14 major and minor irrigation project proposals of Central Water Commission were examined.

Human Resources Development

It has been the earnest endeavor of the Board to keep its technical personnel abreast with the latest developments in all aspects related to ground water development & management. Trainees from State Departments and candidates from abroad are included in the training programme being organized by the Board.

During the year 2011-12 (upto 31. 03.2012), 35 training programmes were conducted by RGI and 619 trainees were trained

Hydrology Project II

CGWB is participating agency in HP-II and has a revised cost provision of Rs 61.51 Crore and project has duration of 6 years staring from May 2006 to 2012. The Budget provision for the year 2011-12 is Rs 13.30 Crore and revised provision is 10.31 Crore. The expenditure incurred on the project till March 2012 in the FY 2011-12 is Rs 4.25 Crore.

H-P-II has two major components i.e. Horizontal Expansion in three new States covering Goa, Himachal Pradesh and Punjab and Vertical Extension in the 9HP-I peninsular States. Under Horizontal Expansion, HP-I type of activities and facilities will be extended to new states, however, under Vertical Extension special knowledge enhancement type of activities such as Decision Support System and Purpose Driven Studies has been taken up. In this year of the project, six domain specific training has been imparted, six Awareness raising programme held and 47 Piezometers in Punjab have been constructed. Under Purpose Driven Study on "Specific Yield Study in Chennai Sub-urban Area", interim report submitted. For procurement of the hardware (7 Servers & 59 Workstations) for upgradation of data centre, supply order has been issued and for procurement of All India Village boundaries GIS data set, advance payment to Survey of India has been made. For hiring of consultancy services for "Development of e-GEMS", Technical Evaluation Report submitted to PCS for approval. For procurement of DWLR with Telemetry monitoring for Delhi PDS, World Bank approval received for re-processing the case afresh and Bid document submitted to PCS. Procurement of

GW modelling software is under advanced stage of processing. Sponsoring to six international training courses have been made, which are attended by ten officers of CGWB.

During this year, the Pilot Project on Aquifer Mapping under is undertaken in six different hydrogeological terrains of the country covering states of Bihar, Rajasthan, Tamil Nadu, Karnataka and Maharashtra under Purpose Driven Study component. Under this project, compilation of data, identification of data gaps and establishment of monitoring wells have been completed. The Revised Detailed Project Proposal submitted to the PCS. Contract agreement for engaging NGRI as consultant for Aquifer Characterisation using advance Geophysical Techniques submitted to PCS for approval.

Publicity and Public Awareness

With a view to generate awareness among the masses, "Water Resources Day" is celebrated every year since 1986. The Board has played a very active role in organizing Water Resources Day functions jointly 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

Central Ground Water Authority has been entrusted with the responsibility of regulating and controlling ground water development and management in the country and issuing necessary directives for the purpose. CGWA has notified 39 additional areas for regulation of ground water development. (The CGWA has issued directions to all Concerned to adopt rain-water harvesting systems. The CGWA has issued directions to all the Chief Secretaries of States having over-exploited blocks to take all necessary measures to promote/ adopt artificial recharge to ground water/rain-water harvesting.

IEC Activities

At the instance of Ministry of Water Resources, Central Ground Water Board organized the Second State level Painting Competition in the country to create awareness on water conservation. The school level competition 2011 for the students of 4^{th}, 5^{th}, and 6^{th} standards was launched in all the States/UT's through an advertisement in the print media starting from August, 2011. This year the target given by Ministry of Water Resources for participation of students was 10 lakhs. Due to the untiring efforts of the officers/staff at the regional offices and constant persuasion from M (SML), **the total number of students that participated in the school level painting competition was 16, 05,346 from 23,475 schools.** The painting competition is open for students of 4^{the}, 5^{th} and 6^{th} standards in three stages, namely, *School*, *State* and *National* Level. All participants are given certificates for participation. The State level winners and National level winners are awarded cash prizes. At State/UT level cash prizes of Rs. 10,000/- for first prize winner, Rs. 8,000/- for Second prize winner, Rs. 5000/- to third prize winner was given. Besides 10 consolation cash prizes of Rs. 1000/-each to 10 children were given out of selected 50 participants. The Topic of painting at State Level painting competition this year was "**CONSERVE WATER FOR THE FUTURE**".

During the State level competition held on 14^{th} November 2011 in 29 state/UTs (except Goa and Pondicherry where it was held on 9^{the} November. 2011), a total of **1352** students participated . The jury drawn from eminent artists from the respective states/UTs selected the best paintings for the award.

Budget

Expenditure of 14585.65 lakhs under Plan and 10335.70 lakhs of rupees was incurred by the Board during the year under Non-plan to carry out various activities mentioned above.

1. INTRODUCTION

1.1 HISTORY OF CGWB

The Central Ground Water Board, as the National apex organization under the Ministry of Water Resources, 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. A brief history of the organization follows;

An Exploratory Tube wells Organisation (ETO) was created in 1954 as a subordinate office under the then Ministry of Food, Agriculture, Community Development and Cooperation (Department of Agriculture) to carry out ground water exploration in the alluvial areas of the country to delineate the regional aquifer systems and Evaluate their yield potential. On 3rd October 1970 the ETO Was renamed as Central Ground Water Board. At that time, it was felt that there was need to have a national unified organization for all works related to ground water surveys, exploration, assessment and management in the country. On the recommendations of the Committee on Science and Technology, the Standing Group of Ministers on Science and Technology chaired by Prime Minister Smt. Indira Gandhi, in its meeting on Sept 9, 1971 approved the merger of Ground Water Wing of the Geological Survey of India (GSI) with the Central Ground Water Board. The merger was effected on August 1, 1972 which gave all the administrative and financial powers and flexibility of operation necessary for CGWB's effective functioning. With this, Central Ground Water Board was constituted as an apex organization at the national level with a full time Chairman and two full time Members namely the Chief Hydrogeologist and the Chief Engineer.

In order to streamline staffing pattern, SIU carried out detailed study (1980) and gave its report on staffing pattern of Headquarters, Regional, Divisional and District Unit Office.

A High Level Multi-disciplinary Committee (HLMC) was set up in 1989 to review the role, functions and responsibilities of CGWB in terms of achievements and developments over the past three decades. The HLMC report (1990) highlighted the importance of ground water development and indicated the measures to be taken for achievement of tasks and mandate assigned to CGWB. The Committee reviewed the functions and gave the revised mandate.

In order to provide scientific and technical support to the mandate, Central Ground Water Board conduct training programmes for various levels of ground water professionals/ sub-professionals from CGWB, States, Universities and NGOs. The courses include induction level courses for newly recruited scientists, engineers and drilling professionals; refresher courses for scientists on advanced techniques of ground water investigation, development and management; and training of trainers. The Board had established Rajiv Gandhi National Ground Water Training & Research Institute in 1997 at Raipur. Infrastructure facilities were created by redeploying officers and staff from Central Ground Water Board. The building of the Institute has since been taken over by the Chhattisgarh State to house Legislative Assembly in 2000. It is proposed to relaunch the institute at Raipur in the newly allotted land by the Government of Chhattisgarh, SFC Memorandum in this regard is under submission. Presently the training courses are being conducted at RGI, Raipur.

Central Ground Water Authority has been constituted under Section 3 (3) of the Environment (Protection) Act, 1986 to regulate and control development and management of ground water resources in the country.

The Authority has been conferred with the following powers: (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 for the appointment of officers.

1.2 MANDATE AND OBJECTIVES

The future of our national food security system as well as the quality of life and livelihood of millions of our people will, to a large extent depend on our ability to conserve and utilize ground water resources in an environment friendly, economically efficient and socially equitable manner. On the basis of the principles of ecology, efficiency, economics and equity, mandate of the Board has been postulated below:

"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:-

- Periodically assess the country's ground water resources and publish, once in 3 years, a report on the status of India's ground water resources.
- Formulate perspective plans, basin or sub-basin wise, for harnessing ground water resources in a phased or need based manner and resolve regional imbalances.
- Monitor ground water development in the country and promote its sustainable management on principles of ecology, economics, efficiency and equity.
- Develop, refine and disseminate, on its own as well as in coordination with other agencies, basin-specific technologies for sustainable ground water development and management involving priority areas such as major command areas for conjunctive use of ground water and surface water, monitoring, prevention and remedy of pollution and saline ingress and the location, design, operation and maintenance devices, recycling and reuse of waste water, and solutions to other problems of urban areas.
- Plan augmentation, conservation, protection and regulation of ground water resources keeping in view the existing and future ground water demand scenario.
- Establish a National Information System in collaboration with State Governments and other agencies to collect, store, process and disseminate ground water data as part of an overall water resources data bank.
- Forecast the manpower, equipment, energy and financial requirements for the ground water sector, in the context of demand projections.
- Promote the economic and efficient use of manpower, energy and equipment employed in the ground water sector through various measures including setting up performance appraisal and management information systems, training, development of technical and managerial skills, and personal development.
- Support and coordinate the efforts of State Ground Water Organizations for the planned development of their ground water resources on the above lines, specially where inter-state issues arise.
- Foster international cooperation to promote scientific exchanges, acquisition of useful technologies including the use of renewable sources of energy for pumping ground water and assistance in other developing countries.
- Establish benchmarks and methodologies for ground water studies in coordination with the State Governments.
- Promote environmental awareness and water quality consciousness.
- Establish a National Institute for Ground Water Research, Training & Management and organize All India Coordinated Research Projects involving appropriate institutions and universities, in order to foster the growth of a national grid of R&D institutions, covering different aspects of ground water conservation and utilization.

1.3 ORGANIZATIONAL SET UP

The Central Ground Water Board is headed by the Chairman and has four full time Members namely, Member (Exploratory Drilling & Material Management), Member (Sustainable Management & Liaison), Member (Survey Assessment & Monitoring) and Member (Training & Technology Transfer). The other Members of the Board are all ex-officio being the nominees of institutions in related fields of expertise. The ex-officio members are:

1. The Joint Secretary (A), Ministry of Water Resources.
2. The Joint Secretary & Financial Adviser, Ministry of Water Resources
3. The Joint Secretary, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.

4. The Chief Engineer, IMO (WP & P), CWC, Sewa Bhawan, New Delhi.
5. The General Manager, ONGC, Ministry of Petroleum & Natural Gas, Dehradun.

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

The Exploratory Drilling & Materials Management Wing broadly looks after the drilling and construction of Exploratory Tube wells and other types of bore holes required for assessment of aquifer parameters during ground water exploration. Other activities of this wing include monitoring of Stores, consumption and inventory for efficient and economic machine utilization, Procurement of drilling equipment, vehicles, instruments etc. This wing also looks for the need of improvement in drilling technology, design of abstraction structures, improvement of efficiency of pumps and other water lifting devices, maintenance and up keeping of drilling machinery and related equipment in the Board.

The Sustainable Management and Liaison Wing looks after sustainable management of ground water related policies & issues, augmentation of ground water resources including artificial recharge and monitoring of artificial recharge studies, It also undertakes studies related to recycling and reuse of ground water, urban ground water management, Drought management, Regulation of ground water development and model legislation, National Information System for ground water data collection, storage and retrieval, Planning and Programme formulation for ground water development including techno-economic studies, analysis and associated aspects of ground water development and technical examination of major, medium and minor Irrigation Projects.

The Survey, Assessment & Monitoring Wing has the responsibility of monitoring the works being done in ground water management studies, works related to monitoring of ground water regime and development and conjunctive use of surface and ground water for the entire country, aquifer mapping and assessment of aquifer characteristics based on exploration and surveys, hydrochemical analysis and studies, pollution studies, short term water supply investigations, special ground water studies, preparation of hydrogeological maps, Atlases, Master plans, State reports, District reports, etc. The other activities of this wing include ground water balance studies, periodic assessment of ground water resources and potential, ground water zoning for guiding economic activity areas, rationalization of water rates, forecasting manpower, energy and financial requirements for ground water sector, site selection for Rajiv Gandhi National Drinking Water Mission, dissemination of data & information to various user agencies and publication of quarterly magazine "Bhujal News" by the Board.

The Training and Technology Transfer Wing of the Board is vested with the responsibility for laying the overall training policy, assessment of training needs, conceptualization of the training modules and the programme implementation strategy, identification of thrust area needing technology import from advanced sources, maintenance of effective liaison and interaction with voluntary agencies and Non Governmental Organisations and the other renowned national and international bodies for training and research purposes. The Member heading this wing also functions as the Principal of Rajiv Gandhi National Ground Water Training and Research Institute of the Board.

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

In order to achieve better results in the Water Resources Sector and have better coordination with the State Government departments, Central Ground Water Board had undertaken various studies in the above mentioned fields being monitored by four wings of the Board through 18 Regional Directorates, supported by 17 engineering divisions, 11 State Unit Offices for carrying out different investigations. The Board had a fleet of 87 rigs for taking up drilling operations during 2011-2012.

1.4 ACTIVITIES OF THE BOARD DURING 2011-12

The following activities had been undertaken during the period 2011-2012.

- Ground Water Management Studies.
- Ground Water Exploration aided by Drilling.
- Monitoring of Ground Water Observation Wells.
- Short Term Water Supply Investigations.
- Periodic Assessment of Ground Water Resources.
- Technical Documentation and Publication of Maps & Reports.
- Taking over of Wells by State Govt.
- Organizing Exhibitions, Seminars, Workshops etc.
- Hydrochemical Analysis.
- Geophysical Studies.
- Artificial Recharge studies.
- Organizing training of Central and State Government personnel.
- R & D Studies.

1.5 ANNUAL ACTION PLAN 2011-2012

The activities of the Board are being pursued on a continuing basis as per National Water Policy (2002) and in accordance with the overall development strategy for the XI Plan.

Ground Water Management studies were carried in more utility oriented way and in areas facing ground water problems like decline in water levels, water logging, salinity ingress and quality deterioration, and other problems were accorded priority.

In ground water exploration, emphasis was given to carry ground water exploration activities on long-term planning and schemes were prepared for different geologic formations and areas. As far as possible, contiguous and composite areas hitherto unexplored, were selected keeping in view scientific requirements and priorities of State Governments were also taken into consideration. Thrust was given to explore areas having artesian flow, boundary and hard rock formations. Ground Water Exploration in alluvial areas was done to delineate geometry of aquifer systems by constructing slim holes. During the year, special emphasis was given on tribal, drought and desert areas in exploratory program of the Board. Special studies for computation of specific yield of phreatic aquifers in different parts of the country were also the part of exploratory program.

The Central Ground Water Board is implementing demonstrative "Studies on Artificial Recharge to Ground Water". Under the scheme, recharge structures are constructed by State Government departments, local NGOs, VOs or other beneficiaries under the technical guidance of the Board. Under the scheme, funds and technical guidance were provided by the Board for pilot recharge projects and the implementing agencies were encouraged to replicate similar types of structures in other areas at their own.

Conjunctive use studies were taken up with the objectives to ascertain the Hydrogeological conditions in command areas, to identify areas affected by water logging and salinity, to assess the availability of ground water. The studies provided insight of the problem and helped to formulate action plan for coordinated use of surface and ground water to ensure development on optimal level.

Water logging is a common phenomenon in canal command areas, which causes serious social and economic problems. Micro level mapping of a few water logged areas were taken up to understand and mitigate the problem. Feasibility studies were also carried out to suggest anti water logging measures for reclaiming the affected areas. Remote sensing and application of GIS as supplementary tool has been considerably utilized to map geomorphological feature, change in land use, fracture zones, vulnerable areas of pollution etc which helped in locating promising areas for ground water exploration and development. These studies provided additional update scientific information in synoptic manner about land use pattern and its temporal changes to ground water exploratory programme, reappraisal surveys, ground water pollution studies, water logging condition, erosion problem and artificial recharge studies taken by the Board during the year.

2. GROUND WATER MANAGEMENT STUDIES

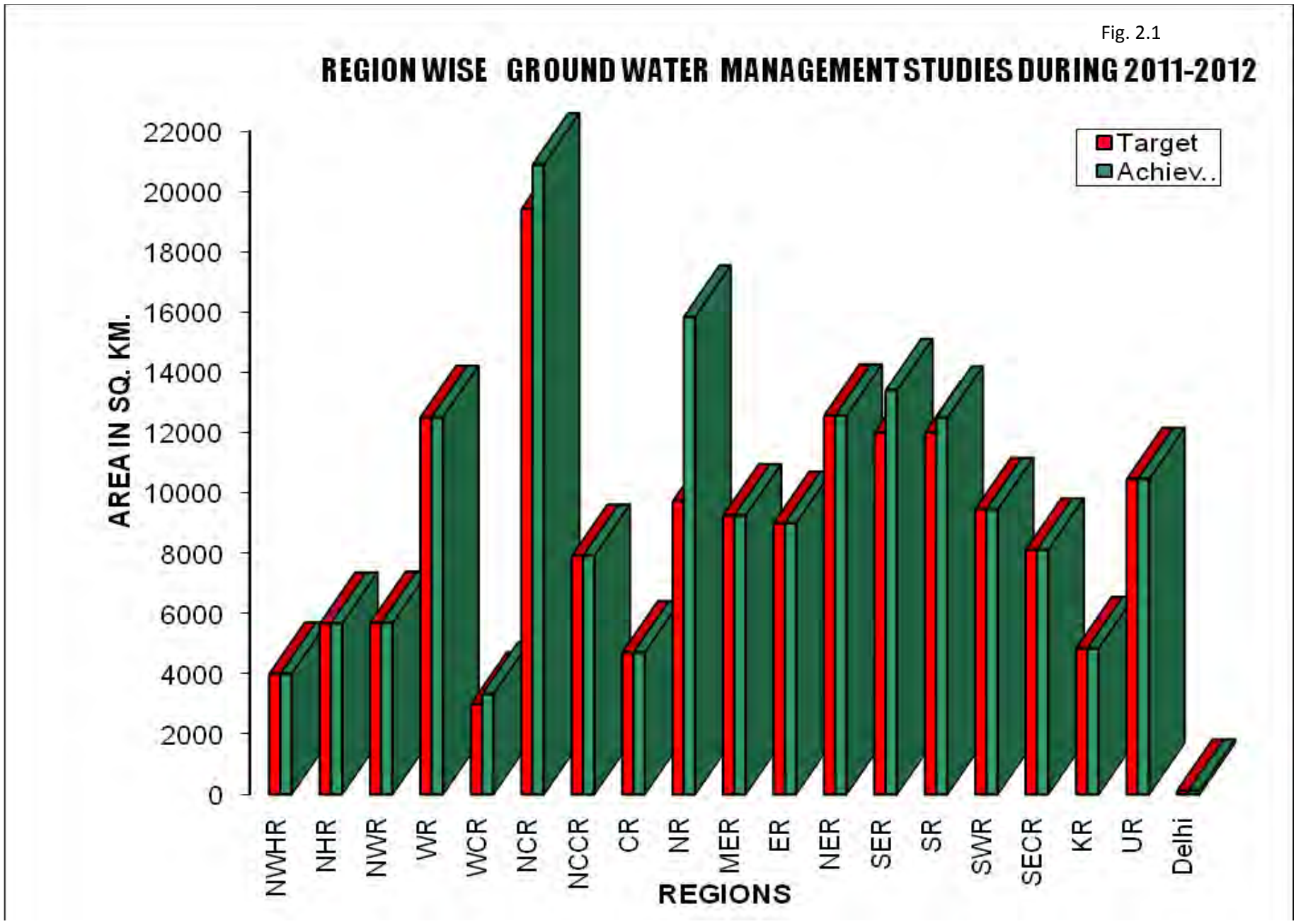
Ground Water Management Studies are being carried out by the Board at various levels i.e. district, block, area specific etc. to evaluate the changes in quantity & quality in the ground water regime owing to development and also to identify related issues for future management strategies. A major part of replenishment of ground water is through infiltration from rainfall. Return flow from irrigation and seepage from surface channels and reservoirs also contribute substantially to the ground water recharge. The effect of ground water withdrawals and out-flows are directly measurable through water table. Since all these inputs and outputs frequently change with time, the ground water situation is being periodically reappraised. As the development of resource leads to changes in its regime and water quality therefore planning for further development of the resource is to be done on the basis of findings of the studies, which provide valuable information for reorienting ground water development programme keeping in view the emerging scenarios. During the year 2011-12, an area of 1.69 Lakh Sq.km. have been covered by the Board under Ground Water Management studies as against target of 1.60 Lakhs. Sq.km. State/District wise target vis-a-vis achievements during the year 2011-12 is shown in Table 2.1 and fig. 2.1.

Table: 2.1 T A R G E T AND ACHIEVEMENTS OF GROUND WATER MANAGEMENT STUDIES DURING 2011-12

Sl. No..	States	Districts	Target (Sq. km.)	Achievement (Sq. km.)
1	Jammu& Kashmir	Budgam	1371	1371
		Rajouri	2630	2630
2	Himachal Pradesh	Kullu district (Normal)	5503	5503
		Paonta & Kala Amb Valley, Sirmaur district	161	161
3	Punjab	Barnala	1410	1410
4	Haryana	Sirsa	4277	4277
5	Rajasthan	Nagaur	3642	3642
		parts of Alwar, Bharatpur & Karauli	5235	5235
		parts of Dausa, Jaipur & Sikar	3643	3643
6	Gujarat	Kachchh	3000	3330
7	Madhya Pradesh	Parts of Raisen	3622	3622
		Vidisha	3185	3185
		Parts of Vidisha, Gyaraspur and Basoda block of Vidisha	3169	3169
		Parts of Bhopal, Sehore & Shivpuri	3326	3622
		Parts of Sagar district	2690	2690
		Parts of Guna district, MP	3484	3484
		Lalitpur District, UP (1125 sq km)	1125	1125
8	Chhattisgarh	Raipur	2953	2953
		Mahasamund	4961	4961
9	Maharashtra	Man Basin in parts of Sangli, Satara and Solapur	4710	4710
10	Uttar Pradesh	Parts of Sagar district, MP (2690 sq km) and parts of Lalitpur District, UP (1125 sq km)	3815	3815
		Parts of Guna district, MP	3484	3484
		Chitrakoot district	1673	1673
		Mahoba district	1785	1785
		Parts of Ghazipur district	1644	1644
		Parts of Ghazipur district	1733	1733
		Mau district	1713	1713
11	Mizoram	Aizawl	3576	3576

Sl. No..	States	Districts	Target (Sq. km.)	Achievement (Sq. km.)
12	Uttaranchal	Uttarkashi	8016	8016
		Rudraprayag	2439	2439
13	Bihar	Bhagalpur	2602	2602
		Aurangabad	3389	3389
14	Jharkhand	Bokaro	3281	3281
15	West Bengal	parts of Murshidabad and Nadia	3000	3000
		parts of Bardhaman	3000	3000
		parts of Bankura	3000	3000
16	Tripura	Dhalai	2314	2314
17	Meghalaya	West Garo Hills	3677	3677
18	Dehli	Najafgarh Drain	125	125
19	Orissa	Parts of Boudh	3000	3444
		Parts of Nayagarh	3000	3335
		Parts of Khurda	3000	3321
		Parts of Ganjam	3000	3307
20	Arunachal Pradesh	East Siang	3000	3000
21	Andhra Pradesh	Ranga Reddyand Mahabubnagar	6000	6500
		Krishna	6000	6000
22	Karnataka	Dakshina Kannada and Kodagu	3260	3260
		Uttar Kannada	4058	4058
		Mandya	2144	2144
23	Tamil Nadu	Parts of Coimbatore and Tiruppur	3510	3510
		Parts of Coimbatore, Erode and Tiruppur	2608	2608
		Parts of Tiruvallur and Chennai	1,500	1,500
		Parts of Dindigul	500	500
24	Kerala	Palakkad	2650	2650
		Coastal area and karamana basin of Trivandrum	1200	1200
		Ernakulam	500	500
		Part of malappuram	500	500

Fig. 2.1


REGION WISE GROUND WATER MANAGEMENT STUDIES DURING 2011-2012
Target
Achiev..
AREA IN SQ. KM.
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
NWHR
NHR
NWR
WR
WCR
NCR
NCCR
CR
NR
MER
ER
NER
SER
SR
SWR
SECR
KR
UR
Delhi
REGIONS

3. GROUND WATER EXPLORATION

Ground water exploration aided by drilling is one of the major activities of the Board. It is aimed at delineation of aquifers in different hydrogeological conditions 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 capabilities in various hydrogeological settings. These studies have helped in identifying areas worthy for further ground water development. Ground Water Exploration contributes to a large extent in guiding the States to implement ground water development schemes.

Ground Water Exploration is being carried out to study the sub-surface hydrogeological setup and to evaluate various aquifer parameters of different aquifer systems. The entire exercise is aimed at quantitative & qualitative evaluation of ground water in the area. It is being carried out by the Board through a fleet of 87 drilling rigs (33 Direct Rotary, 41 Down the Hole and 13 Percussion Combination types).

During the year 2011- 12 (up to 31st March, 2012), the Central Ground Water Board under their Ground water Exploration programme, constructed 734 wells (EW-388, OW-151, PZ-194, SH-1) including 58 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 734 bore wells constructed, 562 wells, 162 wells and 10 wells were constricted in hard rock, alluvium and boundary formation respectively. 142 wells and 214 wells were constructed for exploration in tribal and drought prone areas respectively. The statement showing State-wise distribution of boreholes drilled / completed during 2011-2012 in the country is presented in Table 3.1 & Table-3.2. Region wise & Division wise status of bore holes drilled during 2011-2012 is shown as graph in fig. 3.1 & 3.2.

The Board has drilled a total of 31389 bore holes (including 2845 bore holes through outsourcing) as on 31.03.2012 to identify areas worthy for ground water development in the country. The statement showing State-wise distribution of boreholes drilled / completed till March, 2012 in the country is presented in Table 3.3.

High Yielding Well at Satrasen EW, Chopda Taluka, Jalgaon District.

High Discharge Exploratory well at Vellikulangara, Thrissur

Table 3.1 : State-wise wells constructed by Central Ground Water Board during the year 2011-2012

Sl No.	State/UTs	EW	OW	PZ	SH	DW	Total
1.	Andhra Pradesh	27	14	36	0	0	77
2.	Arunachal Pradesh	0	0	0	0	0	0
3.	Assam	11	07	0	0	0	18
4.	Bihar	12	06	07	0	0	25
5.	Chhattishgarh	28	06	23	0	0	57
6.	Gujarat	16	06	10	0	0	32
7.	Haryana	12	12	0	0	0	24
8.	Himachal Pradesh	07	0	0	0	0	07
9.	Jammu & Kashmir	09	0	0	0	0	09
10.	Jharkhand	08	04	02	0	0	14
11.	Karnataka	26	10	07	0	0	43
12.	Kerala	26	10	0	0	0	36
13.	Madhya Pradesh	37	18	27	0	0	82
14.	Maharashtra	46	14	06	0	0	66
15.	Meghalaya	08	0	0	0	0	08
15.	Orissa	35	14	08	0	0	57
16.	Punjab	04	04	0	0	0	08
17.	Rajasthan	16	02	41	0	0	59
18.	Tamilnadu	23	08	23	0	0	54
19.	Uttar Pradesh	20	13	03	01	0	37
20.	Uttarakhand	03	01	0	0	0	04
21.	West Bengal	14	02	01	0	0	17
TOTAL		388	151	194	01	0	734

Table 3.2 Division wise wells constructed by central ground water board during the year 2011-2012

Sl No.	DIVISION	EW	OW	PZ	SH	DW	Total
1	I- AHMEDABAD	16	06	10	0	0	32
2	II- AMBALA	16	16	0	0	0	32
3	III- VARANASI	16	09	01	0	0	26
4	IV- CHENNAI	37	11	23	0	0	71
5	V- RANCHI	20	10	09	0	0	39
6.	VI-NAGPUR	46	14	06	0	0	66
7.	VII-GUWAHATI	19	07	0	0	0	26
8.	VIII- JAMMU	09	0	0	0	0	09
9.	IX-HYDERABAD	27	14	36	0	0	77
10.	X- BHUWANESWAR	35	14	08	0	0	57
11	XI- JODHPUR	16	02	41	0	0	59
12.	XII BHOPAL	37	18	27	0	0	82
13	XIII- RAIPUR	28	06	23	0	0	57
14.	XIV- BANGALORE	38	17	07	0	0	62
15.	XV- KOLKATA	14	02	01	0	0	17
16	XVI- BAREILLY	07	05	02	1	0	15
17	XVII- DHARAMSALA	07	0	0	0	0	07
TOTAL		**388**	**151**	**194**	**01**	**0**	**734**

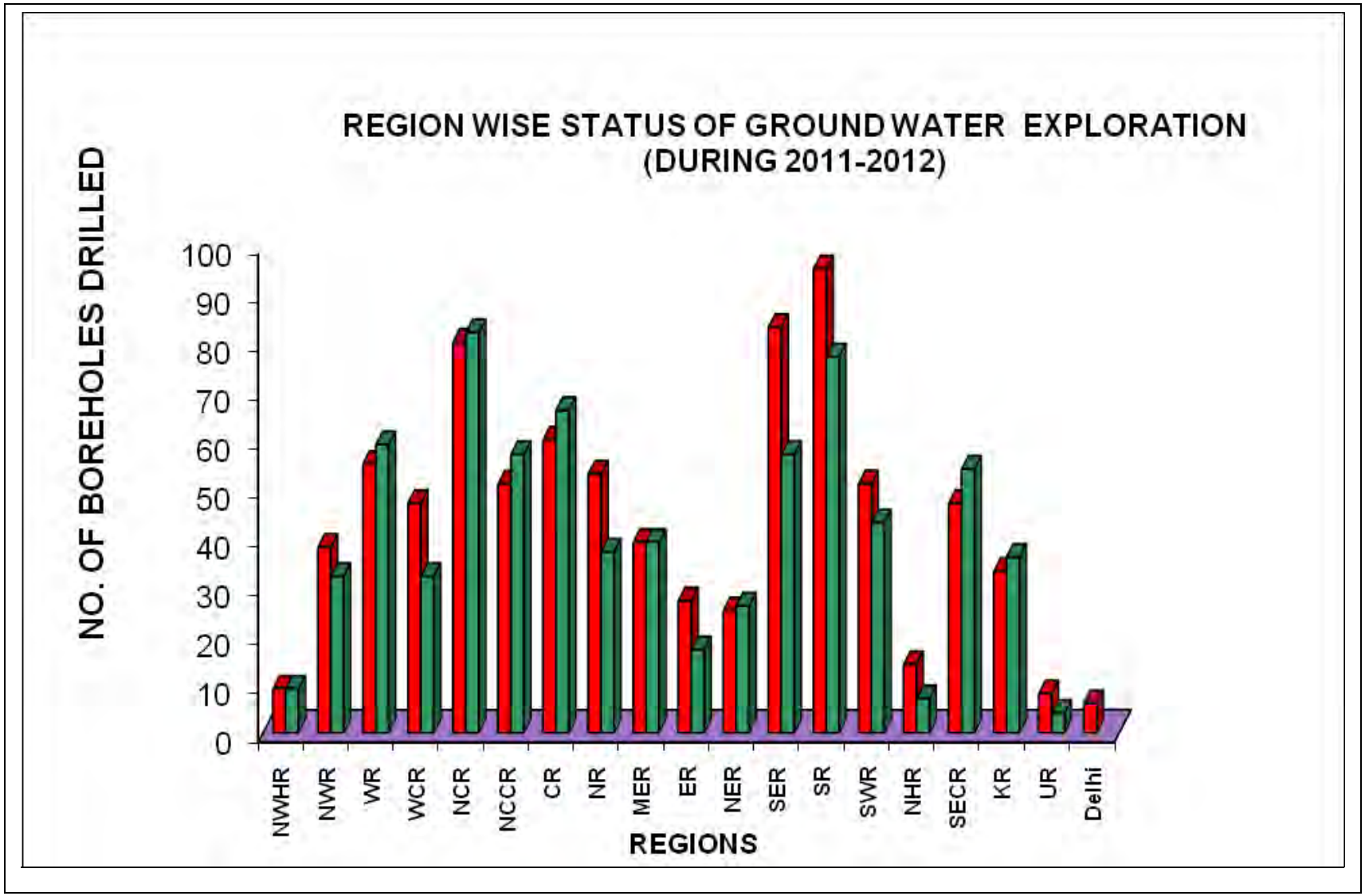
EW - Exploratory Well OW - Observation Well PZ - Piezometers SH - Slim Hole DW - Deposit Well

Table:3.3 - STATUS OF BORE HOLES DRILLED BY C.G.W.B AS ON 31.03.2012.

Sl. No.	STATE/UT	EW	PZ	EW	OW	PZ	SH	DW	Total	TOTAL (I + II)
		(I) Through Outsourcing (Contractual)		(II) Through Departmental Rigs						
A.	**STATES**									
1	Andhra Pradesh	90	0	1278	801	665	14	31	2789	**2879**
2	Arunachal Pradesh	0	0	32	5	0	1	1	39	**39**
3	Assam	0	0	369	165	58	16	42	650	**650**
4	Bihar	0	0	288	172	74	10	514	1058	**1058**
5	Chhattisgarh	300	105	617	187	143	0	28	975	**1380**
6	Goa	0	0	58	18	14	0	31	121	**121**
7	Gujarat	165	0	934	449	495	25	255	2158	**2323**
8	Haryana	7	80	378	255	212	23	170	1038	**1125**
9	Himachal Pradesh	0	0	191	11	3	1	0	206	**206**
10	Jammu & Kashmir	21	0	338	69	31	8	114	560	**581**
11	Jharkhand	50	0	309	155	35	4	71	574	**624**
12	Karnataka	120	0	1253	618	353	7	5	2236	**2356**
13	Kerala	10	0	447	157	231	16	13	864	**874**
14	Madhya Pradesh	332	80	966	628	176	8	149	1927	**2339**
15	Maharashtra	80	88	1186	444	160	2	166	1958	**2126**
16	Manipur	0	0	25	11	0	0	2	38	**38**
17	Meghalaya	0	0	85	24	1	2	8	120	**120**
18	Mizoram	0	0	3	3	0	0	0	6	**6**
19	Nagaland	0	0	11	3	0	0	3	17	**17**
20	Orissa	439	67	1356	317	118	21	191	2003	**2509**
21	Punjab	0	0	176	191	82	20	14	483	**483**
22	Rajasthan	225	0	1124	404	503	93	591	2715	**2940**
23	Sikkim	0	0	31	9	0	0	0	40	**40**
24	Tamil Nadu	110	179	942	366	229	13	93	1643	**1932**
25	Tripura	0	0	60	26	0	4	22	112	**112**
26	Uttarakhand	0	0	59	6	0	1	129	195	**195**
27	Uttar Pradesh	197	0	841	569	168	40	501	2119	**2316**
28	West Bengal	0	100	443	215	170	12	82	922	**1022**
TOTAL(A)		**2146**	**699**	**13800**	**6278**	**3921**	**341**	**3226**	**27566**	**30411**
B.	**UNION TERRITORIES**									
1	Andaman & Nicobar	0	0	46	13	0	1	0	60	**60**
2	Chandigarh	0	0	7	17	14	2	15	55	**55**
3	Dadra & NagarHaveli	0	0	12	1	0	0	0	13	**13**
4	Delhi	0	0	149	64	160	13	380	766	**766**
5	Daman & Diu	0	0	0	0	7	0	0	7	**7**
6	Pondicherry	0	0	30	20	8	5	14	77	**77**
	TOTAL(B)	**0**	**0**	**244**	**115**	**189**	**21**	**409**	**978**	**978**
	GRAND TOTAL(A+B)	**2146**	**699**	**14044**	**6393**	**4110**	**362**	**3635**	**28544**	**31389**

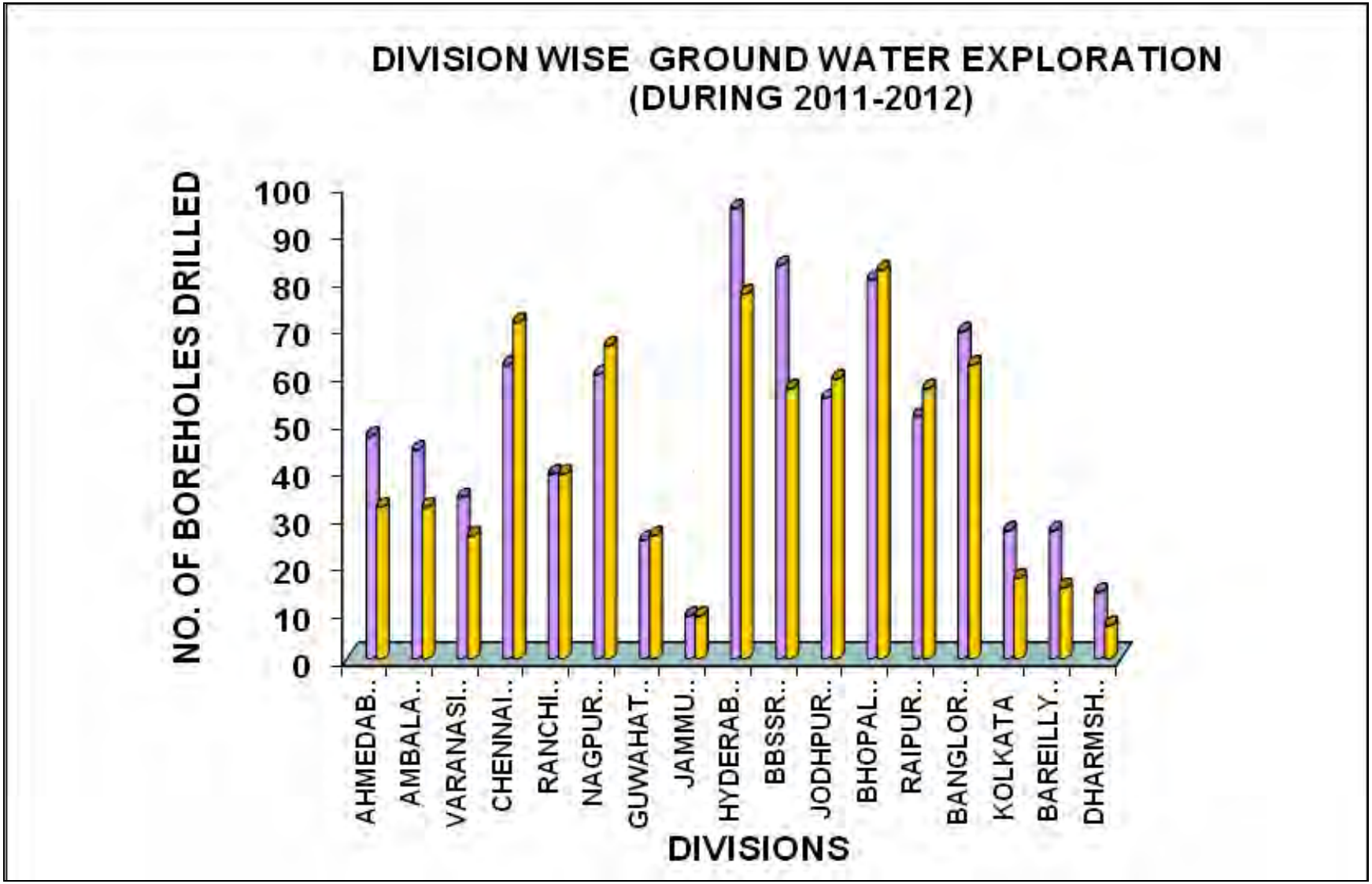
Graph 3.1 Showing Region wise status of Ground Water Exploration during 2011-12

Fig. 3.1



Graph 3.2 Showing Division wise status of Ground Water Exploration during 2011-12

Fig 3.2



4. DEVELOPMENTS 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 characteristics i.e. Transmitivity, storage co-efficient and well characteristics 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. The Board has got the capacity of Conducting 175 to 200 pumping tests per annum with the existing infrastructure facilities. With the increasing drilling activities, the Board is conducting, on an average, about 400 pumping wells every year, which have resulted in backlog of pumping tests. Procurement action has been initiated in the Board to equip each rig unit with adequate pumping test units. However, in spite of constraints faced by the Board in this aspect, a total of 174 wells were developed and tested during the year 2011-2012. Region wise achievement has been presented in Table 4.1

Table 4.1: Regionwise/Statewise Pumping Tests Conducted in the Year 2011 – 2012

Sr. No.	Regions	State/ Union Territories	No of wells tested during 2011--12 Upto March,2012		
			No. of E. wells constructed during 2011-12 and tested	No. of E. wells constructed in earlier Year and tested	Total No. of wells tested
1	NWHR, Jammu	Jammu & Kashmir	3	8	11
2	NWR,Chandigarh	Haryana	0	0	0
		Punjab	0	0	0
		Delhi	0	9	9
3	WR, Jaipur	Rajasthan	8	7	15
4	WCR, Ahmedabad	Gujrat	0	1	1
5	NCR, Bhopal	Madhya Pradesh	1	0	1
6	NCCR, Raipur	Chhattisgarh	1	2	3
7	CR, Nagpur	Maharashtra	3	10	13
8	NR, Lucknow	Uttar Pradesh	1	7	8
9	MER, Patna	Bihar	4	8	1
		Jharkhand	2	2	4
10	ER,Kolkata	West Bengal	4	9	13
11	NER, Guwahati	Assam	0	9	9
		Arunachal Pradesh	0	0	0
		Meghalaya	0	0	0
		Tripura	0	0	0
12	SER ,Bhubneswar	Orissa	5	8	13
13	SR, Hyderabad	Andhra Pradesh	2	31	33
14	SWR, Bangalore	Karnataka	4	4	8
15	SECR, Chennai	Tamilnadu	0	1	1
16	KR, Kerala	Kerala	8	6	14
17	NHR, Dharamshala	Himachal Pradesh	0	6	6
18	UR, Dehradun	Uttarakhand	0	0	0
TOTAL			**46**	**128**	**174**

5. TAKING OVER OF WELLS BY STATES

5.1 Exploratory Wells

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 2012, a total of 14042 wells have been drilled, out of which 11092 successful exploratory wells were offered for handed over and only 5880 wells have so far been accepted /taken over by State Governments while 4219 successful wells are yet to be accepted/ taken over by them and only 993 successful wells to be offered. The status of handing over of exploratory wells drilled by Central Ground Water Board to the State Government as on 31-03-2012 is presented in table 5.1.

Table 5.1: Handing over of wells drilled by CGWB (As On 31.03.2012)

Sl.No.	States/Union Territories	Total Wells drilled	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	
A. STATES						
1	Andhra Pradesh	1278	920	728	140	52
2	Arunachal Pradesh	32	28	14	3	11
3	Assam	369	316	124	88	10
4	Bihar	288	231	87	143	1
5	Chhattishgarh	617	558	196	311	51
6	Goa	58	49	0	49	0
7	Gujarat	934	611	431	104	76
8	Haryana	378	209	145	51	1
9	Himachal Pradesh	191	177	85	65	27
10	Jammu & Kashmir	338	270	167	75	28
11	Jharkhand	309	254	100	149	5
12	Karnataka	1253	1092	471	489	132
13	Kerala	447	325	262	49	14
14	Madhya Pradesh	966	642	492	13	20
15	Maharashtra	1186	991	794	168	29
16	Manipur	25	15	14	0	1
17	Meghalaya	85	76	15	18	43
18	Mizoram	3	3	3	0	0
19	Nagaland	11	7	5	1	1
20	Orissa	1356	1291	405	844	42
21	Punjab	176	152	79	70	3
22	Rajasthan	1124	820	258	525	37
23	Sikkim	31	10	6	0	4
24	Tamilnadu	942	689	511	149	29
25	Tripura	60	54	36	12	6

26	Uttarakhand	57	46	24	10	12
27	Uttar Pradesh	841	695	193	344	158
28	West Bengal	443	390	145	184	61
	Total(A)	**13798**	**10921**	**5790**	**417**	**960**
B.UNION TERRITORIES						
1	Andaman & Nicobar	46	12	0	10	2
2	Chandigarh	7	7	6	0	1
3	Dadra &Nagar Haveli	12	8	8	0	0
4	Delhi	149	131	63	38	30
5	Pondicherry	30	13	13	0	0
	Total(**B**)	**244**	**171**	**90**	**48**	**33**
	GRAND TOTAL(A+B)	**14042**	**11092**	**5880**	**4219**	**993**

6. WATER SUPPLY INVESTIGATIONS

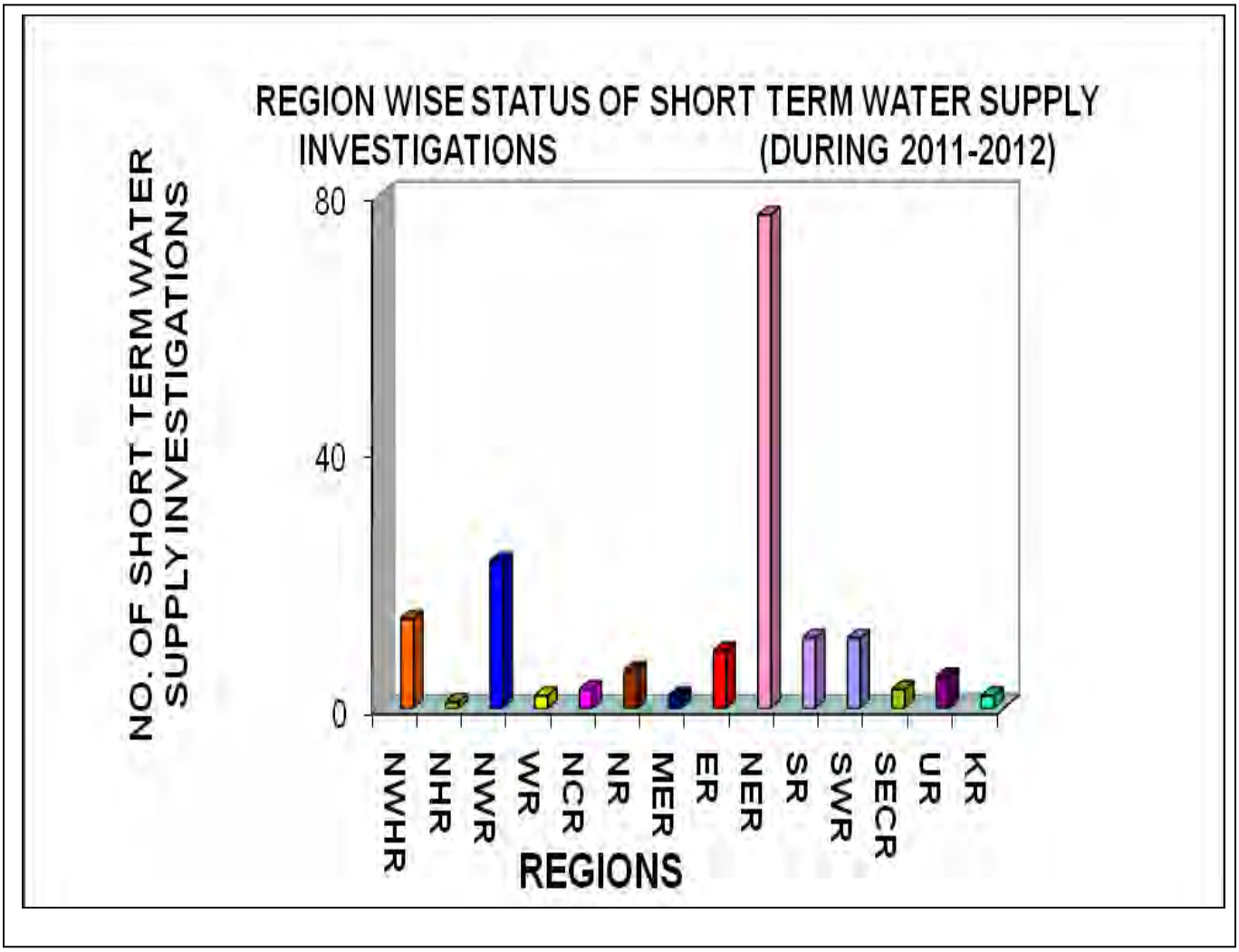
The Board provides assistance to defence and Govt. Agencies establishments to solve their immediate water supply problems by selecting suitable sites for construction of ground water abstraction structures. During 2011-12, 169 Water Supply Investigations were carried out and region wise/state wise status is given in table 6.1 and fig. 6.1.

Table 6.1: Region/Statewise Water Supply Investigations taken up during 2011-2012

Sl. No	Regions	States	Number of Water Supply Investigations
1	**NORTHERN WESTERN HIMALAYAN REGION**	Jammu & Kashmir	14
2	**NORTHERN HIMALAYAN REGION**	Himachal Pradesh	1
3	**NORTH WESTERN REGION**	Punjab	10
		Haryana	6
		Delhi	7
4	**WESTERN REGION**	Rajasthan	2
5	**NORTHERN REGION**	Uttar Pradesh	6
6	**UTTARANCHAL REGION**	Uttaranchal	5
7	**EASTERN REGION**	West Bengal	9
8	**NORTH CENTRAL REGION**	Madhya Pradesh	3
9	**MID EASTERN REGION**	Bihar & Jharkhand	2
10	**NORTH EASTERN REGION**	Assam, Meghalaya, Arunachal Pradesh, Tripura and Nagaland	77
11	**SOUTERN REGION**	Andhra Pradesh	11
12	**SOUTH WESTERN REGION**	Karnataka	11
13	**SOUTH EASTERN COASTAL REGION**	Chennai	3
14	**KERALA REGION**	Kerala	2
		Total	**169**

Graph 6.1 Showing Short term Water Supply Investigations during 2011-2012

Fig. 6.1



7. GROUND WATER LEVEL SCENARIO

7.1 INTRODUCTION:

Monitoring of ground water regime is an effort to obtain information on ground water levels 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 plumage from the aquifer, recharge due to irrigation systems and other practices like waste disposal etc.

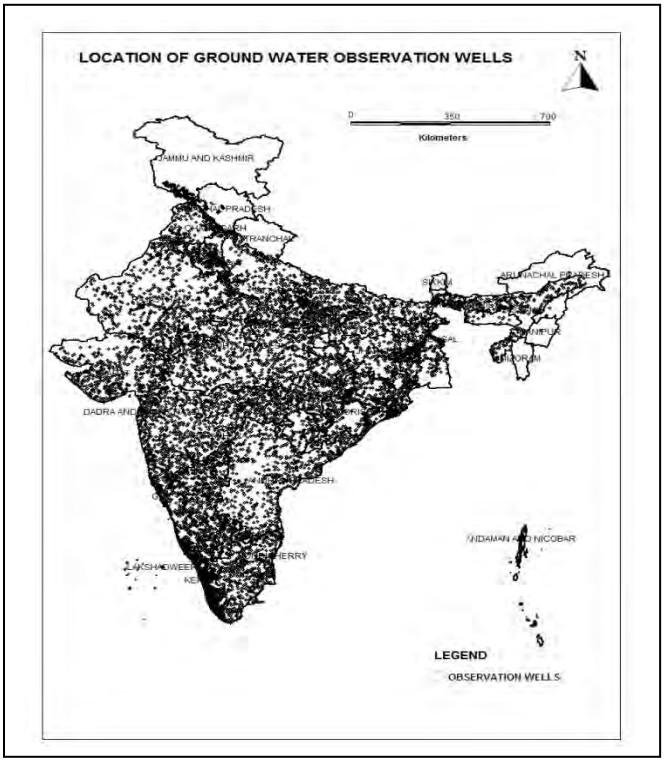
Ground water levels are being measured four times a year during January, April/May, November and November. The ground water regime monitoring was started in the year 1969 by Central Ground Water Board. At present a network of 15653 observation wells located all over the country is being monitored (fig. 7.3). Ground water samples are being 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. The ground water level and quality monitoring is of particular importance in coastal as well inland saline environment to assess the changes in salt water/fresh water interface as also the gradual quality changes in the fresh ground water regime. This data is used for assessment of ground water resources and changes in the regime consequent to various development and management activities.

The State-wise distribution of the ground water observation wells is given in table 7.1 and depiction of bar diagramme is given in fig. 7.1 & their distribution in fig 7.2. Strenthening of observation wells since 1985 (5461 nos) to 2012(15653 nos) is presented in fig. 7.3.

TABLE 7.1: DISTRIBUTION OF OBSERVATION WELLS

Sl. No.	Name of the State	Total No. of Ground Water Monitoring Wells (as on 31.03.2012)		
	States	**DW**	**PZ**	**Total**
1	Andhra Pradesh	580	402	982
2	Arunachal Pradesh	12	0	12
3	Assam	292	10	302
4	Bihar	329	12	341
5	Chhattisgarh	461	248	709
6	Delhi	25	137	162
7	Goa	43	59	102
8	Gujarat	637	376	1013
9	Haryana	198	266	464
10	Himachal Pradesh	89	0	89
11	Jammu & Kashmir	178	19	197
12	Jharkhand	215	12	227
13	Karnataka	1134	373	1507
14	Kerala	658	267	925
15	Madhya Pradesh	870	376	1246
16	Maharashtra	1075	227	1302
17	Manipur	13	10	23
18	Meghalaya	31	5	36
19	Nagaland	12	7	19
20	Orissa	973	137	1110
21	Punjab	159	202	361
22	Rajasthan	722	396	1118
23	Tamil Nadu	566	589	1155
24	Tripura	32	9	41
25	Uttar Pradesh	818	247	1065
26	Uttarakhand	39	94	133
27	West Bengal	468	420	888
	UTs			
1	Andaman & Nicobar	64	0	64
2	Chandigarh	1	27	28
3	Dadra & Nagar Haveli	7	0	7
4	Daman & Diu	9	5	14
5	Pondicherry	4	7	11
	Total	**10714**	**4939**	**15653**

Fig. 7.3



7.2 Ground water lev el scenario – pre monsoon, 2011

Perusal of the ground water level data for the pre Monsoon 2011 (fig. 7.4) indicates that in Sub-Himalayan area, north of river Ganges and in the north eastern part of the country in the Brahmaputra valley, eastern coast of Orissa, Andhra Pradesh and Tamil Nadu states generally the depth to water level varies from 2-5 meter below ground level. Isolated pockets of shallow water level less than 2 m bgl have also been observed in west Maharastra and coastal area of Andhra Prdesh state. In major parts of north-western states depth to water level generally ranges from 10-20 m bgl. In the western parts of the country deeper water level is recorded in the depth range of 20-40 m bgl. In North Gujarat, part of Haryana and western Rajasthan water level more than 40 m bgl is recorded. In the west coast water level is generally less than 10 m and in western parts of Maharashtra State isolated pockets of water level less than 2 m has also been observed. In the east coast i.e. coastal Andhra Pradesh, shallow water level of less than 2 m have been recorded. In eastern states, water level in general ranges from 5-10m bgl. However South-eastern part of West Bengal recorded water level in the range of 10-20 m bgl. In north central India water level generally varies between 10-20 m bgl, except in isolated pockets where water level less than 10 m bgl has been observed. The peninsular part of country generally recorded a water level in the range 5-10 m bgl.

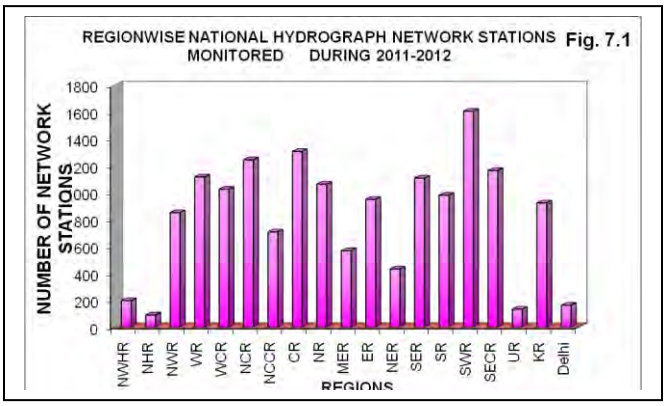
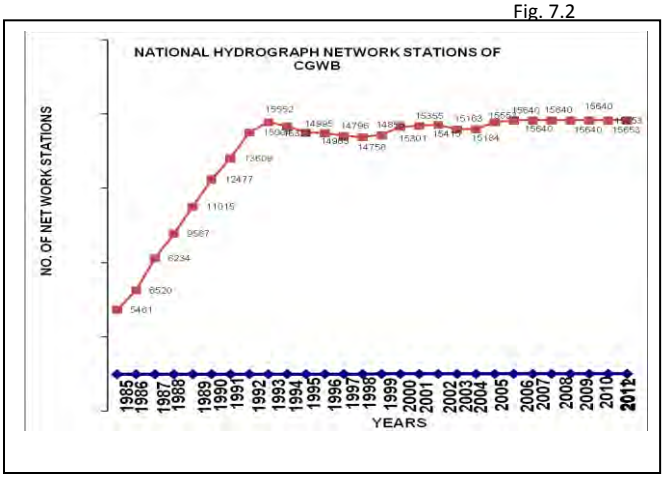


Fig. 7.2



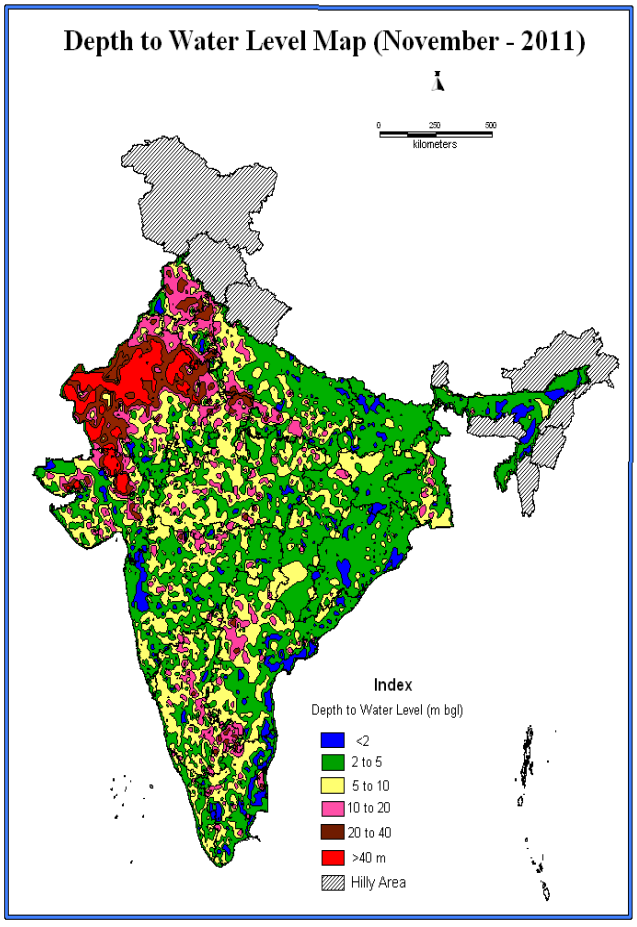
Out of total monitored wells 6.03% wells are showing water level less than 2 m bgl, 27.63 % wells are showing water in the depth range of 2-5 m bgl, 39.31% wells are showing water level in the depth range of 5-10 m bgl, 20.77% wells are showing water level in the depth range of 10-20 m bgl, 4.42% wells are showing water level in the depth range of 20-40 m and remaining 1.83 % wells are showing water level more than 40 m bgl.

7.3 Ground water level scenario – Depth to Water Level (August 2011)

Perusal of the ground water level data for the August 2011 (Fig. 7.5) indicates that in Sub-Himalayan area, north of river Ganges and, eastern coast of Orissa, Andhra Pradesh, Kerala, Gujarat, Madhaya Pradesh and Coastal Tamil Nadu states generally the depth to water level varies from 2-5 meter below ground level. Shallow water level less than 2 m bgl have also been observed in west Maharastra, Assam, Northern Uttar Pradesh, Jharkhand, Orissa and coastal area of Andhra Pradesh state. In major parts of north-western

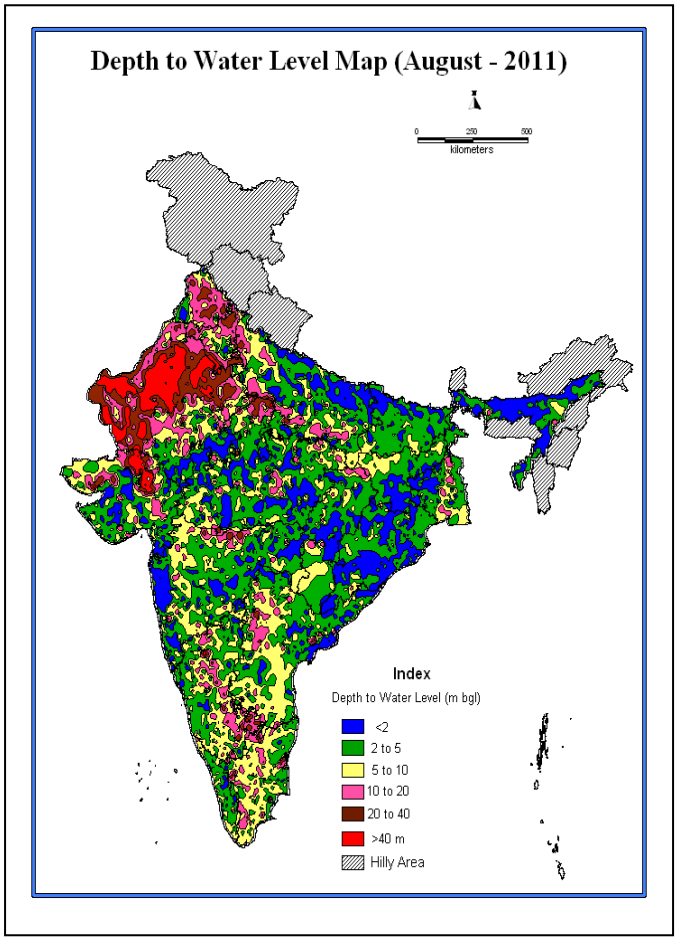
states depth to water level generally ranges from 10-20 m bgl. In the western parts of the country deeper water level is recorded in the depth range of 20-40 m bgl. In North Gujarat, part of Haryana and western Rajasthan water level more than 40 m bgl is recorded. In the west coast water level is generally less than 5 m and in western parts of Maharashtra State isolated pockets of water level less than 2 m has also been observed. In the east coast i.e. coastal Andhra Pradesh, shallow water level of less than 2 m have been recorded. In eastern states, water level in general ranges from 2-5 m bgl. However South-eastern part of West Bengal recorded water level in the range of 10-20 m bgl. In south India water level generally varies between 5-10 m bgl, except in isolated pockets where water level more than 10 m bgl has been observed.

Fig. 7.4



Out of total monitored wells 31.98% wells are showing water level less than 2 m bgl, 30.93 % wells are showing water in the depth range of 2-5 m bgl, 20.74% wells are showing water level in the depth range of 5-10 m bgl, 10.58% wells are showing water level in the depth range of 10-20 m bgl, 4.11% wells are showing water level in the depth range of 20-40 m and remaining 1.66 % wells are showing water level more than 40 m bgl.

Fig. 7.5



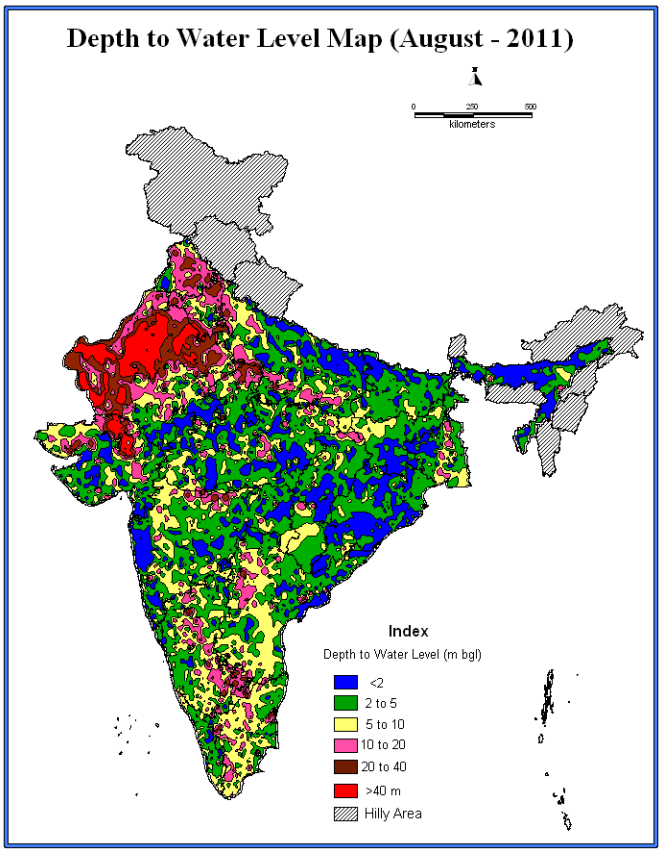
7.4 Ground water level scenario – November, 2011

Perusal of the ground water level data for the November 2011 (fig. 7.6) indicates that in Sub-Himalayan area, north of river Ganges, eastern coast of Orissa, Andhra Pradesh, Kerala, Gujarat, Maharastra, Chhattisgarh, Madhya Pradesh, Bihar, Jharkhand, entire northeast and Coastal Tamil Nadu states generally the depth to water level varies from 2-5 meter below ground level. About 40.85 % wells are showing water in the depth range of 2-5 m bgl. Shallow water level less than 2 m bgl have also been observed in west Maharastra, Assam, North Bihar, Orissa and coastal area of Andhra Pradesh and Tamil Nadu states. In major parts of north-western states depth to water level generally ranges from 10-20 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 North Gujarat, part of Haryana and western Rajasthan water level more than 40 m

bgl is recorded. In the west coast water level is generally less than 5 m and in western parts of Maharashtra State isolated pockets of water level less than 2 m has also been observed. In the east coast i.e. coastal Andhra Pradesh, shallow water level of less than 2 m have been recorded. In eastern states, water level in general ranges from 2-5 m bgl. However south-eastern part of West Bengal recorded water level in the range of 10-20 m bgl and 5-10 m bgl. In south India water level generally varies between 5-10 m bgl, except in isolated pockets where water level more than 10 m bgl has been observed.

Out of total monitored wells 19.56% wells are showing water level less than 2 m bgl, 40.85 % wells are showing water in the depth range of 2-5 m bgl, 23.81% wells are showing water level in the depth range of 5-10 m bgl, 10.45% wells are showing water level in the depth range of 10-20 m bgl, 3.69% wells are showing water level in the depth range of 20-40 m and remaining 1.64 % wells are showing water level more than 40 m bgl.

Fig. 7.6



7.5 Ground Water Level Scenario - January,2012

Perusal of the depth to water level map for the January 2012 indicates that in Sub-Himalayan area, north of river Ganges, Orissa, eastern coast of Andhra Pradesh, Tamil Nadu, north west Gujarat, western coast of Maharastra, entire northeast states generally the depth to water level varies from 2-5 meter below ground level. About 41.67 % wells are showing water in the depth range of 2-5 m bgl. Shallow water level less than 2 m bgl have been observed mainly in coastal area of Andhra Pradesh and Tamil Nadu states. In major parts of the country especially in central India, Madhya Pradesh, Maharastra, Karnataka, northern Andhra Pradesh, depth to water level generally ranges from 5-10 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 North Gujarat, part of Haryana and western Rajasthan water level more than 40 m bgl is recorded. In the west coast water level is generally less 10 m bgl and in western parts of Maharashtra State isolated pockets of water level less than 2 m has also been observed. In the east coast i.e. coastal Andhra Pradesh and coastal Tamil Nadu shallow water level of less than 2 m have been recorded. In north-eastern states, water level in general ranges from 2-5 m bgl. However south-eastern part of West Bengal recorded water level in the range of 10-20 m bgl and 5-10 m bgl.

Fig 7.7

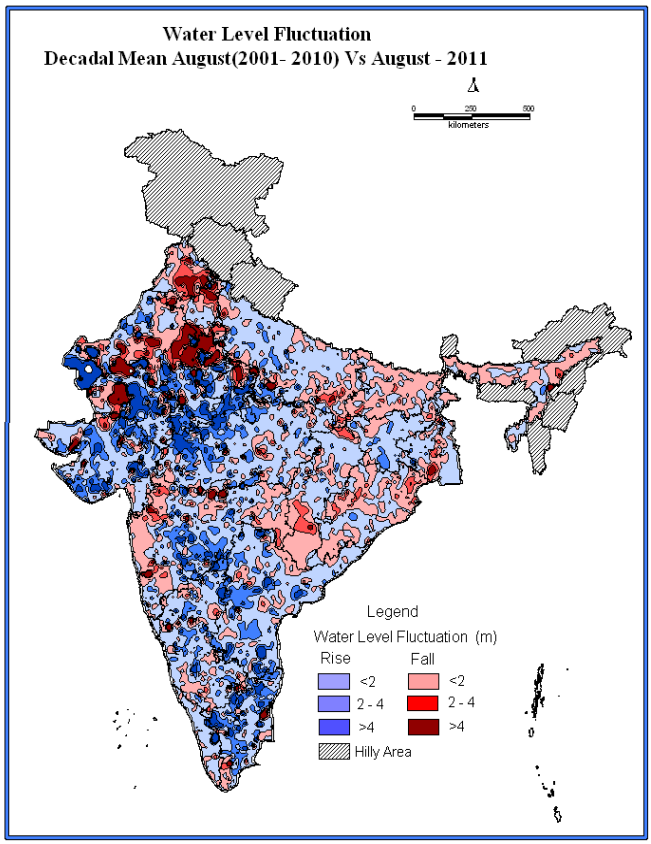


Fig. 7.8

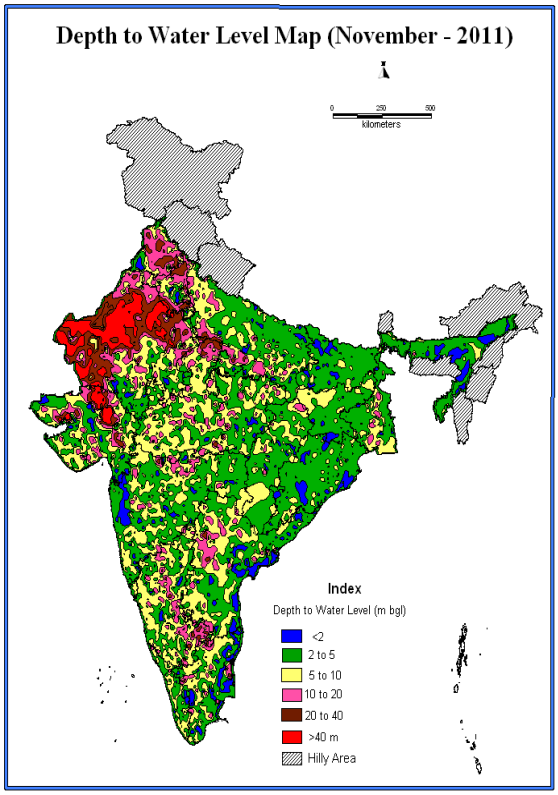
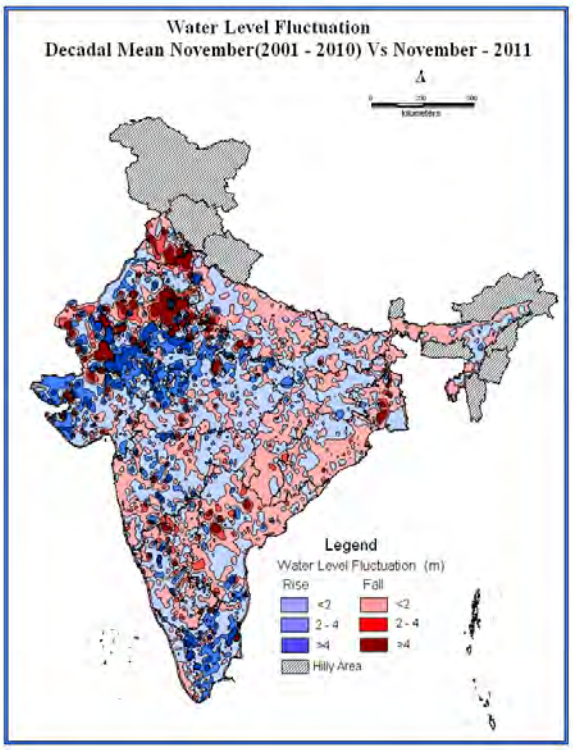

Depth to Water Level Map (November - 2011)
kilometers
Index
Depth to Water Level (m bgl)
<2
2 to 5
5 to 10
10 to 20
20 to 40
>40 m
Hilly Area

Fig 7.9


Water Level Fluctuation
Decadal Mean November(2001 - 2010) Vs November - 2011
Legend
Water Level Fluctuation (m)
Rise
Fall
<2
2 - 4
>4
<2
2 - 4
>4
Hilly Area

8. GEOPHYSICAL STUDIES

The Board has made extensive use of both the surface and the subsurface (well logging) geophysical techniques in the search of groundwater and proper construction of water wells. The findings as a practice are combined with the hydro geological and geomor-phological 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 and of borehole geophysics for well construction. These surveys were undertaken to support, supplement and corroborate the hydrogeological surveys, ground water exploration and short-term water supply investigations as an integral manually and computer software like 'SCHLUM and IPI2WIN etc., The field VES data along with the interpreted results were also entered in GEMS.

These surveys were mostly carried out with an objective of selecting, pinpointing the sites and delineating the depth to potential water bearing zones in 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. Geophysical studies were also conducted in the hilly terrains of Meghalaya by deputing a team of six geophysicists from southern region in this AAP.

The resistivity survey results were analyzed and interpreted for delineating the depth and thickness of ground water potential zones. The interpreted results of the Vertical Electrical Sounding (VES) conducted near the exploratory wells were correlated with the lithologs to establish the resistivity ranges for different formations. The field VES data has been entered in computer software for easy analysis, retrieval, presentation and dissemination and was analysed both

8.1 Central Geophysical Cell

Planning & Programming of Geophysical surveys in CGWB, Finalization of AAP of different Regions for Geophysical investigation and monitoring of progress of geophysical work.

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

8.2. GEOPHYSICAL SURVEYS AT A GLANCE

Central Ground Water Board entrusted with a target of 2000 nos. of VES and need based Resistivity Profiling. Against this target, a total no. of 2136 VES and 15.305 LKm of Resistivity profiling were carried out. Apart from this a total no. of 50 boreholes were logged geophysically with different parameters viz. SP, PR, 16" & 64" Normals and Natural Gamma. Details of Geophysical surveys & geophysical bore hole logging carried out in different regional offices are furnished below in Table 8.1.

During the period under review, in addition to the routine field investigations, many assignments/works were attended by the Geophysical Section. Details of Geophysical surveys & geophysical bore hole logging carried out in different regional offices are furnished below in Table 8.1.

Table 8.1: Geophysical Surveys & Bore Hole Logging During 2011-2012

Region	No. of VES	Resistivity Profiles (line km)	No. of boreholes logged
NWHR, Jammu	60	-	10
NWR, Chandigarh	20	-	7
WR, Jaipur	94	-	2
WCR, Ahmedabad	77	-	3
NCR, Bhopal	78	-	-
NCCR, Raipur	155	-	-
CR, Nagpur	152	-	-
NR, Lucknow	14	-	4
MER, Patna	307	0.305	1
ER, Kolkata	180	1.80	2
NER, Guwahati	51	-	1
SER, Bhubaneswar	111	-	3
SR, Hyderabad	370	7.2	10
SWR, Bangalore	226	6.0	3
SECR, Chennai	168	-	4
KR, Trivendrum	73	-	-
Total	**2136**	**15.305**	**50**

Resistivity Surveys at BSF BOP Octorai, District : Jammu (J&K).

Resistivity Surveys in field area of A.P.

Geophysical study in field area of Bihar

Geophysical Study in Mid Eastern Region, Patna

9. HYDROCHEMICAL STUDIES

Central Ground Water Board has 16 Regional Chemical Laboratories to carry out chemical analysis of major and minor inorganic constituents in water samples. All the Chemical Laboratories are well equipped to carry out Basic analysis & Heavy and Toxic elements determinations using sophisticated instruments like Atomic Absorption Spectrophotometer (AAS), Digital PC based Spectrophotometer, Ion meter, Flame Photometer, pH meter, Conductivity meter, and Nephelometer. The laboratories are also provided with Electronic Monopan and Top loading Balances, Deionizer, Double Distillation Plant, Hot Air Oven, Water Bath, Magnetic Stirrer and Hot Plates. Four Regional Laboratories at Kolkata, Hyderabad, Lucknow and Raipur are also equipped with Gas Chromatograph (GC) to undertake the analysis of organic pollutants (Pesticides) at µg/l level. The Chemical Laboratory at Hyderabad is additionally equipped with Inductive Coupled Plasma Spectrometer (ICPS) for sequential analysis of multiple toxic elements with high accuracy. Total Organic Carbon (TOC) analyzer is installed in the Regional Chemical Laboratory at Kolkata. Some of these laboratories are also equipped with instruments and equipment to carry out biological and bacteriological analysis. The chemical data generated by these laboratories is utilized for monitoring and evaluating the groundwater quality in compliance with National Standards 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 2011-2012, 15620 No. water samples have been analyzed for determination of basic constituents. Analysis of 751 No. water samples including the determination of 85 No. of organic parameters was carried out under specific studies and analysis 3829 No. water samples for involving the determination of Trace elements like As, Cd, Co, Cr, Cu Fe, Mn, Ni, Pb and Zn has been carried out. 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. The details of water samples analyzed by different Chemical Laboratories during 2011-2012 are tabulated (Table 9.1)

Table 9.1: Region-wise Water Samples Analysis during 2011-12

Regions	Basic Analysis		Specific Analysis		Heavy Metals	
	Samples	Constituents	Samples/Organic	Constituents	Samples	Constituents
NWHR*	563	7319	304	362	88	88
NWR*	1491	19383	61(Organic)	732(Organic)	669	3345
WCR	987	15792			242	1936
WR	1335	21285			39	312
NCR	1550	19760			629	2031
NCCR	401	5213			100	700
CR	686	4506			40	400
NR	1434	18642	386 (24 organic)	2098(288organic)	566	1132
ER	775	11625			341	1023
MER	1062	10620			155	155
NER	206	2678			159	159
SER	976	9028			114	684
SR	1349	16923			267	2136
SWR	811	10543			14	28
SECR	1145	14885			225	1800
KR	849	7305			181	1389
UR**(Analysed at NWR Lab)						
NHR**						
SUO Delhi** (Analysed at NWR Lab)						
TOTAL	**15620**	**195507**	**751**	**3192**	**3829**	**17318**

* The samples of UR & SUO Delhi analysed by NWR Lab and samples of NHR analysed at NWHR Lab . ** Regions don't have their own chemical laboratory, samples analyzed at other Regional chemical laboratories.

10. HIGH YIELDING AQUIFERS EXPLORED

During 2011-12, Board under its scientific exploratory drilling programme has explored high yielding aquifers in the various States of the Country based on hydrogeological studies utilizing remote sensing and geophysical techniques. High yielding wells with discharge ranging from 90 litres per minute to 2336 litre per minute have been constructed in the states of Andhra Pradesh, Chhattisgarh, J&K, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa, Rajasthan and Tamilnadu . 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 2011-12 is given Table 10.1.

Table 10.1: High Yielding Wells Constructed During 2011- 2012

Sl. No.	Name of States	Description
1.	Andhra Pradesh	• An Exploratory well drilled at Elguru, Songen Mandal, and Warangal district in highly potential fracture zone yielded a high discharge of 827 Liter per minute. This well can cater to drinking water requirements of a population of about 8300 (@ 60 lpcd for ten hours of pumping a day) in the area. • A well drilled at Nizamabad, Nizamabad district down to a depth of 185m bgl in the granitic terrain in deeper fracture zone yielded a high discharge of 90 Liter per minute. This well can cater to drinking water requirements of a population of about 900 (@ 60 lpcd for ten hours of pumping a day) in the area. • Highly Potential fracture zone yielding 450 Liter per minute have been identified at Exploratory Bore Well, Pogellapalle, Warangal district, Andhra Pradesh. • A well was drilled at Kuntamukkala in the Khondalite terrain of Krishna District down to a depth of 179.40 mbgl yielded a high discharge of 570 Liter per minute. Fractures are encountered at 28m, 49m, and 70m of a total depth of the well 179.40m. This well can cater to drinking water requirements of a population of about 5700 (@ 60 lpcd for ten hours of pumping a day) in the area. • A well drilled at Muchental village, Rangreddy District down to a depth of 106.00 m bgl has yielded high discharge of 356 LPM in the granitic terrain formation. This well can cater to drinking water requirements of a population of about 3500 (@ 60 lpcd for ten hours of pumping a day) in the area
2.	Chhattisgarh	• An Exploratory well drilled at Bilaigarh block, Raipur district down to a depth of 81.55m bgl in fractured sandstone yielded a high discharge of 526 Liter per minute. This well can cater to drinking water requirements of a population of about 5250 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Observation well drilled at Bilaigarh block, Raipur district down to a depth of 92.87 m bgl in factured sandstone yielded a high discharge of 1075 Liter per minute. This well can cater to drinking water requirements of a population of about 10750 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Gunderdehi block, Durg district has yielded high discharge 466 Liter per minute in Cavernous formation. This well can cater a population of about 4650 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Balod block, Durg district has yielded high discharge 592 Liter per minute in Cavernous formation. This well can cater a population of about 5900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Baghbahara block, Mahasamund district has yielded high discharge 356 Liter per minute in Fractured Granite formation. This well can cater a population of about 3500 (@ 60 lpcd for ten hours of pumping a day) in the area.

Sl. No.	Name of States	Description
		• An Observation well drilled at Baghbahara block, Mahasamund district has yielded high discharge 356 Liter per minute in Fractured Granite formation. This well can cater a population of about 3500 (@ 60 lpcd for ten hours of pumping a day) in the area. • A well drilled at Kotiyadih village, Kasdol block, Raipur district has yielded high discharge 210 Liter per minute in shale formation. This well can cater a population of about 2100 (@ 60 lpcd for ten hours of pumping a day) in the area. • A piezometer drilled at Dondi-Lohara block of Durg District has yielded high discharge of 240 liter per minute in the Cavernous limestone/shale formation. • An exploratory well drilled at Kasdol block of Raipur District has yielded high discharge of 190 liter per minute in Cavernous limestone formation. This well can cater to drinking water requirements of a population of about 1900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An observation well drilled at Kasdol block of Raipur District has yielded high discharge of 210 liter per minute in Cavernous limestone formation. This well can cater to drinking water requirements of a population of about 2100 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Baloda block of Raipur District down to a depth of 152.0m bgl has yielded high discharge of 300 liter per minute in Cavernous limestone formation. This well can cater to drinking water requirements of a population of about 3000 (@ 60 lpcd for ten hours of pumping a day) in the area.
3.	Gujarat	• One well was drilled at Aderan (Tarsang), Danta Taluka; District Banaskantha yielded a high discharge of 210 Liter per minute. This well can cater to drinking water requirements of a population of about 2100 (@ 60 lpcd for ten hours of pumping a day) in the area. • A well drilled at in hard rock area of Danta block, Banaskantha District down to a depth of 92.90m bgl has yielded high discharge of 900 LPM in Granite (fractured) and intrusive of pink granite and quartzite formation. This well can cater to drinking water requirements of a population of about 9000 (@ 60 lpcd for ten hours of pumping a day) in the area.
4.	Jammu & Kashmir	• An Exploratory well drilled at Inayatpur Transit camp, Rajauri district was tested with air compressor as yielded a high discharge of 1080 Liter per minute in the Murree formation. This well can cater to drinking water requirements of a population of about 10800 (@ 60 lpcd for ten hours of pumping a day) in the area.
5.	Karnataka	• An Exploratory well drilled at Chandapur in Chincholi taluk of Gulbarga district down to a depth of 136.5m bgl yielded a high discharge of 480 Liter per minute. This well can cater to drinking water requirements of a population of about 4800 (@ 60 lpcd for ten hours of pumping a day) in the area. • An observation well drilled at Chandapur in Chincholi taluk of Gulbarga district down to a depth of 136.5m bgl yielded a high discharge of 360 Liter per minute. This well can cater to drinking water requirements of a population of about 3600 (@ 60 lpcd for ten hours of pumping a day) in the area. • A piezometer drilled to a depth of 162.5 m at IISc campus, Bangalore urban district has yielded 240 Liter per minute. • An observation well drilled at Yellodu site, Gudibanda taluk, Chikballapur district down to a depth of 94.5m bgl has yielded a high discharge 1860 Liter per minute. Potential water bearing zones are encountered between 60 and 94.5m in granite formation. The result is unusual in nature for hard rock terrain. This well when used for public water supply can cater a population of about 20,000 in this drought prone district.

Sl. No.	Name of States	Description
5.	Karnataka	• An Observation well constructed to a depth of 271.80mbgl at Chandapur in Gulburga district yielded a high discharge of 293 Liter per minute. This well can cater to drinking water requirements of a population of about 2900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well constructed to a depth of 332mbgl at Tirumeni in Chikkaballapur district has yielded 840 LPM of drilling discharge. This well when used for public water supply can cater a population of about 10,000 in this drought district. • An Exploratory well constructed to a depth of 153.80 mbgl at Puttanapura in Gundlupet taluk, Chamarajanagar district yielded a high discharge 1200 Liter per minute. This well can cater to drinking water requirements of a population of about 12000 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Erasavadi EW at Chamarajanagar taluk at Chamarajanagar district has yielded a high discharge of 720 LPM . This is one of the water scarcity village of the district. The total depth drilled was 101.65 m bgl with a casing of 22.00 m and swl of 3.65 m bgl. This well can cater to drinking water requirements of a population of about 7200 (@ 60 lpcd for ten hours of pumping a day) in the area.
6.	Kerala	• An Exploratory well drilled at Adoor, Pathanamthitta district down to a depth of 200m bgl, encountered fracture at 48 m and yielded a high discharge of 360 Liter per minute. The formation encountered is khondalite intruded by Charnockite. This well can cater to drinking water requirements of a population of about 3600 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Observation well drilled at Adoor, Pathanamthitta district down to a depth of 177m bgl, encountered fractures at 36, 90 & 155 m and yielded a high discharge of 600 Liter per minute. The formation encountered is khondalite intruded by Charnockite. This well can cater to drinking water requirements of a population of about 6000 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Ranni, Pathanamthitta district down to a depth of 200m bgl, encountered fractures at 23 & 25 m which yielded a high discharge of 300 Liter per minute. The formation encountered is Pyroxena Granulite. This well can cater to drinking water requirements of a population of about 3000 (@ 60 lpcd for ten hours of pumping a day) in the area. • One EW drilled at Vellikulangara, Thrissur district with depth 101m bgl, fracture encountered at 81-82 m and high discharge of 840 Liter per minute. The formation encountered is Charnockite. This well can cater to drinking water requirements of a population of about 8400 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Athirampally, Thrissur district down to a depth of 56.00 m bgl, fracture encountered in the depth range 27- 56 m has yielded high discharge of 984 LPM in Charnockite and Granite formation. This well can cater to drinking water requirements of a population of about 9800 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Kondadu, Kottayam district down to a depth of 150.00 m bgl, fracture encountered in the depth range 38- 149 m has yielded high discharge of 480 LPM in Charnockite formation. This well can cater to drinking water requirements of a population of about 4800 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Vazhachal, Thrissur district down to a depth of 101.00 m bgl, fracture encountered in the depth range 20- 43 m has yielded high discharge of 413 LPM in Granite gneiss formation. This well can cater to drinking water requirements of a population of about 4100 (@ 60 lpcd for ten hours of pumping a day) in the area.

Sl. No.	Name of States	Description
6.	Kerala	• An exploratory well drilled at Sanskrit University, Kalady, Ernakulam district down to a depth of 101.00 m bgl, fracture encountered in the depth range 63-64m has yielded high discharge of 540 LPM in Charnockite formation. This well can cater to drinking water requirements of a population of about 5400 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Kondadu, Kottayam district down to a depth of 118.00 m bgl, fracture encountered in the depth range 116-118m has yielded high discharge of 720 LPM in Charnockite formation. This well can cater to drinking water requirements of a population of about 7200 (@ 60 lpcd for ten hours of pumping a day) in the area.
7.	Maharashtra	• An Exploratory well drilled at Chorwad village falling in the Raver taluka of Jalgaon district down to a depth of 209m bgl in basaltic terrain yielded a high discharge of 190 Liter per minute. This well can cater to drinking water requirements of a population of about 1900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Parbhani taluka, Parbhani district down to a depth of 162.10m bgl in fractured basalt yielded a high discharge of 465 Liter per minute. This well can cater to drinking water requirements of a population of about 4650 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Raver taluka, Jalgaon district down to a depth of 145m bgl in fractured basalt yielded a high discharge of 360Liter per minute. This well can cater to drinking water requirements of a population of about 3600 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Chopda taluka, Jalgaon district down to a depth of 203m bgl in fractured Massive Basalt yielded a high discharge of 266 Liter per minute. This well can cater to drinking water requirements of a population of about 2700 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Chopda Taluka, Jalgaon District down to a depth of 98.00m bgl in Fractured Basalt formation yielded a high discharge of 590 Liter per minute. The Static Water Level is 16.28 mbgl. This well can cater to drinking water requirements of a population of about 5900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Chopda taluka, Jalgaon district down to a depth of 212m bgl in fractured Basalt yielded a high discharge of 266 Liter per minute. This well can cater to drinking water requirements of a population of about 2700 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Wai taluka, Satara district down to a depth of 200m bgl in fractured Basalt yielded a high discharge of 180 Liter per minute. This well can cater to drinking water requirements of a population of about 1800 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Wai Taluka, Satara district down to a depth of 129.40m bgl in Fractured Basalt formation yielded a high discharge of 180 Liter per minute. The Static Water Level is 1.60 mbgl. This well can cater to drinking water requirements of a population of about 1800 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Chopda Taluka, Jalgaon District down to a depth of 195.00m bgl in Fractured Basalt formation yielded a high discharge of 590 Liter per minute. The Static Water Level is 19.65 mbgl. This well can cater to drinking water requirements of a population of about 5900 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Kondhavali, Satara District down to a depth of 200.00 m bgl has yielded high discharge of 180 LPM in Fractured Vesicular Basalt formation. This well can cater to drinking water requirements of a population of about 3300 (@ 60 lpcd for ten hours of pumping a day) in the area.

Sl. No.	Name of States	Description
8.	Madhya Pradesh	• An Exploratory well drilled at water scarcity Sihora site in Rahatgarh block of Sagar district down to a depth of 200m bgl yielded a high discharge of 240 Liter per minute. This well can cater to drinking water requirements of a population of about 2400 (@ 60 lpcd for ten hours of pumping a day) in the area.
9.	Orissa	• An Exploratory well drilled at Birmaharajpur block, Sonepur District down to a depth of 203mbgl in Quartzite/Charnockite formation yielded a high discharge of 261 Liter per minute. This well can cater to drinking water requirements of a population of about 2600 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Observation well constructed to a depth of 172.30mbgl at Swampatna block, Keonjhar district in Granite formation yielded a high discharge of 180 Liter per minute. This well can cater to drinking water requirements of a population of about 1800 (@ 60 lpcd for ten hours of pumping a day) in the area. • An exploratory well drilled at Birmaharajpur block Sonepur District down to a depth of 336.5m bgl has yielded high discharge of 330 LPM in Charnockite formation. This well can cater to drinking water requirements of a population of about 3300 (@ 60 lpcd for ten hours of pumping a day) in the area. • An observation well drilled at Dungripalli blockSonepur district down to a depth of 60 m bgl has yielded high discharge of 372 LPM in Granite formation. This well can cater to drinking water requirements of a population of about 3700 (@ 60 lpcd for ten hours of pumping a day) in the area.
10.	Rajsthan	• An Exploratory well drilled at Bastua block Balesar of Jodhpur district down to a depth of 111.60m bgl in Jodhpur sandstone formation yielded a high discharge of 1350 Liter per minute. The Static Water Level of exploratory well is 40.90m BAL. This well can cater to drinking water requirements of a population of about 13500 (@ 60 lpcd for ten hours of pumping a day) in the area. • Piezometer has been constructed at Charanwali,Block: Kolayat, Distt.Bikaner. High discharge of 1200 lpm has been measured during the prelilminary yield test. The salient details of the piezometer constructed are viz. depth drilled 202 mbgl., depth constructed 139.00 mbgl, Static water level 6.35 mbgl under confined condition, aquifer Tertiary Sandstone, quality is brackish (EC:5100 micromhos/cm at 25^{o}C). • Piezometer has been constructed at Nachana,Block: Nachana, Distt. Jaisalmer. High discharge of 800 lpm has been measured during the prelilminary yield test. The salient details of the piezometer constructed are viz. depth drilled 202 mbgl., depth constructed 115.00 mbgl, Static water level 1.00 mbgl under confined condition, aquifer Tertiary Sandstone, quality is brackish (EC:2300 µS/cm at 25^{o}C). • An exploratory well has been constructed at Bujunda, District Chittorgarh. High discharge of 300 lpm has been measured during the preliminary yield test. This well can cater to drinking water requirements of a population of about 3000 (@ 60 lpcd for ten hours of pumping a day) in the area.

Sl. No.	Name of States	Description
11.	Tamilnadu	• An Exploratory well drilled at Paradur site, Keerapalayam block, and Cuddalore district in Cuddalore sandstone formation yielded a high discharge of 1800 Liter per minute at the time of PYT. The Static Water Level is 36.90 mbgl, drawdown after 100 minutes of PYT - 9.50m, electrical conductivity-954 micromhos/cm at 25^{o} C. This well can cater to drinking water requirements of a population of about 18000 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well constructed to a depth of 153.50m bgl at Bommalapura in Gundlupet taluk of Chamarajanagar district yielded a high discharge of 230 Liter per minute. This well can cater to drinking water requirements of a population of about 2300 (@ 60 lpcd for ten hours of pumping a day) in the area. • An Exploratory well drilled at Paradur site, Keerapalayam block, and Cuddalore district down to a depth of 252m bgl in Cuddalore sandstone formation yielded a high discharge of 2336 Liter per minute. The Static Water Level is 27.05 mbgl, drawdown after 100 minutes of PYT 0.44m. This well can cater to drinking water requirements of a population of about 23000 (@ 60 lpcd for ten hours of pumping a day) in the area.

High yielding Exploratory well at Erasavadi, Chamarajanagar district

High yielding well at Karra, Khunti district (MER, Patna)

Pumping test(EW) at Karra, Khunti district(MER,Patna)

11. HYDROLOGY PROJECT II

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

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

(a) Strengthening the capacity of hydrology departments to develop and sustain the use of the HIS for hydrological designs and decision tools thus creating enabling environment for improved integrated water resources planning and management;

(b) Improving the capabilities of implementing agencies at state/central level in using HIS for efficient water resource planning and management in reducing vulnerability to droughts and thereby meeting the country's poverty reduction objectives;

(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.

CGWB is participating agency in HP-II and has a revised cost provision of Rs 61.51 Crore and project has duration of 6 years staring from May 2006 to 2012. The Budget provision for the year 2011-12 is Rs 13.30 Crore and revised provision is 10.31 Crore. The expenditure incurred on the project till March 2012 in the FY 2011-12 is Rs 4.25 Crore.

H-P-II has two major components i.e. Horizontal Expansion in three new States covering Goa, Himachal Pradesh and Punjab and Vertical Extension in the 9HP-I peninsular States. Under Horizontal Expansion, HP-I type of activities and facilities will be extended to new states, however, under Vertical Extension special knowledge enhancement type of activities such as Decision Support System and Purpose Driven Studies has been taken up. In this year of the project, six domain specific training has been imparted, six Awareness raising programme held and 47 Piezometers in Punjab have been constructed. Under Purpose Driven Study on "Specific Yield Study in Chennai Sub-urban Area", interim report submitted. For procurement of the hardware (7 Servers & 59 Workstations) for upgradation of data centre, supply order has been issued and for procurement of All India Village boundaries GIS data set, advance payment to Survey of India has been made. For hiring of consultancy services for "Development of e-GEMS", Technical Evaluation Report submitted to PCS for approval. For procurement of DWLR with Telemetry monitoring for Delhi PDS, World Bank approval received for re-processing the case afresh and Bid document submitted to PCS. Procurement of GW modeling software is under advanced stage of processing. Sponsoring to six international training courses have been made, which are attended by ten officers of CGWB.

During this year, the Pilot Project on Aquifer Mapping under is undertaken in six different hydrogeological terrains of the country covering states of Bihar, Rajasthan, Tamil Nadu, Karnataka and Maharashtra under Purpose Driven Study component. Under this project, compilation of data, identification of data gaps and establishment of monitoring wells have been completed. The Revised Detailed Project Proposal submitted to the PCS. Contract agreement for engaging NGRI as consultant for Aquifer Characterisation using advance Geophysical Techniques submitted to PCS for approval.

12. STUDIES ON ARTIFICIAL RECHARGE TO GROUND WATER

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

During 2011-12, 109 demonstrative recharge projects on "Artificial Recharge to Ground Water and Rain Water Harvesting" have been approved. The approved cost of 109 projects is Rs. 51.24 crores for implementation by the departments of states under overall technical guidance of Central Ground Water Board for construction of 586 recharge structures.

The details of demonstrative projects on artificial recharge to Groundwater and Rain Water Harvesting approved and being implemented in the States of Madhya Pradesh, Andhra Pradesh, Karnataka, Jharkhand, Maharashtra, Gujarat, Uttar Pradesh & Chandigarh during XI Plan are given in table 12.1. On completion of civil works of recharge facility, impact assessment studies will be taken up to demonstrate the efficacy of artificial recharge and rain water harvesting in above mentioned sites selected on scientific basis in different hydrogeological situations. Successful examples would be replicated by the States in similar set ups in future.

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

1. The government has sanctioned a State sector scheme of "Artificial Recharge to Ground Water through Dug Wells" amounting to Rs.1798.71 Crore for implementation in seven states namely Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu having majority of over exploited, critical and semi critical blocks of ground water development. 1180 Over- exploited, Critical and Semi-Critical blocks in 149 districts affected by declining ground water levels, water quality problems were taken for implementation of dug well recharge by farmers.

2. The scheme envisages installation of 4.45 million ground water recharge structures in the existing Irrigation wells of the farmers to facilitate large scale ground water recharge in the area, of which 2.72 million Are owned by the small and marginal farmers and 1.73 million owned by other farmers. Average cost of recharge per well is Rs.4000, varying from Rs.3600 in Maharashtra to Rs.5700 in Andhra Pradesh. In order to encourage farmers in dug well recharge scheme, provision has been made for giving subsidy to the beneficiary farmers to the extent of 100% for marginal and small category farmers and 50% for farmers of other category in the scheme.

3. Recharge to ground water with dug well recharge approach in scheme is expected to improve availability Of ground water and water quality. Sustainability of drinking water supplies and socio-economic conditions of the population of the affected areas. Outcomes of the scheme would be evaluated through impact assessment studies by an independent agency and dissemination of information to public.

4. In order to implement the scheme, State nodal department was identified in each participating States having role of identification of beneficiaries, preparation of list of beneficiaries with information of their agricultural land, dug well and bank accounts and capacity building & awareness of beneficiaries for construction of dug well recharge facility. Further District Level Implementation & Monitoring Committee (DLMIC) was responsible for implementation of dug well recharge scheme in each district.

5. An amount of Rs. 1499.27 Crores has been released by the Ministry of Finance (MoF) to NABARD (programme partner) for releasing subsidy to beneficiary farmers and funds to state for awareness activities. The Ministry of Water Resources (MoWR) is the Nodal Ministry for the purpose of monitoring the progress of the scheme at national level and to take measures for experience sharing among all stakeholders, knowledge transfer and awareness.

6. As on 31 March, 2012, Rs.277.762 Crore has been utilized as subsidy to the beneficiaries (Rs.260.52 Cr) and Information, Education and communication (IEC)/ capacity building activities (Rs.17.0 Cr) and awareness by Ministry (Rs.0.242 Cr).

The statement showing the details of funds released in the scheme as on 31st March, 2012 given in table 12.2.

Table 12.1: Demonstrative Artificial Recharge Projects sanctioned under CSS "Ground Water Management and Regulation" XI Plan As on 31.03.2012

Sl. No.	State	Demonstrative Recharge Project	Number of Structures	Approved cost (in Lakhs)	Funds released (in Lakhs)	Remarks
During 2008-09 Total 8 projects						
1.	Kerala	Artificial Recharge to Groundwater using Roof Top Rainwater in the premises of government upper primary school, Kolathur II, Bedadka Gram Panchayat of Kasargod district.	1	8.750	2.625	Released as first installment on 31.03.2009.
2.		Artificial Recharge Scheme Manjeshwar Govind Pai Memorial College campus Kasargod.	83	24.500	7.350	
3.		Desiltation of Pond at Pallipara / Nileshwar at Kayyur Cheemeni, Kasargod district	1	1.450	0.435	
4.		Rainwater harvesting to recharge groundwater at Govt. college, Chittoor, Palakkad district	1	4.350	1.305	
5.	Punjab	Pilot project on Artificial Recharge to augment declining ground water resources of Moga district.	62	179.453	53.836	
6.	Arunachal Pradesh	Roof Top Rainwater Harvesting in Arunachal Pradesh	36	259.668	77.900	
7.	West Bengal	Study of Artificial Recharge in the blocks of Nalhati I and Murarai I of Birubhim district.	30	111.091	33.327	
8.	Tamil Nadu	Artificial Recharge to Groundwater in Thalavasal block of Salem district	27	111.000	111.000	Released balance
During 2009-10 Total 6 projects						
9.	Tamil Nadu	Rainwater Harvesting Arrangements in the premise of the National Institute of Technical Teachers Training and Research, Taramani, Chennai	1	40.000	28.000	Released first installment on 26.10.2009
10.		Artificial Rechargeb to Groundwater in Karuvatur watershed Namakkal district .	30	275.350	192.745	
11.		Artificial Ground Water Recharge through road side and open space rainwater harvesting structures in Coimbatore city .	215	100.000	70.000	
12.	Andhra Pradesh	Construction of Artificial Recharge structures in Chittoor district.	29	130.020	91.014	
13.	Karnataka	Demonstrative Artificial Recharge Project in Malur Taluk, Kolar district.	52	109.158	76.410	
14.	Uttar Pradesh	Artificial Recharge to Groundwater in Sataon block of Rae Bareli district.	28	720.063	504.440	Released as 1st installment on 30.03.10
		Total	**596**	**2074.853**	**1250.387**	

During 2010-11 Total 6 projects						
Sl. No	**State**	**Number of structures**	**Demonstrative Recharge Project**	**Approved/ Cost Rs. (in Crores)**	**Released Cost Rs. (in Crores)**	**Remarks**
1	Madhya Pradesh	28	Artificial recharge to Groundwater in **Ratlam District**, Madhya Pradesh.	3.02680	2.11876	Released as 1st installt. Vide Ministry letter dated 11.05.2010
2		12	Artificial recharge to Groundwater in **Shajapur District**, Madhya Pradesh.	1.29180	0.90426	
3	Karnataka	56	Artificial recharge to Groundwater in **Bangalore Rural District**, Karnataka.	0.96585	0.67610	Released as 1st installt. MoWR. dt 20.10.2010
4	Andhra Pradesh	33	Rainwater harvesting in premises of **Kakatiya University**, Warangal dist. Andhra Pradesh	0.75180	0.52640	Released as 1st installt. MoWR. Lt dated 03.11.2010
5	Uttar Pradesh	116	Artificial recharge structures in Indira Nagar & Gomti Nagar regions of **Lucknow city**	10.6064	7.2850	Released as 1st installt. MoWR. Lt dated 12.11.2010
6	Chandigarh	54	Artificial recharge structures in the premises of **Panjab University**, Chandigarh.	7.7603	5.43221	Released as 1st installt. MoWR. Lt dated 15.11.2010
7	Gujarat	96	Artificial recharge structures in Watrak (Mohar) watershed (Sabarmati Basin) area of Kheda & Sabarkanth district, Gujarat	1.6671	1.16697	Released as 1st installt. MoWR. Lt dated 9-12-2010.
8	Gujarat	20	Artificial recharge structures in Saraswati River Bed at Madhu Pavdi check dam, Siddhpur, district Patan, Gujarat	1.4953	1.04671	
9	Maharashtra	49	Artificial recharge structures in Raj Bhawan, Nagpur	0.1515	0.10605	
10	Jharkhand	15	Artificial recharge structures in Ranchi Urban Area, jharkhand	0.1649	0.11543	
	Total	**479**		**27.88175**	**219.37789**	

Check Dam with Bund protection work at Govt College, Manjeswar, Kasargod

Inspection by Technical Committee of at Nala Deepening on Shirpur Pattern at Pala, Warud Taluka, Amravati District.

Sl. No	State	Number of structures	Demonstrative Recharge Project	Approved/ Cost Rs. (in Crores)	Released Cost Rs. (in Crores)	Remarks
1	Andhra Pradesh	1	Rainwater harvesting in premises of Jawarlal Nehru Technology University, Hyderabad	0.39900	0.27930	
2		54	Artificial Recharge Project in Medak District	3.08940	2.16258	
3		2	AR structure at Bhujal Bhavan CGWB Hyderabad	0.19370	0.1085	
4	Arunachal Pradesh	14	Demonstrative Project on AR & RTRWH in West Siang district	0.67830	0.4748	
5		14	Demonstrative Project on AR & RTRWH in East Kameng district	0.67830	0.4748	
6		8	Demonstrative Project on AR & RTRWH in Tawang district	0.3876	0.217	
7		8	Demonstrative Project on AR & RTRWH-1 in Lower Dibang Valley district	0.5902	0.3305	
8	Bihar	6	Artificial Recharge to Ground Water by Subsurface Dam on different Nalas & River	0.54870	0.38410	
9		5	Artificial Recharge to Ground Water by Subsurface Dam on different Nalas & River	0.41140	0.28800	
10	Chhattisgarh	6	Ground Water Recharge in Sanaud Nala, Mili Water Shed, Block Gurur district Durg	1.6727	0.9367	
11		28	Artificial Recharge to Ground Water in Patilah Nala, Water Shed, Block Bilha district Bilaspur	1.0153	0.5673	
12	Delhi	10	Artificial Recharge to Groundwater in the Office, Mess and adjacent area in & around CE Office, WAC, Palam, Delhi	0.4344	0.30411	
13	Himachal Pradesh	1	Check Dam on Mandir Nala at Jwalamukhi	0.12140	0.08498	
14		1	Check Dam on Kona Nala at Duhuk	0.10024	0.07017	
15	Himachal Pradesh	1	Check Dam on Jhajhjhar Nala at Duhuk	0.16233	0.11360	
16		3	Check Dam on Thera Nala at Toru	0.16490	0.11540	
17		1	Artificial Recharge through Check Dam at Piyungal Nala near Sakoh	0.44500	0.31150	
18		1	Artificial Recharge to Groundwater by sub-surface dyke cum Check dam across Pung Khad for LWSS Bhaleth	0.29330	0.20530	
19		1	Artificial Recharge through Check Dam on Kohi Nala upstream of Jansoh Scheme, Nadaun Tehsil	0.09200	0.06440	
20		1	Artificial Recharge through Check Dam on Haretta Khad near LWSS Ghalian, Nadaun Tehsil	0.16350	0.11440	
21		1	Ground Water Recharge through Borewells in Dhamandri in Tehsil Una	0.25260	0.17680	
22		1	Artifical Recharge Through Check dam in Gasoti Khad near Village Khedroo Teh & Dist Hamirpur	0.07410	0.04150	
23		1	Artifical Recharge Through Check dam in Gundwin Khad Dist Hamirpur	0.03490	0.01960	
24		2	Augmentation of water resources through Rain Water Harvesting at Nauni	0.33780	0.18920	
25		5	Augmentation of water resources through Rain Water Harvesting at Neri	0.25810	0.14450	
26	Jammu & Kashmir	1	Artificial Recharge to Groundwater at Phangeri, Tehsil Hiranagar	0.30830	0.21581	
27		1	Artificial Recharge to Groundwater at Dabbie, Tehsil Hiranagar	0.24700	0.17290	

28		1	Artificial Recharge to Groundwater at Marchola, Tehsil Sunderbani	0.22580	0.15806	
29		1	Construction of RCC check Dam at Chunonta, District Jammu	0.40000	0.22400	
30		1	Construction of check Dam For Artificial Recharge of Ground Water At Kiral (Ghar-Samna-Banj), District Udhampur. J&K	0.25360	0.142	
31	Jharkhand	54	Artificial Recharge & Rain Water Harvesting Structures With in the Compounds of Indian School of Mines, Dhanbad	1.74856	1.224	
32		18	Rainwater Harvesting & Artificial Recharge to Groundwater in the campus of University of Agricultural Science	0.82650	0.57855	
33		36	Demostrative Artificial Recharge Project in Panmangore Sub Watershed, Bantwal	1.11510	0.78063	
34	Karnataka	4	Rain Water harvesting & Artificial Recharge to Ground Water for Bijapur Campus of University of Agriculture Sciences, Dharwar	0.7323	0.41	
35		26	Project on Artificial Recharge in Arthal Water Shed, Athni Block Belgavi District.	1.1496	0.6437	
36		2	Roof Top Rain Water Harvesting at Jawahar Navodaya Vidyalaya	0.07630	0.05340	
37	Kerala	2	Roof Top Rain Water Harvesting at Kendriya Vidyalaya No. 2, Vidyanagar	0.05850	0.04090	
38		1	Artificial Recharge Project in Nambirithi Watershed in Palakkad District	0.41600	0.29124	
39	Madhya Pradesh	3	Artificial Groundwater recharge at Jetpora nicrowatershed no5, Block Dhar district Dhar.	2.9098	1.6295	
40		8	Artificial recharge and water conservation of Narwar micro watershed, Kshipra River, Ujjain Block, District Ujjain	1.3807	0.7732	
41	Nagaland	30	Artificial Recharge to Ground Water through Rainwater Harvesting from Roof Top in & around Dimapur town (13.06.2011-One Year)	1.13060	0.79140	
42		34	Artificial Recharge to Ground Water through Rainwater Harvesting from Roof Top in & around Dimapur town	1.11080	0.62200	
43		1	Artificial Recharge Scheme for Ganada Watershed (Part), Korei block	0.11270	0.07889	
44		1	Artificial Recharge Scheme for Himtira Watershed (Part), Kishornagar block	0.13150	0.09207	
45		7	Artificial Recharge Scheme for LigarkatWatershed (Part), Banerpal block	0.16494	0.11545	
46		11	Artificial Recharge Scheme for Uppalairai Desibatia Watershed (Part), Gosani block	0.62020	0.43415	
47		5	Artificial Recharge Scheme for Burudi Watershed (Part), Ganjam block (26.04.2011- One Year)	0.55130	0.38591	
48	Odisha	12	Artificial Recharge Scheme for Kasia Nallah Watershed , Joda block	0.27900	0.19530	
49		9	Artificial Recharge Scheme for Bolagarh Nallah Watershed , Bolagarh block	1.82130	1.27490	
50		12	Artificial Recharge Scheme for Karmeli mini Watershed , Saintala block	0.23480	0.16436	
51		1	Roof Top Rain Water Harvesting in the DRDA Office Building in Collectorate Campus	0.05120	0.03580	
52		1	Roof Top Rain Water Harvesting in the Govt. Women's Polytechnic Hostel Building, Berhampur, Rangeilunda block	0.05683	0.03970	

53		1	Roof Top Rain Water Harvesting at WQL & CC)Level - II) Building, Takatpur, Baripada block	0.04148	0.02900	
54		1	Roof Top Rain Water Harvesting in the premises of the Office Building of Hydrogeologist, GWS & I Division at Danipali, Dhankauda block	0.05950	0.04165	
55		2	Artificial Recharge Scheme for Pandripatha Nala Micro Watershed, Jharsuguda block	0.16700	0.11690	
56		2	Artificial Recharge Scheme for Katikela Nala Micro Watershed, Jharsuguda block	0.35185	0.24630	
57	Punjab	12	Artificial Recharge by Using Canal Water to augment declining GW Resources a Majjupur & Kohali Canal rest House	0.40380	0.28270	
58		12	Artificial Recharge by Using Canal Water to augment declining GW Resources a Bucher & Khalra Canal rest House	0.40500	0.28350	
59	Rajasathan	2	Roof Top Rainwater Harvesting structures at Govt. Mahila Polytechnical Collage	0.11889	0.08332	
60		2	Roof Top Rainwater Harvesting structures at Govt. Polytechnical Collage (Boys)	0.13898	0.09728	
61		2	Roof Top Rainwater Harvesting structures CE, IGNP Office Building	0.08515	0.05960	
62		1	RTRWH Proposal for Govt. Polytechnic College, Churu.	0.0168595	0.0118	
63		1	RTRWH Proposal for Office building of Panchayat Samiti, Churu, District Churu	0.0158391	0.01108	
64		1	RTRWH Proposal for Office building of Zilla Parishad Office, Churu	0.0163991	0.01147	
65		1	RTRWH Proposal for Office building of Krishi Vigyan Kendra. Abusar, Jhunjhunu	0.0174511	0.01221	
66		1	RTRWH Proposal for Office building of G.W.D., Jhunjhunu	0.0102452	0.00717	
67		1	RTRWH Proposal for Office building of C.T.O., Jhunjhunu	0.0102452	0.00717	
68		1	RTRWH Proposal for Office building of C.M.H.O., Jhunjhunu.	0.0107126	0.00749	
69		1	RTRWH Proposal for office Building of Excise Officer. Jhunjhunu	0.0112079	0.00784	
70		1	RTRWH Proposal for Office Building of Govt. Sr. Sec. School, Srimadhopur, District Sikar	0.0450989	0.03156	
71		1	RTRWH Proposal for Office Building of Govt. Sr. Sec. School, Singrawat, District Sikar	0.0272466	0.01907	
72		1	RTRWH Proposal for Office Building of Govt. Sr. Sec. School, Nimera (Khandela), District Sikar	0.0377441	0.02642	
73	Rajasathan	1	RTRWH Proposal for Office Building of Govt. Sr. Sec. School, Dhod, District Sikar	0.0365007	0.02555	
74		1	RTRWH for SDM Office Building ,Khinwasar, District Nagaur	0.0953	0.053368	
75		1	RTRWH for Sub Tehsil building Building ,Sanju District Nagaur	0.0964	0.053984	
76		1	RTRWH for SDM Court Building ,Parbatsar, District Nagaur	0.095	0.0532	
77		1	RTRWH for Panhayat Samiti Building ,Rian Bari, District Nagaur	0.0595	0.03332	
78		1	RTRWH for SDM Court Building Nawa, District Nagaur	0.1058	0.059248	
79		1	RTRWH for GWD Office Building (Jod Beed)District Bikaner	0.1065	0.05964	
80		1	RTRWH for Eastern Part of Govt PG College Dausa Dist Dausa	0.1064	0.059584	

81		1	RTRWH for Building of Govt Vetenary Institute,Bassi Chak tehsil Bassi Dist Jaipur	0.1066	0.059696	
82		1	RTRWH Proposal for Kundanpur School & Community Building P.S. Sangod Kota.	0.0333	0.018648	
83		1	RTRWH Proposal for Sangod Panchyat Samiti Building P.S. Sangod Kota.	0.0333	0.018648	
84		1	RTRWH Proposal for Harish Chandra Sagar Sub Div Sangod, P S Sangod Kota	0.0272	0.015232	
85		1	RTRWH Proposal for Kendriya Vidyalaya Baran	0.0765	0.04284	
86		1	RTRWH Proposal for Navodya Vidyalaya, Atru Dist Baran	0.0753	0.042168	
87		1	RTRWH for Office Building of Govt Polytechniqe College Gandhi Nagar Jaipur	0.0842	0.047152	
88		1	RTRWH for Office Building of Director Dak Lekha Bhavan Institutional Area Jaipur	0.049	0.02744	
89		1	RTRWH for Building of Rajkiya Madhyamik vidyalaya Khejrawas P O sambhar Dist Jaipur	0.1139	0.063784	
90		1	RTRWH for Building of Rajkiya Madhyamik vidyalaya Kalakh P O sambhar Dist Jaipur	0.1144	0.064064	
91		1	RTRWH for Building of Rajkiya Adarsh Uchh Prathamik Village Amarpura Govindpur Dist Jaipur	0.1148	0.064288	
92		1	RTRWH for Building of Rajkiya Uchh Prathamik Village BarbaraGovindpur Dist Jaipur	0.1095	0.06132	
93		1	RTRWH for Building at ShriKalyan Singh Govt Sr Sec.SchoolShahpora Distt Jaipur	0.1894	0.106064	
94		1	RTRWH for Building at Office of the jawai Canal Division Distt Pali	0.105	0.0588	
95		1	RTRWH for Inspection Bunglow Takhatgarh,Sumerpure Distt Pali	0.0956	0.053536	
96		1	RTRWH for Building at Office of the W R Subdivision Sheoganj Distt Sirohi	0.0934	0.052304	
97		1	RTRWH for Building Sojat City Dist Pali	0.0945	0.05292	
98		1	RTRWH for Commercial Tax Building & SDO construction Building Kishengarh Dist Ajmer	0.0886	0.049616	
99	Rajasathan	1	RTRWH- for Building at Office of the W R Division Ajmer	0.0633	0.035448	
100		1	RTRWH for Building at Residences of the W R Division Ajmer	0.0591	0.033096	
101		1	RTRWH for PTS Building Kishengarh Dist Ajmer	0.1079	0.060424	
102		1	RTRWH for PTS Hostel Building Kishengarh Dist Ajmer	0.1126	0.063056	
103		1	RTRWH for ITI Building Kishengarh Dist Ajmer	0.069	0.03864	
104		1	RTRWH for PWD Dak Bunglow Kishengarh Dist Ajmer	0.068	0.03808	
105		1	RTRWH for ACXM Court Building Kuchaman ditrict Nagaur	0.1012	0.056672	
106		1	RTRWH Proposal for Govt Middle School Gajanpura dist Baran	0.066	0.03696	
107		1	Rain water Harvesting proposal of university of Rajasthan	0.5327	0.298312	
108	Uttar Pradesh	32	Artificial Recharge to Ground Water & Water Conservation in Mauranipur Block, District Jhansi	9.90880	6.93616	
109		13	Artificial Recharge to Ground Water in Sareni & Lalganj Blocks,	5.1465	3.60.255	
	Total	**586**		**51.24**	**33.63**	

Table 12.2: **State wise details of funds released in the scheme as on 31st March, 2012**

Sl. No.	States	Fund released as subsidy to Beneficiaries (Rs. In Crores)	Fund released to State/Min. for IEC activities (Rs. in Crores)	Total fund released as on 31.03.11 (Rs. in Crores)	Dug well recharge structures constructed as on 31.03.11
1.	Andhra Pradesh	0.00	0.00	0.000	0
2.	Gujarat	47.55	3.25	50.80	8974
3.	Karnataka	26.06	2.00	28.06	11007
4.	Madhya Pradesh	39.55	2.00	41.55	24682
5.	Maharashtra	14.04	2.00	16.04	38498
6.	Rajasthan	29.73	2.00	31.73	4619
7.	Tamil Nadu	103.57	5.75	109.32	21496
	Ministry		0.242	0	0
	Total (in Rs. Crores)	**260.52**	**17.242**	**277.762**	**109276**

Check dam constructed under demonstrative Artificial Recharge Project in Bareili district U.P.

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 13th 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.

PUBLIC NOTICES:

During this period, the following two Public Notices were issued:

(i) Public Notice No. 1/2011 (issued on 13.8.2011): Sub: Declaration of "Gurgaon District' as "Notified Area" for regulation of ground water abstraction development.

(ii) Public Notice No. 2/2011(issued on 13.8.2011): Sub: Declaration of "Notified Area" for regulation of ground water development and management. (39 additional areas were notified in Haryana, Punjab & Rajastha.(Given in table **13.1**)

DIRECTION ISSUED:

Directions were issued to all the Chief Secretaries of the States & the Administrators of the respective Union Territories and for "**Adopting Artificial Recharge to Ground Water /Rain Water Harvesting and for Promotion of other Ground Water Conservation measures in all the Government Buildings"** vide letter dated 6.9.2011.

ACTIVITIES CARRIED OUT UNDER IEC, SCHEME OF MINISTRY OF WATER RESOURCES

i. Second Painting Competition on Water Conservation:

Central Ground Water Authority, Ministry of Water Resources under IEC programme of Ministry of Water Resources organized 2nd National Painting Competition on 21st January, 2012 at New Delhi. Hon'ble Minister of State for Water Resources and Minority Affairs, Shri Vincent H. Pala was the chief guest on the occasion. In all 87 students from 29 States who were the 1st 2nd & 3rd prize winners of State Level Painting Competition participated in the National Level Painting Competition.

The competition was held in three stages – the School Level competition, followed by the State Level competition and finally terminating at the National Level painting competition. The painting competition on the theme "Conserve Water for the Future" was conducted throughout the country by Central Ground Water Board, Ministry of Water Resources, Govt. of India for school children of classes IV, V and VI. In all 23,475 schools and more than 16 lakh students from 29 States and Union Territories participated in the competition. Out of these, 50 students selected by Jury in each State, were invited to participate in the State Level Painting Competition which was organised in the respective States/UTs on 14th November, 2011 on the occasion of the *Bal Divas*. Top three winners of *State Level Painting competition* were invited to participate in the National Level Painting Competition at National Capital Delhi. The theme of National competition this year was **"Role of Children in Water Conservation"**.

In the competition organized 13 students were declared winners. The first prize of Rs One Lakh was won by Ms. **Disha Roy Chowdhury of Silliguri, West Bengal State.** There were also four second prizes of Rs. 50,000 each, eight third prizes of Rs 25,000/- each. All the participating students were awarded Rs. 5000/- each as a consolation prize and certificates.

(ii) Mass Awareness Programme (MAP) & Water Management Training Programme (WMTP)

Under the IEC Scheme of Ministry of Water Resources the following were organized -

A. MASS AWARENESS

Mass awareness campaigns on various aspects of the ground water management, protection and regulation were organized throughout the year. CGWA through the regional offices of CGWB conducted 15 mass awareness programmes on Rain Water Harvesting and Artificial Recharge of ground water throughout the country involving Central/State/ NGO's, VO's, welfare organizations, educational institutions, industries and individuals during 2011-12.

B. TRAINING ON RAIN WATER HARVESTING

A total of 11 training programmes were conducted to train resource persons as a measure of capacity building for designing rain water harvesting structures to augment ground water in different terrains and diverse hydrogeological conditions during 2011-12.

TECHNICAL APPRAISAL OF PROJECT PROPOSAL FOR NOC FOR GROUND WATER WITHDRAWAL

CGWA carried out technical appraisal of Industrial, Mining, Power, Infrastructural development and ground water based proposals based on recommendation of concerned Regional Director of Central Ground Water Board for according ground water clearance.

During the period 173 projects were accorded NOC for ground water withdrawal and 176 projects were issued letter for exemption for ground water withdrawal. In addition 34 projects were accorded renewal of NOC for ground water withdrawal.

Web site of CGWA: The detailed activities and achievements of CGWA have been put on the website of CGWB at http:// cgwb.gov.in/CGWA. The website is updated for Gazette Notifications, Public Notices; directions issued, guidelines of CGWA, status of project proposals for NOC for ground water withdrawal, current events etc.

Table 13.1: **LIST OF AREAS NOTIFIED FOR GROUND WATER REGULATION VIDE PUBLIC NOTICE NO. 2/2011 DATED 13.8.2011**

Sl. No.	LOCATION
1	Entire Gurgaon District
2	Badra block of Bhiwani District
3	Ladwa block of Kurukshetra District
4	Pehowa block of Kurukshetra District
5	Rania block of Sirsa District
6	Tohana block of Fatehabad District
7	Gulha block of Kaithal District
8	Bapoli block of Panipath District
9	Nakodar block of Jalandhar District
10	Shahkot block of Jalandhar District
11	Lohian block of Jalandhar District
12	Pattran block of Patiala District
13	Phagwara block of Kapurthala District
14	Nihalsinghwala block of Moga District
15	Dhuri block of Sangrur District
16	Sunam block of Sangrur District
17	Barnala block of Sangrur District
18	Sherpur block of Sangrur District
19	Malerkotla block of Sangrur District
20	Rajgarh block of Churu District
21	Osian block of Jodhpur District
22	Bhopalgarh block of Jodhpur District
23	Bilara block of Jodhpur District
24	Merta block of Nagaur District
25	Baetu block of Barmer District
26	Sambher block of Jaipur District

27	Govindgarh block of Jaipur District
28	Sanganer block of Jaipur District
29	Bassi block of Jaipur District
30	Amer block of Jaipur District
31	Shahpura block of Jaipur District
32	Mandore block of Jodhpur District
33	Sayala block of Jalore District
34	Sanchore block of Jalore District
35	Nawalgarh block of Jhunjhunu District
36	Udaipurwati block of Jhunjhunu District
37	Jhunjhunu block of Jhunjhunu District
38	Todabhim block of Karauli District
39	Pisangan block of Ajmer District

First prize winner Penting Disha Roy Choudhury , Siliguri, West Bengal

Hon'ble Minister of State for Water Resources, Shri Vincent H. Pala presenting the First Prize of **2nd National Painting Competition, New Delhi (21-01-2012) to** Ms. **Disha Roy Chowdhury, Siliguri, West Bengal.**

14. GROUND WATER MANAGEMENT STUDIES IN DROUGHT PRONE AREA

Ground Water Management Studies were under taken in drought prone area of 33293 sq. km. in Gujarat, Rajasthan, Orissa, Uttar Pradesh, Karnataka and Maharashtra States of the country under. In addition to this, 214 bore holes (110 EW, 39 OW & 65 PZ) by departmental rigs were drilled in drought prone areas of Karnataka, Kerala, Madhya Pradesh, Maharashtra Orissa, Rajasthan and Uttar Pradesh States.

Details of area covered under ground water management studies and status of exploration in drought prone areas are shown in Table 14.1, 14.2 & depicted in Fig 17.1 & 17.2 respectively.

Table 14.1 : Area covered under ground water management studies in drought prone areas (2011-2012)

Sl. No.	Regions/ State	Districts	Achievement Sq.Km.
1.	**WEST CENTRAL REGION** Gujarat	kachchh	3332
		Total	**3332**
2.	**WESTERN REGION** Rajasthan	Naguar	**3642**
		Total	**3642**
3.	**SOUTH EASTERN REGION** Orissa	Boudh	3444
		Total	**3444**
4.	**NOTHERN REGION** Uttar Pradesh	Part of Sagar district, MP & Parts of Lalitpur district, UP	3815
		Parts of Guna district, MP	3484
		Panwari & Charkhari blocks of Mahoba district, UP	1785
		Ramnagar, Karvi & Pahari blocks of Chitrakoot district,up	1763
		Total	**10847**
5.	**SOUTH WESTERN REGION** Karnataka	Dakshina Kannada and Kodagu	3260
		Uttar Kannada	4058
		Total	**7318**
6.	**CENTRAL REGION** **Maharashrra**	Man Basin in parts of Sangli, Satara and Solapur	**4710**
		Total	**4710**
GRAND TOTAL			**33293**

Table 14.2 : Exploratory wells drilled in "drought prone" area (2011-2012)

(By Departmental Rigs)

Sl. No	States	EW	OW	PZ	T
1	Karnataka	18	8	7	33
2	Kerala	14	3	-	17
3	Madhya Pradesh	37	18	27	82
4	Maharashtra	10	3	2	15
5	Orissa	15	6	4	25
6	Rajasthan	5	-	24	29
7	Uttar Pradesh	11	1	1	13
	Total	**110**	**39**	**65**	**214**

15. GROUND WATER MANAGEMENT STUDIES IN TRIBAL AREAS

The Central Ground Water Board, in its 2011-2012 Annual Action Plan gave emphasis to Ground Water Management Studies and exploratory drilling programme in districts falling under tribal areas of the country. An area of 32793 sq. km. was covered in West Bengal, Chhattisgarh, Madhya Pradesh, Karnataka, Tripura, Arunachal Pradesh, Meghalaya and Uttar Pradesh States under tribal areas and 142 bore hole (EW- 88, OW-24, PZ- 30) were drilled in Gujarat, Jharkhand, Maharashtra, Meghalaya, Chhattisgarh, Jharkhand, Karnataka, Maharashtra and West Bengal States under tribal areas of the country to explore the possibility of tapping potential aquifers.

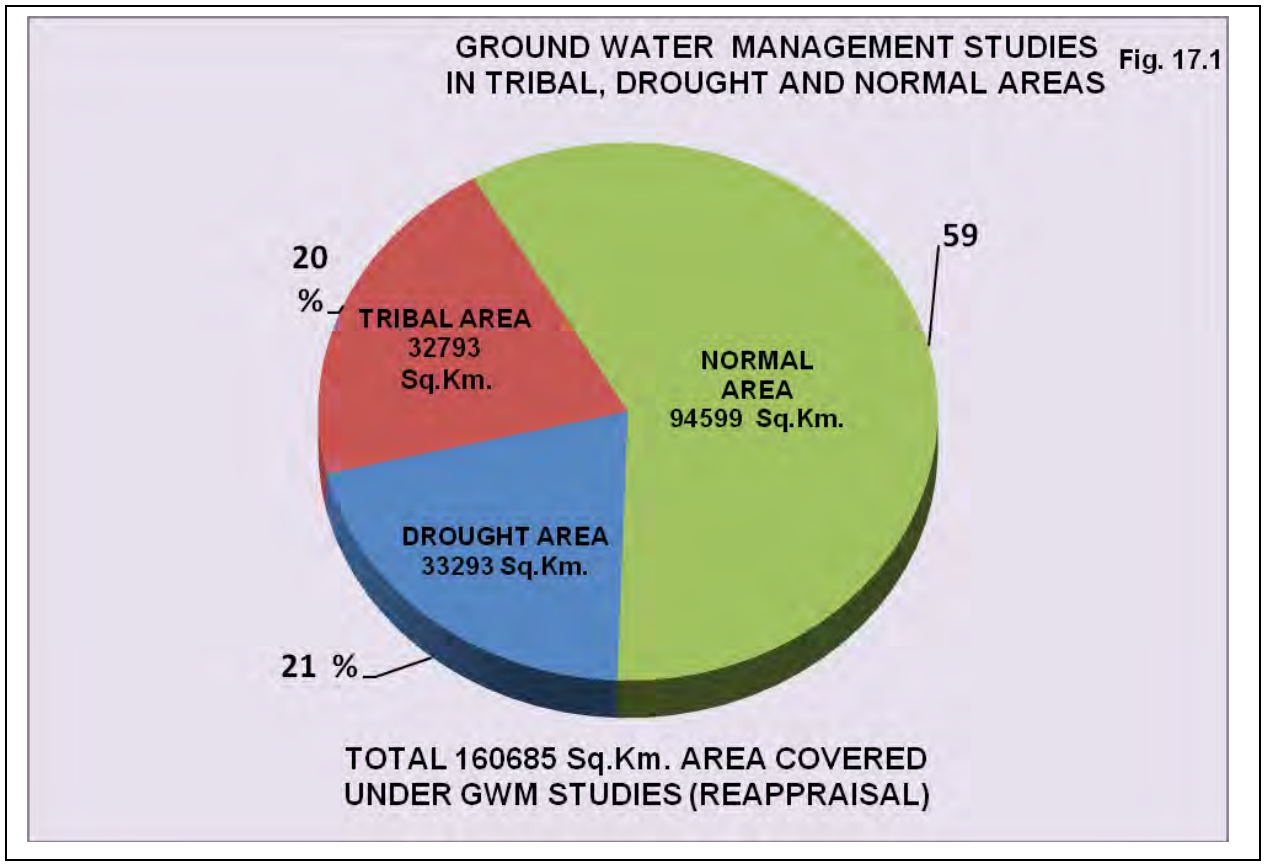
Table 15.1 : Areas covered under Ground Water Management Studies in tribal areas during 2011-2012

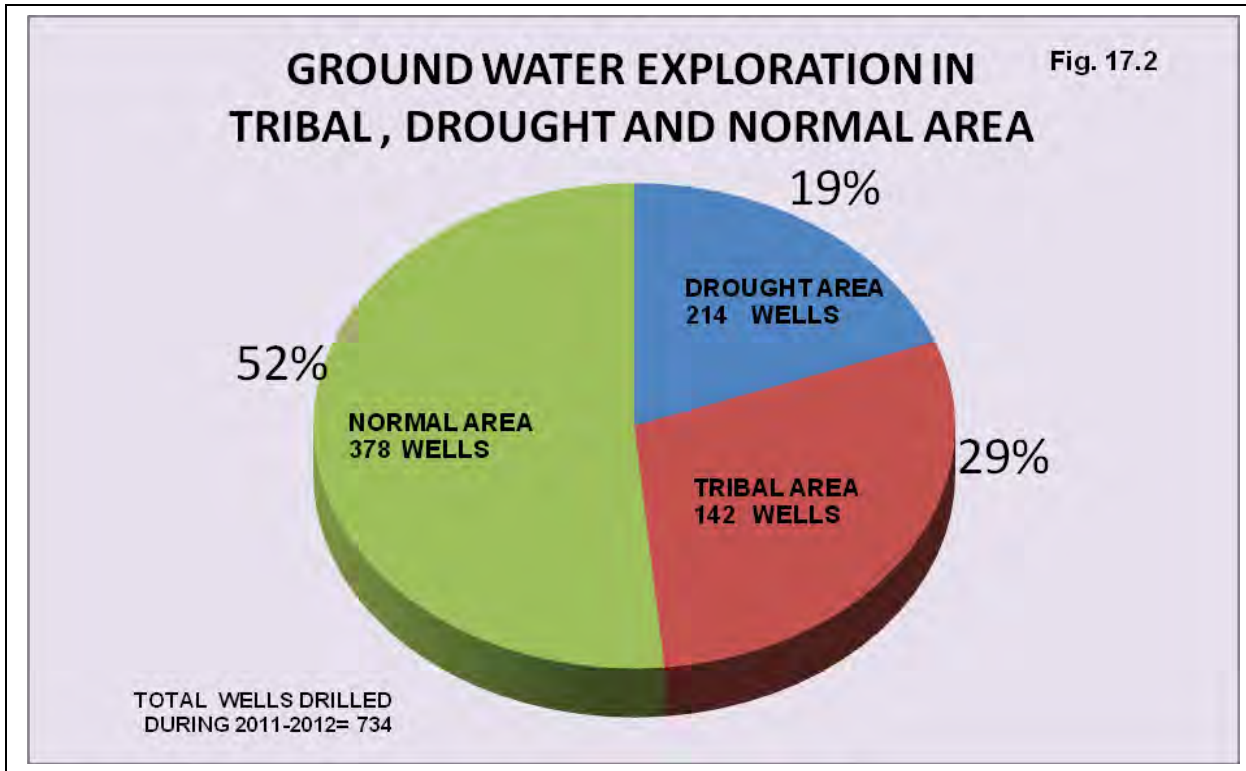
Regions/state	District	Achievement (Sq.Km.)
EASTERN REGION	Murshidabad	307
	Bankura	851
West Bengal	**Total**	**1158**
NORTH CENTRAL CHHATTISGARH REGION	Mahasamund	4961
Chhattisgarh	Total	4961
SOUTH WESTERN REGION	Dakshina Kannada and Kodagu	3260
Karnataka	**Total**	3260
NORTH EASTERN REGION	Dhalai,Tripura	2314
Guwahati	East Siang, Arunachal Pradesh	3000
	Aizawl, Meghalaya	3576
	West Garo Hills, Meghalaya	3677
	Total	**12567**
NORTH CENTRAL REGION and NORTH REGION	Part of Sagar , MP & Parts of Lalitpur , UP	3815
	Parts of Guna,Mp	3484
M.P & Uttar pradesh	Mahoba.up	1785
	Chitrakoot,up	1763
	Total	**10847**
	Ground Total	**32793**

The status of coverage under ground water management studies and exploratory drilling in tribal areas are given in Tables 15.1 & 15.2. and depicted in Fig 17.1 & 17.2 respectively.

Table 15.2 : Exploratory Wells Drilled in "Tribal" Area during 2011-2012
(by Departmental Rigs)

Sl. No	States	EW	OW	PZ	T
1.	Gujarat	10	3	2	15
2	Jharkhand	8	4	2	14
3.	Maharashtra	9	1	2	12
4.	Meghalaya	8			8
5.	Jammu & Kashmir	3			3
6.	Andhra Pradesh	12	6	15	33
7.	Orissa	11	04	4	19
8.	Chhattisgarh	15	3	5	23
9.	Karnataka	08	02		10
10.	West Bengal	4	1	-	05
Grand Total		**88**	**24**	**30**	**142**


GROUND WATER MANAGEMENT STUDIES
IN TRIBAL, DROUGHT AND NORMAL AREAS
Fig. 17.1
20
%
TRIBAL AREA
32793
Sq.Km.
59
NORMAL
AREA
94599 Sq.Km.
DROUGHT AREA
33293 Sq.Km.
21 %
TOTAL 160685 Sq.Km. AREA COVERED
UNDER GWM STUDIES (REAPPRAISAL)


GROUND WATER EXPLORATION IN
TRIBAL , DROUGHT AND NORMAL AREA
Fig. 17.2
19%
DROUGHT AREA
214 WELLS
52%
NORMAL AREA
378 WELLS
29%
TRIBAL AREA
142 WELLS
TOTAL WELLS DRILLED
DURING 2011-2012= 734

16. ESTIMATION OF GROUND WATER RESOURCE BASED ON GEC - 1997 METHODOLOGY

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) .

As per 31.03.2009, the Total Annual Replenishable Ground Water Resources of the Country have been reassessed as 431 Billion Cubic Metres (bcm) and the Net Annual Ground Water Availability is estimated as 396 bcm. Annual Ground Water Draft as on March, 2009 for all uses is 243 bcm. The Stage of Ground Water Development is 61%. The state – wise availability of ground water resources is given in Table 16.1. The development of ground water in different areas of the Country has not been uniform. Highly intensive development of ground water in certain areas in the country has resulted in over – exploitation. As per the latest assessment of ground water resources out of 5842 assessment units (Block/Mandals/Talukas) in the country, 802 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 169 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 523 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 and apart from these, there are 71 blocks completely underlain by saline ground water. The state – wise status of over – exploited and critical and semi-critical areas is given in Table 16.2.

Table 16.2: CATEGORIZATION OF BLOCKS/ MANDALS/ TALUKAS IN INDIA AS ON 31st MARCH, 2009

Sl.No.	States / Union Territories	Total No. of Assessed Units	Safe		Semi-critical		Critical		Over-exploited		Remarks
			Nos.	%	Nos.	%	Nos.	%	Nos.	%	
	States										
1	Andhra Pradesh	1108	867	78	93	8	26	2	84	8	38- Salinity Affected
2	Arunachal Pradesh	16	16	100	0	0	0	0	0	0	
3	Assam	23	23	100	0	0	0	0	0	0	
4	Bihar	533	529	99	4	1	0	0	0	0	
5	Chhattisgarh	146	132	90	14	10	0	0	0	0	
6	Delhi	27	2	7	5	19	0	0	20	74	
7	Goa	11	11	100	0	0	0	0	0	0	
8	Gujarat	223	156	70	20	9	6	3	27	12	14 - Salinity Affected
9	Haryana	116	18	16	9	8	21	18	68	59	
10	Himachal Pradesh	8	6	75	0	0	1	13	1	13	
11	Jammu & Kashmir	14	14	100	0	0	0	0	0	0	
12	Jharkhand	208	200	96	2	1	2	1	4	2	
13	Karnataka	270	154	57	34	13	11	4	71	26	
14	Kerala	152	126	83	22	14	3	2	1	1	
15	Madhya Pradesh	313	224	72	61	19	4	1	24	8	
16	Maharashtra	353	324	92	19	5	1	0	9	3	
17	Manipur	8	8	100	0	0	0	0	0	0	
18	Meghalaya	7	7	100	0	0	0	0	0	0	
19	Mizoram	22	22	100	0	0	0	0	0	0	
20	Nagaland	8	8	100	0	0	0	0	0	0	
21	Orissa	314	308	98	0	0	0	0	0	0	6 - Salinity Affected
22	Punjab	138	23	17	2	1	3	2	110	80	
23	Rajasthan	239	31	13	16	7	25	10	166	69	1 - Salinity Affected
24	Sikkim	4	4	100	0	0	0	0	0	0	
25	Tamil Nadu	386	136	35	67	17	33	9	139	36	11 - Salinity Affected
26	Tripura	39	39	100	0	0	0	0	0	0	
27	Uttar Pradesh	820	605	74	107	13	32	4	76	9	
28	Uttarakhand	17	11	65	5	29	1	6	0	0	
29	West Bengal	269	231	86	38	14	0	0	0	0	
	Total States	**5792**	**4235**	73	**518**	9	**169**	3	**800**	14	
Union Territories											
1	Andaman & Nicobar	33	33	100	0	0	0	0	0	0	
2	Chandigarh	1	1	100	0	0	0	0	0	0	
3	Dadra & Nagar Haveli	1	1	100	-	-	-	-	-	-	-
4	Daman & Diu	2	0	0	1	50	0	0	1	50	
5	Lakshdweep	9	5	56	4	44	0	0	0	0	
6	Puducherry	4	2	50	0	0	0	0	1	25	1-Salinity Affected
	Total Uts	**50**	**42**	84	**5**	10	**0**	0	**2**	4	
	Grand Total	**5842**	**4277**	73	**523**	9	**169**	3	**802**	14	71 - Salinity Affected

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

17. TECHNICAL SCRUTINY / EXAMINATION OF SCHEMES / PROPOSALS

17.1 MAJOR AND MEDIUM IRRIGATION SCHEME / PROPOSALS

As per the directives of planning commission, the board is scrutinizing the majo r and medium irrigation projects reports/proposal sent by the State Government / Central Water Commission/ Command Area Development & Water Management Wing of Ministry of Agriculture from the point of view of their impact on groundwater regime and specific recommendations are being made to project of CWC. The projects examined during the year 2011-12 (up to 31st March, 2012),

Fourteen major and minor irrigation project proposals of Central Water Commission listed below were

1. Rajghat Canal, Madhaya Pradesh.
2. Mahi Right bank Canal, Gujarat.
3. ERM of Ukai LBC Canal, Gujarat.
4. ERM of Minimata(Hasdeo) Bango, Chhattisgarh.
5. Haryana Irrigation network project, Haryana.
6. Gandak Phase-II, Bihar.
7. Kanhar Reservoir project, Jharkhand.
8. Upper Indravati Irrigation, Orissa.
9. Kabini river at Suttur Muttu, Karnataka
10. Uderasthan Barrage on River Falgu, Bihar
11. Western Gandak Canal, Bihar
12. Jigaon Lift Irrigation, Maharastra
13. Flood Carrier Canal by interlinking Tamirabarani, Tamil Nadu
14. First Patiala Feeder & Kotla branch, Punjab.

All of above listed projects were examined and forwarded the observations/ comments in respect of GW component. The observations on 4 irrigation projects are under scrutiny at Regional Directorate.

18. HUMAN RESOURCES DEVELOPMENT

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

18.1 Training Programmes under Hydrology

- Awareness raising training programme under HP-II was conducted on 2.2.2012 at Panda Goa. Sri B.Vijayan IAS, Principal secretary, Water Resources, Govt.Of Goa was the Chief Guest and inaugurated the training programme by lighting the lamp along with other dignitaries. Sri S.T. Nadkarni CE, Water Resource department, Govt, of Goa and Prof. N.P. Singh, Director, ICAR, Goa were Guests of Honour. The training programme was presided over by Dr K.Md. Najeeb, Regional Director. 29 trainees from various departments like Water Resources Department, Goa university, Civil Engineering dept., Goa Engineering college, Department of Agriculture, ICAR, CWC attended the training programme. Scientists from CGWB, SWR Bangalore and State Unit office, Belgaum presented various topics on Water management.

- Successfully organised the awareness raising Training Programme under Hydrology Project at Bilaspur, Chhattisgarh on 27-02-2012.

- A one day "Awareness Raising Training programme" was organized under HP-II at Nagpur on 27th March,2012. Dr. Archana Kadu, Deputy Director, Agriculture Department, Nagpur, graced the function as Guest of Honour during inaugural function, whereas in the valedictory function Dr. Uday Pati, District Superintending Agriculture Officer, Nagpur was the guest of honour. The training programme was presided over by Shri Pradeep Dube, Regional Director, CGWB, Nagpur. During the training 4 lectures were presented on "Ground Water Survey, Monitoring and Assessment using GEMS" by Shri Bhushan R. Lamsoge, Scientist C, CGWB, Nagpur, "Pilot Project on Micro Level Aquifer Mapping for Chandrabhaga (WGKKC-2) watershed-Aims, Objectives, Components and Requirements" by Shri S.D. Waghmare, Asstt. Hydrogeologist, CGWB, Nagpur, "Rain Water Harvesting and Artificial Recharge to Ground Water" by Dr. P.K. Jain, Scientist D and Coordinator and "Pilot Project on Micro Level Aquifer Mapping for Chandrabhaga (WGKKC-2) watershed – Proposed Deliverables and Outcome & Participatory Ground Water Management" by Shri Rahul R. Shinde, AHG, CGWB, Nagpur. The programme was attended by the 20 trainees from Central / State Govt. organizations like GSI, Agriculture Department, Irrigation Department, Zila Parishad,Panchayat Samiti etc. They were provided with the training material and were also awarded the certificates of participation.

- A one day "Awareness Training programme" under Hydrology Project-Phase II was conducted on 29th March 2012 at Bhopal, M.P. The Training Programme was chaired by the Engineer –in- chief, Water Resources Department, Govt. of Madhya Pradesh. Total thirty seven officers of various central /State departments as well as NGO's participated in the training Programme.

18.2 Rajiv Gandhi National Ground Water Training and Research Institute

It has been the earnest endeavor of the Board to keep its technical personnel abreast with the latest developments in all aspects related to ground water development & management. Trainees from State Departments and candidates from abroad are included in the training programme being organized by the Board.

Rajiv Gandhi National Ground Water Training & Research Institute (RGI) under Central Ground Water Board has been established at Raipur (Chhattisgarh) to conduct training courses for CGWB and other Central / State Government organizations, Universities, Institutes etc. RGI imparts training at the induction, mid-career and senior management levels in all relevant aspects of hydrogeological investigations, exploration, assessment, development and management of ground water. During the year 2011-12 (upto 31. 03.2012), 35 training programmes were conducted by RGI and 619 trainees were trained. The details of trainees state-wise are as follows;

Sl. No.	Participatory States/ Organisations	No. of participants from States
1	Andhra Pradesh	17
2	Bihar	2
3	Chhattisgarh	120
4	Gujarat	13
5	Haryana	4
6	Kerala	16
7	Madhya Pradesh	22
8	Maharashtra	25
9	Odisha	6
10	Tamil Nadu	11
11	UT of Pondicherry	9
12	**CGWB**	**310**
13	**Institutes, NGOs, PRIs etc.**	**64**
	Total	**619**

18.3 Other Training Programmes

- Training programme on Capacity Building of Officials of State Drinking Water Supply Agency on "Village Water Security Planning in Micro Watershed" was held between 17th and 22nd October 2011 at Nasik, Maharashtra. The venue for the training programme is Research and Training Centre of Maharashtra Jeevan Pradhikaran (MJP), Nasik. A total of 32 trainees attended the training programme from various State Govt. agencies such as Groundwater Survey and Development Agency (GSDA), Maharashtra Jeevan Pradhikaran (MJP) and Zilla Parisad. The field visit was also organized in Kikwari village to expose the participants to the water conservation and water budgeting works carried out by villagers under community management programme.
- A training course on ERDAS software was organized at Central Ground Water Board, Faridabad by CERMM under the aegis of RGI from 10-14th October 2011 for lady officers of the Board. 10 officers of the Board attended the course.
- Central Ground Water Board, Northern Region, Lucknow organized a six days State Level Training Programme on "Implementation of Sustainability of structures for Drinking Water Security" from 17th to 22nd October 2011 for officers (AEE to SE level) of Uttar Pradesh Jal Nigam including one day hands on training in Saton block of Raiebarely district. The Regional Director, Northern Region, Lucknow and other Senior officers of the Board & RSAC, Lucknow delivered lectures on various topics touching exploration, conservation, preservation and quality aspect of groundwater. The training programme was funded by Department of Drinking Water and Sanitation, MoRD, Govt. of India.

19. 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.

19.1 Reports

Details of various type of technical reports issued by respective regional offices of the Board were as follows:

191.1 State Reports

State Reports containing complete details of ground water surveys, exploration and other ground water related information are compiled and prepared for 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 2011- 2012, Kerala, Jharkhand, Madhya Pradesh, Manipur, Tamil Nadu, Andhra Pradesh, Goa, Rajasthan and Uttarakhand states reports completed.

19.1.2 State Chemical Reports

During 2011-12, 6 State Chemical Reports have been completed / submitted of the states of New Delhi, Bihar, Jharkhand, Tamil Nadu, Andhra Pradesh, Uttarakhand.

19.1.3 District Reports

The Central Ground Water Board is compiling and issuing district reports 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 users agencies. The reports have been found very useful for their strategies for future. During 2011-12, 23 district reports were prepared and submitted. Region wise status of preparation of District Reports are presented in Table 19.1

23.1.4 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 2011-12, 23 reports were prepared . Region wise status of preparation of ground water year book are presented in Table 19.2

Table 19.1: Status of District Reports completed during 2011-2012

Sl. No	Regions	Nos.	Name of District Report
1	North Western Himalayan Region	1	Jammu
2	West Central Region	1	Bhavnagar
3	North Central Chhatisgarh Region	2	Raipur, Rajnandgaon
4	Mid Eastern Region	2	Samastipur, Girdih
5	South Eastern Region	2	Balasore, Bhadrak
6	Southern Region	2	Warangal, Vishakhapatanam
7	South Western Region	1	Ramanagaram
8	South East Coastal Region	2	Erode, Perambalur
9	Kerala Region	3	Pathnamthitta, Kozokode and Lakshwadweep
10	Uttaranchal Region	3	Dehradun, Uttarkashi, Nainital
11	Central Region	2	Jalna, Kolhapur
12	Western Region	1	Jaisalmer
13	Delhi	1	New Delhi
	Total	**23**	

19.1.5 Ground Water Exploration Reports

During 2010-11, 7 Ground Water Exploration Reports have been completed / submitted of the states of Kerala, Bihar, Jharkhand, Chhattisgarh, North East States, New Delhi, Tamil Nadu.

19.2 Bhujal News

Bhujal News is a quarterly journal being published by Central Ground Water Board highlighting the latest advances in ground water research. Besides scientific papers, the journal also contains technical notes, news items, and regular columns. The journal has more than 1500 readers from all over the country. During the year 2011-12 up to 31st March 2012, the Vol. No 25, 1 & 2, 2010 Special issue on Transboundary Aquifer System was published.

Table 19.2: Status of Ground Water Year Books Completed during 2011-12

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 Chhatisgarh Region	1	Chhattisgarh
8.	Central Region	1	Maharashtra
9.	Northern Region	1	Uttar Pradesh
10.	Mid Eastern Region	2	Bihar, Jharkhand
11.	Eastern Region	1	West Bengal
12	North Eastern Region	1	North Eastern States
13	South Eastern region	1	Orissa
14	Southern Region	1	Andhra Pradesh
15	South Western Region	2	Karnataka, Goa
16	South Eastern Coastal Region	1	Tamilnadu
17	Kerala Region	1	Kerala
18.	Uttaranchal Region	1	Uttarakhand
19.	SUO, Delhi	1	Delhi
	Total	**23**	

20. CONSTRUCTION/ACQUISTION OF OFFICE BUILDINGS

The details of following construction work for own office building of Central Ground Water Board have been carried during 2011-12 up to 31st March 2012 is given in table 20.1.

Table 20.1:Construction Work for Own office building during 2011-12

Name of the project	**Physical Achievement**
The Construction work of Building for Regional & Divisional Office at **Guwahati.**	The Construction work for 2 RCC Culverts and Store is Completed and Workshop & Store is functioning in our own Building
Construction of Divisional Office, Workshop & Store on the land of CGWB at **Bhopal.**	The Construction Work of building is in progress.
Construction of Boundary Wall and Earth Filling work for divisional Office, Store & Workshop at **Ambala**	The Construction of Boundary Wall & Earth filling work is Completed. The matter has already been taken-up with CPWD/NPCC Ltd. for preparation of an Estimate for Construction of Building, Which is awaited.
Construction of Boundary Wall for Staff Qtrs.at **Bhubaneswar.**	The Construction work of Boundary Wall is completed. The CPWD has revised the Estimated cost to Rs.33.43 Lac.
Construction of Building for Divisional workshop & Store at **Bangalore.**	The Construction of Boundary Wall has already been constructed and Divisional Workshop is functioning on our own land. Construction work of the building in progress.
Construction of Boundary Wall on the land of CGWB at **Jammu.**	As per requirement from CPWD the funds to the tune of Rs.5 Lacs released during 2012-13. Construction of Boundary Wall is almost at completion stage.
Regional & Divisional Office including Workshop & Store at **Hyderabad.**	The proposal for releasing of additional requirement of funds to the tune of Rs.46 lac as 10% cost escalation has been sent to the Ministry. In turn, the Ministry has desired some clarification from CPWD, which has been called for through RD. The Regional and Divisional Office is functioning in our own Building.
Construction of Boundary Wall for Regional & Divisional Office at **Ahmedabad.**	The construction of B/Wall is in progress and Work likely to be complete during 2012-13. The entire funds placed at the disposal of respective PAO of CPWD.
Acquisition of land for construction of Divisional Workshop & Store at **Ahmedabad.**	The matter for acquisition of land has already been taken-up with the State Government. Status is awaited.
Acquisition of land for accommodating Divisional Workshop & Store at **Chennai**	The matter for preparation of Estimate for Construction of Boundary wall has already been taken-up with CPWD/NPCC, Which is awaited.

Name of the project	**Physical Achievement**
Acquisition of land for Divisional office, workshop & Store **at Jodhpur.**	The Ministry has conveyed an amount of Rs.36,27,723/- for Drawing and Estimate for Construction of Boundary wall. The NPCC Ltd. asked to submit their requirement of funds for the year 2012-13.
Acquisition of land for construction of Building of CGWB at **Dehradun**	The matter for acquisition of land has been taken-up with the State Government. The status of the case is still awaited.
Acquisition of land for construction of Building for Divisional office, Workshop & Store at **Ranchi.**	The land has already been demarcated by the Department of Water Resources, Government of Jharkhand. Physical possession is under process. The Executive Engineer, CGWB, Division-V, Ranchi has also been requested to follow-up the matter.
Construction of boundary wall on the land of CGWB for RGNGWT&RI (RGI), **Raipur.**	Low progress due to dispute on the allotted land. Funds of Rs.20 lac released to CPWD for Construction of Boundary wall. The state Government has agreed to allot land in New Raipur in exchange of old one. Physical possession is under process.
Acquisition of land for construction of Building for Regional office **at Dharmashala.**	The State Government has conveyed for allotment of land. Proposal submitted to Ministry for AA&ES an amount of Rs.23,00,000/-, Which is awaited .

21. DISSEMINATION AND SHARING OF TECHNICAL KNOW-HOW

21.1 Region-wise paper published and training taken by officers during 2011-12

Sl. No.	Regions	Paper presented /published		No. of officers	
		National	International	Trainings	
				National	International
1	NWHR, Jammu	3	-	7	-
2	NWR, Chandigarh	-	-	5	-
3	WR, Jaipur	1	-	13	1
4	WCR,	-	-	4	-
5	NCR, Bhopal	-	-	4	-
6	NCCR, Raipur	1	-	13	-
7	CR, Nagpur	-	-	5	-
8	NR,Lucknow	5	-	6	
9	MER, Patna	3	-	4	1
10	ER, Kolkata	2	-	7	-
11	NER, Guwahati	2	-	6	-
12	SER, Bhubaneshwar	7	-	9	-
13	SR, Hyderabad	3	-	5	1
14	SWR, Banglore	11	-	20	-
15	SECR, Chennai	-	-	7	-
16	KR, Trivendrum	2	-	5	-
17	UR,Dehradun	2	-	5	-
18	NHR, Dharamshala	3	-	3	1
	Total	45	-	128	4

21.2 Presentation of Technical Papers and Lectures

- Dr K.Md.Najeeb, Regional Director, Central Ground Water Board, South Western Region, Bangalore delivered a lecture on "RWH and Artificial Recharge in Urban areas" as a part of disseminating the knowledge and capacity building to the students and faculty of Dr. Ambedkar Institute of Technology, Bangalore. Preliminary field visit was also carried out in the campus to formulate a scheme for rainwater harvesting.
- *Dr.K.R. Sooryanarayana, Scientist-D Central Ground Water Board, South Western Region, Bangalore delivered a lecture on " Rainwater Harvesting Systems to Augment Water Resources in Bangalore City" during the Convention of Teachers and Students organized by Geological Society of India, Bangalore on 21.04.2011 at Khanija Bhawan, Department of Mines and Geology Government of Karnataka. The programme was organized in connection with Earth Day Celebrations with a focal theme" Sustainable water resources: Urban and Rural Challenges".*
- *Regional Director(I/C) Central Ground Water Board, Kerala Region, Trivendrum delivered a lecture on19th April, 2011 on "Drinking Water-Issues and Challenges" in the training programme on "Standard Operation Procedure for Water and Climate Related Disasters" organized by Institute of Land and Disaster Management.*
- *Scientists of Central Ground Water Board, South East Coastal Region, Chennai delivered lectures on findings of their field work i)Landfill studies in North Chennai ii) Analysis of long duration of pumping tests carried out for specific yield studies iii) Ground Water Management Studies in parts of Ramanathapuram district iv) Hydrogeological and Hydrochemical studies regime of shallow & deeper aquifers in Korattalayar and Araniar Basin v) Delineation of water scarcity areas suitable for artificial recharge using remote sensing studies in parts of Tirunelveli district.*
- Shri. D. S. C. Thambi, Regional Director, on behalf of Dr. S. C. Dhimman, Chairman, CGWB presented a combined paper entitled "Impact of climate change on the ground water resources with special reference to Kerala and Lakshadweep" on May 8th in the 3rd International Geographic Congress held during May 06 – 08 2011 at Kozhikode organized by Centre for Water Resources Development and Management, Kozhikode, Kerala and participated in the deliberations.
- Mr. M. Panner, Assistant Hydrogeologist Central Ground Water Board, South East Coastal Region, Chennai delivered a lecture on "Results of Ground water Management Studies carried in parts of Thanjavur and Pudukkottai districts"
- Shri. K. A. Nambi, Assistant Hydrogeologist delivered a lecture on "Latest rainwater harvesting techniques in Tamil Nadu" at the "International Conference on Clear Solution to clean Water" on 28th April 2011.
- Regional Director of Central Ground Water Board, North Western l Region, Chandigarh delivered lecture on "Ground Water Quality Management" in the

Seminar organized by Department of Science and Technology, Govt. of Uttarakhand on 24.05.2011.

- Dr.M.A.Farooqi, Scientist, Central Ground Water Board, South Western Region, and Bangalore delivered Dr Suryaprakash Rao endowment lecture on "Ground water management in Bangalore metropolitan Region with special reference to municipal waste disposal practices and their impact on ground water quality" at Geological Society Of India, Bangalore on 25.5.2011.
- Shri. Y.B. Kaushik, Scientist D of Central Ground Water Board, North Western Region, Chandigarh delivered two lectures at B.B.M.P., Nangal on the topics "Water Management" and "Energy & Water Nexus" on 20th September 2011.
- Shri G.P. Singh, Scientist B of Central Ground Water Board, North Western Region, Chandigarh delivered two lectures at B.B.M.P., Nangal on the topics "Rain Water Harvesting" and "Aquifer Mapping" on 20th September 2011.
- Shri M.K. Garg, Scientist B of Central Ground Water Board, North Western Region, Chandigarh delivered two lectures at Kendriya Vidhyalaya, Zirakhpur on the topics "Ground Water Quality and Related Issues" and "Importance of Rain Water Harvesting Practices in Urban Areas" on 20th September 2011.

21.3 Participation/Organized Workshop, Seminars and Conference

- Scientists of Central Ground Water Board South East Coastal Region, Chennai attended Experience Sharing Workshop for evaluating the progress and challenges of "Crossing Boundaries (CB) Project" conducted by Centre for Water Resources, Anna University at Chennai on 12th April 2011.
- Shri. D. S. C. Thambi, Regional Director, Central Ground Water Board, South East Coastal Region, Chennai was the Guest of Honour in the two days Conference, (28-29 the April 2011) on "International Conference on Clear Solution to clean Water" held at Chennai.
- Scientists of Central Ground Water Board, South East Coastal Region, Chennai attended the "International Conference on Clear Solution to clean Water" held at Chennai 28th to 29th April 2011.
- Scientist of Central Ground Water Board, South Western Region, Bangalore attended inauguration of the Second State Level Science and Technology Conference- 2011(26th-28th May 2011) organized by Karnataka State Council of Science and Technology, IISc, Bangalore. SWR also participated in the exhibition by presenting working models of rain water harvesting and awareness material on water conservation.
- Scientists from Central Ground Water Board, North Himalayan Region, Dharamshala participated in National Seminar on "Saraswati Nadi Ke Udgam Path Ki Talaash" on 10th May, 2011 and 11th May, 2011 at Regional Centre, Department of Geology, Himachal Pradesh University, Dharamshala and presented about the Hydrogeological Set Up of Himachal Pradesh.
- Regional Director and Scientists of Central Ground Water Board, West Central Region, Ahmedabad participated in the Seminar on "Quality Management in Chemical Industry by Merch Millipore" at Vadodara on 3rd May, 2011.
- National Institute of Hydrology(NIH), Roorkee and Central Ground Water Board has organized jointly one day workshop on "Dialogue Initiation Meet to Translate Vision into Mission" for "Mitigation and Remedy of Groundwater Arsenic Menace in India" on 24th June, 2011 at CSMRS Auditorium, New Delhi.
- Scientist of Central Ground Water Board, Kerala Region, Chennai attended the UNICEF funded Workshop on "Drinking Water Quality Issues-Problems and Remedies" held on 23rd June, 2011. A talk delivered on the Environmental / Quality Issues and Ground Water in Kerala by the Head Office.
- Regional Director, Central Ground Water Board, Kerala Region, Trivendrum attended Workshop on "Integrated Water Resources Management (IWRM)" organized by CWRDM at Sasthra Bhawan Auditorium, Pattom on 16th June, 2011.
- A Two days seminar on "Ground Water Management" was organized by ACWADAM, Pune on 22nd and 23rd May, 2011 at YASHADA, Pune. The seminar was attended by Dr. S.C. Dhiman, Chairman, CGWB, Shri Sushil Gupta, Member(SML), Shri S. Kunar, Member(SAM), Shri Pradeep Dube, Regional Director, Central Region and Dr. P.K. Jain, Scientist D & OIC, SUO, Pune.
- Regional Director, Central Ground Water Board, North Western Region, Chandigarh attended Workshop on "Automation in the Instrumentation of Chemical Analysis" on 14th July, 2011.
- Consultative Workshop on preparation of Handbook on Water Quality and Sanitation for the Lower and Upper Primary School Children at Trivendrum conducted by CWRDM on 22nd July, 2011. Workshop was inaugurated by the Chief Secretary, Govt. of Kerala .

- Regional Director, Central Ground Water Board, South East Coastal Region, Chennai attended Workshop on "Methodology for Assessment of Ground Water Availability" at Central Soil and Material Research Station (CSMRS), New Delhi on 26th July, 2011.
- Regional Director, Central Ground Water Board, Southern Region, Hyderabad attended and delivered a lecture on "Ground Water Management Issues" in the Workshop on "Remote Sensing and GIS applications in Water Resources" organized by JNTU, Hyderabad on 2nd August, 2011.
- Scientist-D Central Ground Water Board, Southern Region, Hyderabad attended and delivered a lecture on "Ground Water Problems and Issues in Andhra Pradesh" in the Workshop on "Remote Sensing and GIS applications in Water Resources" organized by JNTU, Hyderabad on 02/08/2011.
- Regional Director and Dr K.R.Sooryanarayana, Scientist -D of Central Ground Water Board, South Western Region, Bangalore attended the interactive session on "A symposium on water " on 23.08.2011 organized by Enzen water, Bangalore.
- The Central Ground Water Board, South Western Region, Bangalore participated in the workshop organized by Department of Civil Engineering, Manipal Institute of Technology on "Rainwater harvesting and pure drilling water" on 13.08.2011 by way of distributing awareness material on water conservation/ rainwater harvesting.
- Regional Director, Central Ground Water Board, South East Coastal Region, Chennai presented the findings and future work plan of specific yield studies during the two days workshop on Purpose Driven Studies (PDS) of Implementing Agencies under Hydrology Project II during September 2011.
- Regional Director and Scientist of Central Ground Water Board, Southern Region, Hyderabad participated the Workshop on "Delineation of Fresh/Saline Aquifers and Estimation of Ground Water Resources in Coastal Aquifers" organized by Ground Water Department, Government of Andhra Pradesh on 20th September 2011 at Rajahmundry.
- Dr.S.C.Dhiman, Chairman CGWB, visited Jaipur to attend International Conference on "Water use efficiency in Industrial Sector "on 09.11.2011 organized by RIICO & IWF at Jaipur. Chairman reviewed the progress.
- Regional Director, Central Ground Water Board, Kerala Region, Trivendrum attended one day Workshop on "Isotopes in Water Resources Management" on 15th November, 2011 organized by Department of Geology , University of Kerala in association with CWRDM, Calicut at Trivandrum.
- Regional Director, Central Ground Water Board, South Western Region, Bangalore delivered valedictory address at the National Workshop on " Recent Trends in Ground Water Hydrology & Artificial Recharge to groundwater" on 13.12.2011 at Mandya. The workshop was organised by PES Engineering College, Mandya.
- As a guest of Honour, Regional Director Central Ground Water Board, South Western Region, Bangalore attended Book release function on 22.12.2011, which was organized by Geological Society Of India, Bangalore. The book Memoir.no.79 on "Bengaluru,-Water problems of the fastest growing City of India" was released by Sri SureshKumar, Hon'ble minister of Urban Development, Govt.of Karnataka.
- Regional Director, Central Ground Water Board, Kerala Region, Trivendrum attended the State Level Credit Seminar on 22.12.2011 organized by NABARD at Trivandrum. The Seminar was inaugurated by the Hon'ble Chief Minister of Kerala, Sri Oomen Chandy and also graced by the presence of Hon'ble Minister for Agriculture, Sri K.P Mohanan and Various Dignitaries.
- Regional Director, Central Ground Water Board, South East Coastal Region, Chennai attended the State Credit Seminar 2011-12 organized by NABARD on 14.12.2011 at Chennai.
- Scientist of Central Ground Water Board, North Central Region, Bhopal attended two days workshop on "Integrated Water Resources Management Strategy For Water Scarce Bundelkhand Region In India" at National Institute of Hydrology, Roorkee on 6th & 7th Dec.2011.
- Scientist of Central Ground Water Board, North Central Region, Bhopal participated in "State Credit Seminar" organized by NABARD on 14th December 2011.
- Regional Director, Central Ground Water Board, South Western Region, Bangalore attended inaugural function of the national seminar on " Geospatial solutions for resource conservation and Management on 18.1.2011 at Bangalore. The seminar and exhibition " organised by KSRAC,

Govt.of Karnataka were conducted for two days ie., 18th and 19th January 2012. CGWB, SWR exhibited models and other display materials on water conservation during the seminar. Also, five scientists from SWR also attended as delegates.

- Scientist of Central Ground Water Board, South Western Region, Bangalore attended one day workshop on empanelment of laboratories on 25.1.2011. The workshop was conducted by KSPCB, Govt. of Karnataka
- Regional Director, Central Ground Water Board, South East Coastal Region, Chennai attended the "State Holders consultation on Climate Change Platform" organized by Water Technology Centre, Agriculture University and made a presentation on Ground Water Resources and Management in Tamil Nadu on 24/01/2012.
- Scientists of Central Ground Water Board, North Western Himalayan Region, Jammu attended National Seminar on "Management of Water Resources of Northern India with special reference to Jammu and Kashmir on 10th January, 2012.
- Regional Director, Central Ground Water Board, South East Coastal Region , Chennai attended the one-day workshop titled "Onshore Petroleum Spills Case Studies in India and the Way Forward" held at Indian Institute of Technology, Madras on 07.02 2012 at Chennai.
- Central Ground Water Board , South Western Region, Bangalore office and Division XIV organized a Hindi Workshop on 01.03.2012 jointly. The faculty for the workshop was Sri Vijoy Kumar, Director (Official language), Central Silk Board, Department of Textile, Bangalore and about 27 officers and officials attended the workshop.
- Sensitization of women folk on ground water related issues of management, conservation at Bhujal Bhawan, Central Ground Water Board, South Western Region, Bangalore on the occasion of International Women day on 08.03.2012.
- Regional Director and Scientist of Central Ground Water Board, North Western Region, Chandigarh delivered lecture and attended workshop on Rain Water Harvesting held at Punjab University, Chandigarh on 9th March, 2012.
- Regional Director Central Ground Water Board, Mid Eastern Region, Patna delivered a keynote address on Groundwater issues in Industrial Areas during the National Seminar on sustainable development of groundwater resources in Industrial Regions organised by Indian School of Mines (ISM), Dhanbad, Jharkhand on 23rd March. 2012.

22. RESEARCH AND DEVELOPMENT STUDIES

An Indian National Committee on Ground Water (INCGW) is constituted by the Ministry of Water Resources, Govt. of India vide order No. 38/1/2008-R&D/5709-II dated September 2008, with a view to accelerate the research & development programmes in ground water sector and giving due consideration to increase need of taking up research in the field of Ground Water. Chairman Central Ground Water Board is Chairman of INCGW. This committee has 15 members and examines the project proposals received on ground water issues for their suitability for funding and recommends for sanctioning by the Ministry of Water Resources.

During the 2011-12, two R&D meetings were held. Fifth meeting of INCGW was held on 04-11-2011 at CGWB, New Delhi. Seven revised proposals were considered during the meeting, out of which 5 proposals were approved subject to minor modifications and remaining PI's were advised to submit the revised proposals. In addition to this, 9 new proposals were also considered, out of which 6 were approved subject to modifications, two were rejected and PI of remaining one was advised to submit the revised proposal. Reports of three ongoing schemes were also accepted during the meeting & approved for onward transmission to the Ministry for release of Overheads.

Sixth meeting of INCGW was held on 1-02-2012 at CGWB, Raipur. During the meeting, ten (10) new R&D proposals were considered, out of which 6 were approved subject to modifications, one was rejected and PI's of remaining three were advised to submit the revised proposal.

Third R&D session of INCGW was organized on 2-02-2012 at Centre for Water Management & Research, University of Rajasthan, and Raipur. The Chief Guest of the Session was ShriMadhukar Gupta, IAS, Divisional Commissioner, Jaipur and Prof. B.K. Srivastava, Dean of Science, University of Rajasthan was the Guest of Honour. The Session was presided over by Dr. S. C. Dhiman, Chairman, Central Ground Water Board and INCGW. The session was hosted by Prof. A. K. Sinha, Director, and Centre for Water Management & Research, University of Rajasthan, and Jaipur. The session was attended by eminent experts from different central, state government organizations and students/research scholars of University of Rajasthan, Jaipur. One day study tour was also arranged. During the session, progress of five ongoing schemes was reviewed. The session was a huge success.

During the meeting of Standing Advisory committee of MoWR held on 5-11-2012, seven (7) proposals of INCGW were considered. Out of seven (7), following two (2) proposals were approved and funded by Ministry, two (2) proposals were conditionally approved for funding subject to submission of clarifications and remaining three (3) proposals were rejected by Ministry :-

a) Estimation of Aquifer Potential in Jharia Coal Mining Region with suitable techniques to improve the recharge Dr. P.K. Singh, Associate Professor, Centre. Cost of the scheme is Rs. 28,54,700 for duration of three years.
b) Study and Investigations on the Marble Waste Material (Marble Slurry) to remove Arsenic from Ground Water - Dr. R.N. Yadav. Cost of the scheme is Rs. 18, 78,080 for duration of three years.

In addition to above, 3 more proposals which were approved during meetings of INCGW were forwarded to Ministry for sanctioning.

23. PUBLICITY AND PUBLIC AWARENESS

Central Ground Water Board/ Ministry of Water Resources participated in following Exhibition/Trade Fair during 2011-12.

i. Participation in International Trade Fairs -2011

Central Ground Water Board participated in the MOWR pavilion of IITF-2011 at Pragati Maidan, New Delhi during 14-27th November 2011. 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.

ii. Tele talk Programme

Regional Director, Central Ground Water Board, North Western Region, Chandigarh participated in Tele talk Programme telecasted on 18.05.2011 through Jalandhar Doordarshan on the topic of "Water Conservation".

iii. Organized Painting competitions at State and school level under IEC activities

At the instance of Ministry of Water Resources, Central Ground Water Board organized the Second State level Painting Competition in the country to create awareness on water conservation. The school level competition 2011 for the students of 4^{th}, 5^{th}, and 6^{th} standards was launched in all the States/UT's through an advertisement in the print media starting from August, 2011. This year the target given by Ministry of Water Resources for participation of students was 10 lakhs. Due to the untiring efforts of the officers/staff at the regional offices and constant persuasion from M(SML), **the total number of students that participated in the school level painting competition was 16,05,346 from 23,475 schools.** The painting competition is open for students of 4^{th}, 5^{th} and 6^{th} standards in three stages, namely, *School*, *State* and *National* Level. All participants are given certificates for participation. The State level winners and National level winners are awarded cash prizes. At State/UT level cash prizes of Rs. 10,000/- for first prize winner, Rs. 8,000/- for Second prize winner, Rs. 5000/- to third prize winner was given. Besides 10 consolation cash prizes of Rs. 1000/-each to 10 children were given out of selected 50 participants. The Topic of painting at State Level painting competition this year was "**CONSERVE WATER FOR THE FUTURE**".

During the State level competition held on 14^{th} November 2011 in 29 state/UTs (except Goa and Pondicherry where it was held on 9^{th} November. 2011), a total of **1352** students participated . The jury drawn from eminent artists from the respective states/UTs selected the best paintings for the award.

iv. Participation in the science exhibition at Shimoga organised by Kuvempu University

Central ground water Board, South Western Region, Bangalore participated in the science exhibition at Shimoga from 16.2.2012 to 19.2.2012, which was organized by Kuvempu University. Sri G.Krishnamurthy Sc-C participated as resource person and Sri P.Narahari Sr.surveyor assisted in exhibiting working models of rainwater harvesting and dugwell recharge and other display materials on water conservation.

v. Second National Level Painting Competition on Water Conservation held at New Delhi

Central Ground Water Board, Ministry of Water Resources under IEC programme organized 2^{nd} National Painting Competition on 21^{st} January, 2012 at A.P. Shinde Symposium Hall, NASC Complex, PUSA, New Delhi. Hon'ble Minister of State for Water Resources and Minority Affairs, Shri Vincent H. Pala was the chief guest of the occasion. In all 87 students from 29 States who are winners of State Level Painting Competition have participated at the National Level Painting Competition.

Hon'ble Minster of State in his address to the Children emphasized on role of Children in Conservation and protection of water resources for a bright future of the country. He said that beautiful ideas presented by the Children in their paintings will motivate others also for

conservation and judicious utilization of country's precious water resources. He informed the audience that steps are required to be taken for conservation of water to avoid water crisis in future. He called upon students, their parents as well as teachers to join hands in creating awareness about water conservation and protection of water sources at home and at School. The minister pointed out that the quality and presentation of the painting are better than the previous year.

Shri R.C. Jha, Chairman, Central Water Commission in his address informed that though India has adequate water at present but innovative ideas presented in this unique media painting by students would help in generating awareness for conservation of water and help in mitigating in solving problem of water in water scarce areas.

Shri G. Mohan Kumar, Additional Secretary, Ministry of Water Resources also expressed his concern about depleting water resources of the country and role of children in conserving the same. Dr S.C.Dhiman, Chairman, Central Ground Water Board presented the vote of thanks.

The painting competition was conducted throughout the country by Central Ground Water Board, Ministry of Water Resources, Govt. of India and the students were given the theme "Conserve Water for the Future" for painting. In all 23,475 schools and more than 16 lakh students in 29 States and Union Territories have participated in this competition. Out of these, 50 students selected by Jury in each State, were invited to participate in the State Level Painting Competition which was organised on 14th November, 2011 on the occasion of the *Bal Divas*. Top three winners of *State Level Painting competition* were invited to participate in the National Level Painting Competition to National Capital Delhi. The theme of competition this year was "Role of Children in Water Conservation".

In the competition organized earlier in the day, in all 13 students were declared winners. The first prize of Rs One Lakh was won by Ms. Disha Roy Chowdhury of Silliguri, West Bengal State. There were also four second prizes of Rs. 50,000 each, eight third prizes of Rs 25,000/- each. All the participating students were awarded Rs. 5000/- each as a consolation prize and certificates.

The list of winners is as follows:-

Prize	Student Name	Location/State
FIRST	Disha Roy Choudhury	Siliguri, West Bengal
SECOND	Bhavika Dugar	Coimbatore, Tamil Nadu
SECOND	A. Yokaran	Chennai, Tamil Nadu
SECOND	Yeerondip Debnath	Sealdah (Kolkata), West Bengal
SECOND	Devjit Choudhury	Jamshedpur, Jharkhand
THIRD	Shreya Das	Faridabad, Haryana
THIRD	Kshitiz Rawat	Delhi
THIRD	Sayani Das	Jamshedpur, Jharkhand
THIRD	A EshaRayal	Hyderabad, Andhra Pradesh
THIRD	Shreeraksha	Mangalore, Karnataka
THIRD	A Priya Dharsini	Coimbatore, Tamil Nadu
THIRD	Bhagyashree Kunwar	Mumbai, Maharashtra
THIRD	Imon Chetia Phukan	Guwahati, Assam

Central Ground Water Board, South East Coastal Region, Chennai has won the trophy for registering the participation of more than 2 Lakhs students. CGWB, South Western Region, Bangalore ranked second and Mid-Eastern Region, Patna ranked third.

The programme was organized under guidance of Dr S.C.Dhiman, Chairman, Central Ground Water Board and Shri Sushil Gupta, Member (SML), Central Ground Water Board. The function was attended by students and their parents/teachers, senior officers of Ministry of Water Resources, Govt. of India, Central Water Commission, Central Soil and Material Research Station, WAPCOS and other Central and State Government Organisations and NGOs.

vi. National Science Day Celebrations

Scientists of Central Ground Water Board, State Unit Office, and Pune attended Prize distribution ceremony of SPM English School, Yamuna Nagar, Nigadi, and Pune on the occasion of National Science Day on 2nd March, 2012. Superintending Hydrogeologist emphasized need for water conservation and recharge in his message to the children and school staff.

vii. Participation in 1st Scinece Expo organised by Raman Science Centre (National Council of Science Museums), Nagpur

CGWB, CR, Nagpur participated in 1st Science Expo organized by Raman Science Centre, Nagpur from 19th to 21st January 2012. In the Science Expo CGWB displayed publicity material like reports, brochures, leaflets, posters etc. and working model on RTRWH and Watershed Management. The EC/TDS and pH of water brought by visitors was also determined by using portable pen type EC and pH meter, display the poster, reports and model, brief the visitors, distribute the publicity material etc.

A Popular Lecture on 'Rainwater Harvesting and Artificial Recharge in Urban and Rural Areas' was presented by Central Ground Water Board on 19th January 2012. The Science Expo was inaugurated by Dr. P.S. Parihar, Director AMD (Exploration & Research), Hyderabad and 14 Scientific and Technological Institutes participated in the Science Expo. The CGWB stall was appreciated by numerous students and general public.

viii. Celebration of Hindi Saptah/Hindi Pakhwara

Hindi Saptaha/ Pakhwara was celebrated in different Regional offices/ HQ of CGWB from 14th September to 28th September 2012. Various competitions like Translation, Dictation, handwriting competition, Essay competition, Pick and speak, debate and Prasna Manch competitions were held. The officers and officials of the Board actively participated in all the competitions. The winners were also given prizes.

ix. Communal Harmony Campaign

Communal Harmony Campaign has been organized in the Central Ground Water Board, Bhujal Bhawan, Faridabad during 19 to 25 November 2011 and various activities on the theme were organized for the officers & staff members. On this occasion, donation has been collected from the officers & staff members of Central Ground Water Board, Faridabad.

Aashmani Ghosh received1st prize from Sh. G. Mohan Kumar, IAS, Additional Secretary (WR)

Participants of 2nd State Level Painting Competition, New Delhi

Aashmani Ghosh received1st prize from Sh. G. Mohan Kumar, IAS, Additional Secretary (WR)

Sh. G. Mohan Kumar, IAS, Additional Secretary (WR), Sh. Sushil Gupta, M(SML), CGWB, Sh. A.D. Rao, Suptg. Hg & OIC, SUO Delhi on the dias

STATE LEVEL PAINTING COMPETITION-2011, CGWB, NER, Guwahati

STATE LEVEL PAINTING COMPETITION-2011, CGWB, NR, Lucknow

24. 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 2011-12 up to 31st March, 2012 is given below in Table 24.1:

Table 24.1- Major achievements of the North Eastern Region

Sl. No.	Activities	Achievements
1.	Ground Water Management studies	12, 567 Sq. km (Pre-monsoon) 12, 567 Sq.Km. (Post-monsoon)
2	A. Ground Water Exploration through department B. Construction of Piezometers through Outsourcing	26 wells drilled in North Eastern Region Sanction is awaited.
3	Water Quality Analysis	206 samples analyzed for basic constituents and 169 samples have been analyzed for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc.
4.	Ground Water Regime Monitoring	Pre-monsoon, Monsoon & Post-monsoon water level monitoring completed in 310 observation wells
5.	Short Term Water Supply Investigation	87 nos.
6.	Chemical Quality Studies in Urban Clusters	Report submitted
7.	Artificial Recharge and Rainwater Harvesting (AR&RWH) Studies	Demonstrative project on AR&RWH are being implemented in Arunachal Pradesh and Nagaland for 144 artificial recharge structures amounting to Rs.717.25 Lakh were approved and fund to the tune of Rs.550.72 lakh released. 26 artificial recharge structures have been constructed.
8.	District Report	2- Dhalai district, Tripura & South Garo Hills district, Meghalaya submitted.
9..	Ground Water Year Books	Ground Water Year Book of NE State issued
10.	Ground Water Exploration Report	Report Submitted
11.	Ground Water Resources Assessment	Dynamic Ground Water resources 2008-09 reports of North East States issued
12	Study of Aquifer Mapping	Preparation of maps of Assam, Mizoram Arunachal Pradesh, Nagaland, Manipur, Tripura and Meghalaya are completed and submitted.

25. PROPAGATION AND PROGRESSIVE USE OF HINDI LANGUAGE

- The provision relating to Section 3(3) of the Official Language Act, 1963 has been complied with.
- Letters received in Hindi were invariably replied in Hindi.
- Hindi Quartely 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 organised 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.
- During 2011-12, Parliamentary committee of official Language made the inspection of CGWB, New Delhi. The committee expressed its satisfaction on the efforts made towards propagation of Hindi & its implementation.
- Incentive for original noting and drafting in Hindi is being implemented. Nine officials were awarded cash prize under this scheme.
- Ten sections of the office have been specified to work cent-percent in Hindi.
- 'Bhujal News Letter' the quarterley magazine highlighting on the activities of Central Ground Water Board is being published regularly.
- 'Hindi Pakhwara' was celebrated from 14 – 28th September 2011. Various competitions and other programmes were organized during the Pakhwara. The participation of officers/ officials in these competitions was encouraging.
- The Board is committed towards the progress and implementation of Hindi and determined for its progressive use of Hindi as per the Annual Programme issued by Official Language Department.

26. VIGILANCE ACTIVITIES

26.1 Vigilance Activities

During the year 2011-2012, 29 complaints cases were brought forward with effect from the last year and 7 new complaints were received during 2011-2012 up to 31st March, 2012. Thus total 36 complaint cases were on the record. Out of these 18 complaints have been closed and 4 complaint cases have been taken up as disciplinary proceedings. Therefore, 14 complaint cases have been carried forward w.e.f. 1.04.2012.

26.2 Disciplinary Proceedings

7 cases of disciplinary proceedings were brought forward w.e.f. 1.04.2011 and 4 cases of disciplinary proceeding have been received and one case was disposed off during the year. Thus a total 10 cases of disciplinary proceedings were on the record and carried forward w.e.f. 1.04.2012.

27. RTI INFORMATION

Total 131 RTI applications were received and out of 131, 122 applications have been disposed off. One application withdrawn by the applicant. Eight applications received without prescribed application fee and wrong IPO. Hence, after long wait these were rejected due to not receipt of revised IPO. An amount of Rs 2681/- was received towards application fee and photocopy charge.

28. PERSONNEL MANAGEMENT

The sanctioned strength, filled up, vacancy position and category-wise personnel deployed in the Board are presented in table 28.1 .

Table 28.1- Personnel Deployment in Central Ground Water Board During 2011-2012 (Up to 31st March, 2012)

GROUP "A"							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	403	310	93	21	-	46	12
Ministrial	7	6	1	-	-	-	-
Engineering	56	49	7	10	-	8	6
Total	**466**	**365**	**101**	**31**	**-**	**54**	**18**
GROUP "B"(Gazetted)							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	219	145	74	17	1	25	7
Ministrial	36	26	10	-	-	1	1
Engineering	110	57	53	4	-	15	7
Total	**365**	**228**	**137**	**21**	**1**	**41**	**15**
GROUP "B"(Non-Gazetted)							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	183	108	75	15	-	25	9
Ministrial	203	172	31	3	4	27	13
Engineering	265	224	41	13	1	65	21
Total	**651**	**504**	**147**	**31**	**5**	**117**	**43**
GROUP "C"							
Section	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
Scientific	91	54	37	3	-	14	5
Ministrial	1136	896	240	120	12	206	77
Engineering	1462	1180	282	118	-	258	99
Total	**2689**	**2130**	**559**	**241**	**12**	**478**	**181**
GRAND TOTAL							
Groups	**Sanctioned**	**Filled**	**Vacant**	**OBC**	**Handicapped**	**SC**	**ST**
GROUP "A"	**466**	**365**	**101**	**31**	**-**	**54**	**18**
GROUP "B"(Gazetted)	**365**	**228**	**137**	**21**	**1**	**41**	**15**
GROUP "B"(Non-Gazetted)	**651**	**504**	**147**	**31**	**5**	**117**	**43**
GROUP "C"	**2689**	**2130**	**559**	**241**	**12**	**478**	**181**
Total Strength	**4171**	**3227**	**944**	**324**	**18**	**690**	**257**

29. PERSONS WITH DISABILITIES

The Persons with Disabilities for the Year 2011-2012 up to 31st March 2012 is given in table 29.1.

Table 29.1 : Persons with disabilities for the year 2011-2012

1.	Schemes/Policies run by the respective Ministry/Department for the benefit of Persons with Disabilities.					Nil
2.	Budget allocated and expenditure incurred under each scheme during the financial year.					Nil
3.	No. of persons benefited					Nil
4.	Per capita expenditure					Nil
5.	Sanctioned strength, the number of vacancies filled since 1996 and the number of persons with disabilities appointed in various posts in Group – A, B, C & D against the 3% vacancies to be reserved for them under Section-33 of the PWD Act.	Group	Sanction Strength	Number of vacancies identified as on 15.11.2009	Number of persons with disabilities appointed	Remarks
		A	466	1	-	Requisition for filling up the vacant post including PH has been sent to the MoWR.
		B	1016	1	-	Requisition for filling up of 8 vacancies including one PH has been sent to the UPSC through MoWr.
		C	2689	11	6	Requisition for filling up 5(2VH, 1HH, 2OH) posts has been sent to the SSC.

30. BUDGET AND ACCOUNTING

Statement showing actual expenditure incurred by the Board during 2011-2012 has been shown in Table 34a, Table 34b, Table 34c, Table 34d and Table 34e.

Table 34a : Statement showing actual expenditure incurred by the Board during 2011-2012 (Up to March, 2012)

Sub-Head	Plan (Rs. In Lakhs)		Non-Plan (Rs. In Lakhs)	
	Funds	Expenditure	Funds	Expenditure
Salary	**2350.50**	2178.11	10265.58	10107.59
Wages	**45.00**	45.11	0.45	0.47
O.T.A.	**4.00**	2.97	7.00	6.85
M/Treatment	**150.00**	122.32	90.00	84.13
D.T.E.	**600.00**	582.02	120.47	121.88
F.T.E.	**10.00**	0.06	0.40	0.28
Office Expenses	**650.00**	618.57	5.50	6.24
R.R.T.	**250.00**	197.04	5.00	2.52
Publications	**80.00**	53.35	2.00	1.77
Advert/Public.	**0.00**	0.00	1.00	0.00
O.A.E.	**80.00**	49.43	0.10	0.00
P.O.L.	**1400.00**	1108.08	2.50	2.49
Minor Works	**200.00**	101.69	0.00	0.00
P.S.	**35.00**	20.92	0.50	0.48
Subsidies	**0.50**	0.01	0.00	0.00
S/Stock	**1200.00**	887.49	0.00	0.00
Other Charges	**10.00**	0.59	0.50	0.00
Motor Vehicle	**200.00**	79.17	1.00	1.00
M &E	**1200.00**	369.29	0.00	0.00
M/Works	**4725.00**	7692.75	0.00	0.00
W.O.L.	**10.00**	0.00	0.00	0.00
Total	**13200.00**	**14108.97**	**10502.00**	**10335.70**

Table 34b: Rajiv Gandhi National Training & Research Institute for Ground Water

Sub-Head	Fund Allotment	Expenditures
Salary	190.00	270.72
Wages	1.00	0.94
M/Treatment	2.00	1.84
D.T.E.	43.00	38.48
F.T.E.	10.00	0.00
O.E.	5.00	9.96
R.R.T.	1.00	5.43
Publication	4.00	0.00
P.O.L.	40.00	3.37
P.S.	2.00	31.18
M.V.	2.00	1.65
M & E	300.00	1.81
Total (RGNTR&I)	**600.00**	**365.38**

Table 34c: Hydrology Project
Ext. Support & Domestic Support

Sub-Head	Fund Allotment	Expenditures
Salary	282.75	167.23
M/Treatment	0.00	0.00
D.T.E.	26.25	14.81
F.T.E.	50.00	9.79
O.E.	71.25	15.75
O.A.E.	0.00	0.00
P.S.	220.00	15.25
M.V.	55.00	0.00
M & E	450.00	46.08
M/Works	45.00	102.36
Salary	92.25	43.93
M/Treatment	0.00	0.00
D.T.E	8.75	6.34
F.T.E.	0.00	0.00
O.E.	23.75	2.98
O.A.E.	0.00	0.00
P.S.	0.00	0.00
M.V.	0.00	0.00
M & E	0.00	0.00
M/Works	5.00	0.45
Total (Hydrology Project)(Ext. Sup & Dom)	**1330.00**	**424.97**

Table 34d : Central Ground Water Board building for offices

Sub-Head	Fund Allotment	Expenditures
Motor Vehicle	0.00	0.00
M. & E.	80.00	8.36
Major Works	1060.00	768.16
Total	**1140.00**	**776**
Total CGWB	**16270.00**	**15675.**

Table 34e : Deduct Recoveries

Sub-Head	Fund Allotment	Expenditures
Issue to Work	**1100.00**	1090.19
Other Suspense Charges	**100.00**	0.00
Total Recoveries	**1200.00**	**1090.19**
NET CGWB	**15070.00**	**14585.65**

Annexure -1

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

REGIONS	HEADQUARTERS	JURISDICTION
i)NORTH WESTERN HIMALAYAN REGION		
Regional Office	Jammu	J&K
Division Office	Div. VIII, Jammu	J&K
ii) NORTH HIMALAYAN REGION		
Regional Office	Dharamshala	Himachal Pradesh
Division Office	Div. XVII, Dharamshala	Himachal Pradesh
iii)NORTH WESTERN REGION		
Regional Office	Chandigarh	Punjab, Haryana, NCT of Delhi & UT of Chandigarh
Division Office	Div. II, Ambala	Punjab, Haryana, NCT of Delhi & UT of Chandigarh
iv)WESTERN REGION		
Regional Office	Jaipur	Rajasthan
State Unit Office	Jodhpur	Western Rajasthan
Division Office	Div. XI, Jodhpur	Rajasthan
v)WEST CENTRAL REGION		
Regional Office	Ahmedabad	Gujarat, UT of Daman & Diu
Division Office	Div.I, Ahmedabad	Gujarat, UT of Daman & Diu
vi)NORTH CENTRAL REGION		
Regional Office	Bhopal	Madhya Pradesh
Division Office	Div.XII, Bhopal	Madhya Pradesh
vii)NORTH CENTRAL CHATTISGARH		
Regional Office	Raipur	Chattisgarh
Division Office	Div.XIII, Raipur	Chattisgarh
viii)CENTRAL REGION		
Regional Office	Nagpur	Maharashtra, UT of D & N. Haveli
State Unit Office	Pune	West Maharashtra
Division Office	Div. VI, Nagpur	Maharashtra, UT of D & N. Haveli
ix)NOTHERN REGION		
Regional Office	Lucknow	Uttar Pradesh
State Unit Office	Allahabad	Uttar Pradesh
Division Office	Div.III, Varanasi	Uttar Pradesh
x)UTTARANCHAL REGION		
Regional Office	Dehradun	Uttaranchal
Division Office	Div.XVI, Bareilly	Uttaranchal
xi)MID EASTERN REGION		
Regional Office	Patna	Bihar, Jharkhand
State Unit Office	Ranchi	Jharkhand
Division Office	Div. V, Ranchi	Bihar, Jharkhand
xii)EASTERN REGION		
Regional Office	Kolkata	West Bengal, Sikkim, UT of A & Nicobar Islands
Division Office	Div. XV, Kolkata	-do-
xiii)NORTH EASTERN REGION		
Regional Office	Guwahati	Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Tripura
State Unit Office	Naharlugan	Arunachal Pradesh
	Shillong	Meghalaya
	Agartalla	Mizoram, Tripura
Division Office	Div.VII, Guwahati	Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Tripura
xiv)SOUTH EASTERN REGION		
Regional Office	Bhubaneshwar	Orissa
Division Office	Div. x, Bhubaneshwar	Orissa
xv)SOUTHERN REGION		
Regional Office	Hyderabad	Andhra Pradesh
State Unit Office	Vishakhapatanam	Coastal Andhra Pradesh
Division Office	Div. ix, Hyderabad	Andhra Pradesh
xvi)SOUTH WESTERN REGION		
Regional Office	Bangalore	Karnataka & Goa
State Unit Office	Belgaum	W. Karnataka & Goa
Division Office	Div. xiv, Bangalore	Karnataka & Goa
xvii)SOUTH EASTERN COASTAL REGION		
Regional Office	Chennai	Tamil Nadu, UT of Pondicherry
Division Office	Div. iv, Chennai	Tamil Nadu, UT of Pondicherry
xviii)KERALA REGION		
Regional Office	Trivendrum	Kerala & UT of Lakshadweep
Division Office	Div. iv, Chennai	Kerala & UT of Lakshadweep
State Unit Office	Delhi	Delhi


केन्द्रीय भूमिजल बोर्ड
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जन चेतना समारोह
मेड़ता पंचायत समिति, जिला नागौर
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Water is Scarce
PRESERVE IT..
Water is Scarce
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