ANNUAL REPORT

2013-14



GOVERNMENT OF INDIA MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION NEW DELHI

Abbreviations

ADB	Asian Development Bank	
AfDB	African Development Bank	
AIBP	Accelerated Irrigation Benefits Programme	
AR	Artificial Recharge	
BB	Brahmaputra Board	
BCB	Bansagar Control Board	
BIS	Bureau of Indian Standards	
BRB	Betwa River Board	
CADWM	Command Area Development & Water Management	
CCA	Culturable Command Area	
Cd	Cadmiumn	
CEA	Central Electricity Authority	
CGWB	Central Ground Water Board	
Ch	Chainage	
CLA	Central Loan Assistance	
CMC	Cauvery Monitoring Committee	
СО	Cobalt	
Cr	Chromium	
CRA	Cauvery River Authority	
CSMRS	Central Soil & Materials Research Station	
Cu	Copper	
cumec	cubic metre per sec	
cusec	cubic foot per sec	
CWC	Central Water Commission	
CWPRS	Central Water & Power Research Station	
CWDT	Cauvery Water Disputes Tribunal	
DBE	Design Basic Earthquake	
DPR	Detailed Project Report	
DRIP	Dam Rehabilitation and Improvement	
DSARP	Project Dam Safety Assurance and Rehabilitation Project	
DSS	Decision Support System	
EFC	Expenditure Finance Committee	
ERM	Extension, Renovation and Modernization	
EW	Exploratory Well	
FBP	Farakka Barrage Project	
FPARP	Farmers' Participatory Action Research Programme	
Fe	Iron	

FMP	Flood Management Programme	
GFCC	Ganga Flood Control Committee	
GHLSC	Gandak High Level Standing Committee	
GRA	Grievances Redressal Authority	
FR	Feasibility Report	
FRL	Full Reservoir Level	
GSI	Geological Survey of India	
ha	Hectare	
HAD	Hydrological Design Aid	
HE	Hydro-electric	
HIS	Hydrological Information System	
HP	Hydrology Project	
HPC	High Performance Concrete	
IBRD	International Bank of Reconstruction and Development	
IDS	Infrastructure Development Scheme	
IEC	Information, Education and	
	Communication	
	India Meteorological Department	
	Irrigation Management Training Institute	
INCGECIVI	Engineering and Construction Materials	
INCGW	Indian National Committee on Ground Water	
INCH	Indian National Committee on Hydraulic Research	
INCID	Indian National Committee on Irrigation and Drainage	
INCOH	Indian National Committee on Hydrology	
ISRO	Indian Space Research Organisation	
ISRWD	Inter-State River Water Disputes	
JBIC	Japan Bank for International Cooperation	
JCWR	Joint Committee on Water Resources	
JET	Joint Expert Team	
JGE	Joint Group of Experts	
JRC	Joint Rivers Commission	
Kfw	Kreditanstalt fur Wiederaufbau	
KHLC	Koshi High level Committee	
KWDT	Krishna Water Disputes Tribunal	
m	Metre	
M & M	Major and Medium	

Mha	million hectares	
MI	Minor Irrigation	
Mn	Magnese	
MoU	Memorandum of Understanding	
MoEF	Ministry of Enviroment & Forest	
MoWR	Ministry of Water Resources	
MPPGCL	Madhya Pradesh Power Generation Corporation Ltd.	
NAPCC	National Action Plan on Climate Change	
NASC	National Agriculture Science Centre	
NCA	Narmada Control Authority	
NCMP	National Common Minimum Programme	
NCSDP	National Committee on Seismic Design Parameters	
NEEPCO	North Eastern Electric Power Corporation Limited	
NeGP	National e- Governance Plan	
NERIWALM	North Eastern Regional Institute of Water and Land Management	
NGRI	National Geophysical Research Institute	
NHDC	Narmada Hydro-electric Development Corporation	
Ni	Nickel	
NLC	Neyveli Lignite Corporation Limited	
NLPMC	National Level Programme Monitoring Committee	
NLSC	National Level Steering Committee	
NPCC	National Projects Construction Corporation Ltd	
NPP	National Perspective Plan	
NRLD	National Register of Large Dams	
NWDT	Narmada Water Disputes Tribunal	
NWM	National Water Mission	
NRSC	National Remote Sensing Centre	
NWDA	National Water Development Authority	
OFD	On Farm Development	
ONGC	Oil and Natural Gas Corporation	
OW	Observatory Well	
PAC	Project Advisory Committee	
PAF	Project Affected Families	
Pb	Lead	
PDS	Purpose Driven Studies	
PIM	Participatory Irrigation Management	

PSC	Permanent Standing Committee	
PZ	Piezometer	
R&R	Rehabilitation and Resettlement	
RFD	Results Framework Document	
RMIS	Rationalisation of Minor Irrigation Statistics	
ROS	Reservoir operation system	
RRR	Repair, Renovation and Restoration	
RRSSC	Regional Remote Sensing Service Centre	
RTDAS	Real Time Data Acquisition System	
RTSF	Research Technology Support Facility	
SAC	Standing Advisory Committee	
SCEC	Sub Committee on Embankment	
	Construction	
SFRU	Steel Fibre Reinforced concrete	
55		
SSCAC	Sardar Sarovar Construction Advisory	
SSP	Sardar Sarovar Project	
SW	Surface Water	
TAC	Technical Advisory Committee	
TAMC	Technical Assistance and Management	
TB	Tungbhadra Board	
Th	Thousand	
TOR	Terms of Reference	
UYRB	Upper Yamuna River Board	
VWDT	Vansadhara Water Dispute Tribunal	
WALMI	Water and Land Management Institute	
WAPCOS	Water and Power Consultancy Services	
WAI 005	(India) Ltd.	
WB	World Bank	
WEGWIS	Web Enabled Ground Water Information System	
WQAA	Water Quality Assessment Authority	
WRIS	Water Resources Information System	
WUA	Water User Association	
WUE	Water Use Efficiency	
Zn	Zinc	

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Chapter 1

An Overview

Ministry of Water Resources, Government of India is responsible for development, conservation and management of water as a national resource; overall national perspective of water planning and coordination in relation to diverse uses of water; general policy, technical assistance, research and development, training and matters relating to irrigation and multi-purpose projects, ground water management; conjunctive use of surface and ground water, command area development, flood management including drainage, flood-proofing, water logging, sea erosion and dam safety.

The Ministry has also been allocated the subject of regulation and development of inter-State rivers, implementation of awards of Tribunals, water quality assessment, bilateral and external assistance and co-operation programmes in the field of water resources and matters relating to rivers common to India and neighbouring countries.

The above functions of the Ministry are performed through its two attached offices (Central Water Commission and Central Soil and Materials Research Station), seven sub-ordinate offices (Central Ground Water Board, Central Water and Power Research Station, Ganga Flood Control Commission, Farakka Barrage Project, Sardar Sarovar Construction Advisory Committee, Banasagar Control Board and Upper Yamuna River Board), seven statutory bodies (Brahmaputra Board, Narmada Control Authority, Betwa River Board, Tungabhadra Board, Ravi and Beas Water Tribunal, Cauvery Water Disputes Tribunal and Krishna Water Disputes Tribunal), two autonomous societies (National Water Development Agency and National Institute of Hydrology) and two public sector enterprises (WAPCOS Limited and National Projects Construction Corporation Limited).

The Ministry was headed by Hon'ble Shri Harish Rawat as the Union Minister of Water Resources up to 31st January, 2014 and thereafter by Hon'ble Shri Gulam Nabi Azad up to 25th May, 2014. At present, it is headed by Hon'ble Sushri Uma Bharti as Union Minister for Water Resources, River Development and Ganga Rejuvenation w.e.f. 26th May, 2014. Shri Santosh Kumar Gangwar is Minister of State for Water Resources, River Development and Ganga Rejuvenation w.e.f. 26th May, 2014. Shri Santosh Kumar Gangwar is Minister of State for Water Resources, River Development and Ganga Rejuvenation w.e.f. 26th May, 2014. Dr. S. K. Sarkar was the Secretary in the Ministry up to 30th June, 2013 and now, Shri Alok Rawat is the Secretary w.e.f. 1st July, 2013. Shri G Mohan Kumar was Special Secretary up to 1st September, 2013. Thereafter, Shri Jatinderbir Singh was Additional Secretary from 30th December, 2013 to 2nd February, 2014. At present, Dr. Amarjit Singh is Additional

Secretary in the Ministry w.e.f. 30th April, 2014. The organisational chart of the Ministry is at **Annexure-I**. The staff strength of the Ministry is at **Annexure-II**.

There are at present 11 wings in the Ministry, namely, Administration, State Projects, Finance, Policy & Planning, Brahmaputra & Barak, Ganga, Indus, Peninsular River, Data Base Management, Economic and National Water Mission.

The Ministry is implementing and monitoring 4 State Sector and 15 Central Sector Schemes. The State Sector Schemes implemented and monitored by the Ministry and releases made for these Schemes during 2013-14 are given in **Table -1** below.

Table-1

Release of finance under State Sector Schemes 2013-14

Name of the scheme	(Rs. crore)
Accelerated Irrigation Benefits Programme (AIBP)	3216.90
Command Area Development & Water Management (CAD&WM)	179.97
Flood Management Programme (FMP)	379.00
RRR of Water Bodies	37.97

The Central Sector Schemes implemented by the Ministry and the budget estimates, revised estimates and expenditure in respect of Central Sector Schemes during 2013-14 are given in **Table-2** below.

Table-2

Release of finance under Central Sector Schemes 2013-14

(Rs. crore)

Central Sector Scheme	BE	RE	Actual Expenditure
Development of Water Resources Information System	150.00	43.00	41.19
Flood Forecasting	150.00	25.00	22.98
Hydrology Project-II	70.00	50.00	38.76
Ground Water Management and Regulation	275.00	140.00	71.67
Research & Development	50.00	35.00	30.17
HRD/Capacity Building	94.00	31.50	23.96
Infrastructure Development	50.00	20.00	9.00
River Management Activities and Works related to Border Rivers	125.00	67.00	17.00
Farakka Barrage Project	150.00	115.00	89.82
Implementation of National Water Mission	110.00	2.00	0.71
Dam Rehabilitation & Improvement Programme	36.00	9.00	4.60
River Basin Management	200.00	150.00	148.46
Irrigation Management Programme (new)	40.00	0.10	0.00
Bodwad Parisar Sinchan	0.00	12.40	0.00
Impact Assessment	0.00	0.00	0.00
Total	1500.00	700.00	498.32

XII Plan allocation in respect of Central Sector Scheme is Rs. 18118 crore. XII Plan allocation in respect of State Sector Scheme is Rs. 91435 crore. The details of XII Plan

outlay, during 2012-13 and 2013-14 in respect of Central Sector Schemes and State Sector Schemes are at **Annexure-III**.

The budget at a glance, indicating the plan and non- plan actuals and budget estimates of various schemes, is at **Annexure-IV**.

Major Achievements

Under Accelerated Irrigation Benefits Programme, the State Governments have been provided an amount of Rs.64905 crore as CLA/Grant since its inception till 31.3.2014 for 294 major/medium irrigation projects and 16456 surface minor irrigation schemes. 142 major/medium and 12083 surface minor irrigation schemes have so far been completed. The irrigation potential of 80.55 lakh hectare has been created up to March 2012.

Of the 65 major/medium projects initially included in the **Prime Minister's Relief Package for agrarian distress districts** of Andhra Pradesh, Karnataka, Kerala and Maharashtra, 40 projects have been funded under AIBP. The grant released for these projects stands at Rs.6732.928 crore.

16 projects have been included under the scheme of **National Projects**. 4 projects, namely, Gosikhurd project of Maharashtra, Shahpurkandi project of Punjab, Teesta Barrage project of West Bengal and Saryu Nahar Pariyojana of Uttar Pradesh have been funded under the scheme. Gosikhurd and Shahpurkandi projects have been provided grant amounting to Rs.2582.94 crore and Rs.26.04 crore respectively up to March 2013. Teesta Barrage project started receiving funding during 2010-11 and grant amounting to Rs.178.20 crore has been provided till March 2013. Saryu Nahar Pariyojana of Uttar Pradesh started funding during 2012-13 and an amount of Rs.448.73 crore has been released.

The scheme of National Projects has been approved for continuation and implementation in 12th Plan with a proposed outlay of Rs.8150 crore under the ambit of AIBP.

The main **policy changes of AIBP in 12th Plan**, inter-alia, include (i) Pari-Passu implementation of AIBP & CAD&WM works, (ii) Enhancement of Central Assistance up to 50% for ongoing and new projects of General Areas subject to the States carrying out water sector reforms and satisfying the "Reform Friendliness" benchmarks, (iii) Central Assistance of 75% of the project (work component) for eligible irrigation projects for new projects in Special Areas of non-Special Category States and (iv)

Central Assistance of 90% of the cost of the project (work component) for eligible irrigation projects for new projects in Special States.

CAD&WM

Initially, 60 major and medium irrigation projects were taken up under the CAD programme, covering a Culturable Command Area (CCA) of about 15 million hectare. After inclusion of new projects, deletion of completed projects and clubbing of some projects, there are now 150 projects under implementation. The outlay for the XII Five Year Plan is Rs.15000 crore and physical target is 7.6 Mha. This also includes a provision of Rs.1000 crore to cover an area of 0.25 Mha for development of Micro Irrigation through Public Private Partnership (PPP).

The core components of physical works under CAD&WM relates to construction of field channels. Since its inception in 1974-75 up to March, 2013, CCA of about 20.5 Mha has been covered. Central Assistance of about Rs.5573 crore has been released to States under the CAD Programme since its inception in 1974-75 up to March, 2013. An amount of Rs.179.98 crore has been released during 2013-14.

Reclamation of Water Logged Areas: 823 schemes of 9 States, namely, Bihar, Gujarat, Madhya Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Odisha and Uttar Pradesh have been approved for reclamation of 122.53 thousand hectare (th. ha) water logged area. Out of this, an area of 78.278 thousand hectare has been reported to be reclaimed by these States up to March, 2013.

RRR: Under the scheme with domestic support, a total of 3341 water bodies were taken up for restoration in 12 States out of which 2030 water bodies have been completed till date. A total central grant amounting to Rs. 890.259 crore had been released to the States for completion of works on these water bodies.

The continuation of Repair, Renovation & Restoration of Water Bodies for XII Plan was approved on 20.9.2013. It is envisaged to provide Central Assistance for restoration of about 10,000 water bodies (9000 in rural areas and 1000 in urban areas) with an earmarked outlay of Rs. 6235 crore.

Flood Forecasting : Through 175 flood forecasting stations (147 level forecasting and 28 inflow forecasting) on major dams/barrages, which covers 9 major river systems in the country including 71 river sub-basins and 15 States, on an average, over 6000 forecasts are being issued during flood season every year by the Central Water Commission. During the flood season 2013 (May to October), 7060 flood forecasts (5741 level forecasts and 1319 inflow forecasts) were issued, out of which 6760

(95.75%) forecasts were found within accuracy limit of +/- 0.15 m for level forecast and +/- 20% for inflow forecast.

Flood Management Programme: Under this programme, a total of 420 works were approved out of which 252 works were physically completed and the Central Assistance of Rs. 3566 crore was released during XI Plan. The completed works have restored 17.01 lakh hectare of old flood prone area and provided reasonable protection to 2.59 lakh hectare of new flood prone area. The Government of India has approved continuation of Flood Management Programme during XII Plan with an outlay of Rs. 10,000 crore. During XII Plan, the central assistance would also be provided for catchment area treatment projects having objectives of flood management. During XII Plan, the central assistance of search up to 31.03.2014.

Hydrology Project - Phase II: The physical achievement during 2013-14 consists of (i) Up-gradation of Hydrological Information System (HIS), (ii) Development and installation of Decision Support System-Planning (DSS-P) in 9 HP-I States, (iii) Development of Decision Support System-Real Time (DSS-RT) model and installation of Data Acquisition System (DAS) equipments, (iv) Development of software for 2 modules under Hydrological Design Aid-Surface Water (DHA-SW), (v) Completion of Heliborne survey for carrying out Aquifer Mapping, (vi) Development of RTSF & ROS model for development and establishment of Real Time Streamflow and Reservoir Operation system in Bhima and Upper Krishna rivers in Maharashtra and completion of installation of Real Time Data Acquisition System (RTDAS), (vii) Completion of 41 Purpose-Driven Studies (PDS) and (viii) Establishment of HIS in 4 new States.

Research and Development: Under Indian National Committee on Surface Water (INCSW) and Indian National Committee on Ground Water (INCGW), 82 research schemes and 8 research schemes respectively were under implementation as on 31st March 2014.

IEC: India Water Week-2013 with the theme "Efficient Water Management : Challenges and Opportunities" was organised during 8 – 12 April, 2013 at New Delhi, which discussed the issues of management of water in agriculture and irrigation, energy generation (hydro & thermal), industrial production & demand management, urban and rural water supply.

The **4**th National Painting Competition on Water Conservation was organized on 27th December, 2013 at New Delhi. The Competition was held among the 90 students comprising 1st, 2nd and 3rd prize winners of State Level Competition. Ms. Unnimaya D.P. from Kerala won the first prize of Rs. 1,00,000/-. There were four second prizes of Rs. 50,000/-, eight third prizes of Rs. 25,000/- and seventy seven consolation prizes of Rs. 5,000/- each along with certificates.

ID: During the XII Plan, Rs. 246.26 crore for the ID scheme has been approved. Out of this, Rs. 216.26 crore is earmarked for L&B component and the balance of Rs. 30 crore for the IT component. During 2013-14, Rs. 50 crore was provided, which has been reduced to Rs.20.00 crore at RE stage. The modernisation of CWC (Hqrs) and construction works of office- cum-residential complex at Patna and Guwahati are in progress. The construction of office-cum-residential complex at Burla have been completed. The construction of Hutment (new activity) at various sites has also been proposed under this scheme.

Farakka Barrage Project: Farakka Barrage Project Authority have completed the anti-erosion works at Birnagar / Simultola for a length of 260 m including strengthening of 40 m just upstream of Farakka Barrage on the left bank of river Ganga. Some interim bank protection works were also undertaken on left bank of river Ganga, downstream of Farakka Barrage. Left bank of river Bagmati protected in a reach length of 140 m. Special repair of another 7 gates of Farakka Barrage, replacement of 33 gates have also been awarded and work of removal damaged gates is under progress whereas fabrication and erection of new gates of Farakka Barrage is going to commence shortly.

National Water Mission: Two Round Table Conferences held on 01.10.2013 and 29.10.2013 at New Delhi on Strategizing and Mainstreaming CSR Initiatives of Industry into Water Sector to help achieving the objectives of NWM. A one week (20th May to 24th May, 2013) training and capacity building program was organized at Tejpur, Assam for the benefit of North Eastern States. A regional workshop on "Water Conservation and Sustainable Management of Ground Water in National Capital Region" was organized by CGWB on 25.03.2014 at New Delhi.

A scoping study for a National Water Use Efficiency Improvement Support program for major /medium irrigation schemes has been initiated with technical assistance from Asian Development Bank (ADB). Two workshops on constraints, opportunities and requirements for implementation of the National Water Mission and improving Water Use Efficiency of Major and Medium Irrigation projects were held on 05th June, 2013 at Chandigarh for Northern States, 25th June, 2013 at Hyderabad for Southern States. Ministry of Water Resources and Indian Council of Agricultural Research (ICAR) organised one day sensitisation workshop on 'Enhancing Water use Efficiency in Yamuna Basin' on 30.08.2013 at New Delhi.

DRIP: Dam Rehabilitation and Improvement Project (DRIP) aims at rehabilitation and improvement of about 223 large dams in four States (Madhya Pradesh-50, Odisha-38, Kerala-31 and Tamil Nadu-104) with World Bank funding. The total project cost is about Rs.2100 crore and has become effective from 18th April, 2012 and will be implemented over a period of six-years.

Central Water Commission is monitoring water quality at 396 key locations covering all the major river basins of India. During 2013-14, CWC carried out design consultancy in respect of 77 projects out of which 56 projects (including 6 from North Eastern region) were at construction stage while the remaining 21 projects (including 8 from North Eastern region) were either at investigation or at DPR stage. Technical examinations for 82 projects were also carried out in the year.

During 2013-14, technical examinations of 36 water resources projects (17 irrigation and 19 flood protection) were completed and accepted by the Advisory Committee of Ministry of Water Resources. The irrigation projects accepted by the Advisory Committee would provide irrigation to 10,12,225 hectare area and flood protection projects will provide protection to 20,34,000 persons and 6,43,000 hectare area. As of now, 62 new irrigation projects (25 major & 37 medium) as well as 22 revised cost estimates (11 major & 11 medium) are under different stages of appraisal.

Glacial Lake Outburst Flood (GLOF) studies of Chatru H E Project & Sach Khas H.E Project of Himachal Pradesh, Raigam HE Project, Gimliang HE Project, New Melling HE Project, Magochu HE Project, T-sachu-1 Lower and T sachu-11 HE Projects of Arunachal Pradesh and Bhutan has been completed. Further Kiru HE Project and Kwar HE Project of Jammu & Kashmir were examined and cleared during the year.

Central Soil and Materials Research Station investigated 45 projects, including 6 abroad and 6 in North- East region of India during 2013-14. The investigations comprised field and laboratory investigations in the areas of soil, rock, geosynthetics and water analysis and construction material.

The self-sponsored research schemes by **CSMRS** currently in progress relates to: (i) Evaluation of strength characteristics of clayey soils by adding additives, (ii) Stabilization of expansive soil using fly ash, (iii) Effect of acidic environment on geosynthetics and on coatings, (iv) Effect of fines on liquefaction potential of soils, (v) Study on flyash based geopolymers as construction material, (vi) Characterization of polymer based admixtures for concrete, (vii) Study on batch to batch variation in properties of chemical admixtures and ageing effect on using in concrete, (viii) Strength and durability aspects of multi blend concrete with particular reference to underwater abrasion, (ix) Compilation and interpretation of properties and parameters of 10 variants of Basalt, (x) Compilation and interpretation of properties and parameters of 10 variants of Gneiss and (xi) Correlation between UCS and indirect tensile strength (Brazilian).

Central Ground Water Board constructed 649 wells (EW-426, OW-137, PZ-86) including 32 high yielding wells to assess the ground water potential in different

CGWB analyzed 21973 water samples including basic constituents, heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc, organic and specific constituents during 2013-14. 2000 water samples were analyzed for major cations/anions, Heavy metals, pesticides, industrial pollution, bacteriological contamination.

CGWA carried out technical appraisal of industrial, mining, power, infrastructural development proposals seeking ground water withdrawal. During the period, 130 projects were accorded NOC for ground water withdrawal and 24 projects were issued letter for exemption for ground water withdrawal. In addition, 25 projects were accorded renewal of NOC for ground water withdrawal.

Under the scheme of Demonstrative Projects on "Artificial Recharge to Groundwater & Rainwater Harvesting", 310 artificial recharge structures were constructed during 2013-14 and total structures constructed under the scheme are 1343.

Water Quality Assessment Authority conducted 3 training programmes involving 128 trainees to enhance capacity building of the scientific/technical officers involved in water quality issues across the country, one each at Centre for Water Resources Development and Management (CWRDM), Kerala; National Institute of Hydrology (NIH), Roorkee and Central Water Commission (CWC), New Delhi.

CWPRS undertook 152 studies on a no-loss no-profit basis in the major sectors of water resources, river engineering, power sector and coastal development during 2013-14.

GFCC is monitoring about 78 flood management schemes. Out of 94 flood management schemes received in GFCC from Ganga Basin States during 2013-14, 57 schemes were technically appraised out of which 26 schemes were accorded techno-

economic clearance. 4 schemes of Uttarakhand with cost of more than Rs. 25.00 crore were appraised and these were cleared from techno-economic angle by TAC-MoWR.

Sardar Sarovar Construction Advisory Committee: Total 32593.412 million units (MU) energy was generated from the power houses till March 2014, out of which 5877.34 MU generated in the Financial Year 2013-14.The dam over flowed this year for about 78 days and maximum water level attained on 25th Aug. 2013 was 131.18 m i.e. about 9.26 m above the crest level.

Bansagar Control Board: The left and right rock fill dam have been completed up to top level, i.e., R.L. 347 m. All masonry non-overflow blocks and both the key block on either side have been completed up to top elevation at R.L. 347 m. Spillway blocks have been raised up to crest level (R.L 326.4 m) and spillway Piers & Bridge have been completed.

Upper Yamuna River Board: "Upper Yamuna" refers to the reach of Yamuna from its origin at Yamunotri to Okhla Barrage at Delhi. A Memorandum of Understanding (MoU) was signed on 12th May, 1994 amongst the basin States of Himachal Pradesh, Uttar Pradesh, Haryana, Rajasthan and Delhi, for sharing the utilizable surface flows of river Yamuna up to Okhla. The MoU also provided for creation of "Upper Yamuna River Board" to implement the said agreement. After creation of Uttaranchal State in 2000, this State has also been included in Upper Yamuna River Board.

NWDA has identified 16 water transfer links under Peninsular Component for Surveys and Investigations and preparation of Feasibility Reports. So far, FRs of 14 links under Peninsular Component have been completed. DPR of one link, namely, Ken-Betwa (phase-I) was completed in April, 2010. Detailed Project Reports (DPRs) of Ken-Betwa Link Project Phase-II and Damanganga –Pinjal Link Project have also been completed during 2013-14. Further, **NWDA** has identified 14 water transfer links under Himalayan Component for Surveys and Investigations and preparation of Feasibility Reports (FRs). So far, FRs of 2 links (Indian portion) in the Himalayan Component have been completed.

The benefits from Inter Basin Water Transfer Link Schemes relates to 25 million hectare of irrigation from surface waters, 10 million hectare by increased use of ground waters, raising the ultimate irrigation potential from 140 million hectare to 175 million hectare and generation of 34 million KW of power, apart from the incidental benefits of flood control, navigation, water supply, fisheries, salinity and pollution control etc. in various States.

National Institute of Hydrology published 177 papers in reputed international and national journals and proceedings of international and national conferences and symposia and prepared 56 technical reports of different studies in the area of hydrology and water resources sector during 2013-14. The Institute also organized 33 training courses/workshops for field engineers, scientists, researchers, etc.

Narmada Control Authority: The Sardar Sarovar Project envisages the development of irrigation potential of 17.92 lakh hectares and 2.46 lakh hectares in the States of Gujarat and Rajasthan, respectively. Out of this, an irrigation potential of 9.48 lakh hectares has already been created in Gujarat.

Betwa River Board: The project envisages creation of an irrigation potential of 1.39 lakh hectares in Uttar Pradesh and 1.22 lakh hectares in Madhya Pradesh. The above irrigation potential has already been created by the party States. The project released 6.42 thousand Million Cubic Feet water for irrigation during the year 2012-13.

Tungabhadra Board: The Tungabhadra reservoir filled up to the full reservoir level 497.738 (1633.00 feet) during this year. The inflow in to the reservoir from April 2013 to March 2014 was 11008.83 million cubic meters (mcum) (388.773 TMCft). The utilization by the Karnataka State & Andhra Pradesh till the end of March 2014 was 2533.338 MCum (89.464 TMCft) and 1305.633 MCum (46.108 TMCft) respectively as against the likely abstraction of 3879.12 MCum (136.990 TMCft (135.000 +1.990 Bhadra Assistance)) for the water year 2013-14. Evaporation losses from April 2013 to March 2014 were 202.607 MCum (7.155 TMC ft) to be shared by Karnataka and Andhra Pradesh in the ratio of 12.5 : 5.5. A total quantity of 6,732.574 MCum (237.759 TMC ft) of water has out flowed over spillway including EPG (extra power generation).

India-China Cooperation: The 7th meeting of Joint Expert Level Mechanism was held from 14th to 18th May, 2013 at Beijing wherein the issues related to bilateral cooperation on exchange of hydrological information between the two countries were discussed. ELM also finalized the renewal of the Memorandum of Understanding (MoU) between India and China on provision of Hydrological Information on Brahmaputra river in Flood Season before its expiry on 4th June, 2013. During the visit of Chinese Premier, Li Keqiang in India, the MoU was renewed on 20th May, 2013. Thereafter, during the visit of Prime Minister of India to China, this MoU was revised to extend the data provision period by 15 days since 2014 that is to start from 15th May instead of 30th May to 15th October of the relevant year.

WAPCOS Ltd.: The Company achieved turnover of Rs. 89640 lakh for the year ending 31.03.2014 as against the previous figure of Rs. 56725 lakh for the corresponding period.

NPCC: At present, the Corporation is working on more than 140 projects spread all over the country. The Corporation achieved a turnover of Rs. 1175.84 crore (unaudited) during 2013-14 compared to previous year's turnover of Rs 1155 crore. NPCC Ltd. has achieved MoU rating of **"Very Good"** with composite score of 2.34 for the year 2012-13. It has also been awarded **'Turnaround Award 2013'** by Board for Reconstruction of Public Sector Enterprises (BRPSE).

INDIA-WRIS website: The first full version of website of INDIA-WRIS (<u>www.india-wris.nrsc.gov.in</u>) was launched by Hon'ble Minister of Water Resources on 07 December, 2010 in New Delhi. The information system contains several GIS layers on water resources projects, thematic layers like major water bodies, land use/land cover, wastelands, land degradation etc., environmental layers as well as infrastructure and other administrative layers. The final version (ver 4.0) has been launched in March, 2014. To maintain and update such a large volume of water resources data at national level, it has been planned to establish a new organization as National Water Resources Information Centre (NWR-IC).

Chapter 2

National Water Policy – 2012 National Water Policy

The National Water Resources Council under the Chairmanship of Hon'ble Prime Minister at its 6th Meeting held on 28th December, 2012 adopted the National Water Policy (NWP), 2012. Accordingly, the NWP, 2012 was released by the Hon'ble Minister of Water Resources in the presence of the President of India on 08th April, 2013 during the inauguration of India Water Week, 2013.



Hon'ble Minister of Water Resources releasing National Water Policy, 2012 and presenting to the President of India on 8th April, 2013

The salient features of the National Water Policy, 2012 are as follows :

- 1. Emphasis on the need for a national water framework law, comprehensive legislation for optimum development of inter-State rivers and river valleys.
- Water, after meeting the pre-emptive needs for safe drinking water and sanitation, achieving food security, supporting poor people dependent on agriculture for their livelihood and high priority allocation for minimum ecosystem needs, be treated as economic good so as to promote its conservation and efficient use.
- 3. Ecological needs of the river should be determined recognizing that river flows are characterized by low or no flows, small floods (freshets), large floods and

flow variability and should accommodate development needs. A portion of river flows should be kept aside to meet ecological needs ensuring that the proportional low and high flow releases correspond in time closely to the natural flow regime.

- 4. Adaptation strategies in view of climate change for designing and management of water resources structures and review of acceptability criteria has been emphasized.
- A system to evolve benchmarks for water uses for different purposes, i.e., water footprints and water auditing be developed to ensure efficient use of water. Project financing has been suggested as a tool to incentivize efficient & economic use of water.
- 6. Setting up of Water Regulatory Authority has been recommended. Incentivization of recycle and re-use has been recommended.
- 7. Water Users Associations should be given statutory powers to collect and retain a portion of water charges, manage the volumetric quantum of water allotted to them and maintain the distribution system in their jurisdiction.
- 8. Removal of large disparity in stipulations for water supply in urban areas and in rural areas has been recommended.
- 9. Water resources projects and services should be managed with community participation. Wherever the State Governments or local governing bodies so decide, the private sector can be encouraged to become a service provider in public private partnership model to meet agreed terms of service delivery, including penalties for failure.
- 10. Adequate grants to the States to update technology, design practices, planning and management practices, preparation of annual water balances and accounts for the site and basin, preparation of hydrologic balances for water systems, and benchmarking and performance evaluation.

A Committee was constituted by Ministry of Water Resources under the Chairmanship of Dr. S.R. Hashim, former Member, Planning Commission & former Chairman, Union Public Service Commission for suggesting a road map for implementation of National Water Policy, 2012. The Committee submitted its Report in September, 2013.

II. National Water Framework Law

Even while it is recognized that States have the right to frame suitable policies, laws and regulations on water; there is a felt need to evolve a broad over-arching national legal framework of general principles on water to lead the way for essential legislation on water governance in every State of the Union and devolution of necessary authority to the lower tiers of government to deal with the local water situation. Such a framework law must recognize water not only as a scarce resource but also as a sustainer of life and ecology. Therefore, water needs to be managed as a community resource held, by the State, under public trust doctrine to achieve food security, livelihood, and equitable and sustainable development for all.

The 12th Five Year Plan Document, approved by the National Development Council and the National Water Policy, 2012 adopted by the National Water Resources Council emphasized the need of having a National Water Framework Law. The National Water Framework Law needed to be evolved through wider consultations with all stakeholders, particularly the State Governments. In view of this, Ministry of Water Resources initiated action for preparation of Water Framework Act. A Drafting Committee headed by Dr. Y.K. Alagh, Chancellor, Central University of Gujarat and former Minister of Power, Planning, Science and Technology, Government of India was constituted for Drafting National Water Framework Law on 3rd July, 2012.

The Drafting Committee for National Water Framework Law submitted its report to Hon'ble Minister (WR) on 28th May, 2013.



Shri Y.K. Alagh presenting the Report of the Committee to draft National Water Framework Bill on 28th May, 2013

The salient features of the draft National Water Framework Bill are given below:

1. The draft National Water Framework Bill proposes to establish an umbrella statement of general principles governing the exercise of legislative and/or executive (or devolved) powers by the Centre, the States and the local governing bodies, which should lead the way for essential legislation on water governance

in every State of the Union and devolution of necessary authority to the lower tiers of government to deal with the local water situation.

- 2. It proposes eighteen basic principles for water management to bring different State legal interventions within a framework of governing principles and alignment of existing legislations both at the Central as well as State level to conform to the principles and provisions of this Bill.
- 3. It proposes that every individual should have a right to a minimum quantity of potable water (not less than 25 litres per capita per day) for essential health and hygiene and within easy reach of the household, which may be provided free of cost to eligible households, being part of pre-emptive need.
- 4. It proposes establishment of an independent statutory Water Regulatory Authority by every State for ensuring equitable access to water for all and its fair pricing on volumetric basis, for drinking and other uses such as sanitation, agricultural and industrial.
- 5. It proposes that all water resources projects conform to the River Basin Master Plan to be prepared, applicable efficiency benchmarks and take into account all social and environmental aspects in addition to techno-economic considerations.
- 6. It proposes that the groundwater be protected, conserved and regulated through appropriate laws and by adequate and efficient measures using precautionary approach, with active participation of community based institutions.
- 7. It proposes conformance to the Service Level Benchmarks for water supply, sanitation, solid waste management and storm water drainage, as may be prescribed.
- 8. It proposes that industries either withdraw only the makeup water or have an obligation to return treated effluent to a specified standard back to the hydrologic system and to file annual 'Water returns'.
- 9. It proposes that the appropriate Government take all possible measures to synergies and integrate different development schemes including schemes for water conservation, sanitation and improvement of water quality at Panchayat or Municipality level, as the case may be, and further at sub basin and basin level.
- 10. It proposes that a High Powered Committee be set up at the Centre and in each State for coordination and policy support mechanism between different agencies dealing with water etc.

III. National Forum of Water Resources and Irrigation Ministers of States

During the 14th National Conference of Water Resources and Irrigation Ministers held on 3rd October, 2012 in New Delhi, majority of the States attending the Conference had endorsed the idea of formation of a National Forum of Water Resources and Irrigation Ministers of States which would focus on general water related issues in the country. Such a forum is expected to be the instrument for sharing of ideas and facilitating

support to new and innovative ideas for better water governance. Accordingly, a National Forum of Water Resources and Irrigation Ministers of States was constituted on 14th December, 2012 for sharing ideas, facilitating support to new and innovative ideas and evolving consensus for better water governance in the country. It will be a permanent forum with the provision that half of its Members would retire after every two years and would be replaced by the Ministers from States/Union Territories from similar regions in the country. The Minister of Water Resources, Government of Rajasthan has been nominated as Chairman of the Forum for a period of two years.



Hon'ble Minister of Water Resources, Shri Harish Rawat addressing the National Forum of Water Resources and Irrigation Ministers of States on 29th May, 2013

The 1st meeting of the Forum was held on 29th May, 2013 in New Delhi, wherein following three documents were circulated:

- (I) Draft National Water Framework Law prepared by a Committee under the Chairmanship of Dr. Y.K. Alagh;
- (II) Draft River Basin Management Bill prepared by a Committee under the Chairmanship of Justice (retd.) T.S. Doabia; and
- (III) Draft National Guidelines for Allocation/distribution of Water amongst States prepared by a Committee under the Chairmanship of Chairman, Central Water Commission.

These documents have been circulated among State Governments and concerned Central Ministries/Departments and also placed on the website of Ministry of Water Resources.

IV. Hydro-Meteorological Data Dissemination Policy (2013)

In pursuance of the recommendations of the National Water Policy (2012) for placing all hydrological data, other than those classified on national security consideration, in public domain, Ministry of Water Resources (MoWR) had prepared a Hydro-meteorological Data Dissemination Policy (2013).

The Hydro-meteorological Data Dissemination Policy (2013) provides for hosting of all unclassified data on India WRIS (web based Water Resources Information System) website, which can be downloaded by any web-registered user free of cost. Accordingly, all unclassified data of CWC has been uploaded on India WRIS.

The hydrological data of Indus basin & other rivers and their tributaries discharging into Pakistan and Ganga-Brahmaputra-Meghna basin & other rivers and their tributaries discharging into Bangladesh/Myanmar have been categorized as classified data. A Classified Data Release Committee under Chairman, CWC has been set up to examine all requests for release of classified data.

Chapter 3

MAJOR PROGRAMMES

MAJOR PROGRAMMES (STATE SECTOR)

ACCELERATED IRRIGATION BENEFITS PROGRAMME

The Accelerated Irrigation Benefits Programme (AIBP) was launched during 1996-97 to give loan assistance to the States to help them complete some of the incomplete major/medium irrigation projects which were in an advanced stage of completion and create additional irrigation potential in the country. The surface minor irrigation schemes of North-Eastern States, Hilly States of Sikkim, Uttarakhand, Jammu and Kashmir, Himachal Pradesh and Koraput, Bolangir and Kalahandi districts of Odisha have also been provided Central Loan Assistance (CLA) under this programme since 1999-2000. Grant component has been introduced in the Programme from April, 2004 like other Central Sector Schemes.

The State Governments have been provided an amount of Rs. 64905 crore as CLA/Grant under AIBP since its inception till 31.3.2014 for 294 major/medium irrigation projects and 16456 surface minor irrigation schemes. After commencement of this Programme, 142 major/medium and 12083 surface minor irrigation schemes have so far been completed. The irrigation potential of 80.55 lakh hectare has been created up to March 2012.

Of the 65 major/medium projects initially included in the Prime Minister's relief package for agrarian distressed districts of Andhra Pradesh, Karnataka, Kerala and Maharashtra, 40 projects have been funded under AIBP so far. The grant released so far for these projects is Rs.6732.93 crore.

Continuation of AIBP in 12th plan

The AIBP has been approved for implementation in 12th plan by Cabinet Committee on Economic Affairs in its meeting held on 12.09.2013. During the 12th plan, a total outlay of Rs.55200 crore has been proposed for continuation of CAD&WM programme and its pari-passu implementation with AIBP with a total outlay of Rs. 15000 crore has been proposed.

Considering the allocation of funds by the Planning Commission, the following targets have been adopted and indicated in **Table-3**.

Table-3

SI. No.	Activities	Proposed Target (lakh hectare)
1	Creation of new irrigation potential (IP) through completion of ongoing MMI projects and new MMI projects and restoration of lost irrigation potential through ERM of old MMI projects	24
2	Creation of new irrigation potential (IP) through completion of new and ongoing surface minor irrigation projects	10
3	Closing the gap of irrigation potential created and irrigation potential utilized	36

Targets for AIBP programmes during XII Plan

AIBP in 12th Plan- Policy Changes

Some of the main policy changes include:

- 1. Pari-Passu implementation of AIBP & CAD&WM works.
- Ongoing and new projects of General Areas continue to get Central Assistance of 25% of the cost. It may be enhanced up to 50% subject to the condition that States actually carryout water sector reforms and satisfy the "Reform Friendliness" benchmarks.
- 3. For new projects in Special Areas of non-Special Category States, the Central Assistance under AIBP will be 75% of the project (work component) for eligible irrigation projects.
- 4. Ongoing projects and surface minor irrigation schemes benefiting Special Category States (including MI schemes of KBK region of Odisha may continue to be eligible for 90% Central Assistance.
- 5. For new projects in Special States, the Central Assistance under AIBP will be 90% of the cost of the project (work component) for eligible irrigation projects.
- 6. For surface minor irrigation (MI) schemes (both new as well as on-going) of Special Category States, individual schemes having Culturable Command Area (CCA) of 10 hectare and cluster of MI schemes with in radius of 5 km having CCA of 20 hectare.
- 7. Advance stage of construction of the projects specified.

NATIONAL PROJECTS

The Union Cabinet in its meeting held on 7th February 2008 gave its consent to the proposal of the Ministry of Water Resources on implementation of National Projects with Central Assistance of 90% of the cost of the project as grant falling in the following selection criteria:

(i)	International projects where usage of water in India is required by a treaty or		
	where planning and early completion of the project is necessary in the interest		
	of the country.		
(ii)	Inter-State projects which are dragging on due to non-resolution of inter-		
	State issues relating to sharing of costs, rehabilitation, aspects of power		
	production, etc., including river inter-linking projects.		
(iii)	Intra-State projects with additional potential of more than 2 lakh hectare and		
	with no dispute regarding sharing of water and where hydrology is		
	established.		

As per the modification in the guidelines of National Projects in September 2012, Extension, Renovation and Modernization (ERM) projects, envisaging restoration of lost irrigation potential of 2.0 lakh hectare or more would now be eligible for inclusion as a National Project with certain conditions.

So far 16 projects have been included in the scheme of National Projects. Four projects, namely, Gosikhurd project of Maharashtra, Shahpurkandi project of Punjab, Teesta Barrage project of West Bengal and Saryu Nahar Pariyojana of Uttar Pradesh have been funded under the scheme of National Projects. Gosikhurd and Shahpurkandi projects have been provided grant amounting to Rs.2582.94 crore and Rs.26.04 crore respectively up to March 2013. Teesta Barrage project started receiving funding under the scheme of National Project during 2010-11 and grant amounting to Rs.178.20 crore has been provided for the project till March 2013. Saryu Nahar Pariyojana of Uttar Pradesh started funding under the scheme of National Project during 2012-13 and an amount of Rs.448.73 crore has been released.

The scheme of National Project has been approved for continuation and implementation in 12th Plan by Cabinet Committee on Economic Affairs on 12.09.2013 with proposed outlay of Rs.8150 crore under the ambit of AIBP.

BHARAT NIRMAN - IRRIGATION SECTOR

Irrigation was one of the six components for development of rural infrastructure under Bharat Nirman. The irrigation component of Bharat Nirman aimed at creation of irrigation potential of 10 million hectare (Mha) during four years i.e. from 2005-06 to 2008-09.

The targets of irrigation potential and its creation from 2005-06 to 2012-13 are given in **Table-4**.

Table-4

Targets for irrigaition potential land creation from 2005-06 to 2012-13

		(million hectare)
Year	Target Irrigation	
		Potential Created
2005-06	1.90	1.69
2006-07	2.40	1.96
2007-08	2.85	1.73
2008-09	2.85	1.93
2009-10	1.75	1.85
2010-11	1.75	1.22
2011-12	Not fixed	1.21
2012-13	Not fixed	1.51

COMMAND AREA DEVELOPMENT AND WATER MANAGEMENT (CAD&WM)

Objective

The Centrally Sponsored Command Area Development (CAD) Programme was launched in 1974-75 for development of adequate delivery system of irrigation water up to farmers' field with an objective to enhance water use efficiency and production and productivity of crops per unit of land and water for improving socio-economic condition of farmers. The Programme envisages integration of all activities relating to irrigated agriculture in a coordinated manner with multi-disciplinary team under a Command Area Development Authority.

Coverage

Initially, 60 major and medium irrigation projects were taken up under the CAD Programme, covering a Culturable Command Area (CCA) of about 15 million hectare. After inclusion of new projects, deletion of completed projects and clubbing of some projects, there are now 150 projects under implementation. The Programme was restructured and renamed as Command Area Development and Water Management

(CAD&WM) Programme w.e.f. 1-4-2004. The Programme is being implemented as a State Sector Scheme from 2008-09 onwards and is *being* implemented pari-passu with Accelerated Irrigation Benefits Programme (AIBP) during the XIIth Five Year Plan.

Programme Components

The components of the CAD&WM Programme are as follows:

- a) Survey, planning and designing of On-Farm Developments (OFD) works;
- b) On Farm Development (OFD) works comprising construction of field channels, land leveling and micro-irrigation;
- c) Construction of field, intermediate and link drains for letting out surplus water;
- d) Correction of system deficiencies above the outlet up to distributaries of 4.25 cumec (150 cusec) capacity;
- e) Reclamation of waterlogged area including use of location specific biodrainage techniques to supplement conventional techniques for reclamation of waterlogged area;
- f) One time functional and infrastructure grants to Water Users' Associations;
- g) Trainings/ adaptive trials/ demonstrations through Water and Land Management Institutes (WALMIs)/ Irrigation Management and Training Institutes (IMTIs) and other Central/State institutions and monitoring & evaluation of the Programme with 75% funding from Government of India;
- h) One time infrastructure grants to WALMIs/IMTIs; and
- i) Establishment cost 10% of the total Central Assistance on items (b), (c), (d) and (e).

The following broad provisions have been made in the Programme during XII Five Year Plan:

- (i) To promote water use efficiency in irrigation, financial assistance is provided to the States for development of infrastructure for microirrigation to facilitate use of sprinkler / drip irrigation as an alternative to construction of field channels. At least 10% CCA of each project is to be covered under micro-irrigation. The assistance under this item is not admissible for sprinkler and drip irrigation systems (assistance for drip and sprinkler irrigation systems is available under the schemes of Ministry of Agriculture) but limited to construction of stilling tank, pump house and laying conveyance pipes up to farmer's fields.
- ii) Any new project having investment clearance by the Planning Commission on CAD&WM component of the project and having provision in the State

budget will be eligible for inclusion under the Programme. However, selection of projects from the bunch of projects received from the States will be carried out subject to availability of funds under the scheme.

Under the Programme, there is a thrust on Participatory Irrigation Management (PIM) and, therefore, following features have been made mandatory for its implementation:

- Central Assistance to States has been linked to enactment of PIM legislation.
 Till this is done, alternative arrangements have to be in place for formation and empowerment of Water Users' Associations (WUAs);
- ii) WUAs have to be in position before Project Components are taken up so that beneficiaries are involved in the implementation of Programme activities since inception;
- iii) Central Assistance for correction of system deficiencies up to distributaries of 4.25 cumec (150 cusec) capacity has been linked to formation of Distributaries Committees and handing over of the distributaries to such Committees for maintenance in future.

Inclusion of Panchayat Representative in WUAs /District Level Implementation Monitoring Committee/ State Level Monitoring Committee shall be considered by the State Government for prioritizing the CAD works, management, operation and maintenance of the projects after handing over.

Programme Implementation

The Command Area Development and Water Management wing of the Ministry of Water Resources coordinate and monitor the implementation of the Command Area Development Programme at the national level. Proposals received from the States for inclusion of new projects under the Programme are examined and, if found techno-economically feasible, are included under the Programme. Progress of the projects is monitored through physical and financial progress reports of the Programme received from the States and six monthly monitoring by field units of Central Water Commission. The quality of works is ensured through monitoring, including field visits. Technical guidelines and manuals have been circulated to the States in this regard. Functionaries are trained on specific subjects from time to time, besides holding various meetings, workshops and seminars on different technical and managerial aspects.

Financing Pattern

The funding pattern for all the programme components is on 50:50 sharing basis between the Centre and the State except for State sponsored software components such as training of farmers and field functionaries and officials, adaptive trials and demonstrations, seminars/conferences/ workshops, monitoring & evaluation of the programme, etc. and one time financial assistance to WALMIs/IMTIs for strengthening & up gradation of infrastructure and infrastructure grant to WUAs for which the funding pattern is 75:25 basis between the Centre and the States. There is also provision of one time functional grants at the rate of Rs. 1200/- per hectare (45:45:10 as Centre: State: Farmers) to the registered Water Users' Associations. The interest accrued from this fund is utilized to upgrade the irrigation system and infrastructure developed under this Programme.

Progress under Command Area Development and Water Management Programme

The approved outlay for Command Area Development and Water Management Programme during the XI Five Year Plan (2008-09 to 2011-12) was Rs.1600 crore and physical target was 1.32 Mha. The outlay for the XII Five Year Plan is Rs.15000 crore and physical target is 7.6 Mha. This also includes a provision of Rs.1000 crore to cover an area of 0.25 Mha for the proposal of development of Micro Irrigation through Public Private Partnership (PPP).

Physical Achievements

The core components of physical works are construction of field channels. Since its inception in 1974-75 up to March, 2013, CCA of about 20.5 Mha has been covered. The progress of works on this component under State Sector Scheme during XI and XII Plan is given in Table-5.

Table-5

Physical Progress for Construction of Field Channels in XI & XII Plan

XI Plan							
Duration	Targets	Achievements					
2008-09	0.27	0.430					
2009-10	0.35	0.384					
2010-11	0.35	0.413					
2011-12	0.35	0.459					
Total	1.32	1.686					
XII Plan							
2012-13	0.35	0.361*					
2013-14	0.50	0.20**					

(million hectare)

*Physical progress of some States is awaited.

**CCA of 0.20 Mha has been covered during 2013-14 as per reports received.

Delay in approval of Cabinet for continuation of the scheme and subsequent delay in issuance of guidelines have adversely affected the progress.

Financial Achievements

Central Assistance of about Rs.5573 crore has been released to States under the CAD Programme since its inception in 1974-75 up to March, 2013. An amount of Rs.179.98 crore has been released during 2013-14. The continuation of CAD&WM Programme has been approved as State Sector Scheme since the year 2008-09. The details of Central Assistance released under State Sector Scheme during XI and XII Plan are as in Table-6.

Table-6

Central Assistance Released under CAD&WM in XI & XII Plan

XI Plan									
Period	Outlay by Planning Commission	BE Allocation	Release	% Releases w.r.t. BE Allocation					
2008-09	350	350	324.29	92.7					
2009-10	400	400	413.70	103.4					
2010-11	499	499	456.40	91.5					
2011-12	584	584	485.73	83.2					
Total	1833	1833	1680.12						
XII Plan									
2012-13	811	811	365.18	45.0					
2013-14	1766	1766	179.98	10.2					

(Rs. crore)

Reclamation of Water Logged Areas

Although development of irrigation has increased agriculture production, it has also caused adverse effect in the form of water logging and associated problem of soil salinity/alkalinity in many irrigation commands. The problem of water logging can be mitigated to a large extent by efficient water management and by adopting suitable preventive measures. However, in spite of best efforts, the problem of water logging has surfaced in many irrigation commands and thus, it is essential to reclaim such areas so as to have optimum agricultural production from them. Ministry of Water Resources,

Government of India introduced a component of Reclamation of Water Logged Areas under the Centrally Sponsored Command Area Development Programme w.e.f. 1.4.1996. So far 823 schemes of 9 States, namely, Bihar, Gujarat, Madhya Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Odisha and Uttar Pradesh have been approved for reclamation of 122.53 thousand hectare (th. ha) water logged area. Out of this, an area of 78.28 thousand hectare has been reported to be reclaimed by these States up to March, 2013.

Participatory Irrigation Management (PIM)

National Water Policy stresses participatory approach in water resources management. It has been recognized that participation of beneficiaries will help greatly in the optimal upkeep of irrigation system and effective utilization of irrigation water. The participation of farmers in the management of irrigation would include transfer responsibility for operation & maintenance and also collection of water charges to the Water Users' Association in their respective jurisdiction with effect from 2008-09. One time functional grant @Rs.1200/- per hectare to be shared by the Centre, State and Farmers in the ratio of 45:45:10 respectively is being paid to outlet level Water Users' Associations' as incentive, the interest from which is to be used for maintenance.

15 States viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Sikkim, Tamil Nadu and Uttar Pradesh have either enacted exclusive legislation or amended their Irrigation Acts for involvement of farmers in irrigation management. Other States are also taking steps in this direction. So far 63,167 Water Users' Associations have been formed in various States covering an area of 14.62 million hectare under various commands of irrigation projects.

Under the restructured "Command Area Development & Water Management" Programme, more emphasis is being given to participatory approach. Under this Programme, payment of Central Assistance to State is linked with the formation of Water Users' Associations.

Development of Micro-Irrigation through PPP under CAD&WM Programme

An outlay of Rs.1000 crore has been kept under CAD&WM Programme for development of micro-irrigation through Public Private Partnership (PPP) with funding for common infrastructure to cover an area of 0.25 Mha CCA. 60% of the funding for the common infrastructure component of this scheme is proposed to be provided by the Ministry of Water Resources to the respective State Governments. The remaining 40% will be met by the State Governments. For On-Farm Distribution system, subsidy available in the extant schemes under Ministry of Agriculture and State Government is proposed to be availed by the farmers. In case the proposal not getting approval, the said outlay will be utilized under the State Sector Scheme during XII Plan.

Repair, Renovation & Restoration (RRR) of Water Bodies

Two schemes of RRR, one with domestic support with an outlay of Rs. 1250 crore and other with external assistance with an outlay of Rs. 1500 crore were launched during XI Plan. Under the scheme with domestic support, a total of 3341 water bodies were taken up for restoration in 12 States out of which 2030 water bodies have been completed till date. A total central grant amounting to Rs. 890.259 crore had been released to the States for completion of works on these water bodies. Under the scheme with external assistance, 10887 water bodies were taken up for restoration in the States of Andhra Pradesh (3000), Karnataka (1224), Odisha (900) and Tamil Nadu (5763).

The scheme for continuation of Repair, Renovation & Restoration of Water Bodies for XII Plan was approved by the Union Government on 20.9.2013 and guidelines were issued in October, 2013. It is envisaged to provide Central Assistance for restoration of about 10,000 water bodies with an earmarked outlay of Rs. 6235 crore for the scheme. Out of 10,000 water bodies, 9000 water bodies in rural areas and balance 1000 water bodies in urban areas would be covered. The proposal of water bodies where the Integrated Water Management Programme (IWMP) is implemented would be considered for inclusion under the scheme of RRR of water bodies. The Central Assistance is provided in the form of grant which is 90% of the project cost in respect of Special Category States (NE States, Himachal Pradesh, J&K, Uttarakhand and undivided KBK districts of Odisha) as well as projects lying in drought prone area, tribal area, desert prone area and naxal affected areas and 25% of the project cost in case of non-Special Category States/Areas.

During 2013-14, a sum of Rs. 37.97 crore was released to Government of Chhattisgarh for completion of work on 131 water bodies of Chhattisgarh spill over from XI Plan under RRR.

FLOOD MANAGEMENT PROGRAMME

During XI Plan, the Government of India launched "Flood Management Programme" for providing Central Assistance to the State Governments for undertaking the works related to river management, flood control, anti-erosion, drainage development, flood proofing including flood prone area development programme, restoration of damaged flood management works and anti-sea erosion works. Under this programme, a total of 420 works were approved out of which 252 works were physically completed and the Central Assistance of Rs. 3566 crore was released during XI Plan. The completed works have restored 17.01 lakh hectare of old flood prone area and provided reasonable

protection to 2.59 lakh hectare of new flood prone area. The details of works approved, funds released so far and area protected are given in Tables -7 & 8 respectively.

In view of demands by States and also recommendations of XII Plan Working Group on Flood Management and Region Specific Issues, the Government of India has approved continuation of Flood Management Programme during XII Plan with an outlay of Rs. 10,000 crore. During XII Plan, the central assistance would also be provided for catchment area treatment projects having objectives of flood management. During XII Plan, the central assistance of Rs.572.85 crore has been released up to 31.03.2014.

Table –7

State-Wise Funds Released under "Flood Management Programme" during XI and XII Plans (up to 31.03.2014)

(Rs. in crore)

SI.	State	Funds	Funds R	Total Funds		
No.		Released	2012 12			Released
		Plan	2012-13	2013-14	Plan)	
1	Arunachal Pradesh	78 77		16.83	16.83	95.60
-	Arunachariradesh	70.77	0.54	10.05	0.51	73.00
2	Assam	/44.90	2.51		2.51	/4/.41
3	Bihar	680.79	54.48	88.57	143.055	823.84
4	Chattisgarh	15.57		3.75	3.75	19.32
5	Goa	9.98	2.00		2.00	11.98
6	Gujarat	2.00			0.00	2.00
7	Haryana	46.91			0.00	46.91
8	Himachal Pradesh	165.31	19.92	9.75	29.67	194.98
9	Jammu & Kashmir	243.50	39.36	28.29	67.65	311.15
10	Jharkhand	17.07	4.27		4.27	21.34
11	Karnataka	20.00			0.00	20.00
12	Kerala	63.68			0.00	63.68
13	Manipur	65.03	0.95	16.96	17.91	82.94
14	Mizoram	3.40			0.00	3.40
15	Nagaland	28.96	15.45		15.45	44.41
16	Odisha	95.64			0.00	95.64
17	Puducherry	7.50			0.00	7.50
18	Punjab	40.43			0.00	40.43
19	Sikkim	82.86		2.43	2.43	85.29
20	Tamil Nadu	59.82			0.00	59.82
21	Tripura	20.91			0.00	20.91
22	Uttar Pradesh	290.69	45.42	30.48	75.90	336.58
23	Uttrankhand	49.63		53.14	53.14	102.77
24	West Bengal	642.87	9.49	128.81	138.30	781.86
	Total	3476.21	193.85	379.00	572.85	4049.06
Spilled over works of X Plan		89.79			0.00	89.79
Grand Total		3566.00	193.85	379.00	572.85	4138.85
Table –8

SI. No	State	Total Schemes Completed (as on date)				
			Area Protected (lakh ha.)			
		Nos.	Old Area	New Area	Total	Benefited
			Restored	Protected		(lakh)
1	Arunachal Pradesh	11	0.000	0.566	0.566	0.697
2	Assam	77	3.864	1.007	4.871	97.848
3	Bihar	26	10.237	0.285	10.522	70.920
4	Goa	1	0.000	0.002	0.002	0.150
5	J&K	8	0.900	0.000	0.900	0.000
6	Manipur	19	0.000	0.280	0.280	1.582
7	Nagaland	9	0.000	0.004	0.004	0.600
8	Odisha	60	1.474	0.082	1.556	7.202
9	Sikkim	21	0.000	0.201	0.201	2.397
10	Uttar Pradesh	6	0.442	0.096	0.538	4.005
11	Uttrakhand	3	0.000	0.001	0.001	0.053
12	West Bengal	7	0.087	0.063	0.150	11.810
13	Tripura	4	0.000	0.002	0.002	0.013
	Total	252	17.004	2.589	19.593	197.277

State-wise Details of Works completed and Area Protected under Flood Management Programme during XI Plan

MAJOR PROGRAMMES (CENTRAL SECTOR)

DEVELOPMENT OF WATER RESOURCES INFORMATION SYSTEM (DWRIS) FOR XII PLAN PERIOD (2012-17)

A scheme namely, "Development of Water Resources Information System (DWRIS)" with an outlay of Rs. 1370 crore has been approved for implementation by Ministry of Water Resources and Central Water Commission (CWC) during XII Five Year Plan period. The scheme covers Hydrological Observations Monitoring System, Irrigation Census, Water Quality Assessment Authority and Monitoring System, Strengthening of Monitoring Unit in CWC and Data Bank and Information System.

The first full version of website of INDIA-WRIS (www.india-wris.nrsc.gov.in) was launched by Hon'ble Minister of Water Resources on 07 December, 2010 in New Delhi. The information system contains several GIS layers on water resources projects, thematic layers like major water bodies, land use/land cover, wastelands, land degradation etc., environmental layers as well as infrastructure and other administrative layers. The information system has all the basic map viewing and navigation capabilities like zoom, overview, bookmark, table of contents, etc. Subsequently, two more versions have been launched. All unclassified data of CWC G&D stations has been uploaded on WRIS website in July 2013 as per Hydro-meteorological data dissemination policy 2013. Further development of Information System is under progress. The final version (ver 4.0) has been launched in March, 2014. To maintain and update such a large volume of water resources data at national level, it has been planned to establish a new organization as National Water Resources Information Centre (NWR-IC).

Rationalisation of Minor Irrigation Statistics(RMIS) Scheme

A Central Sector Plan Scheme, "Rationalisation of Minor Irrigation Statistics (RMIS)" was launched in 1987-88 in the Ministry of Water Resources with 100% assistance to the States/UTs. During Eleventh Five Year Plan, the RMIS scheme was converted to Central Sector as one of the components of Development of Water Resources Information Sysem (DWRIS) scheme of the Ministry of Water Resources. The main objective of the RMIS scheme is to build up a comprehensive and reliable database in the Minor Irrigation (MI) sector for effective planning and policy making.

Under RMIS scheme, each State/UT has identified a nodal department for compilation of minor irrigation statistics for the entire State/UT. A Statistical Cell consisting of suitable number of officers/staff has been set up in the nodal department for taking up the work relating to the MI sector. These cells are responsible for collection, compilation and reporting of data of minor irrigation relating to their State/UT on a regular basis. For this purpose, they coordinate with departments of Rural Development, Agriculture and Irrigation etc. at the State level. These cells are also responsible for conducting census of MI schemes on quinquennial basis with the help of staff of State/UT Governments posted at district/block/village levels.

In the MI census, detailed information on irrigation sources, namely, Dug Well, Shallow Tube Well, Deep Tube Well, Surface Flow and Surface Lift schemes including the irrigation potential created and potential utilized is collected and compiled on systematic basis throughout the country. Besides this, information on their ownership, the social class and holding size of the owner, number of electrical/diesel devices used for lifting water is also collected. Information in respect of adoption of water and energy conserving devices such as sprinkler and drip irrigation, use of non-conventional energy sources such as solar pumps, water mills is also collected in the MI census. The National Informatics Cenre unit in the MoWR is associated with processing of data and generation of tables. Detailed data base on minor irrigation works in the country has been generated through four censuses carried out under the scheme with reference years 1986-87, 1993-94, 2000-02 & 2006-07 respectively. The census reports of 2nd, 3rd & 4th MI census are available on the website of the Ministry of Water Resources (www.mowr.gov.in). The conduct of 5th Minor Irrigation census with reference year 2012-13 is in progress.

Under the RMIS scheme, an expenditure of Rs. 1.356 crore has been made during 2013-14 against a budget estimate of Rs. 25 crore and revised estimate of Rs.2.9 crore.

FLOOD FORECASTING

Ministry of Water Resources through its apex technical arm, Central Water Commission performs the activity of flood forecasting on major rivers and their tributaries in the country. For this purpose, CWC maintains a network of 175 flood forecasting stations which consists of 147 level forecast stations and 28 inflow forecast stations. The level forecasts issued by CWC help the local administration in drawing programmes for evacuation of people from flood affected areas to safer places. The inflow forecasts help the Dam authorities in optimum regulation of reservoirs.

In order to meet the requirement of expeditious flood forecasting, CWC has been making continuous endeavour for modernization of its flood forecasting network. By the end of 2012-13, a satellite based telemetry system comprising of automatic data collection, satellite based data transmission, mathematical model based flood forecast formulation has been installed at 445 stations. Besides, three Earth Receiving Stations

(ERS) at Jaipur (Rajasthan), Burla (Odisha) and New Delhi have been set up. The works of modernization and establishment of computer based system have also been completed at 21 Modelling Centres.

CWC has planned modernization of its remaining network and further expansion of its network during XII Plan and an outlay of Rs 752 crore for the ongoing scheme "Flood Forecasting" has been proposed. It is also proposed to develop Digital Elevation Maps and carry out bathymetric survey for 2 lakh sq km of flood plains in the States of UP, Bihar and West Bengal for use in inundation forecasting.

Hydrology Project - Phase II

Hydrology Project-II (HP-II) is being implemented with the World Bank assistance in 13 States viz. Andhra Pradesh, Chhattisgarh, Gujarat, Goa, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Pondicherry and Punjab, and 8 Central Agencies viz. Central Water Commission (CWC), Central Ground Water Board (CGWB), National Institute of Hydrology (NIH), Central Water & Power Research Station (CWPRS), Central Pollution Control Board (CPCB), Bhakra Beas management Board (BBMB), India meteorological Department (IMD) and Ministry of Water Resources (MOWR). The estimated cost of the project is Rs. 631.83 crore. The World Bank funding is in the form of a loan of US \$104.94 Million from International Bank for Reconstruction and Development (IBRD). The Loan Agreement was signed on January 19, 2006. The project was stated in April, 2006 and stipulated date of completion is May 31, 2014.

Objective of HP-II

The objective of the Project is to extend and promote the sustained and effective use of Hydrological information system (HIS) by all the potential users concerned with Water Resources Planning and Management, both in public and private, thereby contributing to improve productivity and cost effectiveness of water related investments.

Activities of HP-II

The main activities of the project are as under:

- Up-gradation of Hydrological information System (HIS) developed during Hydrology Project Phase-I (HP-I) and keep it functional.
- Development and installation of Decision Support System-Planning (DSS-P) in 9 HP-I states.
- Development and installation of Decision support System-Real Time (DSS-RT) in BBMB
- Development of Hydrological Design Aid Surface Water
- Aquifer Mapping in 6 pilot areas by using sky-TEM (Heliborne survey)

- Development and installation of Real Time Stream-flow forecasting and Reservoir Operation system in Bhima and Krishna river basins, Maharashtra.
- Implementation of Purpose Driven Studies (PDS)
- Extension of HIS in 4 new States

Physical achievement during the current financial year (from 1st April, 2013 to 31st March, 2014)

- 1. Up-gradation of Hydrological Information System (HIS) developed during Hydrology Project Phase-I (HP-I) is at advanced stage of completion.
- Decision support System-Planning (DSS-P) developed and installed in 9 HP-I states (Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha and Tamil Nadu) as per their needs.
- 3. Decision support System-Real Time (DSS-RT) model developed and installation of Data Acquisition System (DAS) equipments are almost completed.
- 4. Under Hydrological Design Aid-Surface Water (DHA-SW), development of software for 2 modules out of 3 almost completed and third module nearly completion.
- 5. Heliborne survey required for carrying our Aquifer Mapping completed.
- For development and establishment of Real Time Streamflow (RTSF) and Reservoir Operation System (ROS) in Bhima and Upper Krishna Rivers in Maharashtra, consultants have developed RTSF & ROS Model for Krishna & Bhima basin. Installation of Real Time Data Acquisition System (RTDAS) almost completed.
- 7. 41 Purpose-Driven Studies (PDS) have been completed.
- 8. The establishment of HIS in 4 new states completed

Financial achievements

The expenditure incurred by all implementing agencies up to 31st March, 2014 is Rs. 476 Crore approximately (overall).

WATER QUALITY ASSESSMENT AUTHORITY (WQAA)

Water Quality Assessment Authority (WQAA), an Inter-Ministerial Authority, was constituted under Environment (Protection) Act, 1986. Secretary, MoE&F is the Chairman of WQAA and Joint Secretary (A), MoWR is its Member Secretary. Water Quality Cell in MoWR is providing secretarial assistance to WQAA. A Sub-committee was

constituted for 'Re-evaluation of Powers and Mandate of WQAA'. Its recommendations were accepted by the Authority in 10th meeting held on 30th May, 2013. The revision of mandate of WQAA is under process. The Authority decided to review the existing Uniform Protocol on Water Quality Monitoring (UPWQM) notified in the year 2005 and appointed a committee for this task. The Committee has revised the existing UPWQM and the same is to be ratified by the Authority in its 11th meeting. The Authority also decided to remove duplicity in monitoring of water quality of the surface and groundwater. A committee was appointed for this work and rationalization of water quality monitoring network is also undergoing. The Authority also decided to issue directions to Central and State Government organizations to initiate process of accreditation of their laboratories in order to improve quality of the data and the directions have been issued accordingly.

The report of the Sub-committee on 'Environmental/ Ecological Flow in Rivers' was also considered by the Authority in its 10th meeting and Authority didn't accept the report. The report of the study assigned to National Environmental Engineering Research Institute (NEERI) on 'Desk Study on Artificial Recharge to Ground Water by Treated Wastewater through Soil Aquifer Treatment (SAT)' has been accepted.

In order to enhance capacity building of the scientific/technical officers involved in water quality issues across the country, 3 training programmes involving 128 trainees have been conducted, one each at Centre for Water Resources Development and Management (CWRDM), Kerala; National Institute of Hydrology (NIH), Roorkee and Central Water Commission (CWC), New Delhi under the aegis of the Authority.

An independent web portal of WQAA having web address<u>http://wqaa.gov.in/</u> has been updated with a number of reports / publications/ photo gallery/ downloads/ projects/ RTI and other information.

RESEARCH AND DEVELOPMENT

Research and Development Programme in water sector is a Plan Scheme under the Ministry of Water Resources (MoWR). Three organizations of the Ministry, viz. Central Water and Power Research Station (CWPRS), Central Soil and Materials Research Station (CSMRS) and National Institute of Hydrology (NIH) are fully devoted to research & development in water sector. CWPRS is the premier national institute for research in the area of hydraulics of water resources structure related to irrigation, hydropower, navigation, coastal works and related instrumentation. CSMRS is involved in the research related to construction materials, concrete technology, geophysics, rock mechanics, soil mechanics and rockfill testing technology. NIH is devoted to systematic and scientific studies in all aspects of hydrology. The objective of these organizations is

to improve the present practices in planning, design and operation of water resources projects.

Promotion of Research in Water Sector

Under the Scheme, the Ministry of Water Resources provides financial assistance to promote research work in the field of water resources sector. The assistance is provided by way of grants to academicians / experts in the Universities, IITs, recognized R&D Laboratories / Institutes, Water Resources / Irrigation Departments of the Central and State Governments in the country and NGOs for carrying out research and studies related to water resources sector. Research proposals of applied nature as well as basic research are considered for financial assistance.

The coordination of the Programme for providing financial assistance for research and development is done by Research & Development Division under the Policy & Planning wing of the Ministry. Considering wide range of topics covered under water resources engineering, there existed five Indian National Committees (INCs), namely, INC on Hydraulics (INCH), INC on Hydrology (INCOH), INC on Irrigation & Drainage (INCID), INC on Geo-Technical Engineering and Construction Materials (INCGECM) and INC on Ground Water (INCGW). However, in June 2012, for quick and smooth disposal of proposals, the existing four Indian National Committees (INCs) i.e. INCH (Hydraulics), INCOH (Hydrology), INCID (Irrigation & Drainage) and INCGECM (Geo-Technical Engineering and Construction Materials) have been merged and reconstituted as Indian National Committee on Surface Water (INCSW). In view of emerging challenges and issues relating to climate changes, a new Indian National Committee on Climate Change (INCCC) has been created. Thus, now the total number of INCs is three. The members of these Committees are drawn from various Central and State Government agencies as well as experts from academic and research organisations.

Indian National Committee on Surface Water (INCSW)

INCSW deals with the issues related to irrigation & drainage, hydrology, hydraulics and geo-technical engineering & construction materials. The research scheme pertaining to hydrology, hydraulics and geo-technical engineering & construction materials which so far were being dealt by INCOH, INCH and INCGECM have been brought under INCSW with its secretariat at CWC, Sewa Bhawan, R.K.Puaram, New Delhi.

As on 31st March 2014, there were about 82 research schemes under implementation under INCSW.

Indian National Committee on Ground Water (INCGW)

Considering the importance of various issues related to ground water, Indian National Committee on Ground Water (INCGW) with responsibility of coordinating various research activities in the relevant field was constituted in September 2008. The secretariat of INCGW is located at CGWB, Jam Nagar House.

As on 31st March 2014, 8 research schemes were under implementation.

Indian National Committee on Climate Change (INCCC)

Indian National Committee on Climate Change (INCCC) was constituted on 15th June, 2012, with Mission Director, National Water Mission as Chairman and Director, National Institute of Hydrology (NIH), Roorkee as its Member-Secretary. The secretariat of INCCC is at NIH, Roorkee under administrative control of Mission Director, National Water Mission. The INCCC has the responsibility of coordinating various research activities pertaining to climate change such as down scaling of climate change models, assessment of impact of climate change on water resources, adaptation strategies for climate change scenario and studies proposed in the strategies.

Other Activities during XII Plan

With a view to address the research problems in water sector in proper perspective, the State Government institutions such as engineering / irrigation research institutions, Water and Land Management Institutes are being actively involved in (a) performance evaluation of completed irrigation projects; (b) environmental impact evaluation of completed irrigation projects; (c) efficiency studies for completed major and medium irrigation projects; (d) reservoir sedimentation studies; and (e) effect of climate change on water resources and studies in respect of vulnerability assessment and adaptation.

INFORMATION, EDUCATION & COMMUNICATION (IEC)

The following major activities were undertaken under IEC during 2013-14 :-

Participation in Fairs/Exhibitions

Ministry of Water Resources erected a pavilion in 33rd edition of India International Trade Fair organized by ITPO in Pragati Maidan from 14th to 27th November, 2013. The pavilion carried out different exhibitory materials viz. working models, translites, banners, posters etc. The theme of the pavilion was "Inclusive Growth".

4th Painting Competition on Water Conservation

Ministry of Water Resources has been conducting a three tier Painting Competition since 2010 across the country for 6th, 7th and 8th standard students in three stages, namely, School, State and National Level to spread awareness on water conservation.

This year, the School Level Competition was launched in all the States/UT's from September, 2013. School Principals were requested to organise painting competition on the themes of 'Save Water, Secure the Future' of 2 hour duration in their respective schools.

The State Level Painting competition on the theme 'Care for Water before it becomes Rare' was conducted on 18.11.13. The winners were awarded Rs. 10,000/- for First Prize, Rs. 8000/- for Second Prize and Rs. 5000/- for Third Prize and Ten Consolation Prizes of Rs. 1000/- each along with a certificate of merit.

The 4th National Painting Competition on Water Conservation was organized on 27th December, 2013 at National Agriculture Science Centre (NASC) Complex, Pusa, New Delhi. Hon'ble Minister of Water Resources, Shri Harish Rawat was the chief guest on the occasion and distributed the prizes to the winners.

The Competition was held among the 90 students comprising 1^{st} , 2^{nd} and 3^{rd} prize winners of State Level Competition. Ms. Unnimaya D.P. from Kerala won the first prize of Rs. 1,00,000/-. There were four second prizes of Rs. 50,000/-, eight third prizes of Rs. 25,000/- and seventy seven consolation prizes of Rs. 5,000/- each along with certificates.



Hon'ble Minister of Water Resources, Shri Harish Rawat presenting First Prize of Rs. 1,00,000 to Ms. Unnimaya D.P. from Kerela, the Winner of the 4th National Painting Competition

Special Painting Competition for Northern Hilly States

A Painting Competition was held among School children of three Northern Hilly States, namely, Uttarakhand, J&K & Himachal Pradesh wherein 39 students (13 winners of State Level Painting Competition) participated.

The Painting Competition was organised at Hotel Viceroy Inn, Dehradun, Uttarakhand on 24th January, 2014. The winners were awarded Rs. 50,000/- for First Prize, Rs. 30,000/- for Second Prize and Rs. 15,000/- for Third Prize and 36 Consolation Prizes of Rs. 3000/- each.

Participation in other Events

Celebration of Special Days/ Week

India Water Week-2013 with the theme "Efficient Water Management : Challenges and Opportunities" was organised during 8 – 12 April, 2013 at Vigyan Bhawan, New Delhi. The Conference was inaugurated by the Hon'ble President of India. The issues of management of water in (i) Agriculture and Irrigation, (ii) Energy Generation (hydro & thermal), Industrial Production & Demand Management, (iii) Urban and Rural Water Supply were discussed. 6 Brainstorming Sessions, 9 Panel Discussions and 17 Seminar Sessions were held during the event along with a number of parallel events. An exhibition "Water Expo-2013" with participation by a number of organisations and companies involved in water sector was concurrently held. The Conference was attended by about 1400 national and international delegates. The major recommendations of the event were ensuring efficiency in irrigation management through demand side as well as supply side management, adoption of benchmarking and water auditing by all States, establishment of "National Bureau on Water Use Efficiency", extensive use of modern tools, promoting micro- irrigation and accelerating micro-irrigation component in CAD &WM schemes, etc.

Print Media Campaign

Print Media Campaigns were undertaken throughout the country. Advertisements on Water Conservation to create awareness among the masses were published in all leading newspapers throughout the country on 17th July 2013, 20th August, 2013, 27th September, 2013, 19th November, 2013 and 27th December, 2013.

Electronic Media Campaign

1. Ministry of Water Resources initiated two and half months long electronic media campaign w.e.f. 17.10.2013 by telecast of video spots on DD National, DD News, Regional Channels including Lokvani Channels of Prasar Bharti for spreading

messages of water conservation among the masses in the Water Conservation Year – 2013 followed by 100% free bonus telecast.

- 2. Electronic Media Campaign for a period of three months on Lok Sabha TV and various Radio Stations of All India Radio was undertaken w.e.f. 10.12.2013 and 12.12.2013 respectively.
- 3. Broadcast of Audio Video spots of Ministry on 74 Private TV Channels and 97 Private FM Stations and 42 Community Radio Stations was undertaken for a period of two months w.e.f. 28.12.2013.

Celebration of Water Conservation Year

The following mass awareness activities were conducted under Water Conservation Year-2013 :

- 1. A seminar on Water Conservation in Domestic and Irrigation Sector at National Water Academy, Central Water Commission, Pune on 14.06.2013.
- 2. A Mass Awareness event by Central Ground Water Board, Raipur at Dongargarh, Rajnandgaon district, Chhattisgarh on 26.06.2013.
- 3. A seminar on Water Conservation at Central Soil and Materials Research Station Auditorium, New Delhi on 28.06.2013.
- 4. Debate / discussion on Water Conservation at Kendriya Vidyalaya, Sector-3, Pushp Vihar, New Delhi on 28.06.2013.
- 5. One day Mass Awareness Programme on Water Conservation and Water Quality for the rural communities comprising 4 Competitions: Drawing, Poem, Speech and Quiz for women & children at village Brahmpur and nearby areas.
- 6. Lectures about Water by scientists of National Institute of Hydrology on 28.06.2013.
- 7. Central Ground Water Board, Chennai participated in the Integrated Educational Exhibition (IEE) organised by the Vyasa Vidhyalaya Matriculation Higher Secondary School, Velacherry during 21-23.06. 2013.
- 8. Narmada Control Authority organised a Mass Awareness program in Devi Ahilya University, Indore on 29.06.2013.
- 9. Water Conservation programme at Hanumangarh. Mass Awareness activities in Jhajjar, Haryana in association with Upper Yamuna River Board on 29.06.2013.
- 10. 14 visits of school students from different schools of NCR to the Engineering Museum at Kalindi Bhawan to create awareness among the school children.
- 11. A 'Padyatra' on 30.6.2013 in Patna in which more than 200 people including the officers and staff members of CWC, GFCC, NWDA, CGWB, WAPCOS & NPCC participated.
- 12. An oath for water conservation was administered by Chairman, Ganga Flood Control Commission to all the participants.

- 13. A Mass Awareness Programme on Water Conservation on 05.07.2013 at Devar Khana village in Jhajjar district of Haryana by Upper Yamuna River Board.
- 14. A one day workshop on "Rain Water Harvesting and Water Conservation" by CWPRS, Pune on 09.07.2013 under Water Conservation Year 2013.
- 15. A Jal Pad Yatra in C.S.I School, Nizamabad by CWC on 03.08.2013. Around 300 students participated in awareness programme.
- A painting competition by Lower Krishna Division, CWC, Hyderabad at St. Thomas High School, Nagarjuna Sagar Dam on 17.08.2013. Around 100 students & 150 people attended the valedictory function.
- 17. Workshop on 'Conjunctive Use of Surface & Ground Water Management' in collaboration with Acharya N. G. Ranga Agricultural University (ANGRAU), Rajendra Nagar on 28.08.2013.
- 18. A programme on Water Conservation at Municipal High School, Gandhi Nagar, Kakinada on 31.08.2013.
- 19. Debate competition in a school at Hyderabad during 2nd Week and 4th Week of September 2013 by NWDA.
- 20. Lectures on water conservation at TB Dam for staff & college students by Tungbhadra Board in September 2013.
- 21. Essay competition amongst students of 10+2 level in Guwahati on 01.09.2013 by Brahmaputra Board.

INFRASTRUCTURE DEVELOPMENT

Infrastructure Development (I.D) scheme has been approved by the Government by merging four continuing schemes, viz. (i) Land & Building and Information Technology plan of Central Ground Water Board (CGWB), (ii) Land & Building of Central Water Commission (CWC), (iii) Information Technology Development plan of Ministry of Water Resources and (iv) e-Governance of the Ministry of Water Resources.

During the XII Plan period of 2012-17, Rs. 246.26 crore for the ID scheme has been approved. Out of this, Rs. 216.26 crore is earmarked for L&B component and the balance of Rs. 30 crore for the IT component. During 2013-14, Rs. 50 crore was provided, which has been reduced to Rs.20.00 crore at RE stage.

The scheme aims at providing better working environment in the offices, creation of assets and savings on payment of monthly rent. To achieve this, construction of offices at various locations, provision of hutments for field workers, provision for construction of staff quarters as well as modernization of existing offices of the Ministry (Proper), CWC and CGWB have been achieved under the ambit of the scheme. The modernisation of CWC (Hqrs) and construction works of office- cum-residential complex at Patna and Guwahati are in progress. The construction of office-cum-residential

complex at Burla has been completed. The construction of Hutment (new activity) at various sites has also been proposed under this scheme.

Under the ID scheme of CGWB (L&B), there are 10 projects - three ongoing & seven new. The projects are likely to be completed within the 12th Five year Plan.

Under IT plan of CGWB, it is envisaged to establish an enterprise wide, unified, single window web based system where in a centralized repository of data, documents, work flow and knowledge would be created using internet and warehousing technologies/ tools and applications. A unified/ standardized web based environment would translate the capabilities of the IT into e-Governance. Unified/ consolidated and centralized repository along with associated applications would realize the concept of the "less-paper" office. Easy access to information would facilitate collaborative processing and team-work. For the senior level officers, the information would be available in the form of 'Dash Boards'. During 2013-14, detailed systems study for the development of web based unified, administrative, financial & project management, drilling operations management, material management and a citizen interface for dissemination of ground water information to citizens would be completed in association with National Informatics Center (NIC), New Delhi.

Ministry of Water Resources has taken various steps for strengthening e-Governance initiatives/activities in the Ministry.

- a) The website of this Ministry is in final stage of being redesigned as per *Guidelines for Indian Government Websites (GIGW)*, formulated by NIC, in order to make it more transparent and more citizen-centric. Besides, the Ministry took initiatives for providing updated information on its schemes/ programmes on the website i.e. <u>www.mowr.gov.in</u>.
- b) Ministry has taken a step forward in implementation of e-Office, wherein, the following have been concluded:
 - i) Knowledge Management System module of e-Office, which is a central repository of important documents/ circulars/ orders/ MoUs/ EFC Memo/ guidelines/ presentations etc. has been operationalized w.e.f. 16.08.2013.
 - e-Leave system which is an online module/ system of e-Office for applying and getting approval on any kind of leave for the employees of this Ministry has been operationalized in Administration/ GW division w.e.f. 11.10.2013 that covers almost 40% strength of the Ministry.
 - iii) A demonstration of Collaboration and Messaging Services (CAMS) module of e-Office comprising of 3 sub-modules viz. eTalk, Instant Mailing/

Messaging Service (IMS) and Appointments / Meetings has been conducted on trial/ test drive basis.

RIVER MANAGEMENT ACTIVITIES AND WORKS RELATED TO BORDER AREAS

A Central Sector Scheme has been formulated for Rs. 740 crore to cover the following works/ schemes during XII Plan. The scheme has following components:

Hydrological observations and flood forecasting on common border rivers with neighbouring countries – As mutually agreed, the hydrological observations and establishment of equipment for confirmation of hydrological and seismic parameters considered at the time of preparation of DPR, are continuing.

As per Indo-Bangladesh Treaty of 1996, during lean season (From 1st January to 31st May) the waters of Ganga river are shared at Farakka and for this purpose, joint hydrological observation at Farakka (on Indian side) and at Harding Bridge (on Bangladesh side) are carried out by joint teams deputed by both the countries. During the year 2013-14 also, these observations were conducted in the lean season during 1st April 2013 to 31st May 2013 and the same would again be started in the next lean season from 1st January 2014.

The Cabinet Note for Pancheswar Development Authority (PDA) is under finalization. The views of MEA have been sought on issues pertaining to tax exemption on procurement of equipment by PDA.

The hydro-meteorological data of 54 sites located in Nepal has been received in India as per Indo-Nepal bilateral arrangements.

Investigations of Water Resource projects in neighbouring countries -

Nepal has a vast potential for hydropower generation and continuous dialogues are held with Nepal on construction of large storage projects. Under bilateral agreements with Nepal, the Pancheshwar Multipurpose Project, Sapta High Dam and Sun Kosi Storage cum Diversion have already been identified.

The field investigations for preparation of Detailed Project Report (DPR) of Pancheshwar Multipurpose Project on river Mahakali (known as Sarda in India) have already been completed by the Joint Project Office and Indian side has prepared the DPR which is yet to be mutually agreed between India and Nepal. Subsequently, a Pancheshwar Development Authority (PDA) has been agreed between India and Nepal to be set up to resolve the outstanding bilateral issues. The field investigations and preparation of DPR of Sapta Kosi High Dam and Sun Kosi Storage cum Diversion project are in progress. Besides, feasibility study of Kamla Dam project and preliminary study of Bagmati Multipurpose Project have also been undertaken and are targeted to be completed along with DPRs of Sapta Kosi High Dam and Sun Kosi Project. The field investigations suffered some delay due to security aspects on Nepal side but the issues have been taken up with the Government of Nepal and works have been resumed and are in progress.

Pre-construction activities of Pancheshwar, Naumure and activities of Panchehswar Development Authority- The task of setting up of Pancheshwar Development Authority (PDA) is to be performed on priority, a provision has been made for the same under the above scheme.

Grant-in-aid to States and Union Territories for flood management / anti-sea erosion works – The scheme provides for 100% grant to States and UTs for river management works.

Ganga Flood Control Commission – The expenditure on activities of Ganga Flood Control Commission is met from the above Plan Scheme.

The above scheme is yet to be approved by the Cabinet Committee on Economic Affairs (CCEA) for XII Plan.

FARAKKA BARRAGE PROJECT



The Farakka Barrage Project was commissioned in 1975 for preservation & maintenance of the Calcutta port and for increasing the navigation depth of the Bhagirathi – Hooghly waterway. The Farakka Barrage Project comprises of 2225 m long barrage across river Ganga at Farakka in Murshidabad district of West Bengal, a canal head regulator at Farakka for diverting water to Feeder Canal, a 38.38 km long Feeder Canal and Jangipur Barrage at river Bhagirathi-Hooghly system, besides the road-cum- rail bridge across Ganga at Farakka, Navigation Locks at Farakka, Jangipur and Kalindri (Nurpur/ Malda), a road-cum-rail bridge across the Feeder Canal, Townships at Farakka, Ahiron and Khejuriaghat having 4000 dwelling units. Its appurtenant works include flood embankments, marginal bunds, afflux bunds and guide bunds, etc.

Farakka Barrage Project Authority have completed the anti-erosion works at Birnagar / Simultola for a length of 260 m including strengthening of 40 m just upstream of Farakka Barrage on the right bank of river Ganga. Left bank of river Bagmari protected in a reach length of 140 m which was required for the safety of Bagmati Syphon. Special repair of another 7 gates of Farakka Barrage is under progress.

The work of replacement of 6 gates including supply of 2 sets of stop logs and one counter weight has also been completed. The work of replacement of 33 gates has also been awarded and work of removal of damaged gates is under progress whereas fabrication and erection of new gates of Farakka Barrage is going to commence shortly.

Filling of scour pocket at Bagmati Syphon is under progress and likely to be completed by June, 2014.

NATIONAL WATER MISSION

The Government of India launched National Action Plan on Climate Change (NAPCC) on 30th June, 2008, which, inter-alia, envisages the approach to be adopted to meet the challenges of impact of climate change through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for a Green India, (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change. Ministry of Water Resources is the nodal Ministry for National Water Mission which has been established with the main objective of "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management".

A Comprehensive Mission Document for National Water Mission was prepared, which has been approved by the Union Cabinet on 6th April, 2011. It identifies five goals as under:

- 1. Comprehensive water data base in public domain and assessment of the impact of climate change on water resources,
- 2. Promotion of citizen and State actions for water conservation, augmentation and preservation,
- 3. Focused attention to vulnerable areas including over-exploited areas,
- 4. Increasing water use efficiency by 20% and
- 5. Promotion of basin level integrated water resources management.

Goal I - Comprehensive Water Data Base in Public Domain and Assessment of the Impact of Climate Change on Water Resources

First set of water data has already been placed and this is a continuous ongoing exercise. The next generation water resource information system is included in the scheme of Development of Water Resources Information System (DWRIS), for which the Cabinet approval has been accorded on 28.11.2013.

The Central Water Commission (CWC) has launched Water Resources Information System (WRIS) in association with National Remote Sensing Centre (NRSC) and Version 3.0 was launched in December 2012. The Version 4.0 has been launched in March, 2014 and now GIS data is available in public domain at 1: 2,50,000 scale. The "Indian National Committee on Climate Change (INCCC)" considered project proposals from IITs/NITs/IISc and forwarded them to Standing Advisory Committee (SAC) for its consideration. As per decision taken in SAC meeting held on 29th July 2013, the R&D guidelines have been revised, circulated/placed on Ministry of Water Resources website. INCCC secretariat has initiated consultations with the Project implementation Institutes (PI) to revise the proposals as per the revised guidelines. Three revised proposals have been received for impact studies for Luni, Tapi and Subarnarekha river basins.

Goal II - Promotion of Citizen and State Action for Water Conservation, Augmentation and Preservation

Action taken in respect of second goal includes publicity campaigns through print and electronic media as also training programme for capacity building of stakeholders, both of which have already commenced.

The EFC has recommended Rs. 10 crore for the XII Plan for Human Resources Development and Capacity Building component of NWM. Two Round Table Conferences have already been held with the representatives of Industries on 01.10.2013 and 29.10.2013 in partnership with FICCI and CII respectively at New Delhi on Strategizing and Mainstreaming CSR Initiatives of Industry into Water Sector to help achieving the objectives of NWM.

A one week (20th May to 24th May, 2013) training and capacity building program (Training of Trainers program on Increasing Water Use Efficiency in Irrigation Sector under NWM) was organized in association with National Water Academy and NERIWALM at Tejpur, Assam for the benefit of North Eastern States.

A regional workshop on "Water Conservation and Sustainable Management of Ground Water in National Capital Region" was organized by CGWB on 25.03.2014 at New Delhi.

Goal III - Focused Attention to Vulnerable Areas including Over-exploited Areas

Cabinet has approved a National Action Plan for three dimensional mapping for underground aquifers. The first targets are the vulnerable and over exploited blocks. Out of 5842 assessment units in the country (Blocks/Mandals/Taluks), 802 have been categorized as over-exploited.

The revised master plan for artificial recharge of groundwater has been prepared and placed in public domain on 04.04.2013.

An MoU has been signed between the Government of India and Asian Development Bank for a Technical Assistance with the objective to undertake operationally relevant research to identify and test integrated flood mitigation and flood plain management strategies for flood issues. This Ministry in association with the ADB has undertaken pilot project to demonstrate 'Coping with flood' through community participation. The phase- I of the study has been completed and under the Phase- II, the Buri Gandak sub-basin in Bihar and Brahamani basin in Odisha have been undertaken for detailed study.

Goal IV - Increasing Water Use Efficiency by 20%

Increasing water use efficiency is envisaged in agricultural, domestic and industrial sector but the approach has to be different in each sector. While, agriculture accounts for more than 80% of water usage, domestic sector accounts for around 7% with industrial sector accounting for around 13%.

In the agriculture sector, the water user efficiency would come from proper maintenance of irrigation channels, use of sprinkler/drip technology and usage of appropriate crops conducive to the soil texture and water table prevalent in the area. In the case of Accelerated Irrigation Benefits Programme (AIBP) in which Plan allocation is roughly of the order of Rs. 70,000 crore, Command Area Development & Water Management (CAD&WM) has been made pari- passu. In the new guidelines issued under XII Plan, a mandatory provision of 30 mts. of pucca channel per hectare has been stipulated under CAD&WM, which is expected to enable better utilization of water in the field. Traditionally, local water bodies, particularly in rural areas used to be an important source for drinking water and irrigation. Under the scheme of Repair, Renovation & Restoration (RRR), it is envisaged to cover 10,000 water bodies, of which 10% shall be in urban areas. The XII Plan allocation for Central share is Rs. 6235 crore. Keeping in view the relatively larger lead time involved in irrigation scheme, the impact can be realistically assessed after two to three years.

In the industrial sector, a series of workshops have been held with various industrial associations like FICCI, CII, etc. and their response has been encouraging. The NWM secretariat has identified paper (pulp), steel, textile, etc. for efficiency development projects. As the role of NWM is to act as a facilitator, they are in touch with the concerned Ministry/Stakeholders in these fields.

Steps have been taken by the National Water Mission secretariat, to coordinate with Bureau of Indian Standards, which has a regulatory mechanism built into the legislation. NWM is interacting with BIS and a list of appliances that could be considered by the Technical Committee of BIS in terms of inclusion of water rating are washing machines, dish washer, water taps, bath showers, flushing cistern, water purifier and other fixtures etc. The scope is proposed to be further extended, depending on the initial experience in the matter. A scoping study for a National Water Use Efficiency Improvement Support program for major /medium irrigation schemes has been initiated with technical assistance from Asian Development Bank (ADB).

Two workshops on constraints, opportunities and requirements for implementation of the National Water Mission and improving Water Use Efficiency of Major and Medium Irrigation projects were held on 05th June, 2013 at Chandigarh for Northern States, 25th June, 2013 at Hyderabad for Southern States in association with Asian Development Bank (ADB) as a part of consultation with States and Central Agencies.

Ministry of Water Resources and Indian Council of Agricultural Research (ICAR) organised one day sensitisation workshop on 'Enhancing Water use Efficiency in Yamuna Basin' on 30.08.2013 at New Delhi. Experts, Engineers, Managers representing Central/State Government organisations and other stakeholders participated in the workshop.

Goal V - Promotion of Basin Level Integrated Water Resources Management

There are 22 river basins in the country. Guidelines for taking up of basin- wise studies have been framed and proposals have been invited from experts in the field.

The draft guidelines on "Integrated Water Resources Development and Management" were prepared and circulated amongst all the States/UTs/related Ministries for their comments in the month of August, 2012 and placed in public domain on 21.06.2013.

Conference on River Basin Planning and Integrated Water Resources Management (IWRM) was organized by North Eastern Regional Institute of Water and Land Management (NERIWALM) on 4th & 5th March, 2014 at Guwahati with the objective to sensitize water related departments of the Government of Assam on importance of making sub-basin/ sub-catchment/ watershed wise assessment of water availability and deliberate on water uses/ demands for various purposes, managing flood and erosion in present and futuristic scenarios.

A number of advisory groups/committees have been constituted at various levels for providing assistance, guidance and monitoring activities of National Water Mission. The EFC recommendations for National Water Mission were approved by the Ministry of Finance on 25.10.2013; as such the impact of National Water Mission is expected to be experienced more in the coming years.

Dam Rehabilitation and Improvement Project (DRIP)

Dam Rehabilitation and Improvement Project (DRIP) aims at rehabilitation and improvement of about 223 large dams in four States (Madhya Pradesh, Odisha, Kerala

and Tamil Nadu) with World Bank funding. Apart from structural and non-structural measures for rehabilitation and improvement of identified dams, the scope of project includes the development of appropriate institutional mechanisms for the safe operation and maintenance of all large dams in participating States. In addition, strengthening of the institutional setup for national level dam safety surveillance and guidance would be taken up in Central Water Commission (CWC).

The project implementation agencies for DRIP are Water Resources Departments (WRD) of the four participating States and State Electricity Boards of Tamil Nadu and Kerala. The overall implementation of the project would be coordinated by Central Water Commission with the assistance of a management and engineering consulting firm.

The State-wise numbers of dams covered under DRIP and the estimate of the project cost is summarized in Table-9 below:

Table -9

State	Total Nos. of	No. of	Total Project Cost
	Large Dams	DRIP	(Rs. crore)
		Dams	
Kerala	58	31	279.98
Odisha	198	38	147.74
Madhya Pradesh	899	50	314.54
Tamil Nadu	116	104	745.49
CWC			132.00
Unallocated Resources			480.24
Total		223	2100.00

No. of dams state-wise under DRIP and estimate of project cost

The project has become effective from 18th April, 2012 and will be implemented over a period of six-years. The lining up of Engineering and Management Consultant for Central Project Management Unit (CPMU) of DRIP is under process. Design flood reviews of 46 DRIP dams have been completed. First tender documents in respect of five dams have been approved and works are expected to commence shortly. Project Screening documents in respect of 23 dams have been prepared and are at different stages of review.

Some more States/Organizations are expected to join DRIP and their cost allocations have been finalized in consultation with the Bank.

Chapter 4

Inter-State River Issues

Inter-State River Water Disputes Act, 1956

Inter-State River Water Disputes (ISRWD) Act, 1956 was originally enacted by the Parliament in 1956 for adjudication of disputes relating to waters of Inter-State rivers and river valleys. In view of the Sarkaria Commission recommendations, the said Act has been amended and came into force from 6th August, 2002. The amendments include time frame for constitution of the Inter-State Water Disputes Tribunals and time limit for the Tribunals to give their awards. As per the amendment, Central Government will have to constitute a Tribunal within a period of one year from the date of receipt of a request from any State Government. Also, the award of the Tribunal shall have the same force as an order or decree of Supreme Court.

Inter-State Water Disputes Tribunal

Cauvery Water Disputes Tribunal (CWDT)

The Cauvery Water Disputes Tribunal (CWDT) was constituted by the Government of India on 2nd June 1990 to adjudicate the water dispute regarding inter-State river Cauvery and the river valleys thereof. The term of CWDT has been extended by the Government up to 02.11.14 as per provisions of ISRWD Act, 1956.

Progress in adjudication of the dispute before CWDT

The Cauvery Water Dispute Tribunal has submitted its reports and decision under section 5 (2) of Inter-State River Water Dispute Act, 1956 to Government on 5th February, 2007. Under Section 5(3) of the said Act, the Central Government as well as party States sought further clarification/guidance in this regard. The Tribunal took up the petitions of the party States for consideration on 10th July, 2007. In its order, the Tribunal, inter-alia, observed as under:-

"It appears that the State of Karnataka, the State of Tamil Nadu and the State of Kerala filed Special Leave Petitions against the aforesaid decision of this Tribunal dated 5th February, 2007 before the Supreme Court. The Supreme Court has granted Special Leave. The appeals are pending. According to us, in this background, these applications under Section 5(3) of the said Act should be listed for orders after disposal of the appeals by the Supreme Court".

The application filed by the riparian States, Civil Appeal No. 2453 of 2007 of the State of Karnataka versus State of Tamil Nadu and other alongwith Civil Appeal No. 2454 of 2007 and Civil Appeal No. 2456 of 2007 of the State of Kerala and State of Tamil Nadu respectively were heard by the Hon'ble Supreme Court of India. Hon'ble Supreme Court, during hearing on 4th February, 2013 on an application filed by Tamil Nadu, directed the Central Government to publish in Official Gazette the final decision given by CWDT dated 5th February, 2007 as early as may be possible, but not later than 20.02.2013. In pursuance, the Central Government published in Gazette of India on 19.02.2013, the notification of Final Order and Decision of CWDT dated 5th February, 2007.

Hon'ble Supreme Court, in its Order dated 10.05.2012, has given directions for constitution of a protem Supervisory Committee under the Chairmanship of Secretary, MoWR and Chief Secretaries of the 4 riparian States/UTs to implement the Award. In compliance, Government of India has constituted the Protem Cauvery Supervisory Committee (CSC) vide notification dated 22.05.2013. So far, four meetings of the Cauvery Supervisory Committee (CSC) have been held on 01.06.2013, 12.06.2013, 15.07.2013 and 08.11.2013, at New Delhi.

IA No.6 in civil appeal No. 2456 of 2007 was taken up in the Hon'ble Supreme Court on 1.7.2013 and ordered for listing for consideration on 5th July, 2013 by giving time up to 4th July, 2013 for putting up response by the rejoinder. The case was again taken up on 5th July, 2013, and it was ordered the rejoinder-Affidavit may be filed by the State of Tamil Nadu within three weeks and list the same on 5th August, 2013.

The case was taken up on 5th August, 2013 wherein it was ordered that having regard to good rains, learned Senior Council for the State of Tamil Nadu is not desirous of pressing IA No. 6 of 2013 and accordingly it was ordered to list the appeal on 15th Jan, 2014.

The original suit 3 of 2002 was taken up by the Hon'ble Supreme Court on 3.12.2013 and it was ordered that the case is connected to original suit 03/2001 and in the next date of hearing of the case on 15.1.2014, the Hon'ble Court directed to list the group of matters 'For Directions' on 12th March, 2014 and no further orders of listing of the case have been given.

The cumulative quantum of water made available at Billingundulu Gauge & Discharge site during the period 1st June, 2013 to 31st March, 2014 was 252.07 TMC against 187.00 TMC as per final order of CWDT.

Chairman, Tribunal Mr. Jusrice N.P. Singh resigned on 9th April, 2012. Hon'ble Chief Justice of India has nominated Dr.Justice B.S.Chauhan, sitting Judge of Supreme Court of India to function as Chairman of CWDT. He joined the Tribunal on 21st May, 2014. The expenditure incurred by the Tribunal is given in Table-10 below : -

Table-10

Expenditure incurred by the CWDT

SI. No.	Specification	Rs. Lakh
i)	Budget Allocation for 2013-14	224.50
ii)	Expenditure incurred by the Tribunal during 2012-2-13	155.54
iii)	Cumulative Expenditure up to 03/13	2076.29
iv)	Expenditure from 04/13 to 03/14	150.73
v)	Cumulative Expenditure up to 31/03/14	2227.02

Krishna Water Disputes Tribunal

The Krishna Water Disputes Tribunal (KWDT) was constituted on 2nd April, 2004 for adjudication of the dispute relating to sharing of waters of Inter-State river Krishna and river valleys thereof. In the Writ Petition No. 408 of 2008, Hon'ble Supreme Court has ordered that the effective date of constitution of the Tribunal will be 01.02.2006. Consequently, the term of the Tribunal was extended up to 31.12.2010 as per provisions of ISRWD Act, 1956. The report and the decision by the Tribunal under Section 5(2) of the Act were forwarded to the Ministry of Water Resources on 30th December, 2010. Further, the tenure of the Tribunal has been extended from time to time.

The Report and Decision 2010 was pronounced on 30.12.2010 by the KWDT-II under Section 5(2) of the Act. Thereafter the Party States i.e. Andhra Pradesh, Karnataka, Maharashtra and also the Central Government had filed their Reference Applications u/s 5(3) of the Act to the Tribunal. Subsequently, replies and rejoinders were filed by the Party States and the Central Govt. Arguments were advanced on behalf of the Party States and Central Govt. on the dates hearing before the Hon'ble Tribunal. The Tribunal concluded the hearing of the arguments vide order dated 30.08.2013. The order on References was pronounced by the Tribunal on 29.11.2013 by way of further report and same was forwarded to the Central Govt. and the respective Party States under Sec. 5(3) of the Act for their information and implementation.

The Hon'ble Supreme Court, vide its order dated 16th September, 2011 directed that till further orders, the decisions which may be taken by the Tribunal on the reference petitions filed by the three States and the Central Government shall not be published in the official Gazette in terms of Section 6(1) of the Act.

Meanwhile, as per Andhra Pradesh Re-organization Act, 2014, the term of the Tribunal has been extended for two years w.e.f. 1st August, 2014 for submission of further report by the Tribunal so as to address the terms of reference specified in clauses (a) and (b) of the Section 89 of the Andhra Pradesh Re-organization Act, 2014 (6 of 2014). The expenditure incurred by the Tribunal is given in **Table-11** below: -

Table-11

Expenditure incurred by the KWDT

SI.	Specification	Rs.
No.		Lakh
i)	Budget Allocation for 2013-14	195.5
ii)	Expenditure incurred by the Tribunal during 2013-14 (up to March, 2014)	206.15
iii)	Cumulative Expenditure up to to March, 2014	1332.40

Vansadhara Water Dispute Tribunal

The Hon'ble Supreme Court had directed Central Government to constitute the Vansadhara Tribunal before February 2010. The Tribunal was notified on 24.02.2010 under the Chairmanship of Mr. Justice B.N. Agrawal with Justice Nirmal Singh and Justice B.N. Chaturvedi as its Members. However, Hon'ble Justice B.N. Agrawal resigned from the post of Chairman on 9th December, 2010 and Justice Nirmal Singh, Member, resigned from the post of Member with effect from 02.01.12. The Central Government has since nominated Hon'ble Dr. Justice Mukundakam Sharma as Chairman of the Tribunal who took over charge of the post on 17.09.2011 and Justice Shri Ghulam Mohammad as Member of the Tribunal who took over charge of the post on 08.04.12.

The Ministry of Water Resources vide letter No.1 (1)/ 87-GA dated 31.10.2011 has allotted office space for VWDT at 5th floor, Mohan Singh Place, New Delhi. The Tribunal has held 14 sittings so far.

Further, the Hon'ble Supreme Court vide its order dated 13.12.2013 in I.A. No.7 in Writ Petition (Civil) No.443/2006 has observed as under:

"It is common ground that Vansadhara Water Disputes Tribunal started functioning with effect from 17.9.2012. We are of the view that this date be considered as the effective date of the Constitution of the said Tribunal for the purpose of calculating the period of three years as provided under Section 5(2) of the Inter State River Water Disputes Act, 1956."

In pursuance of the order of the Hon'ble Supreme Court dated 13th December, 2013, the Central Government vide S.O. 778(E) dated 14th March, 2014 has decided that the effective date of constitution of said Tribunal shall be 17th September, 2012, and accordingly, under the provisions of sub-section (2) of section 5 of the said act, the period of three years of submission of report and decision by the Vansadhara Water Disputes Tribunal shall commence from the 17th September, 2012.

Hon'ble Tribunal delivered its judgement in the I.A. No. 1 of 2010 on 17th December, 2013, allowing the Government of Andhra Pradesh to construct the Side Channel Weir along with the ancillary works as proposed and has, inter-alia, directed for constitution of a 3 member Protem Supervisory Flow Management and Regulation Committee on River Vansadhara. The above order granting permission to construct the Side Weir with its ancillary work and the conditions laid therein are all temporary in nature and can be varied by the Tribunal as and when there is appropriate cause and reason for it. Ministry has initiated appropriate action on the issue.

The expenditure incurred by the Tribunal is given in **Table-12** below:

Table-12

SI.	Specification	Rs. lakh
No.		
i)	Budget allocation for 2013-14	421.00
ii)	Expenditure incurred by the Tribunal during	285.49
	01-04-13 to 31.03.14	
iii)	Cumulative Expenditure up to March, 2014	792.79

Expenditure incurred by the VWDT

Mahadayi /Mandovi Water Disputes Tribunal

The Central Government issued a Notification No. S.O. 2786 (E) dated 16th November, 2010 consisting a Tribunal called as "the Mahadayi Water Disputes Tribunal" for adjudication of water disputes relating Inter-State river Mahadayi and the river valley thereof, consisting of (1) Hon'ble Mr. Justice J.M. Panchal, Judge, Supreme Court of

India as Chairman, (2) Hon'ble Mr. Justice Viney Mittal, Judge, High Court of Madhya Pradesh as Member and (3) Hon'ble Mr. Justice P.S. Narayana, former Judge, High Court of Andhra Pradesh as Member.

The office accommodation for MWDT has been allotted at 5th Floor, A-Wing, Janpath Bhavan, New Delhi and the Tribunal has held 15 sittings so far and directed the parties to file the statement of the cases, reply rejoinder, if any.

The expenditure incurred by the Tribunal is given in **Table-13** below:

Table-13

Expenditure incurred by the MWDT

SI.No.	Specification	Rs. lakh
i)	Budget allocation for 2013-14	358.90
ii)	Expenditure incurred by the Tribunal	221.00
	from 01.04.2013 to 31.03.2014	
iii)	Cumulative Expenditure up to	410.98
	31.03.2014	

Ravi & Beas Waters Tribunal

The Ravi and Beas Waters Tribunal which was constituted on 2nd April, 1986 submitted its report on 30th January, 1987. The report was circulated in May, 1987. A reference was made to the Tribunal in August, 1987 comprising reference received from the Central Government and references received from Governments of Punjab, Haryana, and Rajasthan, seeking explanation/guidance on certain points in the report.

The period for forwarding of further report by the Tribunal has been extended up to **5th August 2014**. The Tribunal hearings have become dependent on the outcome of a Presidential Reference related to Punjab Termination of Agreement Act, 2004. The expenditure incurred by the Tribunal is given in Table-14 below:

Table-14

Expenditure incurred by the R&BWT

SI.No.	Specification	Rs. lakh
i)	Budget allocation for 2013-14	47.70
ii)	Expenditure incurred by the Tribunal in 2013-14 up to 31-03-2014	37.63

Chapter 5

Co-operation with Neighbouring Countries

INDIA-BANGLADESH COOPERATION

Indo-Bangladesh Joint Rivers Commission

An Indo-Bangladesh Joint Rivers Commission (JRC) has been functioning since 1972 with a view to maintain liaison in order to ensure the most effective joint efforts in maximizing the benefits from common river systems. It is headed by Ministers of Water Resources of both the countries. So far, 37 meetings have been held. The last meeting was held in March, 2010. Next meeting is due to be held at Dhaka.

Treaty on Sharing of Ganga Waters at Farakka

A Treaty was signed by the Prime Ministers of India and Bangladesh on 12th December 1996 for the sharing of Ganga/Ganges waters at Farakka during the lean season. As per the Treaty, the Ganga/Ganges waters is being shared at Farakka (which is the last control point on river Ganga in India) during lean period, from 1st January to 31st May every year, on 10-daily basis as per the formula provided in the Treaty. The validity of Treaty is 30 years.

The sharing of water as per the Treaty is being monitored by a Joint Committee headed by Members, JRC from both sides. 56th and 57th meeting of Joint Committee were held at Dhaka and Kolkata, respectively in March 2014. The 58th meeting of the Joint Committee is scheduled to be held in June 2014 in Bangladesh. The Treaty is being implemented to the satisfaction of both the countries since 1997.



Finalization of the Records of Discussions and Annual Report-2013 during 55th Meeting of Joint Committee by Members of India-Bangladesh Joint Rivers Commission in New Delhi (Sept.2013)

Cooperation in Flood Forecasting

India is providing the flood data of Farakka and Sahibganj for Ganga (from 15th June to 15th October) and the flood data of Pandu, Goalpara and Dhubri for Brahmaputra and of Silchar for Barak besides the data of river Teesta, Manu, Gumti, Jaladhaka and Torsa, etc. during monsoon period (from 15th May to 15th October) to Bangladesh for use of their flood forecasting and warning arrangements. The transmission of flood forecasting information from India during the monsoon which is being supplied free of cost has enabled the Civil and Military authorities in Bangladesh to take timely precautionary measures and shift the population affected by flood to safer places. Flood data of the above sites was communicated to Bangladesh on continuous basis during the Monsoon of the year 2013.

INDIA-BHUTAN COOPERATION

A Joint Group of Experts (JGE) on flood management was constituted between India and Bhutan in 2004 to discuss and assess the probable causes and effects of the recurring floods and erosion in the southern foothills of Bhutan and adjoining plains in India and recommend to both Governments appropriate and mutually acceptable remedial measures. Ministry of Water Resources is also operating a separate scheme for setting up of flood forecasting system on rivers common to India and Bhutan run by Ministry of Water Resources in Bhutan for the development of mutual cooperation between the two countries in the field of hydro-meteorological data collection and flood forecasting activities on rivers common to India and Bhutan. The present network in Bhutan comprises of 32 hydro-meteorological sites on common rivers flowing from Bhutan to India for the above work. The data received from these stations are utilized in India by the Central Water Commission for formulating flood forecasts. A Joint Expert Team (JET) consisting of officials from the Government of India and Royal Government of Bhutan continuously reviews the progress and other requirements of the network.

INDIA-CHINA COOPERATION

The Government of India has entered into cooperation in Water Resources Sector with the neighbouring countries including Bhutan and China to address the issues arising on the trans-border rivers flowing between the countries. During the visit of the Chinese Premier Zhu Rongji to India in January 2002, a MoU was signed between the Ministry of Water Resources, Government of India and the Ministry of Water Resources, People's Republic of China upon Provision of Hydrological Information on the Brahmaputra River in Flood Season and it was renewed in 2008.

Further, during the visit of Chinese President Hu Jintao to India, in November, 2006, India and China agreed to set up an Expert Level Mechanism (ELM) on trans-border rivers. The ELM has held seven meetings so far since 2007. Government takes up relevant issues relating to trans-border rivers, with the Chinese side through this Expert Level Mechanism. The 7th Meeting of Joint Expert Level Mechanism was held from 14th to 18th May, 2013, at Beijing wherein the issues related to bilateral cooperation on exchange of hydrological information between the two countries were discussed and also finalized the renewal of the Memorandum of Understanding between India and China on Provision of Hydrological Information on Brahmaputra River in Flood Season before its expiry on 4th June 2013. This has subsequently renewed on 20th May , 2013 during the visit of Chinese Premier Li Keqiang to India. Thereafter, during the visit of Prime Minister of India to China, this MoU was revised to ensure that the data provision starts from 15th May instead of 30th May to 15th October of the relevant year.

Another MoU for the provision of similar data by China to India during the flood season in respect of Sutlej was signed in 2005 and was renewed in 2010. The hydrological information received from the Chinese side is utilized in the formulation of flood forecasts by the Central Water Commission.

INDIA – NEPAL COOPERATION

Pancheshwar Multipurpose Project (5600 MW)

Pancheshwar Multipurpose Project is the *<u>Centerpiece</u>* of Mahakali (Sarda) Treaty of 1996 between India and Nepal. The required field investigations for the Pancheshwar Multipurpose Project having an installed capacity of 5600 MW at Pancheshwar with irrigation and incidental flood control benefits and a re-regulating structure to primarily meet irrigation requirements downstream in Uttar Pradesh, have been completed. During the 3rd meeting of India Nepal Joint Committee on Water Resources (JCWR) held from 29.09.08 – 01-10-08 at Kathmandu (Nepal), it was decided to set up Pancheshwar Development Authority (PDA) at the earliest for the development, execution and operation of Pancheshwar Multipurpose Project. During the 5th meeting of JCWR held on 20-22, November, 2009 at Pokhara (Nepal), JCWR finalized the Terms of Reference (TOR) of PDA. Substantive issues such as sharing of cost and benefits, location of reregulating structure, stage based implementation, etc. are, however, not finalized. During its 6th meeting held on 24-25 November, 2011 at New Delhi, JCWR agreed for initiating the process of establishment of Pancheshwar Development Authority (PDA) at the earliest for implementation of Pancheshwar Multipurpose Project. Terms of Reference of the Authority are under finalization.

Sapta Kosi High Dam Multipurpose Project & Sunkosi cum Diversion Scheme (3300 MW)

In order to undertake the Joint Investigations of SaptaKosi High Dam Multipurpose Project and Sun Kosi Storage cum Diversion Scheme; a Joint Project Office (JPO-SKSKI) was set up in Nepal in August, 2004 to take up field investigations and preparation of Joint DPR. *The work was to be completed* by February, 2007. However, because of political instability and frequent strikes / bandhs in Nepal, the field investigations have been delayed. The tenure of JPO-SKSKI has now been extended up to February, 2015.

India-Nepal Joint Ministerial Level Commission on Water Resources (JMCWR)

India- Nepal Joint Committee on Water Resources (JCWR) during its 3rd meeting held from 29th September, 2008 to 1st October, 2008 at Kathmandu (Nepal) recommended constitution of Joint Ministerial Level Committee on Water Resources (JMCWR) to be headed by Ministers of Water Resources of India and Nepal. The composition of the JMCWR was also decided by JCWR. The first meeting of JMCWR was held on 15th Feb., 2012 at New Delhi.

India-Nepal Joint Committee on Water Resources (JCWR)

Seventh meeting of India- Nepal Joint Committee on Water Resources (JCWR) was held on 24-25 January, 2013 at Kathmandu, Nepal. During the meeting, all issues related to cooperation in water resources including Mahakali treaty were discussed. Progress of investigation of Sapta Kosi High Dam Project and Sun Kosi Storage-cum-diversion Scheme was also reviewed. All other issues concerning floods and irrigation on common border areas were discussed and it was agreed to resolve them mutually.

India-Nepal Joint Standing Technical Committee (JSTC)

Fourth meeting of India- Nepal Joint Standing Technical Committee (JSTC) was held on 12-13 September, 2013 at Kathmandu in which all outstanding technical issues between the two countries were discussed.

India-Nepal Joint Team of Experts (JTE)

Thirteenth meeting of Joint Team of Experts (JTE) was held on 23-24 Dec.,2012 at Kathmandu, Nepal. During the meeting, drilling works being carried out by Nepal Electricity Authority (NEA) were discussed. It was decided in the meeting to extend JPO-SKSKI by another two years to complete the residual work.

INDO-PAKISTAN CO-OPERATION

Under the Indus Waters Treaty 1960, India and Pakistan have each created a permanent post of Commissioner for Indus Waters. Each Commissioner is the representative of his Government and serves as a regular channel of communication on all matters relating to implementation of the Treaty. The two Commissioners together form the Permanent Indus Commission (PIC).

During the year 2013-14, the Commission held one meeting (22nd to 25th September 2013) and two tours (29th May to 1st June 2013 & 3rd to 6th July 2013).

In fulfillment of the requirement of Indus Waters Treaty, the daily Gauge and Discharge (G&D) data of hydrological sites on six basins, The Indus, The Jhelum, The Chenab, The Ravi, The Beas and The Sutlej of Indus system was sent to Pakistan every month.

Irrigated cropped area statistics for the year 2012-13 for Indus, Jhelum & Chenab basin have been sent to Pakistan as per the provisions of Indus Waters Treaty during November, 2013.

Flood flow data for agreed sites on the river Ravi, Sutlej, Tawi and Chenab was also communicated by India to Pakistan for their benefit through telephone during 1st July to 10th October, 2013 to undertake advance flood relief measures.

Pakistan raised two disputes in respect of Kishenganga HEP (330 MW) on river Kishenganga, a tributary of river Jhelum in 2010. Seven members Court of Arbitration (COA) was set up and gave its partial award on 18th February, 2013 and final award on 20th February, 2013. The Court upheld India's right to divert the water of river Kishenganga for power generation subject to maintaining minimum flow of 9 cumec below dam of Kishenganga. The Court has also clarified that except in the case of an unforeseen emergency, the Treaty does not permit reduction below Dead Storage Level in the reservoirs of Run-of-River Plants on the Western rivers.

Assistance to States (Non- Plan) – Sutlej –Yamuna Link Canal

The construction of Sutlej-Yamuna link canal in Punjab territory is centrally funded under non Plan as a special case in accordance with the Cabinet decision of 9.2.1987. The Govt. of India released funds amounting to Rs. 499.12 crore up to the end of March, 1994 to the Govt. of Punjab. The Hon'ble Supreme Court vide order dated 4.6.2004 directed the Union of India to carry out its action plan for the completion of the Sutlej-Yamuna link canal in Punjab territory. The Central Public Works Department (CPWD) was nominated as the Central Agency to undertake and complete the SYL canal. However, on 12.7.2004, the State of Punjab enacted a Punjab Termination of Agreements Act, 2004. A presidential reference on Punjab Termination Agreements Act, 2004 was made to the Hon'ble Supreme Court of India. Further action can only be taken after the outcome of the above reference, which is still awaited.

Chapter 6

External Assistance in Water Resources Sector

Ministry of Water Resources assists the State Governments in availing external assistance from different funding agencies to fill up the resource gap and state of the art technology for water resources development and management in the country.

There are 16 on-going externally aided projects in various States with the assistance of different funding agencies, viz. World Bank (10), Asian Development Bank (3) and Japan Bank for International Cooperation (JBIC) (3).

Out of 10 on-going externally aided projects assisted by World Bank, 2 relate to water sector restructuring in the States of Madhya Pradesh and Uttar Pradesh (Phase II); 2 relate to water sector improvement in the States of Maharashtra and Andhra Pradesh; 2 relate to community based tank management in the States of Andhra Pradesh and Odisha; 1 relates to irrigated agriculture modernization and water bodies restoration and management in Tamil Nadu; 1 relates to Hydrology Project (Phase II) which covers 13 States & 8 Central Agencies; 1 relates to accelerated development of minor irrigation in West Bengal; and 1 relates to Dam Rehabilitation and Improvement Project, which covers 4 States, namely, Madhya Pradesh, Odisha, Kerala and Tamil Nadu. A brief status of World Bank assisted on-going externally aided projects is given in Table-15.

The main achievements / outcome of some of the World Bank assisted projects are given below:

Madhya Pradesh Water Sector Restructuring Project

The major outcome of the World Bank aided Madhya Pradesh Water Sector Restructuring Project has been the reclamation of lost irrigation potential of old schemes. The Rabi irrigation delivered in 2009-10, 2010-11, 2011-12 and 2012-13 stood at 1.50 lakh hectares, 1.77 lakh hectares, 4.45 lakh hectares and 5.10 lakh hectares respectively.

Uttar Pradesh Water Sector Restructuring Project, Phase I

The Impact Assessment of UPWSRP Phase-I, inter alia, indicate the following:

A: Availability of water by percent households at different reaches of Jaunpur branch

Year	Head	Mid	Tail End
	Reach	Reach	
2005-06	36%	34%	19%
2008-09	55%	48%	46%

B: Increase in Gross Irrigated Area : Percent of GSA Irrigated

		Canal and other
Year	Canal (Only)	sources
2005-06	48.7	52.7
2008-09	52.1	67.7

C: Income per farm (Rs.)

Income	2006-07	2008-09
Net farm income	33244	38588
Total family income	47068	67286

D: Increase in cropping intensity : 7% (compared with 2005-06)

E: Poverty Impacts: The project benefited about 4.01 lakh farm households by enhancing their average annual income by about Rs 11,325 (at 2011 prices) per hectare The project generated about 16,600 jobs, providing sustainable on-farm employment for about 10% of the landless agricultural labourers in the project area through irrigated area expansion and agricultural intensification. At 2011 prices, about 40,100 farms with holding sizes greater than 1.9 ha have moved above the poverty line due to the project interventions.

F: Drainage impacts: The project has improved drainage by rehabilitating 2,369 km of old drains in the Sarda Sahayak Command area, including the masonry works. The improved drainage area is estimated at 20,932 hectare.

Table –15

S. No	State	Name of Project	Agreement Date / Terminal Date of Disbursement	Amount of Assistance (US \$ million) (IBRD/IDA)	Cumulative Disbursem ent up to 31.3.14 (US \$ million)
1	Madhya Pradesh	Madhya Pradesh Water Sector Restructuring Project 4750-IN	30.11.2004/ 30.06.2015	387.40(IBRD)	265.65
2	Uttar Pradesh	Uttar Pradesh Water Sector Restructuring Project, Phase II 5298 IN	24.10.2013/ 31.10.2020	239.40 (XDR)	6.13
3	Andhra Pradesh	Andhra Pradesh Water Sector Improvement Project 7897-IN	14.08.2010/ 31.07.2016	450.60(IBRD)	140.98
4	Maharashtra	Maharashtra Water Sector Improvement Project 4796-IN	19.08.2005/ 28.03.2014	310.00(IBRD)	290.77
5	Andhra Pradesh	Andhra Pradesh Community Based Tank Management Project 4857-1N	08.06.2007/ 30.09.2014	94.50(IBRD)	63.79
		Andhra Pradesh Community Based Tank Management Project 4291-IN	08.06.2007/ 30.09.2014	58.14(IDA) XDR	41.78
6	Odisha	Odisha Community Tanks Management Project 7576-IN	27.01.2009/ 30.06.2016	38.47(IBRD)	8.25
		Odisha Community Tanks Management Project 4499-IN	27.01.2009/ 31.08.2014	16.98(IDA) XDR	5.28
7	West Bengal	West Bengal Accelerated Development of Minor Irrigation Project 8090-IN	21.12.2011/ 31.12.2017	125.00(IBRD)	1.22
		West Bengal Accelerated Development of	21.12.2011/	78.20(IDA)	9.31
		Minor Irrigation Project 5014-IN	31.12.2017	XDR	
8	Madhya Pradesh,	Dam Rehabilitation and Improvement Project	21.12.2011/	139.65(IBRD)	0.44
	Odisha, Kerala and Tamil Nadu	7943-IN	30.06.2018		
		Dam Rehabilitation and Improvement Project	21.12.2011/	93.02(IDA)	4.70
		4787-IN	30.06.2018	XDR	
9	Tamil Nadu	Tamil Nadu Irrigated Agriculture Modernization and Water Bodies Restoration 4846-IN	12.2.2007/ 30.09.2014	335.00(IBRD)	180.40
10	Multi-State*	Hydrology Project (Phase-II)	19.01.2006/	104.98 (IBRD)	78.47
10		4749-IN	31.05.2014		

*Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Goa, Punjab, Puducherry and Himachal Pradesh.

Source: Country-wise Monthly Disbursement as on 31.3.2014 (loans)- Ministry of Finance (DEA)-Aid Accounts & Audit Division
World Bank Assisted On-going Project

Rajasthan Water Sector Restructuring Project

The main outcome of the project is as under:-

- (i) Increase in yield for mustard and wheat from 1 ton/hectare to 1.68 ton/hectare and 2 ton/hectare to 3.89 ton/hectare respectively.
- (ii) Restored area under irrigation 105622 hectare.
- (iii) Increased farm household income up to Rs.1.20 lakh per annum.

Maharashtra Water Sector Improvement Project

The outcome of the World Bank aided Maharashtra Water Sector Improvement Project mainly relates to completion of 176 schemes for canal rehabilitation, 237 schemes for dam safety works, formation of 1674 Water User Organizations (WUOs) and handling over of Distribution System to 947 Water User Associations for further irrigation management. The main achievements of this project relate to increase in water use efficiency by 37.5 % and net increase in agriculture income by 29.53 %.

Andhra Pradesh Community Based Tank Management Project

- Substantial increase in per capita income ranging from 150.7% for the large farmers to 283.2% for marginal farmers in project tanks.
- Increase in irrigated area from 54% to 80%.
- Area under non-paddy crops increased from 17.2% to 26.3 % in project tanks.
- Increase in cropping intensity from 103 % to 126.7 %.
- Increase in rice yield by 21.8 %, increase in maize productivity by 39.3%, increase in groundnut productivity by 50.6% and increase in tomato productivity by 8.7%.
- Increase in Fisheries productivity from 125 kg/ha to 494 kg/ha due to the package of practices introduced and adopted by the Fishermen Cooperative Societies.

The brief status in respect of recently undertaken World Bank assisted projects are given below:

DRIP

The project became effective from 18th April, 2012 and will be implemented over a period of 6 years. Design flood reviews of 46 DRIP dams have been completed. First tender documents in respect of 5 dams have been approved and works are expected to commence shortly. Project Screening documents in respect of 23 dams have been prepared and are at different stages of review.

Uttar Pradesh Water Sector Restructuring Project, Phase II

The total estimated cost of the project is US \$ 515 million, out of which World Bank IDA loan amount of US \$ 360 million was approved on 28th August, 2013. The balance amount of US \$ 155 million will be provided by the State Government. The Project Development Objective is to (a) strengthen the institutional and policy framework for integrated water resources management for the entire State; and (b) increase agricultural productivity and water productivity by supporting farmers in targeted irrigation areas. The proposed project will be implemented through six components: (A) Strengthening of State-level Water Institutions and Inter Sector Coordination (US \$17million); (B) Modernization and Rehabilitation of Irrigation and Drainage System (US \$ 324 million); (C) Consolidation and Enhancement of Irrigation Institution Reforms (US \$ 32 million); (D) Enhancing Agriculture productivity and On-Farm Water Management (US \$ 32 million); (E) Feasibility Studies and Preparation Activities for the Next Phase (US \$ 2 million); and (F) Project Coordination and Monitoring (US \$ 23 million).

Capacity Building for Integrated Water Resources Development & Management - Benchmarking Studies - World Bank Grant

With a view to raise the technical standards of National Institute of Hydrology (NIH), Central Ground Water Board (CGWB), Central Water & Power Research Station (CWPRS) and Central Soil & Materials Research Station (CSMRS) and bring them up to international standards, Benchmarking Studies of these institutions have been carried out with the assistance from World Bank to the tune of US\$ 2 million grant under the Project, "Capacity Building for Integrated Water Resources Development and Management – DFID". The Final Reports on Benchmarking of these organizations have been submitted by the Consultants appointed by the World Bank. A Committee of Experts was also appointed to study the final report submitted by the Principal Consultant / Expert, to recommend its acceptance or suggest modifications and to draw up a schedule of implementation or action plan.

The Review Committee Reports on Benchmarking Studies of all the organizations have since been submitted to the Ministry for its consideration and approval.

A brief status of Asian Development Bank (ADB) assisted on-going external aided projects is given in **Table-16**.

The achievements in respect of recently completed Chattisgarh Irrigation Development Project are as follows:

Chattisgarh Irrigation Development Project – Phase I

During 2012-13, kharif and rabi cropping intensity reached 100% and 52% respectively while paddy yield was 5.9 T/ha in schemes under intensive intervention program covering an area of about 1 lakh ha. against the baseline yield of 2.8 T/ha for irrigated paddy.

S. No	State	Name of Project	Agreement Date / Terminal Date of	Amount of Assistance (US \$ million)	Cumulative Disbursement up to 31.3.14
			Disbursement		(US \$ million)
1	Odisha	2444-IND Odisha	25.02.2009/	16.50	12.14
		Integrated Irrigated Agriculture and Water	31.03.2015		
		Management Investment			
		Program Project-I			
2	Maharashtra	2679-IND Sustainable	17.08.2011/	51.56	4.36
	and	Coastal Protection and Management Investment	31.12.2014		
	Karnataka	Program Project-I			
3	Assam	Assam Integrated Flood	10.05.2011/	56.90	12.75
		and River Bank Erosion Risk Management	30.09.2014		
		Investment Program 2684-IND			

Table -16Asian Development Bank Assisted On-going Projects

Source: Country-wise Monthly Disbursement as on 31.3.2014 (loans)- Ministry of Finance (DEA)-Aid Accounts & Audit Division

Projects under Pipeline – ADB

Climate Adaptation through Sub Basin Development Investment Program

The goals and objectives of the project are to help citizens in Cauvery Delta of Tamil Nadu to address sea water intrusion and flooding in the light of climate change and rehabilitation and modernization of the flood management infrastructure. The Screening Committee of Department of Economic Affairs, which considered the proposal on 13th Sept. 2013 agreed to pose the project for ADB funding. The total cost of investment program is US \$ 300 million (ADB : US \$ 210 million & State: US \$ 90 million). Cost of proposed 1st Tranche of the project is US \$ 125 million (ADB: US \$ 100 million & State: US \$ 25 million). Project is planned for approval in 1st quarter of 2015.

Karnataka Integrated and Sustainable Water Resources Management Investment Program (KISWRMIP) (43253 IND)

This project seeks ADB financing to enhance water security in selected basins where there is increasing water stress due to rapid economic growth and future competing needs for water supply and industry. An integrated water resources management (IWRM) approach would be adopted to meet increasing water demands while promoting its judicious use and protecting human water needs and river environments. Total cost of proposed investment program is US\$ 225 million (ADB Loan US\$ 150 million and State share US\$ 75 million). Cost of proposed 1st Tranche of the project is US\$ 52.4 million (ADB US\$ 33 million, State US\$ 19 million & beneficiaries US\$ 0.4 million). The Project is planned for approval in first quarter of 2014.

National Water Use Efficiency Improvement Support Program (NWUEISP)

ADB is supporting National Water Mission (NWM) in its goal of improvement of WUE by 20% and undertook scoping study for development of concept paper for NWUEISP. The Program's impact will be increased availability of water for agriculture and others uses in river basins and sub-basins. Its outcome will be increased agricultural productivity and water use efficiency. The outputs will be (i) Physical infrastructure of MMI schemes upgraded and modernized; (ii) Management operation and maintenance (MOM) policies, processes and procedures modernized in State Irrigation Departments; (iii) PIM programme established and WUAs functioning; (iv) Support services providing improved services in MOM and PIM; (v) Increased adoption of modern technologies and irrigation management practices at on-farm level. Project is planned for approval in 2015.

ADB TA 7967-RDTA: Innovations for More Food with Less Water (MFLW)

The Asian Development Bank (ADB) is financing a research and development technical assistance (RDTA), namely, TA 7967-RDTA: Innovations for More Food with Less Water to support the identification, assessment and design of new investments for more sustainable, water-efficient irrigated agriculture in India. The MFLW study will build on the outputs of the scoping study for a National Water Use Efficiency Improvement Support Program (NWUEISP) which will support the NWM and the 12th Five Year Plan reform agendas aimed at improving WUE and agricultural production on major and medium (MMI) schemes in India. MFLW will support 2 Pilot projects in India.

TA 8089-Operation Research to Support Mainstreaming of Integrated Flood Management under Climate Change: TA aims to support operational research initiatives to help better integrate non-structural and community-led measures into flood planning and management. The impact will be to increase the protection and resilience of the flood-prone areas in India. The outcome will be to improve knowledge for decision making and program implementation of IFM. The TA will be implemented in two phases, starting with phase 1, which will comprise scoping studies. These studies will involve (i) a review of the lessons learnt from the integration of structural and non-structural components of flood management in India and globally; (ii) identification of the scope and location of the research activities; and (iii) preliminary data collection and support for the phase 2 start-up. Phase 2 will immediately follow from Phase 1 and will comprise operational research to support the mainstreaming of IFM in a way that takes into account projected future conditions and climate change uncertainties.

TA for Institutional Strengthening and Capacity Building for Integrated Water Resources Management: The proposed technical assistance will strengthen the capacity of Central and State Water Resources agencies by (i) enhancing knowledge in integrated water resources management (IWRM) for improved resource planning and utilization within selected basins and sub-basins; (ii) stakeholder analysis and consultation processes; (iii) data and information management for improved integrated water resources planning; (iv) participatory river basin planning through mathematical modeling; and (v) knowledge exchange and cross learning with study tours to suitable river basins within the Asia – Pacific region. The TA will include States with shared water resources like Karnataka and Tamil Nadu. It will support the Twelfth Five Year Plan (2012-17) and will also be aligned with the goal of the National Water Mission relating to promotion of basin level IWRM and improved State and inter-State water resources management. TA is to be approved in 2014.

Climate Resilient Coastal Protection and Management Project in India

With a view to incorporate climate change dimensions into the Sustainable Coastal Protection and Management Investment Programme (SCPMIP) which is being implemented with ADB loan assistance in the States of Karnataka and Maharashtra, a complementary grant of US \$ 1.8 million from Global Environment Facility (GEF) – Special Climate Change Fund (SCCF) for implementing Climate Resilient Coastal Protection and Management Project is under consideration. The objectives of this complementary grant are to strengthen the resilience of the coast, coastal infrastructure and communities to the adverse impacts of climate change by creating conducive institutional and practice frameworks for mainstreaming of climate change considerations into coastal protection and shoreline management.

A brief status of Japan International Cooperation Agency (JICA) assisted on-going external aided projects is given in Table-17

Table -17

S. No	State	Name of Project	Agreement Date / Terminal Date of Disbursement	Amount of Assistance (JPY million)	Cumulative Disbursement up to 31.3.14 (JPY million)
1	Andhra	IDP-181 Andhra Pradesh	30.03.2007/	23974	9917.92
	Pradesh	Irrigation & Livelihood	11.07.2016		
		Improvement Project			
2	Odisha	Rengali Irrigation Project (IDP-	31.03.2010/	3072	3067.75
		210 and IDP-210A)	24.11.2015		
3	Rajasthan	IDP-161 Rajasthan Minor Irrigation Improvement Project	31.03.2005/ 28.07.2015	11555	3266.64

JICA Assisted On-going Projects

Source: Country-wise Monthly Disbursement as on 31.3.2014 (loans)- Ministry of Finance (DEA)-Aid Accounts & Audit Division

The achievements in respect of Rajasthan Minor Irrigation Improvement Project are as follows:

Rajasthan Minor Irrigation Improvement Project

Out of 353 sub-projects for rehabilitation of minor irrigation schemes, 137 sub-projects with CCA of 48,488 hectare have so far been completed. All works are proposed to be completed by June, 2014.

After rehabilitation of sub-projects, 22% losses will be reduced thereby increasing conveyance and operational efficiency from 50% to 72%. The overall irrigation efficiency will increase from 35% to 54%. The total increase in CCA would be 24%.

Projects under consideration – JICA

Rengali Irrigation Sub-Project LBC-II, Phase II and Andhra Pradesh Irrigation and Livelihood Improvement Project (APILIP), Phase II

The proposal of Government of Odisha for availing Ioan assistance from JICA under FY 2013 ODA package for the Rengali Irrigation Sub-Project, Left Bank Canal (LBC)-II, Phase II (RD 71.313 Km to 141 Km) at an estimated cost of Rs.1074.36 crore (including JICA funding of Rs.936 crore) and the proposal of Government of Andhra Pradesh for availing Ioan assistance from JICA under FY 2013 ODA package for the Andhra Pradesh Irrigation and Livelihood Improvement Project (APILIP), Phase II involving a total outlay of Rs.1155 crore (including external assistance of Rs.974.76 crore) for taking up modernization of 11 Medium Irrigation Projects, 35 Lift Irrigation Schemes and 53 Minor Irrigation Schemes are under consideration. Both the above proposals have been included in JICA's Rolling Plan by Department of Economic Affairs for posing to Government of Japan for JICA Loan Assistance under FY 2014 ODA Package.

Study on Development and Management of Land and Water Resources for Sustainable Agriculture in Mizoram-JICA

The salient features of the study, inter alia, include:-

- i) Minor Irrigation (MI) Department, Government of Mizoram will be responsible for implementation of the study in cooperation with Japan International Cooperation Agency (JICA) and will be implemented within the framework of the Colombo Plan Technical Cooperation scheme.
- ii) The study which is of 20 months' duration will cover the entire State of Mizoram;

- iii) In Phase I of the study, Master Plan would be formulated and in Phase II, development of model planning and formulation of DPR on selected project sites would be undertaken.
- 2. The goals of the study are:-
 - Master Plan would be adopted as Policy of Government of Mizoram;
 - Area irrigated under Minor Irrigation project and rice production under wet rice cultivation will be increased, based on Master Plan and improved model for formulating DPR; &
 - Ratio of organization of water users association will be increased, based on improved model for formulating DPR.

During the first meeting of the Joint Coordination Committee (JCC) under the Chairmanship of Chief Secretary, Govt. of Mizoram on 7th October, 2013 at Imphal, the Inception Report of the Study submitted by the JICA Team of Experts was discussed and after due deliberations, the Committee approved the Inception Report and formally launched the Study.

Bilateral Cooperation/ Signing of MoUs- A Memorandum of Understanding on cooperation in the field of Water Resources Management between the Governments of India and Australia was signed on 10th November 2009 for a period of five years. Pursuant to signing of this MoU, a Joint Working Group (JWG) having equal members from each side was formed in 2010 and its first meeting was held during 15th-19th November, 2010 in New Delhi wherein an Action Plan charting out various activities for co-operation on Water Resources Management between the two countries was signed on 19th November, 2010. For preparing Integrated Water Resources Management (IWRM) Plan for Brahmani-Baitarani Rivers Basin in India, a Joint Workshop having water experts from both the sides was held at Bhubaneswar during 5th-6th October, 2012 to discuss the Plan's concept and methodology, status of water availability and demand including future projections and the road map.

The second meeting of the JWG was held at Canberra, Australia during 29th April to 3rd May, 2013. Pursuant to the second meeting, a two-day master-class on Water Resources Management for senior officers of Ministry of Water Resources was conducted by the Australian water experts in New Delhi on October 30-31, 2013 followed by a specialized technical training of two-week period on Australia's eWater Source River Basin modelling system for technical staff involved in the preparation of

Brahmani-Baitarani Rivers Basin Water Resources Management Plan at National Water Academy, Pune during November 18-29, 2013.

The MoU on cooperation in Water Resources Development and Management between Ministry of Water Resources and Ministry of Agriculture and Animal Resources of Republic of Rwanda was signed on 22nd January, 2013 at New Delhi. The areas of cooperation, *inter-alia*, include marshland and hillside irrigation; watershed management and water governance; irrigation projects proposals techniques; procedures of planning irrigation projects; guidelines for water management for irrigation; crop water requirements; pressurized and surface irrigation techniques; water availability and reliability for irrigation projects; water use efficiency technologies; on-farm water management including operation and maintenance; economic analysis; organization of Water users associations etc. To take follow-up action on the MoU, a Joint Commission has been formed.

During the visit of Hon'ble Prime Minister of Iraq to India in August 2013, a Memorandum of Understanding on mutual cooperation in Water Resources Development and Management between the Governments of India and Iraq was signed on 23rd August, 2013 at New Delhi. The areas of cooperation, *inter-alia*, include project hydrology, practising hydrology and hydrological modelling; applications of remote sensing & GIS in hydrology and water resources; integrated water resources development and management; flood and drought management; irrigation and drainage; surface and groundwater management and development; minor irrigation; modernization/renovation of old irrigation schemes; hydrometeorology; watershed, lakes and wetlands development; dam safety and surveillance; reservoir regulation; training and capacity building and micro irrigation. To take follow-up action on the MoU, formation of India-Iraq Joint Working Group is under process.

During the 17th India-Iran Joint Commission Meeting, a Memorandum of Understanding for cooperation in Water Resources Management between India and Iran was signed on 4th May, 2013. The areas of cooperation, *inter-alia*, include development and management of water resources, both surface and ground water and particularly in respect of traditional system of water conservation, groundwater recharge, drought and impact of climate change on water resources. Both parties agree to invest on construction of irrigation and drainage networks. To take follow-up action on the implementation of the MoU, formation of a Joint Working Group is under process.

During the 1st India-China Strategic Economic Dialogue held at Beijing, China on September 26, 2011 with the Indian side led by H.E. Mr. Montek Singh Ahluwalia, Deputy Chairman, Planning Commission, Republic of India and the Chinese side led by H.E. Mr. Zhang Ping, Chairman, National Development and Reform Commission, People's Republic of China, inter-alia, agreed to enhance communication, encourage bilateral cooperation on water conservation and clean water technologies with a view to increase water use efficiency.

This was followed up by working level meetings between Indian and Chinese delegates. Both sides agreed on mutual cooperation in the area of Micro Irrigation and Water Efficient Irrigation. In pursuance, a Memorandum of Understanding (MoU) between the Ministry of Water Resources, Government of the Republic of India and the National Development and Reform Commission, Government of the People's Republic of China on cooperation in the field of water efficient irrigation was signed on 20th May, 2013.



Deputy Chairman, Planning Commission signing Memorandum of Understanding with China for cooperation on water efficient irrigation on 20th May, 2013

A Memorandum of Understanding on cooperation in Water Resources Management and Development between Ministry of Water Resources, Government of India and Ministry of Energy and Water Resources of State of Israel has been finalized. The MoU, interalia, seeks cooperation in the areas of efficient use of water, micro-irrigation, recycling/re-use of waste water, desalination, aquifer recharge and in-situ water conservation techniques, and water resource management. The signing of the aforesaid MoU is under process.

Chapter 7

Organizations and Institutions

ATTACHED OFFICES

CENTRAL WATER COMMISSION (CWC)

Introduction

Central Water Commission with its headquarters at New Delhi is a premier technical organisation in the field of Water Resources in the country since 1945. The Commission has been entrusted with the general responsibility of initiating, coordinating and furthering, in consultation with the State Governments concerned, schemes for control, conservation and utilization of water resources throughout the country for the purpose of Flood Control, Irrigation, Drinking Water Supply and Water Power Development.

Central Water Commission is headed by a Chairman with status of an Ex-officio Secretary to the Government of India. The Commission has three technical wings, namely:

- Designs and Research wing
- Water Planning and Projects wing
- River Management wing

Each wing is headed by a Member with the status of an Ex-officio Additional Secretary to the Government of India. The activities of the wings are carried out by 18 functional units at the headquarters, each headed by a Chief Engineer. The National Water Academy, Pune headed by a Chief Engineer is also a part of the Commission. Besides this, the Commission also has 13 Regional Organizations, each headed by a Chief Engineer.

Activities

The activities of CWC may be summarized as follows:

- Flood Forecasting and Assistance to State Governments in Flood Management
- Collection and Analysis of Hydrological Data

- Techno-Economic Appraisal of Projects
- Monitoring of Selected Projects including those receiving Central Assistance
- Planning & Design of Projects
- Surveys, Investigations and Preparation of DPR
- Studies on Environmental and Socio-Economic issues
- Studies Related to Irrigation Planning and Water Management
- Basin Planning and Management
- National Water Resources Assessment
- Assistance in Resolution of Inter-State Water Disputes
- Construction Equipment Planning
- Studies on Dam Safety
- Research and Development
- Standardization of Engineering Practices
- Operation of Reservoirs
- Training and Capacity Building
- International Co-operation in Water Sector

Major Activities

Hydrological Observations

Central Water Commission is operating a network of 954 hydro-meteorological observation stations throughout the country on all major river basins to observe (i) Water Level (Gauge), (ii) Discharge, (iii) Water Quality, (iv) Silt besides (v) Selected Meteorological parameters including snow observations at key stations. The hydrological data collected from sites is scrutinized, validated and published in the form of Water Year Book, Water Quality Year Book and Sediment Year Book, etc. The data so collected is utilized for planning and development of water resources projects, climate change studies, water availability studies, flood / inflow forecasting, examination of international & inter-State issues, river morphological studies, inland waterway development, reservoir siltation studies and research related activities, etc.

Water Quality Monitoring

Central Water Commission is monitoring water quality at 396 key locations covering all the major river basins of India. CWC is maintaining a three tier laboratory system for analysis of the physio-chemical parameters of the water. The level- I laboratories are located at 373 field water quality monitoring stations on major rivers of India where physical parameters such as temperature, colour, odour specific conductivity, total dissolved solids, pH and dissolved oxygen of river water are observed. There are 18 level–II laboratories located at selected division offices throughout India to analyze 25 physico-chemical characteristics and bacteriological parameters of water. 5 level-III / II+ laboratories are functioning at Varanasi, Delhi, Hyderabad, Coimbatore and Guwahati where 41 parameters including heavy metals / toxic parameters and pesticides are proposed to be analyzed. The water quality data generated is computerized in Data Base system and disseminated in the form of Water Quality Year Books, Status Reports and Bulletins. The water quality data is used by different agencies for planning of water resources project, research purposes, etc.

• **Procurement of Online Water Quality Monitoring Systems**

Online Water Quality Monitoring System at three sites, namely, Agra (Jawahar Bridge) on river Yamuna, Lucknow on river Gomti and Moradabad on river Ramganga has been installed for measurement of pH, conductivity, temperature, dissolved oxygen, bio-chemical oxygen demand (BOD), chemical oxygen demand (COD). The real time water quality data is available for above sites from 18th July, 2013 on web site http://cwc.rtwqms.com.

Flood Forecasting and Inflow Forecasting

There are 175 flood forecasting stations, of which 147 are level forecasting and 28 are inflow forecasting stations on major dams/barrages. It covers 9 major river systems in the country including 71 river sub-basins and 15 States viz., Andhra Pradesh, Assam, Bihar, Chattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Tripura, Uttaranchal, Uttar Pradesh & West Bengal and one Union Territory Dadra & Nagar Haveli and National Capital Territory of Delhi.

On an average, over 6000 forecasts are being issued during flood season every year by the Central Water Commission. Normally, these forecasts are issued 12 to 48 hours in advance, depending upon the river terrain, the locations of the flood forecasting sites and base stations. For the purpose of flood forecasting, hydrological data is being observed at more than 700 gauge and discharge sites and hydro-meteorological data over 500 rain gauge stations and communicated through a network of about 550 wireless stations. Synoptic weather situations, weather forecast/heavy rainfall warnings etc. are also being collected from FMO's (Flood Meteorological Officers of IMD).

During the flood season 2013 (May to October), 7060 flood forecasts (5741 level forecast and 1319 inflow forecasts) were issued out of which 6760 (95.75%) forecasts were found within accuracy limit of +/- 0.15 m for level forecast and +/- 20% for inflow forecast. During the flood season, the real time hourly data of over 250 stations (mostly of flood forecasting stations and few base stations) were collected, compiled, analyzed

and used to generate flood reports of the regions. During the flood season 2013 (May to October), all the 175 flood forecasting stations were geared up to issue forecast as soon as the water level crosses warning level or the inflow crosses the threshold limit fixed for each dam/barrage.

Modernization of Flood Forecasting Services

The Central Water Commission is making a constant endeavour in updating and modernizing the forecasting services. The forecasting of flood involves a number of steps: namely, data observation, collection, transmission, compilation and analysis, formulation of forecasts and their dissemination. To make the flood forecasts more accurate, effective and timely, the modernization activities are being taken up on a continuous basis.

During 9th Plan, telemetry system at 55 stations was installed in Chambal and Upper Mahanadi basins for real time data collection and transmission to forecast formulation centres under World Bank aided Dam Safety Assurance and Rehabilitation Project (DSARP) scheme. During 10th Plan, telemetry system at 168 stations has been installed in different river basins under the scheme "Establishment & Modernization of Flood Forecasting Network in India including Inflow Forecast".

During XI Plan, 222 telemetry stations have been installed in different river basins. Moreover 1 Earth Station and 10 Modelling Centres at Patna (MGD-V) in Bihar, Jalpaiguri (LBD) in West Bengal, Lucknow (MGD-I) and Varanasi (MGD-III) in Uttar Pradesh, Dehradun (HGD) in Uttarakhand, Gandhinagar (MD) and Surat (TD) in Gujarat, Bhusaval (UTSD) in Maharashtra, Shimla (SHD) in Himachal Pradesh and FFM Directorate in NCT, Delhi have been installed. The data reception from all the sites modernised is being monitored from FFM Directorate, CWC, New Delhi.

The EFC Memo for 12th Plan period (2012-17) has a provision for installation of automatic data acquisition system and satellite based data transmissions system for existing 219 stations of CWC as also 568 new stations for 240 new inflow forecasting stations all over the country. Out of 219 stations, 125 stations are under process for modernisation during 2013-14. The station index number, uplink frequency and time slot allotments for these 125 stations have been obtained from India Meteorological Department. Tenders have been floated/under process for the data acquisition system by field organisations. Planning for modernisation of remaining sites is under process.

To improve the flood forecast modelling, windows based Mike-11 have been procured and supplied to modelling centres established under IX and X Plans. Basin specific models have been developed for Chambal and Mahanadi basins. These are being used for real –time flood forecasting. Models for Jenapur, Rengali Dam ,Rajghat under ERD (Bhubaneshwar), Bhadrachalam, Jaikwadi under LGD (Hyderabad), Srisailam, Almatti Dam under LKD (Hyderabad), Delhi, Mathura under UYD (New Delhi), Agra, Etawah under LYD (Agra), Guwahati under MBD, (Guwahati) and Hathnur Dam under Tapi Division (Surat) have also been developed and are under testing. Regular training for working staff in the field are being organised for working on Mike-11 models.

In addition, 2 lakh sq. kms (20 Mha) flood prone area in the State of UP, Bihar and West Bengal has been proposed to be mapped by high resolution through preparation of digital elevation model in association with Survey of India. The proposal forms part of the 12th Plan EFC, which is under consideration of Government of India.

Survey and Investigation

CWC is carrying out surveys and investigations for preparation of Detailed Project Reports (DPRs) in the NE region, Sikkim, Uttrakhand, Bihar and J&K on the request of the respective States for development of water resources potential for irrigation, hydropower and other uses.

CWC has completed surveys and investigations for preparation of DPR of Pancheshwar HE Project. Additional investigation works at alternative dam site at Rupaligad (reregulating structure downstream of Pancheshwar) and hydrological observations at Pancheshwar and Rupaligadare are to be taken up. Joint Project Office Sapta Kosi Sun Kosi Investigations (JPOSKSKI) based in Biratnagar (Nepal) is carrying out surveys and investigations for preparation of DPR of Sapta Kosi high dam and Sun Kosi storagecum-diversion project jointly with Nepal for mutual benefit of both the countries.

The investigations for various projects were continued during 2013-14 namely, Ujh MP Project (J&K), Kirthai-II HE Project (J&K), Suntaley HE Project (Sikkim), KalezKhola HE Project (Sikkim), Rukni Irrigation Project (Assam), Sonai Irrigation Project (Assam), preparation of DPRs of HE projects in Tawangchu sub Basin (Arunachal Pradesh). In addition, funding to Himachal Pradesh Power Corporation Ltd (HPPCL) was provided to carry out survey and investigations for preparation of DPR of Gyspa Project in Himachal Pradesh. The work of preparation of DPR of Bursar HE Project (J&K) by NHPC could

not be taken up due to environmental, law & order related problems in upstream areas of the Project.

Project Appraisal

During the year 2013-14 (up to March 2014), technical examination of 36 water resources projects (17 irrigation and 19 flood protection) were completed and accepted by the Advisory Committee of Ministry of Water Resources. The irrigation projects accepted by the Advisory Committee would provide irrigation to 10,12,225 hectare area and flood protection projects will provide protection to 20,34,000 persons and 6,43,000 hectare area. As of now, 62 new irrigation projects (25 major & 37 medium) as well as 22 revised cost estimates (11 major & 11 medium) are under different stages of appraisal.

Apart from the appraisal of irrigation and flood control projects, civil components of hydroelectric projects are also appraised by Central Water Commission and coordinated by Project Appraisal Organization (PAO). Other components of hydro-electric projects are appraised in CEA and TEC to the project is also accorded by the CEA. During the year 2013-14 (up to 31.03.2014), CEA has accorded TEC to hydro-electric projects having total installed capacity of 5822 MW.

Project Monitoring

A three tier system of monitoring at Centre, State and Project level was introduced in 1975. At Central level, this work was entrusted to CWC. The main objective of monitoring is to ensure the achievement of physical and financial targets and achieve the targets of creation of irrigation potential. Monitoring system is also expected to contribute in identification of the inputs required, analysis of the reasons for any shortfalls/bottlenecks and suggest remedial measures etc., with a view to complete the projects in a time bound manner.

During 2013-14, 54 projects under general monitoring and 147 ongoing projects under AIBP were targeted for monitoring by CWC. Out of 54 Major, Medium and Extension, Renovation and Modernization (ERM) projects taken up for monitoring by CWC, 7 projects (Major) were targeted for monitoring from CWC Headquarter and remaining by its Regional Offices.

To supplement the existing monitoring mechanism by providing authentic and objective data base on existing irrigation infrastructure, it was felt necessary to utilize the Remote Sensing technique for the assessment of irrigation potential creation in AIBP assisted projects. At the instance of Planning Commission, pilot studies of two projects i.e. Upper Krishna in Karnataka and Teesta Barrage in West Bengal were carried out successfully using Satellite Data by NRSA, Hyderabad. The study results of the assessment were found satisfactory and compared well with ground realities.

It has also been decided to take up similar assessment in respect of 50 projects covering an area of 851.428 thousand hectares. Till date, final reports of 46 projects out of 50 projects have been submitted by NRSC, Hyderabad.

Morphological Studies

The study of river morphology and implementation of suitable river training works as appropriate have become imperative for our nation as large areas of the country are affected by floods every year causing severe damage to life and property in spite of existing flood control measures taken both by Central and State Governments. Problems are aggregating mainly due to large quantity of silt/ sediment being carried and deposited in its downstream reaches. The special behaviour of the river needs to be thoroughly understood for evolving effective strategies to overcome the problems posed by it.

Morphological study of six rivers was proposed in 10th Plan, out of which morphological studies of three rivers, namely, Ghaghra, Sutlej and Gandak were taken up during 10th Plan period. The Final Reports of Ghaghra and Sutlej have been submitted by NIH, Roorkee and the Final Report of river Gandak has been submitted by CWPRS, Pune.

During the 12th Plan period, morphological studies of 15 rivers have been planned. Consultancy proposals for 15 rivers have been received from different IITs/NITs. A provision of Rs. 15.60 crore has been sanctioned by MoWR in August 2013 for the 12th Plan under the Plan scheme 'R&D programme in Water Sector' for the works related to morphological studies.

National Water Mission and Climate Change Issues

MoWR has established six Chairs in Academic institutes - IIT Kanpur, IIT Kharagpur, IIT Guwahati, IIT Roorkee, NIT Patna and NIT Srinagar with the objective of carrying out studies and research on "Impact of climate change on Water Resources". Management Committees have been constituted under the Chairman, CWC for each of the Institute separately which has to meet once in a year.

CWC has prepared "Inventory of Glacial Lakes/Water Bodies in the Himalayan Region of Indian River Basins" in cooperation with NRSC, Hyderabad and started monitoring of these glacial lake water bodies on monthly basis during monsoon season from 2011 onwards. This monitoring would continue during XIIth five year plan period. Training program for CWC officers including field officers has been conducted in NRSC, Hyderabad as a part of technology transfer. Another work of "Snowmelt Runoff Forecasting in Himalayan River Basin" has been taken up by CWC and the model development part has been entrusted to NRSC, Hyderabad by CWC. The model development part is almost completed and experimental forecasts were issued by NRSC in April 2012. Refinement of models is under progress as per validated data received from field offices of CWC. MoWR/CWC have entered into an agreement to undertake a study on "Operational Research to Support Mainstreaming of Integrated Flood Management under Climate Change" through Technical Assistance (TA) with the Asian Development Bank (ADB) in order to meet the objective of strengthening the protection and resilience of flood-prone areas in India.

Hydrological Studies

Hydrological studies form the backbone of a water resources project. The success of a project is largely governed by the hydrological inputs. The inputs at Detailed Project Report (DPR) or Pre-Feasibility Report (PFR) are made available in the form of:

- (i) Water availability/Yield studies
- (ii) Design flood estimation
- (iii) Sedimentation studies
- (iv) Diversion flood studies

In addition to above, special studies in respect of review of flood hydrology for existing projects as per dam safety guidelines are also carried out. So far, design flood reviews of 140 DRIP dams have been completed.

CWC also provides support in the field of Hydrology related to capacity building and training, modernization, BIS standardization, development of computer software as well as technical coordination with National and International organizations.

Estimation of design storm depths has been found to be a major bottleneck in design flood studies since necessary data and expertise is available with only a few organisations like IMD and CWC. To overcome this, it was decided to publish generalized PMP Atlases covering the whole country, to give a first hand estimate of design storm depths. Further, work of preparation of new PMP Atlases and updation of existing PMP Atlases has been taken up in the XI Plan scheme, "Dam Safety Studies and Planning".

Design Consultancy

Central Water Commission is actively associated with design of majority of the mega water resources projects in India and neighbouring countries viz. Nepal, Bhutan, Afghanistan and Myanmar by way of design consultancy or in the technical appraisal of the projects. Four design units are functioning to cater to specific requirements and to attend to special design related problems of different regions. These units have specialized directorates for Hydel Civil Design, Concrete & Masonry Dam Design, Embankment Design, Gates Design and Barrage & Canal Design.

During 2013-14, CWC carried out design consultancy in respect of 77 projects out of which 56 projects (including 6 from North Eastern region) were at construction stage while the remaining 21 projects (including 8 from North Eastern region) were either at investigation or at DPR stage.

Technical examinations for 82 projects were also carried out in the year. In addition, special studies have been carried out and special problems handled in respect of 3 projects during the year.

Dam Safety

As per the latest information compiled through the National Register of Large Dams (NRLD) maintained by CWC, there are 5195 dams, out of which, 4847 large dams have been completed and 348 large dams are under construction. Out of completed large dams, about 76% were completed before 1990. The NRLD is now available at CWC Website .

National Committee on Seismic Design Parameters

The National Committee on Seismic Design Parameters (NCSDP) was constituted through MoWR Order dated 21stOctober 1991 with the objective to recommend the site specific design seismic coefficients, Maximum Credible Earthquake (MCE), Design Basis Earthquake (DBE) etc. for the proposals in respect of new dams received from the dam owners. The 25th meeting of NCSDP was held on 28th June & 8th July 2013 wherein 11 projects were cleared by the Committee. The 26th meeting of NCSDP was held on 11th December 2013 wherein 7 projects were discussed and 6 cleared.

National Committee on Dam Safety (NCDS)

Ministry of Irrigation, Government of India constituted a Standing Committee under the Chairmanship of Chairman, Central Water Commission in 1982 to review the existing practices and to evolve unified procedures of dam safety for all dams in India. Subsequently, Ministry of Water Resources reconstituted the Standing Committee in 1987 as the National Committee on Dam Safety to:

- Monitor the follow-up action on the report on Dam Safety procedures both at the Centre and at the State level,
- Oversee dam safety activities in various States and suggest improvements to bring dam safety practices in line with state-of the art practices consistent with Indian conditions, and
- Act as a forum for exchange of views on techniques adopted for remedial measures to relieve distress in dams.

The National Committee was reconstituted in 2002 and consists of 28 Members drawn from 16 States and various other organizations viz. MoWR, CWC, GSI, IMD and BBMB. The 32nd meeting of NCDS was held on 27.12.2013.

Dam Break and Glacial Lake Outburst Flood (GLOF) Studies

Dam break analysis is carried out to prepare the inundation map and disaster management plan in the unlikely event of dam failure. It estimates the maximum water level at the downstream locations of the dam in the event of a hypothetical failure of the dam. GLOF studies are carried out to account for the flood, resulting from the breach of moraine dams, in the design of the projects. During the year, the GLOF studies of Chatru H E Project & Sach Khas H.E Project of Himachal Pradesh, Raigam HE Project, Gimliang HE Project, New Melling HE Project, Magochu HE Project, T-sachu-1 Lower and T sachu-11 HE Projects of Arunachal Pradesh and Bhutan has been completed. Further Kiru HE Project and Kwar HE Project of Jammu & Kashmir were examined and cleared.

Dam Safety Legislation

Ministry of Water Resources has prepared a draft of modified Dam Safety Bill 2012, which has been approved by Ministry of Law and Justice for submission to Parliament.

The proposed Dam Safety Legislation will provide for proper surveillance, inspection, operation and maintenance of all dams of certain parameters in India to ensure their safe functioning and for matters connected therewith or incidental thereto. The proposed Legislation seeks to enjoin responsibility on Central Government, State Governments and owners of specified dams to set up an institutional mechanism for ensuring safety of such dams. It defines the duties and functions of these institutions in relation to perpetual surveillance, routine inspections, operation and maintenance, maintenance of log books, instructions, funds for maintenance and repairs, technical documentation, reporting, qualifications and trainings of concerned manpower etc. Provisions have been made concerning the necessity of periodical inspections, instrumentations and establishment of hydrological and seismological stations. The Bill addresses the issues of emergency action plan and disaster management and also enlists the requirements of comprehensive dam safety evaluation.

Environmental Management and Rehabilitation & Resettlement

CWC is compiling data relating to salient features of Rehabilitation & Resettlement aspects of Major/Medium, existing /on-going water resources projects. Till now the information received from the State Governments related to 490 Major and Medium irrigation Projects have been compiled and brought out in publication in March 2014.

A National Environmental Monitoring Committee for River Valley Projects (NEMCRVP) has been set up by the Ministry of Water Resources to monitor implementation of Environment Management Plan and observance of environmental clearance. Member (Water Planning & Projects) is the Chairman of this inter-ministerial multi-disciplinary Committee NEMCRVP has representatives of Ministries of Environment & Forests, Agriculture & Co-operation, Tribal Affairs and Water Resources, besides Planning Commission.

The Empowered Steering Committee (ESC) of National Ganga River Basin Authority (NGRBA) has been constituted by Ministry of Environment & Forests, Government of India for effective abatement of pollution and conservation of the river Ganga. Chairman, CWC is a Member of the committee. ESC of NGRBA has conducted six meetings till now.

Environmental Impact Assessment

Central Water Commission (CWC) has taken up environmental evaluation/impact assessment study of selected river valley projects in the country. Studies on environmental (including social) impacts of completed water resources projects have been taken up under R&D scheme of the Ministry of Water Resources. The studies of two projects viz., Mahanadi Delta Project (Odisha) and Mahi Bajaj Sagar Project (Rajasthan) are in progress.

Central Water Commission CWC has also taken up environmental impact assessment studies of Subansiri and Siang sub basins based on the recommendation of an Inter-Ministerial Group, which was constituted under the Chairmanship of Secretary (WR) to evolve a suitable framework to guide and accelerate the development of hydro power in the North East especially to assess the downstream impact on Assam. Memorandum of Understanding for conducting environmental impact assessment studies of Subansiri and Siang sub basins studies was executed on 16.12.2011. The revised Interim Report of Subansiri sub basin was considered by Expert Appraisal Committee (EAC) of MoEF during its 68th meeting held on 24.09.2013 and offered comments for compliance.

Environment Management Organization, CWC was involved in the process of carrying out Cumulative Environmental Impact Assessment (CEIA) studies of Kameng and Dibang sub basins of Brahmaputra river in Arunachal Pradesh during 2013-14. The ToR for both of these basins were prepared by CWC and got approved from Ministry of Environment and Forests (MoEF).

Application of Remote Sensing Techniques in Water Resources Sector

The progress of work of CWC component, namely, "Estimation of Sedimentation in Reservoirs using Remote Sensing Techniques" under the Plan scheme "Research & Development Programme in Water Sector" of 12th Five Year Plan Period during 2013-14 (up to 31st March, 2014) is given as under:

(i) One in-house study i.e. Satellite Monitoring of AIBP funded project i.e. Chandrabhaga Dam command area under Chandrabhaga Medium Irrigation Project of Maharashtra was taken up on a pilot basis during 2013-14 and the study has been completed using Cartosat-1 high resolution (2.5 m) satellite data. Accordingly, the Report on "Assessment of Irrigation Potential created in Chandrabhaga Dam command area under Chandrabhaga Medium Irrigation Project using High Resolution Cartosat Satellite Data" has been finalized and circulated to all concerned in October, 2013.

(ii) Satellite Remote Sensing based Reservoir Sedimentation Assessment Study (In-house) of 1 reservoir i.e. Peechiparai (Tamil Nadu State) was initiated in October, 2013 and completed by March 2014. (iii) Award of work of 30 reservoirs for Satellite Remote Sensing based Reservoir Sedimentation assessment study through outside agencies has been taken up. The Expression of Interest (EoI) was published in leading newspapers in December 2013. Further, process of award of work is under progress.

Performance Overview of Irrigation Projects

Large investment has been made for creating irrigation facilities in the country, which has contributed in achieving the food security of the country. Evaluation of performance of completed irrigation projects periodically provides an opportunity to assess the actual performance of projects vis-a vis envisaged objectives and targeted benefits, identify problematic area and corrective measures to address them. This has also been emphasized by Planning Commission as well as in the reports of Working Group of Ministry of Water Resources.

Keeping in view these aspects, Central Water Commission is carrying out various studies and dealing with other related issues of completed major/ medium irrigation projects in the country. The details are given below:

Performance Evaluation of Completed Irrigation Projects

Central Water Commission is carrying out Post Project Performance Evaluation Studies (PES) of completed major/medium irrigation projects in the country. Studies include evaluation of system performance and agro-economic, socio-economic and environmental impacts of projects including economic analysis. Identifying deficiencies and recommending measures for improving the performance of a project for achieving the envisaged objectives and targeted benefits is part of the studies.

A Technical Advisory Committee (TAC) under the Chairmanship of Member (WP&P), CWC has been constituted for guiding, supervising and approving the studies.

During 2013-14, the performance evaluation studies of following seven irrigation projects were under consideration.

- (i) Krishnagiri project, Tamil Nadu
- (ii) Giri project, Himachal Pradesh
- (iii) Jayakwadi stage-I project, Maharashtra
- (iv) Salandi project, Odisha
- (v) Bhimsager project, Rajasthan

- (vi) Som-Kamla-Amba project, Rajasthan
- (vii) Subarnarekha project, Jharkhand

Out of above, 6 studies are in progress. Out of 6 studies, inception reports of three Projects have been accepted and approved by TAC. One project (Subarnarekha project, Jharkhand) has been recommended for discontinuation.

Water Use Efficiency Studies of Completed Major/Medium Irrigation Projects

Irrigation sector is the biggest consumer of fresh water and its share in the overall demand of water is about 80%. However, water use efficiency in irrigation sector is relatively low. Central Water Commission is undertaking water use efficiency studies of completed major/medium irrigation projects in the country with the objective of having assessment of water use efficiency of irrigation projects. The studies cover the following aspects of irrigation projects:

- i) Reservoir Filling Efficiencies (Inflow and Release Pattern)
- ii) Delivery System/Conveyance Efficiency
- iii) On farm Application Efficiency
- iv) Drainage Efficiency
- v) Irrigation Potential Created and Utilized

A Technical Advisory Committee has been constituted for guiding, supervising and approving the studies.

During 2013-14, the Draft final reports of the following five projects of North Eastern Regional Institute of Water and Land Management (NERIWALAM), Assam, Tezpur were considered in 8th TAC meeting held on 27.11.2013 and the minutes of the meeting has been sent to all members of TAC for their consent.

- 1. Dekadong Irrigation Project (Assam)
- 2. Kaldia Irrigation Project (Assam)
- 3. Singda Irrigation Project (Manipur)
- 4. Sekmai Barrage Irrigation Project (Manipur)
- 5. Imphal (Manipur)

In addition, 16 new proposals received from various States for conducting water use efficiency studies are under consideration.

Benchmarking of Irrigation Projects

Benchmarking in Water Resources Sector is in practice in developed countries for quite some time. This concept is now being acknowledged as a management tool in irrigation sector in India as well. A Core Group under the Chairmanship of Member (WP&P), CWC has been set up for Benchmarking of Irrigation Systems in India. This Core Group has been reconstituted.

National/ regional/ project level workshops are being organized by CWC through State Government institutions in various States to facilitate concerned State Governments to take up Benchmarking of irrigation projects in their respective States. First National Workshop on Benchmarking of Irrigation Projects was organized in February, 2002 at Hyderabad and since then, sixteen regional projects level workshops have been organized in various parts of the country.

Capacity Survey of Important Reservoirs in the Country

Capacity survey of reservoirs has been a continuing scheme, hitherto known as hydrographical survey of major reservoirs, initiated during the VIII Plan and continued through IX and X Plan. Up to the end of X Plan, the capacity survey of 23 reservoirs was completed in all respects and remaining 3 reservoirs were completed in the first year of XI Plan.

During XI Plan, a scheme for undertaking 20 more reservoirs under capacity survey at an estimated cost of Rs. 410 lakh was sanctioned by the MoWR. Out of these 20 reservoirs, capacity survey of 10 reservoirs was taken up in December, 2010 and completed in all respects by June 2012. The capacity survey work of 25 reservoirs has been targeted during XII Plan.

CENTRAL SOIL AND MATERIALS RESEARCH STATION (CSMRS)

Central Soil and Materials Research Station (CSMRS), New Delhi, is a premier organization in the country dealing with field explorations, laboratory investigations and basic and applied research in the field of geotechnical engineering and civil engineering materials, particularly for construction of river valley projects and safety evaluation of existing dams. The Research Station primarily functions as an adviser and consultant to the various Departments of Government of India, State Governments and Government of India Undertakings. The Research Station has been constantly updating its facilities and training its staff for the last three decades and has acquired some unique capabilities in the country in the field of geotechnical engineering and construction materials' characterisation. The Research Station is involved in the safety evaluation of existing hydraulic structures and quality control of construction for various river valley projects. The sphere of activities of the Research Station is covered under the following main areas:

- Soil Mechanics including studies on expansive soils, studies on dispersive soils, hydraulic fracturing of core materials, soil chemistry and quality control
- Rockfill, Soil Dynamics including Geosynthetics, numerical modelling and quality control
- Concrete Technology including construction materials survey and characterisation, design of concrete mixes, roller compacted concrete, substitution of sand with bottom ash, thermal studies and quality control
- Concrete Diagnostics and Chemistry including diagnostic investigation/ health monitoring, material for repair and rehabilitation, petrography, chemical investigation, durability of concrete, chemistry and mineralogy, water quality, alkali aggregate reaction, new material such as polymer, grout etc. SSC/ SFRC/ HPC/ HSC/ CFRD and quality control
- Rock Mechanics (I) including foundation rock characterisation, in- situ measurements such as stress & deformability, geophysical investigations, numerical modelling
- Rock Mechanics (II) including rock mechanics laboratory investigations, workshop & instrumentation and electronics

Investigation for Projects

45 projects, including 6 abroad and 6 in North- East region of India, were investigated. The investigations comprised field and laboratory investigations in the areas of soil, rock, geosynthetics, water analysis and construction material. The investigations employing geophysical methods and instrumentation work were also undertaken.



Remote Operated Underwater Vehicle

International Projects

- 1. Punatsangchu-II Hydroelectric Project, Bhutan
- 2. Sapta Kosi High Dam Multipurpose Project, Nepal
- 3. Sun Kosi Storage-cum- Diversion Project, Nepal
- 4. Amochu HE Project, Bhutan
- 5. Wangchu HE Project , Bhutan
- 6. Salma Dam, Afghanistan

Indian Projects

Projects in North-East India

- 1. Kalez Khola HE Project, West Sikkim
- 2. North Guwahati Circle, Brahmaputra Board, Majuli Division
- 3. Suntaley H E Project, Sikkim
- 4. Tawang HE Project, Stage-I, Arunachal Pradesh
- 5. Tawang HE Project, Stage-II, Arunachal Pradesh
- 6. Kalai-I H.E. Project, Arunachal Pradesh

Other Projects

- 7. Babnai Dam, Ken Betwa Link Canal Project (Phase -II), M.P.
- 8. Bijoratha Barrage of Ken Betwa Link Project (Phase-II), M.P.
- 9. Bogudiyar H E Project, Uttarakhand
- 10. Burhi- Gandak-Non-Baya-Ganga Link Canal Project, Bihar

- 11. Dagmara H.E. Project, Supaul, Bihar
- 12. Damanganga- Pinjal Link Project, Valsad, Gujarat.
- 13. Dwarkeswar Gandheswari Reservoir Project, WB
- 14. Garudeshwar Weir Site, Gujarat sent to SSNNL, Vadodara by the Rock Fill Division.
- 15. Kabrai Dam Project, Uttar Pradesh
- 16. Kahalgaon Super Thermal Power Project, Bhagalpur, Bihar
- 17. KCC Tailing Dam, Rajasthan
- 18. Kirthai H.E. Project (Stage II), J&K
- 19. Kotha Barrage of Ken Betwa Link Project (Phase-II), M.P.
- 20. Kundaliya Major Multipurpose Project, Madhya Pradesh
- 21. Lower Orr, Dam Ken Betwa Link Canal Project, Madhya Pradesh
- 22. Madhya Ganga Canal Construction Division 15, Moradabad, UP
- 23. Mohanpura Multipurpose Project, M.P.
- 24. Narkherghat Barrage of Ken Betwa Link Project (Phase-II), M.P.
- 25. National Highway Authority of India, New Delhi
- 26. Neemkheda Barrage of Ken Betwa Link Project (Phase-II), M.P.
- 27. Parariya Barrage of Ken Betwa Link Project (Phase-II), M.P.
- 28. Renukaji Dam Project, HP
- 29. Rihand Dam Project, UP
- 30. RMC Road Project, Govt. of NCT of Delhi
- 31. Sardar Sarovar Project, Gujarat
- 32. Subarnarekha Irrigation Project, Odisha
- 33. Tapovan Vishnugarh H E Project, Uttarakhand
- 34. Tehri Dam Project, Uttarakhand
- 35. Tehri Pump Storage Plant, Uttarakhand
- 36. Thana Plaun H.E. Project, H.P.
- 37. Tharr Dam, Ken-Betwa Link Canal Project, M.P.
- 38. Ujh Multipurpose Project, J&K
- 39. Varas Aurangabad Section of NH-2 for Six Lane Road Project, UP

Standing Technical Advisory Committee (STAC)

The STAC of CSMRS was reconstituted by the Ministry of Water Resources in 2013 for a period of 3 years. This Committee is headed by Member (D&R), Central Water Commission, New Delhi, and has a total strength of 15 Members (including Director, CSMRS as the Member Secretary). The 29th meeting of STAC was held on 18th April, 2013.

Self- Sponsored Research Schemes

The self-sponsored research schemes currently in progress are as follows:

- 1. Evaluation of strength characteristics of clayey soils by adding additives
- 2. Stabilization of expansive soil using fly ash
- 3. Effect of acidic environment on geosynthetics and on coatings
- 4. Effect of fines on liquefaction potential of soils
- 5. Study on flyash based geopolymers as construction material
- 6. Characterization of polymer based admixtures for concrete
- 7. Study on batch to batch variation in properties of chemical admixtures and ageing effect on using in concrete
- 8. Strength and durability aspects of multi blend concrete with particular reference to underwater abrasion.
- 9. Compilation and interpretation of properties and parameters of 10 variants of Basalt
- 10. Compilation and interpretation of properties and parameters of 10 variants of Gneiss
- 11. Correlation between UCS and indirect tensile strength (Brazilian)

Monographs/Manuals

Monogram on "Polymers in Concrete" was prepared.

SUBORDINATE OFFICES

CENTRAL GROUND WATER BOARD (CGWB)

Mandate: Central Ground Water Board (CGWB), under the Ministry of Water Resources, is a multi-disciplinary scientific organization with a mandate to:

"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."

The Board is headed by the Chairman and has four wings, namely, (i) Sustainable Management & Liaison (ii) Survey, Assessment & Monitoring (iii) Exploratory Drilling & Materials Management and (iv) Technology Transfer & Water Quality. Each wing is headed by a Member. The Rajiv Gandhi National Ground Water Training and Research Institute is located at Raipur which is headed by Director (RGI). The administrative & financial matters of the CGWB are dealt with by the Director (Administration) and Finance & Accounts Officer respectively. The Board has 18 regional offices, each headed by a Regional Director, supported by 17 Engineering Divisions and 11 State Unit Offices for undertaking various field activities.

Main Activities of Central Ground Water Board

- 1. National Aquifer Mapping
- 2. Pilot Project on Aquifer Mapping
- 3. Monitoring of Ground Water Regime in the Country with Enhanced Density of Wells
- 4. Regulation of Ground Water Development (Central Ground Water Authority)
- 5. Estimation of Ground Water Resources
- 6. Rajiv Gandhi National Ground Water Training and Research Institute
- 7. Hydrology Project II (HP-II)

Website of CGWB: CGWB has prepared a portal and put on their various activities/achievements etc. at <u>www.cgwb.gov.in</u>. The portal contains publications, downloads of manual/guides/reports, State ground water profiles, district broachers, Ground Water Information System (GWIS) and RTI, etc.

Achievements of CGWB during 2013-14

Aquifer Mapping

Aquifer mapping is a multi-disciplinary scientific process wherein a combination of geologic, geophysical, hydro-geological, hydrological and water quality data are integrated to characterize the quantity, quality and distribution of ground water in aquifers. Aquifer mapping at the appropriate scale has to be devised and sustainable management plan has to be prepared and implemented for this common pool resource. This will help in achieving drinking water security, improved irrigational facility and sustainability in ground water resources development in large part of rural India and many parts of urban India. Aquifer mapping has to be taken in priority areas on 1:50,000 scale in general and 1:10,000 scale in critical areas.

The major activities envisaged under aquifer mapping and preparation of aquifer management plans are as follows:

- (i) Compilation of Existing Data
- (ii) Data Gap Analysis
- (iii) Generation of Additional Data

(iv) Preparation of Aquifer Plan

Each activity has numbers of sub-activities and tasks and is carried out as per detail protocol for implementation.

i. Data Compilation from CGWB and other Agencies: The procurement of digital topo sheets from Survey of India is under process. Hard copy of topomaps for 154149 sq.km, hard copy of geology map of 43319 sq.km, soil maps of 33943 sq.km and geomorphological maps for 24802 sq.km have been procured.

In respect of data compilation, against a target of Data base on Exploration Wells – 165713 sq.km, Analysis of Geological Data- 89381 sq.km., Analysis of Geophysical Data-100276 sq.km., Analysis of Hydrological Data- 55526 sq.km., Analysis of Geochemical Data- 86586 sq.km., Analysis of Hydrogeological Data-120244 sq.km., Preparation of Composite Lithologs - 69366 sq.km., Delineation of Principal Aquifers-(Vertical and Lateral) – 94786 sq.km., Aquifer Wise Water Level Data-98597 sq.km., Aquifer Wise Draft Data – 26543 sq.km. have been completed.

Data Gap Analysis: Data Gap Analysis, in respect of Geology- 100042 sq.km., in respect of Geophysics- 120306 sq.km., in respect of Hydrology-93741 sq.km., in respect of Geochemical Data – 94756 Sq.Km., in respect of Hydrogeology-141810 sq.km. has been identified. Delineation of Principal Aquifers by Exploration-103141 sq.km. Aquifer Wise Water Level Data – 125988 sq.km. and Aquifer Wise Draft Data – 38591 sq.km. has been identified.

iii. Field Activities for Aquifer Mapping

Generation of Additional Data: For generation of additional data, fieldwork has been initiated in 54,000 sq.km through in-house resources of CGWB in 2013-14. Activities of ground water management studies viz; exploratory drilling, geophysical surveys, chemical quality studies and micro-level hydrogeological surveys have been taken up during the year for value addition to aquifer maps. The achievements for additional data generation are as follows:

1.1 Ground Water Exploration

The exploration is aimed at generation of precise demarcation of aquifer disposition and characteristics of hydrological parameters of sub-surface ground water data in the area. It is being carried out by the Board through a fleet of 90 drilling rigs (33 Direct Rotary, 47 Down the Hole and 10 Percussion Combination types).

During financial year 2013-14 (up to 31.03.2014), the Central Ground Water Board constructed 649 wells (EW-426, OW-137, PZ-86) including 32 high yielding wells to assess the ground water potential in different hydrogeological set ups. The Board has also constructed 231 exploratory wells through outsourcing in the States of Uttar Pradesh, Haryana and Uttarakhand.

1.2 Geophysical Studies: Geophysical studies are undertaken as an integral part of aquifer mapping and short-term water supply investigations. During 2013-14 (up to 31st March, 2014), CGWB carried out 2383 Vertical Electrical Soundings, 145 Line Kilometer Resistively Profiling and Geophysical Logging of 96 bore holes in various parts of the country. 550 Vertical Electrical Soundings have been conducted through outsourcing.

1.3 Water Quality Analysis: 21973 Samples including basic constituents, heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc, organic and specific constituents have been analyzed during the year 2013-14 (up to 31st March, 2014). 2000 water samples were analyzed for major cations/anions, heavy metals, pesticides, industrial pollution, bacteriological contamination.



EW at Taluka- Newasa, District – Ahmednagar

Depth drilled -200.0 m bgl, Discharge- 7.73 lps, Formation: Vesicular and Jointed Fractured Basalt

EW at Taluka- Newasa, District - Ahmednagar and Kalmeshwar, District – Nagpur



Depth drilled -200.0 m bgl, Discharge- 12.00 and 7.76 lps,

Formation: Zeolitic Vesicular and Fractured Basalt and Gondwana Sandstone

Pilot Project on Aquifer Mapping

The project is being implemented in six different hydrogeological environs of the country as given below.

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

Contract agreement between CGWB and NGRI has been signed on 21st May, 2012 for Aquifer Characterization using advanced geophysical techniques and to establish the efficacy of various geophysical techniques for different hydrogeological terrains. The contract has been extended up to May 31, 2014. National Geophysical Research

Institute (NGRI) will apply different advanced geophysical techniques with corroboration from existing borehole information to provide precise information about shallow and deep aquifers with their geometry at a reasonable scale (1: 50,000) in six pilot project areas including, latest state of art Aquifer mapping methods using Heliborne Transient Electromagnetic techniques.

In the Pilot Aquifer mapping project, the activities can be broadly grouped into compilation of existing data and identification of data gap; generation of data; preparation of aquifer maps; formulation and implementation of aquifer management plan.

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

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 Defense. The Board has carried out a total of 169 investigations during this year up to 31st March, 2014.

Ground Water Regime Monitoring

The Board has monitored the ground water levels in the country through a network of 18200 Ground Water Observation Wells for month of April/May, August 2013, November 2013 and January 2014 in all regions. Additional 2500 observation wells have been established to enhance the density of existing observation wells. Water quality of the wells is monitored during pre-monsoon period.

Central Ground Water Authority

Central Ground Water Authority (CGWA) has been entrusted with the responsibility of regulating and controlling ground water development and management in the country and issuing necessary directives for the purpose. The Authority exercise the following powers and performs the following functions: -

- (i) To regulate and control, management and development of ground water in the country and to issue necessary regulatory directions for the purpose.
- (ii) 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.
- (iii) To resort to penal provisions contained in Sections 15 to 21 of the said Act.
- (iv) Exercise of powers under Section 4 of the Environment (Protection) Act, 1986 for the appointment of officers.

Water Quality Assessment Authority (WQAA)

Water Quality Assessment Authority (WQAA), an inter-ministerial Authority, was constituted under Environment (Protection) Act, 1986. Secretary, MoE&F is the Chairman of WQAA and Joint Secretary (A), MoWR is its Member Secretary. Water Quality Cell in MoWR is providing Secretarial assistance to WQAA. A Sub Committee was constituted for 'Re-evaluation of Powers and Mandate of WQAA'. Its recommendations were accepted by the Authority in the 10th meeting held on 30th May, 2013. The revision of mandate of WQAA is under process. The Authority decided to review the existing Uniform Protocol on Water Quality Monitoring (UPWQM) notified in the year 2005 and appointed a Committee for this task. The committee has revised the existing UPWQM and the same is to be ratified by the Authority in its 11th meeting. The Authority also decided to remove duplicity in monitoring of water quality of the surface and groundwater. A committee was appointed for this work and rationalization of water guality monitoring network is undergoing. The Authority also decided to issue directions to Central and State Government organizations to initiate process of accreditation of their laboratories in order to improve quality of the data and the directions have been issued accordingly.

The Report of the Sub-Committee on 'Environmental/ Ecological Flow in Rivers' was also considered by the Authority in its 10th meeting and Authority didn't accept the report. The report of the study assigned to National Environmental Engineering Research Institute (NEERI) on 'Desk Study on Artificial Recharge to Ground Water by Treated Wastewater through Soil Aquifer Treatment (SAT)' was accepted.

In order to enhance capacity of the scientific/technical officers involved in water quality issues across the country, three training programmes involving 128 trainees have been conducted, one each at Centre for Water Resources Development and Management (CWRDM), Kerala; National Institute of Hydrology (NIH), Roorkee and Central Water Commission (CWC), New Delhi under the aegis of the Authority.

An independent web portal of WQAA having web address<u>http://wqaa.gov.in/</u> has been updated with a number of reports / publications/ photo gallery/ downloads/ projects/ RTI and other information.

34th Meeting of Central Ground Water Authority

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

Technical Appraisal of Project Proposals for NOC for Ground Water Withdrawal

CGWA carried out technical appraisal of industrial, mining, power, infrastructural development proposals seeking ground water withdrawal. During the period, 130 projects were accorded NOC for ground water withdrawal and 24 projects were issued letter for exemption for ground water withdrawal. In addition, 25 projects were accorded renewal of NOC for ground water withdrawal.

Workshops

During the year, 20 workshops were organized by all the regional offices of CGWB on various water conservation issues.

Estimation of Ground Water Resources of the Country

The Dynamic Ground Water Resources of the country have been assessed jointly by respective State Ground Water Departments and Central Ground Water Board under the supervision of the State Level Committees. The base year of computation of Ground Water Resources is 2008-09. Brief details of the Report on "Dynamic Ground Water Resources of India" (as on 31st March, 2009) are given in Table –18
Table-18

i.	Annual Replenishable Ground Water Resources	431 (bcm/yr)
ii.	Net Annual Ground Water Availability	396 (bcm/yr)
iii.	Annual Ground Water Draft for Irrigation, Domestic & Industrial uses	243 (bcm/yr)
iv.	Stage of Ground Water Development	61%
۷.	Categorization of Blocks/Mandals/Talukas	
	Total Assessment Units	5842
	Safe	4277
	Semi-critical	523
	Critical	169
	Over-exploited	802
	Saline	71

Dynamic Ground Water Resources of India(2009)

Central Ground Water Board has prepared and compiled reports on "Dynamic Ground Water Resources Assessment (as on 31st March 2011)" and "Total Ground Water Availability (as on 31st March 2009)" and is under approval.

Collaborative studies by Central Ground Water Board

Central Ground Water Board is taking up scientific studies in collaboration with premier Govt. Organizations/Institutes, which are engaged in specific field of study related to ground water. The areas of collaboration are ground water modeling, geophysical studies, strengthening of data base, isotope studies, micro level aquifer mapping, data dissemination etc. and the collaborating institutions include WAPCOS, NGRI, IMD, BARC and GSI. These studies have helped in better understanding and solving various problems in the ground water sector. The Board, with the help of its multi-disciplinary scientific activities, provides assistance to the State Governments through recommendations for better ground water development and management practices.

Promotion of Rain Water Harvesting and Artificial Recharge of Ground Water

A. Scheme on Artificial Recharge to Ground Water through Dug Wells

Ministry of Water Resources had implemented a scheme on "Artificial Recharge to Groundwater through Dug wells" in 7 States, namely, Andhra Pradesh, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Gujarat and Madhya Pradesh with the objective to recharge rain runoff generated in agriculture fields through existing dug wells in areas underlain by hard rock terrain and having majority of over-exploited, critical and semicritical assessment units. The approved cost of the scheme was Rs. 1798.71 crore. A total subsidy of Rs. 257.620 Crore had been released to 7,23,086 beneficiaries. A total of 1,24,853 dug well recharge structures have been constructed in the participating States till 30th Nov.2013 at a cost of Rs.277.495 crore. The scheme has been closed on 31.03.2010. The State- wise progress made by the participating States is given in **Table-19** below:

Table-19State-wise progress made by participating States

B. Demonstrative Projects on "Artificial Recharge to Groundwater & Rainwater Harvesting

CGWB implemented demonstrative projects on Artificial Recharge to Groundwater and Rain Water Harvesting in the States of Andhra Pradesh, Arunachal Pradesh, Bihar, Chhattisgarh,

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

SI No.	State	No. units for which Subsidy Released	Subsidy Released (Rs. crore)	Fund Released under IEC (Rs. crore)	Fund Released to Ministry for Awareness (Rs. crore)	Operating Cost availed by NABARD @ 1% of Net Subsidy Released (Rs. cr.)	Number of Dug Well Recharge Structures Completed
1	Andhra Pradesh #	0	0.000	0		·	0
2	Gujarat	141381	47.1480	3.25			8974
3	Karnataka	65936	25.1797	2.00			21520
4	Madhya Pradesh	91883	39.2390	2.00		2 75	29851
5	Maharashtra	59857	14.0097	2.00	0.2224 & 0.0193	2.75	38393
6	Rajasthan	88476	29.6845	2.00			4619
7	Tamil Nadu	275553	102.2569	5.75			21496
	Total:	723086	257.5181	17.00	0.2417	2.75	124853

Delhi, Gujarat, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharastra, Nagaland, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar

Pradesh, West Bengal and UT Chandigarh (21 States/UT) during XI Plan. A total of 133 projects amounting to Rs. 99.87 crore envisaging construction of 1661 recharge structures were approved and funds of Rs. 85.03 crore were released till March 31, 2014. During 2013-14, spillover balance funds of Rs. 7.34 crore (31 March 2014) have been released as second installment for the ongoing projects. Three hundred and ten artificial recharge structures were constructed during 2013-14 and total structures constructed under the scheme are 1343 (as on 31 March 2014).

First Meeting of National Inter-Departmental Steering Committee (NISC)

First meeting of National Inter-departmental Steering Committee (NISC) for monitoring the National Project on Aquifer Mapping and Management (NAQUIM) under the Chairmanship of Secretary, Ministry of Water Resources was held on 21.11.2013 at Shram Shakti Bhawan, New Delhi. The prioritization of work for implementing Aquifer Mapping, mechanism of coordination with States, mechanism of coordination with central agencies, review of physical and financial progress and implementation plan were discussed during the NISC meeting.



First Meeting of National Inter-departmental Steering Committee(NISC) for Monitoring the National Project on Aquifer Mapping and Management(NAQUIM) under the Chairmanship of Secretary, Ministry of Water Resources on 21.11.2013 at New Delhi

Inaugural Function of Heli-borne Geophysical Survey in the Pilot Project Area, Baswa-Bandikui, Dausa District

The inaugural function of Heli-borne Geophysical Survey in the pilot project area, Baswa-Bandikui, Dausa district was organized on 27.09.2013 at Dausa. Shri Harish Rawat, Hon'ble Union Minister of Water Resources, graced the occasion as Chief Guest and Shri Ashok Gehlot, Hon'ble Chief Minister, Rajasthan presided over the function. Mr. Freddy Svane, H.E. The Ambassador of Denmark in India, Dr. Jeetendra Singh, Hon'ble Minister of Energy, Non-Conventional Energy, PHED, GWD, Information and Public Relations, Govt. of Rajasthan, Shri Murari Lal Meena, Hon'ble Minister of State for Technical Education and Agriculture graced the occasion.





Live demonstration of Heli-borne Geophysical equipment was flagged off by the Hon'ble Minister (WR)

Scrutiny of Major/Medium Irrigation Projects

The CGWB scrutinized the following 12 Major and Medium Irrigation project reports during 2013-14 from the point of view of their impact on groundwater regime.

Sr.	Project
No	
1	Jihe Kathapur Lift Irrigation, Maharashtra
2	Sonthi Lift Irrigation Scheme, Karnataka
3	Barna Project (Major-ERM), Madhya Pradesh
4	Lower Tapi Major Project in Tapi Basin, Maharashtra.
5	ERM of Narayanapur Left Bank Canal System (2012-13P.L), Karnataka
6	ERM of Loktak Lift Irrigation, Manipur
7	Mahi Irrigation Project, Madhya Pradesh
8	Sip-Kolar Link Project, Madhya Pradesh
9	Arpa Bhaisajhar Barrage Project on Arpa River in Mahanadi Basin,
	Chhattisgarh
10	Pench Diversion Project, Madhya Pradesh
11	Flood Carrier Canal from Kannadian Channel to Drought Prone Areas by
	Inter-linking, Tamil Nadu
12	Shiggaon Lift Irrigation Scheme, Karnataka

CENTRAL WATER AND POWER RESEARCH STATION (CWPRS)

Introduction

The Central Water and Power Research Station (CWPRS), established in 1916, is the premier hydraulic research institute offering comprehensive R&D support to a variety of projects dealing with water, energy resources development and water-borne transport; disseminating expertise and research findings amongst hydraulic research fraternity; and aiding and promoting research activities, besides training of research manpower. CWPRS is recognized as the Regional Laboratory for Economic and Social Committee for Asia and Pacific (ESCAP) since 1971. The institution, with an inter-disciplinary approach to its activities, provides unique R&D services to its national and international clientele.

Website: www.cwprs.gov.in

Organization

CWPRS provides specialized services through physical and mathematical model studies, field investigations, desk studies and/ or a combination of these in 7 major disciplines of CWPRS

- River Engineering
- River and Reservoir Systems Modelling
- Reservoir & Appurtenant Structures
- Coastal and Offshore Engineering
- Foundation & Structures
- Applied Earth Sciences
- Instrumentation, Calibration and Testing Facilities

R&D Studies

CWPRS carries out basic, applied and field-oriented research under one umbrella, in seven major laboratories, at its campus at Khadakwasla, Pune. The research output of the institution is primarily in the form of advice relating to safe, economic and rational technical solutions to the problems posed. Studies referred to the institution are mostly related to scrutiny of designs by way of model/ desk studies, field investigations and calibration of equipment. In the specific area of design, aspects such as safety, optimization, feasibility and overall efficiency are covered. When the studies are related to investigation, adequate and reliable data on the basis of which planning can be made is provided to the project authorities. Calibration of current/ flow meters also form an important activity of CWPRS.

Physical achievement for R&D activities and dissemination of information is shown in the **Table-20** below against the target set under Result Framework Document (RFD) during 2013-14.

Table -20

Physical Achievements during 2013-14 (Up to 31 st March 2014)					
No.	Item	2013-14			
		Targets (2013-14)	Achievements		
Α.	R&D Activities				
1.	Physical & Mathematical Model/ Desk studies	125	152		
2.	Testing of soil, rock, concrete, cement, fine and coarse aggregate samples, mechanical samples	200	910		
3.	Water quality analysis for salinity intrusion, sedimentation etc. – Testing of samples	500	508		
4.	Calibration of current meters	750	1031		
5.	Calibration of flow meters / testing of valves	125	81		
6.	Technical Reports	90	112		
В.	Dissemination of Information				
1.	Publishing research papers (Journals / Conferences / Seminars & Technical Memoranda)	60	63		
2.	Training of staff	60	54		
3.	Organizing workshops/ seminars / symposia/ conferences	07	11		
4.	Invited Lectures Delivered	50	68		
5.	Participation in Technical Committee Meetings	30	21		
6.	Participation in Symposia, Seminars etc.	30	37		

Physical achievements for R&D activities and dissemination of information

CWPRS undertakes assignments on a no-loss no-profit basis. During 2013-14 in the major sectors of water resources, river engineering, power sector and coastal development, more than 152 studies were undertaken by the institution.

Some of the major projects for which CWPRS undertook studies are: Kahalgaon STPP for NTPC, Bihar; Jetty at Koliwada, Navi Mumbai for HE Division, Govt. of Maharashtra ; Fish landing facilities at Ratnagiri, Maharashtra; Fishing Harbour at Poompuhar for Govt. of Tamil Nadu; widening of navigation channel for JNPT, Mumbai; design of breakwater for Cochin Port, Kerala; inundation problem of storm drain for RTPS of Damodar Valley Corporation through WAPCOS; ship mooring analysis for Cochin Port, Kerala; spillway studies for HE project, Uttarakhand; storm surge analysis for project Varsha, Ministry of Defense; repairs for Krishnarajasagar Dam, Karnataka; Coastal Protection works at Moti Daman, Daman; wave flume studies for Theronda creek, Raigad, MMB, Mumbai; seismic design parameters for Tawang HEP II, Arunachal Pradesh; Development of coal berth facility at Hazira for Reliance Industries on behalf of WAPCOS; 3D random wave model studies for Ennore Port, Tamil Nadu; evaluation of geo-textile materials properties of geobags for WRD, Govt. of Bihar; assessing turbine efficiency at Kopili HE Project, Assam; studies for offshore breakwater at Paradip Port, Odisha; analysis of instrumentation data for Indirasagar Project, Narmadanagar, MP; design of coastal protection works for PFBR plant site at Kalpakkam, Tamil Nadu; wave tranquility studies for Kandla Port; mathematical model studies for reservoir sedimentation for Arun-III HE Project, Nepal; seismic refraction survey for Punatsangchhu HE Project, Bhutan for M/s WAPCOS; flood protection measures for Beas river, Himachal Pradesh. 3D comprehensive model studies for Salma Dam spillway, Afghanistan.

Plan Schemes

Final expenditure incurred during XIth Plan for various schemes was Rs.27.82 crore. The budget outlay during XIIth Plan is Rs.72 crore.

Activities during 2013-14

For the XIIth Five Year Plan, outlay of Rs.72 crore was set for CWPRS. A budget outlay of Rs 9.00 crore has been allocated during 2013-14. The progressive expenditure made till now is Rs.8.96 crore.

The activities included in the Five Year Plan are shown below:

Establishment :Training and dissemination, Basic Research

Information and Communication Technology (ICT) centralized experimental facilities for river engineering and sediment mitigation studies, renovation of cavitation tunnel and

accreditation for HM laboratory, renovation of existing old hangar and development of multipurpose basin facilities for estuarine and tidal hydrodynamics, facility for thermal dispersion studies for coastal power projects, water recirculation system, electrical infrastructure, renovation of various office-cum-laboratory buildings, resurfacing of roads, repairs of boundary wall, sewage lines etc., renovation of residential quarters and guest house, horticulture around office building and guest house and exhibition hall.

Stores and Machinery: Mathematical Modeling software and Machinery & Equipments for various laboratories of CWPRS.

Operative Costs: Operational Expenses of the organization.

CWPRS being a hydraulic research institute carrying out the project sponsored studies on the basis of the data provided by the respective project authorities and no separate data base are maintained related to efficient water management.

However, CWPRS is maintaining coastal data regarding wave climate, tides, beach cross-sections, bathymetry, tidal currents, remote sensing and sediment properties at CWPRS coastal data center.

The research based solutions are provided to various Government authorities for optimal water resource development in the country.



Shri Harish Rawat, Hon'ble Minister for Water Resources visiting Devsari Flushing Model and Yamuna / Kosi River model on 10.07.2013

Ganga Flood Control Commission

Organisation and its Functions

Ganga Flood Control Commission was established in 1972 with its headquarters at Patna.

The Commission is headed by a Chairman with two full time Members and other supporting officers and staff. The representatives of concerned Central Ministries and Departments as well as the Engineer-in-Chief/ Chief Engineers of the Ganga basin States are part- time Members/ permanent invitees.

The Commission has been assigned the following tasks:

- Preparation and updation of comprehensive plans for flood management of the river systems in the Ganga basin;
- Phasing/ sequencing of programme of implementation of works included in the basin-wise plans;

- Providing technical guidance on flood management to the Ganga basin States, namely, West Bengal, Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, Chhattisgarh, Madhya Pradesh, Delhi, Haryana, Himachal Pradesh and Rajasthan;
- According techno-economic clearance to flood management schemes of the Ganga basin States with estimated cost of more than Rs. 12.5 crore and up to Rs. 25.0 crore except for schemes of the States of Haryana, Uttar Pradesh and Delhi on the river Yamuna in the reach from Tajewala to Okhla barrage. The schemes with estimated cost of more than Rs. 25.0 crore are appraised by GFCC and their techno-economic clearance is accorded by TAC-MoWR.
- Monitoring the execution of the important flood control schemes particularly those receiving Central Assistance under Flood Management Programme or being executed under Central Sector;
- Assessment of adequacy of the existing waterways under the road and rail bridges and additional waterways required to be provided for reducing the drainage congestion to reasonable limits;
- Performance evaluation of major flood control measures executed by the States including the Inter-State Flood Control Schemes;

Achievements during 2013-14

Maintenance of Flood Protection Works of Kosi and Gandak Projects

Flood protection works on river Kosi and Gandak are being carried out based on site inspection after every flood season and on the recommendations of Kosi High Level Committee (KHLC) and Gandak High Level Standing Committee (GHLSC) respectively. The reimbursement of expenditure incurred on maintenance of the flood protection works executed in Nepal portion is made by Government of India after utilization certificate of the same is received from the State Government of Bihar for Kosi and Government of Uttar Pradesh for Gandak respectively.

Like previous years, this year also, the GHLSC/ KHLC inspected the flood protection works on rivers Gandak and Kosi during the months of October and November, 2013 respectively, held meetings and finalized the recommendations for flood protection works on these rivers to be taken up and completed, in a time bound manner.

Updating of Comprehensive Plan for Flood Management

Comprehensive plans for flood management for all the 23 river systems of the Ganga basin were prepared between 1975 and 1990. The work of updating these comprehensive plans

was taken up due to changes, additional information/ data on hydro- meteorology and morphology in the basin in the subsequent years. All 23 comprehensive plans have been updated once. Second updating of 5 plans has also been completed. During the year, the second updation of the comprehensive plans of Kosi and Rupnarayan-Haldi-Rusulpur is under progress, which is likely to be completed during 2014-15.

Monitoring of Important Flood Management Schemes

GFCC is monitoring about 78 flood management schemes which, inter-alia, include:

- (a) 54 flood management schemes supported under "Flood Management Programme" of Ministry of Water Resources;
- (b) 2 schemes of maintenance of flood protection works of Kosi and Gandak Projects in Nepal;
- (c) 3 schemes viz., extension of embankment along Lalbakeya, Kamla and Bagmati rivers in Nepal; and
- (d) 19 schemes on common/border rivers in West Bengal along India-Bangladesh border under the Central Sector Scheme, "River, Management Activities and Works related to Border Areas".

Techno-economic Appraisal of Flood Management Schemes

Techno-economic appraisal of flood management schemes of Ganga basin States is a continuing activity of GFCC. 94 flood management schemes were received in GFCC from Ganga Basin States during 2013-14 up to 31st March, 2014. Fifty seven schemes were technically appraised in GFCC up to 31st March, 2014, out of which 26 schemes were accorded techno-economic clearance. Four schemes of Uttarakhand with cost of more than Rs. 25.00 crore were appraised and these were cleared from techno-economic angle by TAC-MoWR.

Joint Committee on Inundation and Flood Management (JCIFM) between India and Nepal

During the 4th meeting of Joint Committee on Water Resources held in March, 2009 at New Delhi, a committee for flood management known as Joint Committee on Inundation & Flood Management (JCIFM) was constituted after merging various other committees, namely, SCIP, HLTC, JCFM, SCEC and SCFF into a single committee. The terms of reference of JCIFM are:

- 1. The JCIFM shall be an umbrella Committee to implement the decisions of JSTC in inundation and flood management issues.
- 2. The JCIFM shall address the issues related to flood management and inundation and can form Task Group(s), if required.
- 3. The JCIFM shall monitor the progress of works and provide guidance to task group(s) and report to JSTC.

Since then eight meetings of JCIFM have been held.

The 8th meeting of the Committee was held during 4th February to 8th February, 2014 at Kathmandu. In the meeting various issues relating to flood inundation and flood management were discussed and decisions taken.

Ganga Flood Control Board-Meeting

The 16th meeting of Ganga Flood Control Board, chaired by Hon'ble Minister, Water Resources was held on 16th January, 2013 at New Delhi, in which various issues related to Ganga basin States were discussed.

SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE

Composition and Functions

The Sardar Sarovar Construction Advisory Committee (SSCAC) was constituted in 1980 by the Government of India in accordance with the directives of the Narmada Water Disputes Tribunal (NWDT) with a view to ensure efficient, economical and early execution of Unit – I (Dam and Appurtenant works) and Unit – III (Hydropower_works) of the Sardar Sarovar Project. The Secretary, Ministry of Water Resources is the Chairman of the SSCAC. The officers of the departments like Water Resources, Irrigation, Power, Finance and Revenue etc. concerned with the Construction of the project, of the four party States viz Gujarat, Maharashtra, Rajasthan and Madhya Pradesh along with concerned officers from the Government of India and the Narmada Control Authority are members of the committee. The secretariat of the Committee is located at Vadodara and it has a full time Secretary of the rank of Joint Secretary belonging to the Central Water Engineering (Group – A) service.

Sardar Sarovar Construction Advisory Committee (SSCAC) Meeting

The 81st meeting of the SSCAC was held on 28th March 2014 at New Delhi, wherein following important matters related to Sardar Sarovar Project (SSP) were discussed and appropriate decisions taken:

• Insurance Coverage for Sardar Sarovar Power Houses

- Real Time Data Acquisition System (RTDAS) and Commissioning of Water Management System
- Share Cost of SSCAC Secretariat
- Payment of Share Cost of SSP by the party States
- Draft Proposal for Annual Development Plan (ADP) 2014-15 of Unit-I & Unit-III works of SSP
- Claim put forth by M/s. Jaiprakash Associates (JPA) on account of shortfall in concrete progress during the various seasons from 1993-94 to 1997-98 due to the restrictions imposed in raising the spillway of Sardar Sarovar Dam
- Review of the progress of Unit-I & Unit-III works of Sardar Sarovar Project
- Construction of Garudeshwar Weir
- Reconstitution of PSC of SSCAC
- Audit of SSCAC

Permanent Standing Committee (PSC) Meetings

The Sardar Sarovar Construction Advisory Committee has a Sub-committee, named as Permanent Standing Committee (PSC), with the Executive Member, Narmada Control Authority as the Chairman and representatives from the Ministry of Water Resources, Central Water Commission, Central Electricity Authority and all the four party States as Members. The Secretary, SSCAC is the Member-Secretary of the PSC.

106th and 107th meeting of PSC of SSCAC were held on 8th Aug. 2013 at New Delhi and 18.12.2013 at Gandhinagar respectively, where in following important issues related to Sardar Sarovar Project (SSP) were deliberated and appropriate decisions taken.

Major Issues Discussed in the 106th and 107th Meetings of PSC of SSCAC

- Closure of Contract with M/s BHEL for Work Package I & II of EMC
- Real Time Data Acquisition System (RTDAS) in Narmada River
- Insurance Coverage for Sardar Sarovar Power Project
- Review of the Progress of Unit I and Unit III Works of Sardar Sarovar Project
- Construction of Garudeshwar Weir of SSP

- Annual Development Plan for 2013-14 & 2014-15 of Unit I & Unit III Works of Sardar Sarovar Project
- Payment of share cost of SSCAC Secretariat

Sardar Sarovar Project

Revised Cost Estimate for SSP and Expenditure

Revised cost estimate of Sardar Sarovar Project at Rs 39240.45 crore (2008-09 price level) was accepted by the Planning Commission for investment in the state plan in May 2010. An expenditure of Rs 41274.71crore has been incurred on the Sardar Sarovar Project up to end of Oct.2013.The cost of the project is shared by all four party States, viz. Gujarat, Madhya Pradesh, Maharashtra and Rajashtan. SSCAC is regularly making efforts to reduce the dues payable by other party States to Gujarat for the project. Overall position of disputed cost, undisputed share cost and balance of undisputed dues payable by the party States to the Government of Gujarat is given in Table-21.

Table-21

Status of balance dues on undisputed booked share cost up to March 2013

(Rs. crore))
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Particulars	Gujarat	Madhya Pradesh	Maharashtra	Rajasthan	Total
Undisputed	21597.21	2963.05	1403.55	725.23	26689.03
Share of					
expenditure					
Share Cost	21597.21	2164.19	1115.53	677.75	25554.68
Paid					
Balance	0.00	798.86	288.02	47.48	1134.36
Undisputed					
Share Cost					
Dues					
Disputed	(On interest on market borrowing, R & R expenditure				15974.96
expenditure	& Rockfill dykes & Link Channel)				
incurred by		-			
GoG					

Progress of Main Dam Works

The work of raising blocks No.30 to 46 to 121.92 m commenced on 9th March 2006 and was completed on 31st December 2006. The balance works remaining to be carried out

are raising of piers and installation of Radial Gates in the spillway portion of the dam. As per Court's directions, the permission for further raising of dam is now to be given by the NCA, after obtaining clearances from the Resettlement and Rehabilitation Subgroup, the Environmental Sub-group and in consultation with the Grievances Redressal Authorities of Gujarat, Maharashtra and Madhya Pradesh.

The overall progress of Main Dam (Unit-I) achieved up to March 2014 is given in **Table-22**.

Table-22

Overall progress of Main Dam (Unit-I) achieved till March, 2014

Items	Est. Qty.	Cumulative Progress up to December 2013	Percentage Progress up to December 2013
Excavation (Lakh Cu.m)	64.00	63.59	99.36
Concreting (Lakh Cu.m)	68.20	65.76	96.43
Drilling& Grouting (Lakh RM)	2.82	2.50	88.81

Progress of Canal Head Power House (CHPH)

The civil and electrical works of Canal Head Power House were completed in all respect in January 1998; however, power could only be generated after the dam had attained the height of EL 110.64 m (Minimum Draw Down Level). All the five units of CHPH (5x50 MW) have since been commissioned successfully during August 2004 to December 2004.

Progress of River Bed Power House (RBPH)

All the civil and electrical works of RBPH are complete and all the 6 units of RBPH have been commissioned. Computerized Control System (CCS) has been established and put in operation from 14.06.2010.

Garudeshwar Weir

The work of Garudeshwar Weir, which is part of Unit-III works, has been approved by SSCAC on 16.03.2012 in its 79th meeting. The estimated cost of Garudeshwar Weir is

Rs.438.18 crore and work awarded to lowest bidder on 4th May 2012 for Rs. 299.43 crore to be completed in 48 months.

The work of construction of Garudeshwar Weir has been started by the agency from 08.02.2013. The works related to approach roads, diversion structure, excavation and coffer dam of Garudeshwar Weir are in progress. The progress of work as per monthly report of March 2014 sent by SSNNL is given in Table-23.

Table-23

Sr. **Particulars** Unit Total Progress Progress up Percentage of No. Revised during to March Progress 2013-14 2014 Qty. Excavation LCM 1 16.15 0.46 0.81 5.02 2 LCM 7.63 Concreting 00.00 00.00 0.00 3 Steel MT 4220 0000 0000 0.00

Progress of work as per monthly report of March, 2014 - SSNNL

Power Generation

Total 32593.412 million units (MU) energy was generated from both the power houses till March 2014, out of which 5877.34 MU generated during 2013-14.

Progress of the Irrigation Bye-Pass Tunnels (IBPT)

The Irrigation Bye-Pass Tunnels (IBPT) arrangement comprises of two circular tunnels of 5.5 m finished diameter across the right bank hill connecting the main reservoir with the first irrigation pond. The twin IBPTs, with invert level of EL 88.39 m at the inlet, will have a discharge capacity of about 283.12 cumecs (10,000 cusecs) at reservoir level of 97.53 m and 424.81 cumecs (15,000 cusecs) at reservoir level of 110.64 m. IBPT works completed in May 2008.

The dam over flowed this year for about 78 days and maximum water level attained on 25th Aug. 2013 was 131.18 m i.e. about 9.26 m above the crest level.

BANSAGAR CONTROL BOARD

Organisation & Composition

The Bansagar Control Board was set up by the Government of India through a Resolution in January 1976. The Resolution was amended in 1978. The Resolution was in accordance with an agreement reached between the Government of Madhya Pradesh, Uttar Pradesh and Bihar on the 16th September 1973 for sharing the waters of river Sone and the cost of the Bansagar Dam. After amendment the main features of the resolution are as below:

"In consultation with the Government of Madhya Pradesh, Bihar and Uttar Pradesh, it has been decided to set up the Bansagar Control Board with a view to ensuring the efficient, economical and early execution of Bansagar dam including all connected works in Madhya Pradesh, but excluding the canal systems which will be executed by respective States, namely, Madhya Pradesh, Uttar Pradesh and Bihar. The Control Board will be in overall charge of the project including its technical and financial aspects. The actual work of construction will be carried out under the direction of the Control Board by the Chief Engineer concerned of the Madhya Pradesh Government.

The three State Governments agree to delegate powers to the Chief Engineer, Madhya Pradesh, to contract for works, supplies and services under the direction of the Control Board. The contract in respect of all works will, however, be executed in the name of the Governor of Madhya Pradesh."

The Union Minister of Water Resources is the Chairman of the Board and the Minister of State for Water Resources, Union Minister of Power, Chief Ministers, Minister-in-Charge Irrigation and Finance of the three States and Minister-in Charge of Electricity of Madhya Pradesh are its Members. The Executive Committee set up under the Chairmanship of the Chairman, Central Water Commission, manages the day-to-day affairs of the Board. The expenditure on the office of the Board is initially met out of the budget grants of Union Ministry of Water Resources and subsequently reimbursed by the three States of Madhya Pradesh, Uttar Pradesh and Bihar.

Bansagar Dam Project

Bansagar Dam, on Sone river, a joint venture of the States of Madhya Pradesh, Uttar Pradesh and Bihar is being executed by the Water Resources Department, Government of Madhya Pradesh under the directions of the Bansagar Control Board. The party States are carrying out the execution of the canals and power systems independently under their jurisdiction.

Progress of Works

The left and right rock fill dam have been completed up to top level, i.e., R.L. 347 m. All masonry non-overflow blocks and both the key block on either side have been completed up to top elevation at R.L. 347 m. Spillway blocks have been raised up to crest level (R.L 326.4 m) and spillway Piers & Bridge have been completed. Fabrication and erection of 18 Radical Crest Gates and Stop-Log Gates have also been fully completed by June 2006. All constructions sluices have been plugged and gates lowered. Works on installation of Irrigation Sluice Gates have been fully completed. Works on all the Saddles have also been fully completed.

UPPER YAMUNA RIVER BOARD

Introduction

"Upper Yamuna" refers to the reach of Yamuna from its origin at Yamunotri to Okhla Barrage at Delhi. A Memorandum of Understanding (MoU) was signed on 12th May, 1994 amongst the basin States of Himachal Pradesh, Uttar Pradesh, Haryana, Rajasthan and Delhi, for sharing the utilizable surface flows of river Yamuna up to Okhla. The MoU also provided for creation of "Upper Yamuna River Board" to implement the said agreement.

Accordingly, the Central Government constituted the Upper Yamuna River Board in 1995 as a subordinate office under the Ministry of water Resources. After creation of Uttaranchal State in 2000, the resolution was modified to include Uttaranchal (now Uttrakhand) also in the Board.

The resolution also provided for constitution of a Review Committee, to be known as the Upper Yamuna Review Committee (UYRC), comprising the Chief Ministers (Governor in case of President's rule) of the co-basin States as Members and Union Minister/Minister of State for Water Resources as Chairman, to supervise the working of the Upper Yamuna River Board (UYRB).

3.1 Organization

The Board comprises of Member (WP&P), Central Water Commission as the part time Chairman; one representative from each of the six basin States, Central Electricity Authority, Central Ground Water Board and Central pollution Control Board as its part-time Members and a full time Member Secretary. The expenditure on the Board is shared equally by the six basin States. The Board has a sanctioned staff strength of 58.

3.2 Functions of UYRB

The functions of the Board include all aspects of water management in the Upper Yamuna Basin, viz. implementation of the water sharing agreement; water allocation; water accounting and data warehousing; monitoring and upgrading the quality of surface and ground water; co-ordination of the constitution of all projects in the basin, integrated operation of all the projects, watershed development and catchment area treatment plans.

3.3 Activities of UYRB

The Board has been making tentative seasonal distribution of water to basin States at various distribution points. The Board has also been engaged in resolving the inter-State issues amongst the basin States related to water distribution and issues related to benefits and cost sharing from the proposed storage projects in Yamuna Basin. The Board had constituted Water Accounting Committee to prepare Water Accounting Manual for UYRB. The committee has submitted its draft report on Water Accounting Manual which was circulated among members of Basin States for comments. Comments received from the States have been forwarded to the Committee with a request to finalize the Manual. The Board had also awarded Surface Water – Ground Water Interaction Study in Palla region of Yamuna River to the National Institute of Hydrology (NIH) Roorkee. The NIH Roorkee has submitted its final Report on the Study. The Board has held 44 meetings so far. The last meeting was held on 25th July, 2013.

Following the complaints from Rajasthan and Haryana that they were not receiving their due share of water from Okhla Barrage due to incorrect assessment of inflows at Okhla Barrage, it was decided that a gauge and discharge (G&D) observation site would be established and measurement started at Hindon Cut Canal site. Uttar Pradesh has requested UYRB to establish two more G&D site at Agra Canal.

5th meeting of Upper Yamuna Review Committee (UYRC) was held on 28th May, 2013 at New Delhi under the Chairmanship of Hon'ble Minister of Water Resources.

REGISTERED SOCIETIES

NATIONAL WATER DEVELOPMENT AGENCY

Introduction

The National Water Development Agency was set up in July 1982 by the Government of India as a Society under Societies Registration Act 1860 under the Ministry of Water

Resources (MoWR) to study the feasibility of the links under Peninsular Component of National Perspective Plan. NWDA is fully funded by the Government of India. Subsequently in 1990, NWDA Society resolved to take up the studies of the Himalayan Component also. Further, on 28th June, 2006 preparation of Detailed Project Report (DPR) of link projects and pre-feasibility/ feasibility reports of intra-State links as proposed by States were also included in the functions of NWDA. Accordingly, MoWR vide resolution dated 30.11.2006 has modified the functions of NWDA Society. The functions of NWDA were further modified vide MoWR resolution dated 19.05.2011 to undertake the work of preparation of DPRs of intra-State links also by NWDA and the same has been published in the Gazette notification of Govt. of India dated 11th June, 2011.

Functions of NWDA

The Agency functions with the following main objectives:

- (a) To carry out detailed surveys and investigations of possible reservoir sites and inter-connecting links in order to establish feasibility of the proposals of Peninsular Rivers Development and Himalayan Rivers Development Components forming part of the National Perspective Plan for Water Resources Development prepared by the then Ministry of Irrigation (now Ministry of Water Resources) and Central Water Commission.
- (b) To carry out detailed surveys about the quantum of water in various Peninsular River systems and Himalayan River systems which can be transferred to other basins/States after meeting the reasonable needs of the basin/States in the foreseeable future.
- (c) To prepare feasibility report of the various components of the scheme relating to Peninsular Rivers development and Himalayan Rivers development.
- (d) To prepare detailed project report of river link proposals under National Perspective Plan for Water Resources Development after concurrence of the concerned States.
- (e) To prepare pre feasibility / feasibility / detailed project reports of the intra-State links as may be proposed by the States. The concurrence of the concerned co-basin States for such proposals may be obtained before taking up their FRs / DPRs.
- (f) To do all such other things the Society may consider necessary, incidental, supplementary or conducive to the attainment of above objectives.

The Hon'ble Union Minister of Water Resources is the President of the Society. The President exercises such powers for the conduct of the business of the Society as may be vested in him by the Society.

The Governing Body (GB) of the NWDA Society under the Chairmanship of the Secretary (Water Resources), Govt. of India manages, administers, directs and controls the affairs and funds of the Society subject to the rules, bye-laws and orders of the Society and generally carries out the activities of the Society.

Organizational Setup

NWDA is headed by the Director General of the rank of Additional Secretary to Govt. of India. He is the Principal Executive Officer of the Society, responsible for the proper administration of the affairs and funds of the Society assisted by Chief Engineer (HQ) and Directors and is also responsible for coordination and general supervision of the activities of the Society. The Headquarters of the Agency is at New Delhi. NWDA has 2 field organizations each headed by a Chief Engineer, 5 Circles each headed by a Superintending Engineer, 16 Divisions each headed by an Executive Engineer and 3 Sub-Divisions each headed by an Assistant Executive Engineer.

Major Activities

Inter Basin Water Transfer Proposals

The National Water Development Agency has been carrying out studies of National Perspective Plan for water resources development. The proposal comprises of two components, namely; (a) Peninsular Rivers Development Component and (b) Himalayan Rivers Development Component.

Peninsular Rivers Development Component

Under Peninsular Component, NWDA has completed collection of data and water balance studies of all 137 basins/sub-basins and 52 identified diversion points, 58 reservoir studies, Toposheet studies of 18 links and all 18 pre-feasibility reports. Based on these studies, NWDA has identified 16 water transfer links under Peninsular Component for Surveys and Investigations and preparation of Feasibility Reports. So far FRs of 14 links under Peninsular Component have been completed. DPR of one link, namely, Ken-Betwa (phase-I) was completed in April, 2010 and submitted to concerned States of UP and MP. Detailed Project Reports (DPRs) of Ken-Betwa Link Project Phase-II and Damanganga –Pinjal Link Project have also been completed by NWDA during the year 2013-14 and submitted to the

concerned State Governments. The work of preparation of DPR of Par-Tapi-Narmada Link Project is in progress.

Himalayan Rivers Development Component

The studies in respect of Himalayan Rivers Development Component were started by NWDA during the year 1991-92. The Himalayan Component envisages construction of storage reservoirs on the principal tributaries of the Ganga and the Brahmaputra in India, Nepal and Bhutan, along with interlinking canal systems to transfer surplus flows of the eastern tributaries of the Ganga to the west, apart from linking of the main Brahmaputra and its tributaries with the Ganga and Ganga with Mahanadi.

Under the Himalayan Rivers Development Component, NWDA has completed water balance studies of all the 19 diversion points, Toposheet studies of 16 storage reservoirs & 19 water transfer links and pre-feasibility report of 14 links. Based on these studies, NWDA has identified 14 water transfer links under Himalayan Component for Surveys and Investigations and preparation of Feasibility Reports (FRs). So far FRs of 2 links (Indian portion) in the Himalayan Component have been completed. The surveys and investigations and preparation of draft feasibility reports of seven more links in Indian portion have been completed. Field surveys & investigations for the remaining links under Himalayan Component are under progress except one link which lies entirely in Nepal.

Benefits from Inter Basin Water Transfer Link Schemes

The National Perspective Plan would give additional benefits of 25 million hectares of irrigation from surface waters, 10 million hectares by increased use of ground waters, raising the ultimate irrigation potential from 140 million hectare to 175 million hectare and generation of 34 million KW of power, apart from the incidental benefits of flood control, navigation, water supply, fisheries, salinity and pollution control etc. in various States.

NWDA has identified the States, which are to be benefited from the inter-basin water transfer links and assessed the annual irrigation benefits likely to accrue to the concerned States from these link schemes. While the Himalayan Component of the inter-basin water transfer proposal will benefit directly Uttar Pradesh, Uttrakhand, Haryana, Rajasthan, Gujarat, Assam, West Bengal, Bihar, Jharkhand and Odisha and enrich the Peninsular Component from the surplus waters of Brahmaputra, the Peninsular Component will benefit Andhra Pradesh, Odisha, Karnataka, Tamil Nadu, Kerala, Puducherry, Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharashtra and Gujarat.

Other Initiatives

(a) **Preparation of Detailed Project Report (DPR)**

(i) Ken-Betwa Link Project

A tripartite Memorandum of Understanding (MoU) for the preparation of Detailed Project Report (DPR) of Ken-Betwa Link Project was signed amongst the Union of India, Governments of Madhya Pradesh and Uttar Pradesh on 25.8.2005.

Detailed survey and investigation work in Panna Tiger Reserve area for preparation of DPR of this project was carried out by NWDA after obtaining permission from National Board of Wildlife (NBWL) in October, 2006 and preparation of DPR and EIA studies of Ken-Betwa, Phase-I Project were completed by NWDA.

During Secretary level meeting held on 3.2.2010, it was decided that DPR of K-B link will be split in Phase-I & Phase-II. Phase-I will comprise of Daudhan Dam and its appurtenants works, tunnel, power houses, link canal and Phase-II will comprise projects proposed by M.P. Govt. in upper Betwa basin.

The Detailed Project Report (DPR) of Ken-Betwa Project, Phase-I was completed by NWDA during April, 2010 and circulated to concerned State Governments. The Governments of Madhya Pradesh and Uttar Pradesh and the Union Govt. have given their consent and approval for its implementation.

To sort out the environmental issues, a meeting was held between Special Secretary (WR) & Secretary (Environment & Forests) on 1-07-2013. It was decided in the meeting that Wildlife Institute of India (WII), Dehradun will examine the magnitude of tiger habitat loss and explore the feasibility of adding contiguous habitat in the interest of tiger conservation. A meeting chaired by Hon'ble Minister (WR) on water issues between Madhya Pradesh and Uttar Pradesh was held on 01-08-2013 wherein Govt. of Madhya Pradesh agreed for making land available for aforestation.

Detailed Project Report (DPR) of Ken-Betwa Link Project Phase-II has also been completed by NWDA and submitted to Government of Madhya Pradesh and Uttar Pradesh duirng January, 2014.

Ken-Betwa Project has been declared as a National Project by the Government of India in 2008 and subsequently been included as a part of Prime Minister's package for development of drought prone Bundelkhand region.

(ii) Par-Tapi-Narmada and Damangaga-Pinjal Link Project

MoU for preparation of DPRs of both these links was signed by the Chief Minister of Gujarat, Maharashtra and Union Minister (WR), in the presence of Hon'ble Prime Minister, on 03.05.2010 and work for preparation of DPRs of these links have been initiated. DPR of Damanganga-Pinjal link project has been completed during March, 2014. Subsequently, the DPR has been submitted to the concerned State Governments of Gujarat and Maharashtra. For Par-Tapi-Narmada link, surveys & investigation works and designs of various structures and hydrological & EIA studies have been completed. Cost estimate is under preparation and DPR will be completed as per schedule by December, 2014.

(b) Consensus Group Headed by Chairman, CWC

The objective of the Consensus Group headed by Chairman, CWC is to discuss and expedite the process of arriving at consensus amongst the States regarding sharing of surplus water in river basins/sub-basins and quantum of surplus water to be transferred from surplus basins to deficit basins/areas as per the proposals of inter basin water transfer of NWDA and helping the States. The Consensus Group has held 11 meetings so far. The 11th meeting of the Consensus Group was held on 27.11.2013 for Mahanadi-Godavari-Krishna-Pennar-Cauvery-Vaigai-Gundar link system. During the meeting, it was decided to retain the original proposal of Mahanadi (Manibhadra) – Godavari (Dowlaiswaram) link and pursue with the concerned States for consensus regarding the preparation of DPR of all 8 links in the system.

(c) Committee of Environmentalists, Social Scientists and other Experts

As a follow up action on comprehensive assessment of Interlinking of Rivers, the Ministry of Water Resources had constituted a Committee of Environmentalists, Social Scientists and other Experts under the Chairmanship of Secretary, MoWR in December, 2004 to make the process of proceeding on Interlinking of Rivers fully consultative. Nine meetings of this Committee have been held so far.

(d) Intra-State Links

NWDA has received 36 proposals from seven States viz. Jharkhand, Maharashtra, Bihar, Gujarat, Odisha, Rajasthan and Tamil Nadu. NWDA has initiated action for preparation of PFRs of these intra – State link proposals. PFRs of the 33 intra-State links (Maharashtra-17, Gujarat-1, Odisha-3, Jharkhand-3, Bihar-6, Rajasthan-2 and Tamil Nadu-1) have been

completed and sent to concerned States. The DPRs of Burhi Gandak-Noon-Baya-Ganga and Kosi-Mechi link projects of Bihar State have been completed and submitted to Government of Bihar in December, 2013 and March, 2014 respectively. DPRs of Wainganga (Goshikurd) – Nalganga (Purna Tapi) link project of Maharashtra State and Ponnaiyar-Palar link project of Tamil Nadu are under progress.

Constitution of Special Committee on "Interlinking of Rivers"

The Hon'ble Supreme Court in the matter of Writ Petition (Civil) No.512 of 2002 on Networking of Rivers along with Writ Petition No.668 of 2002 delivered a judgment dated 27.2.2012. The Hon'ble Supreme Court has directed that an appropriate body should be created to plan, construct and implement the inter linking of rivers program for the benefit of the nation as a whole. The relevant Para 63 of the judgment reads as follow:

"We would recommend, with all the judicial authority at our command that these projects are in the national interest, as is the unanimous view of all experts, most State Governments and particularly, the Central government. But this Court may not be very appropriate forum for planning and implementation of such a programme having wide national dimensions and ramifications. It will not only be desirable, but also inevitable that an appropriate body should be created to plan, construct and implement this inter linking of rivers program for the benefit of the nation as a whole".

Further, the Hon'ble Supreme Court has directed the Union of India and particularly the Ministry of Water Resources to constitute a committee under the Chairmanship of Hon'ble Minister of Water Resources. In compliance, MoWR has constituted a committee called Special Committee on Interlinking of Rivers vide Office Memorandum dated 06.05.2013.

Other Important Meetings

Annual General Meeting (AGM) of NWDA

28th Annual General Meeting of NWDA under the Chairmanship of Shri Harish Rawat, Hon'ble Minister of Water Resources & President of the NWDA Society was held on 13.03.2013. The meeting was attended by the senior officers of NWDA, CWC, MoWR and other Central and State Government Departments.

Governing Body (GB) Meeting of NWDA

60th Meeting of the GB of NWDA was held on 30.01.2014 at New Delhi. Shri Alok Rawat, Secretary (Water Resources) and Chairman, Governing Body presided over the meeting. The meeting was attended by the senior officers of NWDA, CWC, MoWR and other Central and State Government Departments.

NATIONAL INSTITUTE OF HYDROLOGY

National Institute of Hydrology, a Govt. of India Society under the Ministry of Water Resources, established in December 1978 at Roorkee, is conducting basic, applied and strategic research in the fields of hydrology and water resources development. The Institute is fully aided by the Ministry of Water Resources, Govt. of India.

Objectives

- To undertake, aid, promote and coordinate systematic and scientific work on all aspects of hydrology;
- To cooperate and collaborate with other national and international organizations in the field of hydrology;
- To establish and maintain a research and reference library in pursuance of the objectives of the society and equip the same with books, reviews, magazines and other relevant publications; and
- To carry out activities that the Society may consider necessary, incidental or conducive to the attainment of the objectives for which, the Institute has been established.

Organization

The Union Minister of Water Resources is the President of the NIH Society and the Union Minister of State of Water Resources is its Vice- President. The Ministers-in-Charge of Irrigation/Water Resources in the States (ten States to be nominated for every three years by the President of the Society), the Secretaries of Ministries in the Government of India concerned with water and related areas, and eminent experts in hydrology and water resources are members of the Society. Secretary, Ministry of Water Resources, Government of India, is the Chairman of the Governing Body. The Institute's research and other technical activities are monitored and guided by the Technical Advisory Committee (TAC),

headed by the Chairman, Central Water Commission. The Director of the Institute is appointed by the Government of India and is the Principal Executive Officer of the Society.

The Institute has set up six regional Centres in order to deal with the area specific hydrological issues of different regions in the country and for providing effective interaction with the States in the region. These Centres are: Hard Rock Regional Centre (Belgaum), Western Himalayan Regional Centre (Jammu), Deltaic Regional Centre (Kakinada); Ganga Plains Regional Centre (Bhopal), Centre for Flood Management Studies for Brahmaputra basin (Guwahati), and Centre for Flood Management Studies for Ganga basin (Patna). The studies and research in the Institute are carried out under five scientific themes at the Headquarters, two Centres for Flood Management Studies and four regional Centres. The five scientific themes at the Headquarters are: (1) Environmental Hydrology, (2) Ground Water Hydrology, (3) Hydrological Investigations, (4) Surface Water Hydrology, and (5) Water Resources Systems. The Institute has a Research Management and Outreach Division (RMOD), which provides the interface with various research and academic institutions.

Major Research Areas (XII Plan)

- Hydrology of Extremes
- Regional Hydrology
- Environmental Hydrology
- Integrated Water Resources Management
- Hydrology for Watershed Management
- R&D under National Water Mission
- Technology Transfer and Outreach Activities

Studies and Research

The studies and research in the Institute are being carried out broadly under the following major categories:

- Basic Studies and Research
- Applied Studies and Research
- Software Development
- Field and Laboratory Oriented and Strategic Research
- Sponsored Research

Sponsored Research Activities

The Institute has been undertaking research studies for providing solutions to the real life hydrological problems in the field using advanced techniques. Some of the significant contributions of NIH include studies for solution of real-life problems related to augmentation of water supply and water management in cities, glacier contribution in streamflow of Himalayan rivers for hydro-electric power projects, watershed development, water quality management plan for lakes, watershed development, storm water drainage network in cities, flood inundation mapping and flood risk zoning, and water quality assessment in major cities.

Consultancy Capabilities

The Institute has excellent capabilities in the areas of hydrology and water resources to take up national and international consultancy. The Institute is taking up consultancy projects, which provide a good opportunity for the scientists of NIH to implement the results of their research for solving need-based problems.

Laboratories

The Institute has the following well equipped laboratories with state-of-art instruments to provide the necessary support to field studies:

- Nuclear Hydrology
- Remote Sensing & GIS
- Soil Water
- Snow & Glacier
- Water Quality
- Ground Water Modeling
- Hydrological Instrumentation

Technical Publication

The research output of the Institute is published in the form of reports and peer reviewed scientific papers. During the year 2013-14, the Institute published 177 papers in reputed international and national journals and proceedings of international and national conferences and symposia. The Institute prepared 56 technical reports of different studies carried out in the area of hydrology and water resources sector during 2013-14.

Technology Transfer

One of the main objectives of the Institute is to transfer the developed technology/ R&D output to the target users. Besides wide dissemination of reports and research papers, organization of workshops, training courses, seminars, symposia, conferences, brain storming sessions, etc. have been major activities under the Technology Transfer Programme. The Institute has organized 33 training courses/workshops for field engineers, scientists, researchers, etc.

Capacity Building Activities

NIH organized a number of training courses covering various topics of interest. The objective of the training courses was to upgrade the knowledge, skills and attitudes of the field engineers, NGO representatives, research students and other stakeholders operating in different States. A total of 43 scientists/officials of the Institute were trained at various places mainly in the country during the year 2013-14. An orientation training course was also organized at NIH Roorkee during 17-21 December, 2013 for newly appointed/promoted scientists of the Institute.





ISO 9001:2008 Certification

The ISO 9001:2008 certification was awarded to the Institute on December 13, 2012.

STATUTORY BODIES

BRAHMAPUTRA BOARD

Background

The Brahmaputra Board was constituted in the year 1980 by an Act of Parliament (Act 46 of 1980 called "The Brahmaputra Board Act") with the objective of planning and integrated implementation of measures for control of floods and bank erosion in Brahmaputra and for matters connected therewith. It started functioning since January 11, 1982 with headquarters at Guwahati, Assam. The jurisdiction of the Board includes the States of Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, Sikkim and northern part of West Bengal falling within the Brahmaputra Basin.

Composition of Brahmaputra Board

The Board consists of the Chairman, Vice-Chairman, General Manager and Financial Adviser as Ex-officio members and 17 part-time Members representing 7 States of the North Eastern Region, North Eastern Council, concerned Ministries of Government of India, namely, Water Resources, Finance, Agriculture, Power, Road Transport & Highways and Organizations of Government of India, namely, Central Water Commission, Central Electricity Authority, India Meteorological Department and Geological Survey of India.

High Powered Review Board

A High Powered Review Board to oversee the work of the Brahmaputra Board was constituted with the Union Minister of Water Resources as the Chairman and Chief Ministers of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura and Union Ministers / Ministers of State for Finance, Transport, Power, Agriculture, Central Water Commission as Members. The Chairman, Brahmaputra Board is the Member-Secretary and Member (RM), CWC is a permanent invitee. So far 6(six) meetings of High Power Review Board meetings have been convened.

North Eastern Hydraulic & Allied Research Institute (NEHARI)

The Institute was established near Guwahati with facilities of Hydraulic Modeling, Soil Testing, Concrete and Rock Mechanics Laboratory in association with CSMRS, CWPRS. The Board has successfully carried out sample testing as requested by various organizations like NEEPCO, CWC, NEC, NHPC and State Government of Assam, Manipur, Meghalaya and Mizoram for their on-going projects. So far, NEHARI has completed physical model studies of (i) Jiadhal River, (ii) Brahmaputra river from Porvita to South Salmara, (iii) Majuli Island and (iv) Kameng river (Jia Bharali in Assam).

Major Functions

The main function of the Board as per the Act is 'Survey and Investigation' in the Brahmaputra Valley and preparation of Master Plans for the control of flood and bank erosion and improvement of drainage giving due importance to the development and utilization of Water Resources of the Brahmaputra Valley for irrigation, hydropower, navigation and other beneficial purposes.

The other important functions are preparation of Detailed Project Reports (DPRs) and Estimates of projects proposed in the Master Plans, approved by Ministry of Water Resources and construction of Multipurpose Dams and other works in the field of management and development of water resources in Brahmaputra and Barak River System proposed in the Master Plans.

Restructuring of Brahmaputra Board

Restructuring of Brahmaputra Board as 'Brahmaputra River Basin Authority' – the first River Basin Authority in the country - is under active consideration in Ministry of Water Resources. Based upon the views of the basin States, draft Act is in an advanced stage of finalization.

NARMADA CONTROL AUTHORITY

In pursuance of the decisions of the Narmada Water Disputes Tribunal (NWDT) under Clause-XIV of its final order, the Government of India framed the Narmada Water Scheme, which, inter-alia, constituted the Narmada Control Authority and Review Committee in 1980 for proper implementation of the decisions and directions of the Tribunal.

The Narmada Control Authority (NCA) has been vested with powers for the implementation of the orders of the Tribunal with respect to the storage, apportionment, regulation and control of the Narmada water, sharing of power benefits from Sardar Sarovar Project (SSP), regulated release of water by Madhya Pradesh, acquisition of land likely to be submerged under the Sardar Sarovar Project by the concerned States, compensation, resettlement/rehabilitation of the oustees, and sharing of costs and implementation of the environmental safeguard measures.

Organisation

The Authority is headed by the Secretary, Ministry of Water Resources, Govt. of India, as its Chairman, with Secretaries of the Union Ministries of Power, Environment & Forests, Social Justice & Empowerment and Tribal Welfare, Chief Secretaries of the four party States, viz. Madhya Pradesh, Maharashtra, Gujarat & Rajasthan, one full time Executive Member and three full time Members appointed by the Central Government and four part time Members, one each nominated by party States as Members.

The Review Committee for Narmada Control Authority (RCNCA), headed by the Union Minister of Water Resources, comprises Union Minister for Environment & Forest and Chief Ministers of four party States, viz., Madhya Pradesh, Rajasthan, Maharashtra & Gujarat as Members.

The Narmada Control Authority has its headquarter at Indore (MP), Regional Offices at Indore, Bhopal & Vadodara, Liaison Unit in New Delhi and Field Offices at Mandla, Hoshangabad, Kevadia and Indore.

Environmental Monitoring Activities

Environment Sub-group of Narmada Control Authority chaired by Secretary, Ministry of Environment and Forests monitors various surveys, studies and implementation of environmental safeguard measures in respect of Sardar Sarovar Project and Indira Sagar Project as per terms of Narmada Water Scheme and var ious clearances issued to the projects by the Central Government including clearance from environmental angle issued by Ministry of Environment & Forest, Govt. of India. Accordingly, the progress on following activities is being monitored by the Narmada Control Authority.

- 1. Phased Catchment Area Treatment
- 2. Compensatory Afforestation
- 3. Command Area Development
- 4. Flora, Fauna & Carrying Capacity of Surrounding Area
- 5. Seismicity
- 6. Health Aspects
- 7. Archaeological & Anthropological Aspects

Progress reports received from the party States are discussed in Environment Sub-Group meeting and are also being displayed on NCA website <u>www.nca.gov.in</u>. NCA officers are also making field visits to review & reconcile the progress on environmental issues.

Resettlement And Rehabilitation (R&R) Activities

Sardar Sarovar Project (SSP)

The progress of R&R is being monitored by the Resettlement and Rehabilitation (R&R) Sub-group chaired by the Secretary, Ministry of Social Justice and Empowerment and also by a Task Force constituted by NCA in its 72nd meeting held on 08.09.2004. In addition, R&R Sub-Group and NCA's R&R officials' undertook field visits as per requirements for the submergence villages and R&R sites. During the year, one meeting, i.e., 77th meeting of R&R & Sub-Group of NCA was held on 27.06.2013.

Indira Sagar Project (ISP)

In pursuance to the direction of Hon'ble High Court of M.P. dated 6.9.2006 in WP. No. 3022 of 2005 and decisions of R&R Sub-group of NCA from time to time, the NCA is coordinating with Grievances Redressal Authority (GRA)-ISP, NVDA and NHDC, and NCA's R&R officials are also undertaking field visits.

Energy Management Centre (EMC)

Energy Management Centre (EMC) is planning, scheduling & coordinating activities of Power Generation of Sardar Sarovar Power Complex (River Bed Power House 6X200 MW & Canal Head Power House 5X50 MW) in consultation with Western Regional Power Committee (WRPC), Western Regional Load Dispatch Centre (WRLDC), Central Electricity Authority (CEA) and beneficiary States & concerned State Generation/ Transmission departments. The generation planning, daily scheduling, monitoring of generation, transmission planning, schedule for maintenance and energy accounting etc. are carried out in compliance of NWDT Award. The total energy generation at SSP complex was 5877.324 MU (5216.804 MU from RBPH & 660.520 MU from CHPH) during the FY 2013 -14. The net power available at bus bar in RBPH switchyard after allowing for station auxiliaries was shared among the party States i.e., Madhya Pradesh, Maharashtra and Gujarat in the ratio of 57%, 27% and 16% respectively as prescribed by provisions of NWDT Award. Generation at SSP Power Complex achieved its highest ever-annual generation in the financial year 2013-14 since its commissioning in 2004. Apart from energy generation, RBPH Units are also being operated in synchronous condenser mode as per requirement, for voltage regulation and to provide stability to the grid. During the FY 2013-14, SSP machines were operated for 243.23 hrs. in synchronous condenser mode.

Further, in compliance to the directions issued by Western Regional Power Committee (WRPC), quarterly mock drill for crisis management/disaster management was carried out at SSP and the quarterly reports sent regularly to all concerned organizations viz. WRPC/CEA.

Hydrometeorological Network

The contract with M/s ECIL Limited, Hyderabad for Real Time Data Acquisition System (RTDAS) has been foreclosed and the tendering process for implementation of proposed RTDAS based on GSM technology has been kept on hold due to GoMP's decision for taking up implementation of above network within their territory by them. The efforts to resolve this issue are under way. The new RTDAS once implemented would be useful in issuing inflow forecasts at various major reservoirs and will facilitate transmission of hydro-meteorological data from these 42 stations to Master Control Centre at Indore on real time basis.



Fig. Upstream view of C.R. CH. 144.50 km. of Narmada Main Canal, Gujarat
BETWA RIVER BOARD

Organisation and its Composition

A decision to harness the available water resources of Betwa river was taken in a meeting held on 22nd July 1972 between Chief Ministers of Uttar Pradesh and Madhya Pradesh. Further, Uttar Pradesh and Madhya Pradesh in a meeting held on 9th December 1973 agreed for setting up of a tripartite Control Board for the speedy, smooth and efficient execution of the various inter-State projects of both the States. Betwa River Board (B.R.B) was constituted in 1976 by an Act of Parliament to execute the Rajghat Dam Project and Power House. The project authority started construction of the project under the overall guidance of Betwa River Board after promulgation of Betwa River Board Act 1976. The benefits and cost of the above projects are being shared equally by both the State Governments.

The Union Minister of Water Resources is the Chairman of the Board. Union Minister of Power, Chief Ministers and Ministers-in-charge of Finance, Irrigation and Power of the two States are its Members. An Executive Committee of the Board headed by Chairman, Central Water Commission manages the activities of the Board.

Rajghat Dam Project

The Rajghat Dam with appurtenant structures has been constructed across river Betwa to provide irrigation facilities to 1.38 lakh hectares in Uttar Pradesh and 1.21 lakh hectares in Madhya Pradesh with power generation of 45 MW through Rajghat Hydro Electric project at the toe of dam on the left flank. The costs as well as benefits of the project are shared equally by both the States. Construction work of Dam and Power House is almost complete.

Land Acquisition

The Dam submerged 38 villages in U.P. and 31 villages in M.P. Compensation in M.P. area has been completed. In U.P., the District Administration, Lalitpur have paid the land compensation of 25 villages and B.R.B. have paid the compensation of 13 villages by mutual negotiation except the property compensation of village Kalapahar between FRL and MWL and the case has already been submitted for its valuation to the concerned department of U.P.

Approximately 99.5% of the work has been completed and this year, the Dam has been filled up to FRL i.e. 371.00 m.

Planning and Present status of Rajghat Power House works

The estimate of Rajghat Hydro Electric project at 1997 price level was Rs. 131.26 crore which included Rs. 58.41 crore for the civil works. Further revised cost of the civil works of Power House is Rs. 66.89 crore at December, 1999 price level and the same has been furnished by BRB to MPPGCL. MPPGCL has contributed Rs. 59.51 crore. The total expenditure incurred on civil works of Rajghat Power House is Rs. 59.51 crore and the work has been completed.

The three units of Power House have been tested and commissioned during 1999-2000. Since commissioning the power generation has been 1355.10 million units till 31.03.2014.

O & M Estimate of Rajghat Dam Project during Transition Period

An amount of Rs. 9.00 crore per annum towards O&M has been prepared and submitted to both the party States by Chief Engineer, BRB for transition period until the project is taken over by one of the party States. The matter was discussed in Secretary, MoWR level meeting held on 02.02.2006. It was agreed to operate O&M account of the project from October, 2005. Both the States agreed to contribute their due share towards O&M head in addition to pending liabilities under capital cost. The State of U.P. has paid only Rs. 68.50 crore and M.P. has paid only Rs. 41.40 crore against their due share of Rs. 81.975 crore each up to March, 2014.

Utilization of Present Storage

The phase-1 of the construction of Dam up to Spillway crest level was completed in 1992. Since then reservoir storage is being utilized in down stream in Betwa Canal System (U.P) and Bhander Canal System (UP & MP). The impounding of water above crest level has started since 1999-2000.

Full Reservoir Level (FRL) of the reservoir is 371.00 m. Reservoir has been filling up gradually during the last 12 years, the details of which are given in Table-24

SI. No.	Year	Filling level (m)	
1.	2001-02	368.35	
2.	2002-03	367.00	
3.	2003-04	370.00	
4.	2004-05	370.00	

Table-24

Year-wise level of filling of reservoir

5.	2005-06	369.85
6.	2006-07	370.20
7.	2007-08	366.75
8.	2008-09	370.15
9	2009-10	370.35
10.	2010-11	369.05
11.	2011-12	371.00
12.	2012-13	371.00
13.	2013-14	371.00

Financial position of B.R.B.

The financial position of Rajghat Dam Project is given in Table-25

Table-25

Financial position of Rajghat Dam

		(Rs. crore)		
S.No.	Item	U.P.	M.P.	Total
1.	Apportioned cost as per revised	150.30	150.30	300.600
	cost estimate			
2.	Contribution received	150.30	150.30	300.600
3.	Balance to be contributed	Nil	Nil	Nil
4.	Revenue/other receipts	-	-	40.21
5.	Contribution of dues against	81.975	81.975	163.95
	O&M head up to March, 2014			
6.	Contribution received against	68.50	41.40	109.90
	O&M head up to March, 2014			
7.	Balance to be contributed against	13.475	40.575	54.05
	O&M head up to March, 2014			
8.	Gross expenditure up to 03/2014	-	-	435.06
9.	Balance available with BRB in	-	-	15.66
	March, 2014			

TUNGABHADRA BOARD

Introduction

The Tungabhadra Board was constituted by the President of India in exercise of the powers vested under Sub-section (4), Section 66 of Andhra State Act 1953 for completion of the Tungabhadra project and for its operation and maintenance. The Board is regulating water for irrigation, hydro-power generation and other uses from the reservoir.

Organization

The Board consists of a Chairman, appointed by the Government of India and three Members, one each representing the States of Andhra Pradesh, Karnataka and Government of India (MoWR). In the discharge of its assigned functions, the Board exercises powers of a State Government. It makes rules for the conduct of its own business. The Government of Andhra Pradesh and the Government of Karnataka provide funds in agreed proportions and also depute staff to man the various specified posts, as per an agreed proportion. The working table for canal-wise distribution of water to the States is prepared every year by the Tungabhadra Board in consultation with the State Governments and is reviewed from time to time during the water year. The regulation of water is carried out in accordance with the agreed working table.

Status of Activities

Irrigation

The Tungabhadra reservoir filled up to the full reservoir level 497.738 (1633.00 feet) in this year. The inflow in to the reservoir from April 2013 to March 2014 was 11008.83 Million Cubic Meters (Mcum) (388.773 TMCft). The utilization by the Karnataka State & Andhra Pradesh till the end of March 2014 was 2533.338 MCum (89.464 TMCft) and 1305.633 MCum (46.108 TMCft) respectively as against the likely abstraction of 3879.12 MCum (136.990 TMCft (135.000 +1.990 Bhadra Assistance)) for the water year 2013-14. Evaporation losses from April 2013 to March 2014 were 202.607 MCum (7.155 TMC ft) to be shared by Karnataka and Andhra Pradesh in the ratio of 12.5 : 5.5. A total quantity of 6,732.574 MCum (237.759 TMC ft) of water has out flowed over spillway including EPG (extra power generation).

Hydro Power

Two Power Houses are maintained by the Tungabhadra Board, with a total installed capacity of 72 MW and a target of 145 million units of power generation is envisaged during the water year 2013-2014. Against this, the power generated till the end of March 2014 was 174.9549 million units. The power is shared between the States of Karnataka and Andhra Pradesh in the ratio of 20:80.

Mini Hydel Power Plant

1. A Mini Hydel plant at the head of Right Bank High Level Canal of the Tungabhadra project under Build, Operate, Own and Transfer (BOOT) system through an independent power producer viz., M/s NCL Energy Ltd., Hyderabad was commissioned on 27.10.2004. The Mini Hydel plant comprised 3 units of 2.75 MW each and generated

25.5666 million units up to March 2014. The power generated is purchased by the Transmission Corporations of Karnataka and Andhra Pradesh in the agreed ratio of 20:80.

2. One more new Mini Hydel plant was implemented at the head of Rayabasavanna canal of Tungabhadra project under Build, Operate, Own and Transfer (BOOT) system through an independent power producer viz., M/s Khandaleru Power Company Limited, Hyderabad. The project construction was started in September, 2012 and commissioned in record time of 11 months i.e., 31.8.2013. The total project capital cost is Rs.11.5 crores. The Mini Hydel plant comprising single unit of 1.4 MW has generated 4.182 million units up to March, 2013. The power generated is purchased by GESCOM, Gulbarga (Karnataka) and rate of power purchase is Rs.2.80 per unit.

Fisheries

The Tungabhadra reservoir has a water spread area of 378 sq.km at full reservoir level affording tremendous scope for development of fisheries. Quality fish seeds are produced and reared in the Board's Fish Farm to meet the demand of the public and for stocking in the reservoir to increase the biomass of fish wealth. The fishing rights of the reservoir were auctioned for the year 2013-14 to a local Fishermen's Cooperative Society for Rs. 130.05 lakhs. In order to facilitate preservation of fish catch, the Board is running an ice-cum-cold storage plant. The gross earnings from the Ice Plant up to March 2014 is 32.43 lakhs.

Board Meeting

During the year, the Tungabhadra Board held three meetings till the end of March 2014.

Khandaleru Mini Hydel

Water is released from reservoir to the Rayabasavanna canal through a single sluice. Board decided to utilize the head and the discharge available at single vent of sluice for power generation. Accordingly a Mini Hydel Power Plant was contemplated to be set up in Private Sector under built, own, operate and transfer (BOOT) basis. Independent power producer (IPP) M/s. Khandaleru Power Company Limited, Hyderabad permitted to set up the plant. Tungabhadra Board has provided required land in Rayabasavanna stilling basin to IPP on lease for period of 30 years.

The power plant comprises single unit of 1.4 MW capacity, from consideration of Head and Power, horizontal full Kaplan Turbine and Synchronous generator was selected. The Annual generation is available with the installed capacity of 1.4 MW is 7.19MU. The total project capital cost is Rs.11.5crores.

The project construction was started in September 2012 and commissioned in record time of 11 months i.e., 31-8-2013.

During the year 2013-14 the total generation from the Mini Power House is 4.182 million units; generated power is purchased by GESCOM @ Rs.2.80 per unit.

Chapter 8

Public Sector Enterprises

WAPCOS Limited

Introduction

WAPCOS Limited is a "MINI RATNA-I" Public Sector Enterprise under the aegis of the Union Ministry of Water Resources. Incorporated on June 26th, 1969 under the Companies Act, 1956; WAPCOS has been providing consultancy services in all facets of Water Resources, Power and Infrastructure Sectors in India and Abroad. The quality management systems of WAPCOS comply with the Quality Assurance requirements of ISO 9001:2008 for Consultancy Services in Water Resources, Power and Infrastructure Development Projects.

VISION

To be a Premier Consultancy Organization recognized as a Brand in Water, Power and Infrastructure Development for Total Project Solutions in India and Abroad.

MISSION

Sustained Profitable Growth, Excellence in Performance, Use of State-of-the-art Technical Expertise, Innovativeness and Capacity Building to Meet Society's Needs Globally.

Objectives

- To perform the role of a premier agency for offering integrated package of services of scientific, technological and managerial quality for optimal planning and development Projects.
- To adopt modern technology and systems to build in quality, reliability and accuracy thereby ensuring customer satisfaction.
- To continue the pace of growth of domestic and overseas business and to transfer know-how to Clients.

- To adopt international standards in surveys, investigations, designs, cost estimates, project planning including environmental studies and project management services for cost-effective and integrated development of Water resources, Power and Infrastructure Projects.
- To promote research and development through interaction with other national and international agencies.
- To maintain pre-eminence in the field of consultancy through diversification in allied fields.
- To secure a fair monetary return to the enterprise as a result of its operations through improved productivity.
- To play a dynamic role in the use of state-of-the-art consultancy for innovative design alternatives.
- To attract the best available talent and promote a committed and motivated workforce.
- To strive to achieve client satisfaction.
- To promote WAPCOS as a Brand Name.

Fields of Specialization

Main fields of specialization of the company cover Irrigation and Drainage, Flood Control and Land Reclamation, River Management, Dams, Reservoir Engineering and Barrages, Integrated Agriculture Development, Watershed Management, Hydropower and Thermal Power Generation, Power Transmission and Distribution, Rural Electrification, Ground Water Exploration, Minor Irrigation, Water Supply and Sanitation (Rural and Urban), Environmental Engineering including Environmental Impact Assessment and Environmental Audit, Ports and Harbours and Inland Waterways, Rain Water Harvesting; Survey & Investigations, Human Resource Management, System Studies and Information Technology. WAPCOS has also been venturing into newer fields such as Software Development, City Development Plans, Financial Management System, Technical Education, Quality Control and Construction Supervision, Roads & Bridges. The Company has amended its Memorandum of Association to provide concept to commissioning services for developmental projects in India and Abroad.

Range of Consultancy Services

WAPCOS' spectrum of services covers a wide range of activities e.g. pre-feasibility studies, feasibility studies, simulation studies, diagnostic studies, socio-economic studies, master plans and regional development plans, field investigations, detailed engineering including designs, detailed specifications, tendering process, contract and construction management, commissioning and testing, operation and maintenance, quality assurance and management, software development and human resource development.

Registration with International Organizations and Operations Abroad

WAPCOS is registered with various international funding agencies for participating in the funded projects like World Bank, Asian Development Bank, African Development Bank, Japan Bank for International Cooperation and United Nations Office for Project Services.

Apart from India, WAPCOS has successfully completed/on-going consultancy assignments abroad in 55 countries and is currently engaged in providing consultancy services in Afghanistan, Bangladesh, Bhutan, Burundi, Cambodia, Central African Republic, Chad, DR Congo, Ethiopia, Ghana, Kenya, Lao PDR, Maldives, Malawi, Mozambique, Myanmar, Nepal, Nigeria, Rwanda, South Sudan, Sri Lanka, Swaziland, Sierra Leone, Tanzania, Togo, Yemen and Zimbabwe.

Dividend

In view of the excellent performance of the company for the year 2012-13, a dividend of Rs. 1200 lakh, which is highest-ever in the history of the company was paid.

Bonus Shares

With a view to share prosperity of the Company with the Shareholders, Bonus Shares of Rs. 8 crore were issued in the year 2013.

MoU Score for 2012-13

WAPCOS achieved MoU Composite Score of 1.00 with MoU Rating "Excellent" for the year 2012-13, on the basis of audited data by the Department of Public Enterprises, Ministry of Heavy Industries and Public Enterprises, Government of India. This is the highest achievable score under the MoU system of Company's performance evaluation by the DPE.

Awards/Recognition

The Company has received following Awards: -

- Hon'ble President of India conferred "SCOPE Meritorious Award Corporate Governance" organised by Standing Conference of Public Enterprises, an apex body of Central Government owned Public Enterprises and Department of Public Enterprises, Government of India
- PSE Excellence Awards 2013 instituted by Department of Public Enterprises, Government of India and Indian Chamber of Commerce under the categories of Company of the year; Corporate Governance and Human Resource Management
- Secretary, Ministry of Water Resources, Government of India presented 'Rajbhasha Vaijaynti Cup' Second Prize and Merit certificate for excellent implementation of Official Language.
- Seventh ENERTIA Awards 2013 for Sustainability Energy and Power most valuable Power Sector Enterprises making global impact and CMD, WAPCOS as Power persona of the year –Hydro Power Sector.
- Hon'ble Minister of Trade and Industry, the Czech Republic presented 44th National Export Award–"Excellence in EPO Services". The Award is instituted by Engineering Export Promotion Council (EEPC), Ministry of Commerce and Industry, Government of India for Outstanding Export Performance.
- Commissioner, Central Excise and Chairman, Town Official Language Implementation Committee, Gurgaon presented 'Karyalaya Darpan Smriti Chinha' Shield and Certificate for excellent publication of "WAPCOS Darpan" – In-house quarterly magazine. The Award is instituted by Raj Bhasha Sansthan, New Delhi.
- "Millennium Rashtriya Rajbhasha Shield Samman" and "Rashtriya Rajbhasha Patrika Shield Samman" conferred by Rashtriya Hindi Academy, Rupambara, Kolkata recognizing WAPCOS contribution in the field of Official Language.

- Water Awards 2013-14 under the category of "Best Consultancy Company". The award is Supported by UNESCO, PHD Chamber of Commerce and Water Digest
- Corporate Governance and Sustainability Award 2014 instituted by Indian Chamber of Commerce
- Appreciation was received from Chairman, Standing Committee on Water Resources vide letter dated 18.11.2013 conveying, inter alia, as follows :

The Committee observed that Company is managing its business operations from its own resources and has not taken recourse to any borrowings, loan or any other form of financial assistance from the Government or any other financial institution so far. Rather it has paid consistently high percentage of dividends on its Paid-up capital. The Committee also noted the appreciations, awards and the excellent grading earned by the Company, consequently under the MoU system of evaluation. Besides, Company's support for the weaker sections of the society under the Corporate Social Responsibilities has been lauded.

Corporate Social Responsibility and Sustainability

CSR and Sustainability activities have been undertaken in different States of India and in diverse fields, which include providing electricity through solar lighting, construction of rainwater harvesting structures and water conservation awareness programs and School sanitation hygiene and health. Livelihood options have been promoted for marginalized and vulnerable sections of the society with specific focus on women and children through training and skill development in retail, marketing, computer operations and making of various handicraft items. Health care programs for under privileged people have also been organized. WAPCOS organized one training session to sensitize the employees and change their mind set on CSR and Sustainability at its Office Complex, Gurgaon.

Corporate Governance

WAPCOS is committed to adoption of and adherence to best Corporate Governance practices. It has been complying with the guidelines on Corporate Governance issued by the Department of Public Enterprises (DPE), Government of India.

WAPCOS has been graded as "Excellent" by the Department of Public Enterprises on the basis of compliance with Guidelines on Corporate Governance for the year 2012-2013, which was conveyed vide their OM No. 18(8)/2005-GM Dated 27th November, 2013 by Department of Public Enterprises, Government of India.

Research and Development

The Company promotes Research and Development to ensure latest technology for the benefit of the clients of the Company. Adequate R&D backup in the fields of primary operations is established, which assists in achieving the coveted technology and managerial excellence. The Company has a medium term R&D Plan.

Important Projects- Foreign

AFGHANISTAN

SALMA DAM PROJECT

Salma Dam Project is a Multipurpose project planned for generation of 42MW of power, irrigating potential of 75000 ha, water supply and other benefits. It is one of biggest projects executed by Ministry of External Affairs in the foreign land. The Project envisages construction of 107.5 meters high, 550 meter long rock fill dam across the Harirud River. Project has Hydro Mechanical (H&M) and Electro Mechanical (E&M) components, 36 meter wide concrete spillway controlled by radial gates, Surface Power house, Diversion tunnel etc. A single circuit 110 KV transmission line of about 157 km is being constructed for evacuation of power to Herat city.

The project site is located in a remote area of Herat province and connected with the nearest commercial town by dilapidated 160 km kacha road which has been closed for the Indian project officials by the Govt. of Afghanistan since January 2011 because of security reasons. Indian project personnel are transported to site and back, by Helicopter which is provided by Govt. of Afghanistan once in a month. The project is being executed in adverse infrastructural, logistic and security conditions.

- Gereshk Hydro-Electric Project
- Pre-feasibility studies and priority ranking of 22 Sub-Projects and Feasibility Studies of 10 sub-Projects in Faryab Jawzia, are currently on hand.

BANGLADESH

Detailed Project Report for establishment of an "Inland River Port" at Ashuganj

BHUTAN

- > Detailed Design Engineering of Punatsangchhu-I H.E. Project (6x200MW)
- > Detailed Design Engineering of Punatsangchhu-II H.E. Project (6x170 MW)
- > Environmental Impact Assessment Study for Chamkharchhu H.E. Project
- > Detailed Design Engineering of Sankosh H.E. Project (2560 MW)
- > Pre-Feasibility Report for Kuri Gongri H.E. Project (2700 MW)
- Survey, Investigations & Studies for Preparation of DPR for Amochhu Reservoir HE Project
- Construction Supervision of Transmission lines for Mangdechhu H.E. Project (720 MW)
- Hydrological, Power Potential Studies, Glacial Lake Outburst Flood, Cost Estimates, Geological mapping for Wangchhu HE Project

BURUNDI

 Project Management Consultancy for Execution of Kabu 16 (20 MW) Hydro Electric Project, including Substation and Transmission Lines

CAMBODIA

- Construction of 230 kV Double Circuit Transmission Line between Kratie and Stung Treng and Associated 230/22 kV Substation at Kratie
- Ground Water Exploration for Augmentation of Rural Water Supply in 2 Provinces
- Stung Tasal Dam Project
- Storm Water Drainage System for Ta Pronhm Temple Complex based on Trenchless Technology, Siem Reap

DEMOCRATIC REPUBLIC OF THE CONGO

 Project Management Consultancy for Grand Katende Hydro Electric Project (64MW)

ETHIOPIA

• Gerbi Dam Reservoir, Transmission and Treatment Plant, Design and Tender Document Preparation Project

GHANA

- Rehabilitation of the Kpong and Akosombo Dam Safety Monitoring System / Instrumentation
- Engineering Design and Construction Supervision of Irrigation Schemes (Central and Western Schemes) ACCRA

KENYA

- Environmental and Socio Impact Assessment and Development of a Resettlement Policy Framework for the proposed Borenga and Norera small Dams in the Mara River Basin
- Bondo and Siaya Water Supply and Sanitation Project
- Feasibility Study and Implementation Programme for Greater Bura Irrigation Development Project
- Feasibility Study, Preliminary and Final Designs and Environmental and Social Impacts Assessment for the Proposed Rare Dam Water

LAO PDR

- Project Management Consultancy for Engineering, Procurement and Construction of 230kV and 115kV Transmission Line and Associated Substation Projects
- Extension of Thabok and Nabong substations at 230 kV and extension of one number of 115 kV Line Bay at Thasla 115/22 kV Sub-station, 115 kV Single Circuit Transmission Line from Nam Gnuang (Thasla) to Laksao, 115/22 kV Sub-station at Laksao

• Development of Irrigation Schemes in Champassack Province

MALAWI

 Construction Supervision of Supply, Installation and Construction of Integration and Expansion Works for Salima Lakeshore Water Supply Schemes

MOZAMBIQUE

- Detailed Design Review, Pre-Contract Services and Supervision of Civil Works Contract for Multinational Nacala Road Corridor Project- Phase I, Nampula – Cuamba Road Project
- Water Services and Institutional Support Project, Design Check and Supervision of Network Expansion for Nacala
- > Pre-feasibility Study for Development of Port at Zambezia
- > Feasibility Study Report of Lurio H.E. Project
- > Rehabilitation of Pequenos Livombos H.E. Project
- Irrigation Service Provider for Horticulture under PROIRRI –Sustainable Irrigation Development Project
- Consultancy services for design for project of improving the quality of power supply-Distribution

MALDIVES

 Feasibility Report, Detailed Scheme Report, Bid Documents and supervision of Construction for a Roof Water Harvesting based Water Supply Scheme in North Ari Atoll Ukulhas

NEPAL

- Irrigation Studies under Sapta Kosi High Dam Multipurpose Project
- Construction Management for Rahughat H.E. Project (32 MW)
- Detailed Project Report, Tender Engineering for Arun-3 H.E. Project (900 MW)

- Project Management Consultants for India-Nepal Power Transmission Interconnection Project
- Construction Management and Construction Supervision of Kulekhani-III H.E. Project

NIGERIA

• Feasibility Studies, Detailed Engineering Design and Preparation of Contract Documents for the Development and Construction of a Coal Fired Power Plant in Benue/ Kogi/ Gombe Axis

RWANDA

- Nayaborongo Hydro Electric Project (2 X 14 MW)
- Detailed Design Study for Lake Kivu Water Transport Project
- Supervision of Engineering-Procurement-Construction of the 15 MW Peat-to-Power Plant

SIERRA LEONE

- Supervision of Supply and Installation of Solar Street Lights in Freetown, Lungi and 12 Districts Headquarter Towns
- Rehabilitation of Existing Potable Water Facilities in Lungi, Kaiahun, White Water Community, Allen Town, Wellington and Tender Hill Communities

SRI LANKA

 Project Management Consultancy for 4000 Housing Units in Central and Uva Provinces

SUDAN

 Site Survey and Detailed Feasibility Report for Various Projects for Govt. of South Sudan

TANZANIA

- Environmental and Socio Impact Assessment and Development of a Resettlement Policy Framework for the proposed Borenga and Norera small Dams in the Mara River Basin
- Project Management Consultancy Services for Augmentation of Water Supply Scheme in Dar Es Salaam and Chalinze (Design and Construction Supervision Phase)

TOGO

• Project Management Consultancy for Rural Electrification Project (Phase II)

YEMEN

- Construction Supervision for Rehabilitation and Reconstruction of Regional Roads in Hadram out Governorate
- Construction Supervision of Power Sector Project

ZIMBABWE

- Skill support for Operation and Maintenance of Hwange Thermal Power Station (920 MW) for Zimbabwe Power Company
- > Project Management Consultancy Services for Gairezi Hydro Electric Project
- Geological and Resource Mapping Survey for Coal Bed Methane Gas project in Lupane Area
- Upgradation of Deka Pumping Station and river water intake system at Hwange Power Station
- Replacement of existing boilers with CFBC boilers for Small Thermal Power Station at Harare, Bulawayo and Munyati for Zimbabwe Power Company
- Restoration of Coke Oven Gas plant at Hwange Thermal Power Station
- Strategy Paper on Integrated Water Resources Development and Management for Save River Basin

- Specialist Consultant for Hwange Stage 1 & 2 Plant Improvement and Life Extension Projects
- Skill Development for Zimbabwean Engineers and Operators through development of Power Training Institute including provision of Simulators for 220 MW and 120 MW similar to Hwange Power Station

INDIAN PROJECTS

- External Monitoring and Evaluation Study for the Study for the Uttar Pradesh Sodic Lands Reclamation Project, Lucknow
- Design review of Latatapovan H.E. Project, Uttarakhand
- Engineering Consultancy for executing Kundah Pumped Storage H.E. Project, Tamil Nadu
- Detailed Engineering and Project Management Consultancy Services for Provision of Buildings and Services Works at various locations in Arunachal Pradesh
- Detailed Engineering and Project Management Consultancy Services for provision of Buildings and Services works at Missamari, Assam
- Hydraulic Model Studies for Lower Siang H.E. Project, Arunachal Pradesh
- Detailed Project Report for 170 MW Bogudiyar Sirkar Hydro Electric Project
- Techno-Economic Feasibility of Sher Machharewa and Shankar Complex Project NVDA
- Construction Quality Management and Technical Supervision under Tamil Nadu Irrigated Agriculture Modernization and Water Bodies restoration and Management Project, Government of Tamil Nadu
- Remodeling and Covering of Ramesh Nagar Drain from Kirti Nagar Furniture Block/ Railway Line to Najafgarh Drain, Delhi
- Topographical, Cadastral survey of the project area, Detailed study of Project area systems and identification of problems and Redesigning of Irrigation and Drainage System and Detail Project Report for revamping of Chambal Canal's Distribution system in Right and Left Main Canal, Rajasthan

- Design Supervision Consultancy-Bhimtal; Infrastructure Development Investment Program for Tourism, Uttarakhand
- Project Management Consultant for Development of Ring Road No. 4, Road Network System, Water Supply System, Sewerage, Electrical Networks, Storm Water Drains and Reuse System for Kamal Vihar, Raipur, Chhattisgarh
- Techno–Economic appraisal of Detailed Project Reports of Infrastructure Projects of Roads, Bridges, Water Supply, Institutional Buildings, Sports Stadium, Power Distribution, Transmission and Irrigation Sectors under Ministry of Development of North-Eastern Region, Government of India
- Detailed Project Report of Turga Pumped Storage Project (4×250 MW), West Bengal
- Project Management Consultancy for Implementation of R-APDRP Part-B Scheme of Government of India in 6 SCADA Towns of Uttar Pradesh
- Development/Upgradation, Dredging, FLCs, MNR etc. of Fisheries Harbours including Project Management Units (VERAVAL, Porbander, Mangrol etc.)
- Fisheries Port Development Work at Navabandar, Sutrapada and Madhvada
- Detailed Project Reports and Construction Supervision for Rural Roads in 4 districts of Madhya Pradesh
- Project Monitoring & Construction Supervision along with Quality Control for Sewerage Project of Jabalpur City under JNNURM, Madhya Pradesh
- Preparation of City Survey Records of Town Planning Schemes
- Project Management Consultancy for Various Works in Different Schemes under Jasdan Nagar Palika
- Monitoring, Evaluation Learning and Documentation under Integrated Watershed Management Program Latur Agriculture Division
- Project Management Consultancy for construction of 42 nos. of 33/11KV substations for package 5, 6 & 7 within the jurisdiction of DISCOMS North -

- Eastern Electricity Supply Company of Odisha Ltd. & Western Electricity Supply Company of Odisha Ltd. for Segment II under the phase-1 of Odisha Distribution System Strengthening project.
- Detailed Route Survey & Investigations for Slurry Pipeline from Kirandul to Vizag and water pipeline from Sukma to Kirandul

FINANCIAL PERFORMANCE

The Company has achieved turnover of Rs. 89640 lakh^{*} (Provisional, Subject to Audit) for the year ending 31.03.2014 as against the previous figure of Rs. 56725 lakh for the corresponding period.

^{*} The figure of Rs. 89640 lakh is inclusive of Salma Dam Project turnover of Rs. 37300 lakh (as against the previous figure of Salma Dam turnover of Rs. 13751 lakh).



Shri Pranab Mukherjee, Hon'ble President of India presenting "SCOPE Meritorious Award" for "Corporate Governance" to CMD, WAPCOS in the presence of Shri Praful Patel, Hon'ble Minister of Heavy Industries & Public Enterprises, Government of India



Presentation of Dividend for the year 2012-13 to Shri Harish Rawat, Hon'ble Minister of Water Resources by CMD, WAPCOS in the presence of Shri Alok Rawat, Secretary, Ministry of Water Resources, Govt. of India



On behalf of the President of India, Shri Harish Rawat, Hon'ble Minister of Water Resources receives 7,99,952 Equity Shares of Rs. 100 each, issued as Bonus Shares, from CMD, WAPCOS in the presence of Shri Alok Rawat, Secretary, Ministry of Water Resources, Govt. of India



Spillway under construction, Salma Dam Project, Afghanistan



Punatsangchhu-II HEP:Diversion Tunnel Inlet



Concreting of face slab under Progress, Stung Tasal Dam Project, Cambodia

National Projects Construction Corporation Limited (NPCC)

Organisation

National Projects Construction Corporation Limited (NPCC) was established on 9th January 1957 as a premier construction company to create necessary infrastructure for economic development of the country. NPCC Ltd. complies with quality management requirements of **ISO 9001-2008** for execution of civil works for Thermal & Hydro Electric Projects, River Valley Projects, Industrial Structures, Project Management Consultancy Services for Buildings, Housing, Roads, Bridges and Infrastructure Projects. The corporation has been making profit for the last four years and now has a positive net worth. Consequence to which on 31.10.2013, National Project Construction Corporation Ltd. was awarded '**Turnaround Award 2013**' by Board for Reconstruction of Public Sector Enterprises (BRPSE).



Dr. Nitish Sengupta, Chairman, BRPSE (Board for Reconstruction of Public Sector Enterprises), presented BRPSE 'Turnaround Award 2013' to Shri H.L. Chaudhary, CMD, NPCC in presence of Shri Sunil Kohli, JS&FA, Ministry of Water Resources

Fields of Specialization

Townships & other Residential Buildings, Institutional Buildings, Office Complexes, Roads, Bridges & Fly-Overs, Hospitals & Health Sector Projects, Industrial Structures, Surface Transport Projects, Environmental Projects, Thermal Power Projects, Hydro-Electric Power Projects, Dams, Barrages & Canals, Tunnels & Underground Projects and Real Estate Works.

Financial Status

The authorized capital of the Corporation is Rs. 700 crore and its paid up capital is Rs. 94.53 crore. The Corporation achieved a turnover of Rs. 1175.84 crore (unaudited) during 2013-14 compared to previous year's turnover of Rs 1155 crore. The turnover from 2008-09 to 2013-14 has been indicated in chart below:



MoU Rating for the year 2012-13

NPCC Ltd. has achieved MoU rating of "Very Good" with composite score of 2.34 for the year 2012-13 on the basis of audited data provided to Department of Public Enterprises (DPE).

Major Works Secured during 2013-14

- Campus development & building construction projects of NIELIT in North Eastern States & Patna
- Building works related to residential/ offices/ posts for Assam Rifles in North Eastern States
- Road and bridge works under Pradhan Mantri Graminn Sadak Yojna at Jharkhand
- Building construction of additional works of Lok Narayan Jai Prakash Institute Chapra
- Construction of different buildings for Indira Gandhi National Tribal University at Amarkantak, Chattisgarh and Manipur
- Construction of various buildings & external development works of the campus of Rajiv Gandhi National Institute of Youth Development Sriperumbudur, Tamil Nadu
- Road & Drain improvement works in Shimoga district and Bagalkot district under Mukhya Mantri Nagarothana Phase- 2 Project

- Construction of buildings for Rajiv Gandhi National Ground Water Training & Research Institute (RGI), Raipur (Chattisgarh)
- Construction of office building, residential quarters and guest house for Income Tax Department at Belgaum (Karnataka)

Status of Major Works under Execution

At present, the Corporation is working on more than 140 projects spread all over the country. These includes Indo Bangladesh Border Fencing works in Tripura, Mizoram, Assam & Meghalaya, various assignments of Assam Rifles in different States of North East, Irrigation & River Valley Projects (Dolaithabi Barrage in Manipur, Kalsi Barrage Project in Tripura), Hydroelectric Projects (Haithiari Power House in Uttrakhand) & other miscellaneous projects.



Hard Rock cutting for high altitude road work at Leh

Chapter 9

Initiatives in North-East

The North Eastern Regional Centre (NERC), Guwahati catering for the seven North-Eastern States, Sikkim and parts of West Bengal (Teesta Basin) was established in August 1988 at Guwahati and has been working for various water resources problems of the region. Considering flood as the major problem in the region, Ministry of Water Resources, Govt. of India decided to rededicate the Regional Centre towards service of the region and re-named it as NIH Centre for Flood Management Studies for the Brahmaputra Basin (NIH-CFMS). The focus is on following areas:

- Flood estimation and routing,
- Structural / non structural measures for flood management,
- Integrated watershed management for flood control,
- Hydrological data base management system,
- Drainage congestion and erosion problems,
- Water quality problems,
- Socio-economic aspect of flood disaster, and
- Technology transfer activities

The current emphasis is on pilot basin studies. During 2013-14, the Centre has been working on the following studies:

- i) Risk Assessment of Heavy Metal Pollution in Surface Soils of Kulsi River Basin (Assam / Meghalaya)
- ii) Short Term Flood Forecasting Using Bootstrap based Artificial Neural Networks within Kulsi River Basin
- iii) Application of the Arc-SWAT Model for the Prediction of Runoff within Kulsi River Basin (Assam / Meghalaya)
- iv) Status Report on Soil Erosion and Sedimentation in Brahmaputra River Basin

North-East India with its geographical area of 26.52 million hectare is endowed with enormous water resources. The combined annual water resources potential of Brahmaputra and Barak rivers is about 586 BCM, which is the highest among all river basins in the country. Ministry of Water Resources has taken significant initiatives through its organizations for the development of North-Eastern region, which are detailed below.

CSMRS

Government of India has allocated Rs.30 lakh to CSMRS for 2013-14 under Budgetary Head 2552.00.444.01.04 North Eastern Area – General (Major & Medium Irrigation) Research – R & D programmes in Apex organization. Few polytechnics in North-East were visited by the members of a committee specially constituted in CSMRS. Efforts are on to assist these polytechnics with equipments based on their needs.

The Mass Awareness Programme was organized in Khliehriat, Eastern Jaintia hills, Meghalaya on 17th May, 2013 and Tura, GARO hills district, Meghalaya on 21st May, 2013. The following activities were organized:

- Quiz Competition
- Painting Competition
- Water Conservation Race
- Communication Skill Round

Development of Water Resources Project in the North-East region by carrying out different studies such as estimation of site specific seismic design parameters for Tawang HEP II, Arunachal Pradesh; conducting field studies for assessing turbine efficiency under different reservoir levels at Kopili HEP, Assam; hydraulic model studies for modified extended ski – jump bucket spillway of Subansiri Lower Hydroelectric Project, Arunachal Pradesh/ Assam.

Studies carried out and technical report submitted for various projects of North-East region are: Pare Hydro Electric Project; Arunachal Pradesh; Kulu and Oa-Dehing Multipurpose Project, Brahmaputra Board, Assam.

NPCC

NPCC has been working in 8 North Eastern States for the last 35 years for developing the infrastructure and other social amenities for the upliftment of socio-economic status of the people of North Eastern States.

Initially, NPCC worked for construction of fencing in Tripura and Mizoram for 351 Km. mostly in insurgency prone area. NPCC has today made the area totally accessible having a network of roads, along the border fencing, where, there was no accessibility earlier and BSF Jawans had to trek more than 20 to 30 Kms. to reach the existing border.

Indo-Bangladesh Border Flood-Lighting Works

The excellent performance of NPCC, encouraged MHA (GoI) for construction of Border Flood Lighting of Tripura & Meghalaya. NPCC has kept performance intact & taken Border Flood Light Work of 632.36 Km in Tripura and 485.37 km in Meghalaya. The Border Flood Light is helping to BSF 24 hrs vigil over insurgent groups & illegal migrant of Bangladesh.



Indo-Bangladesh Border Fencing along with Flood Lighting Work



Indo-Bangladesh Border Fencing Work at Tripura

Border out Post work

Ministry of Home Affairs, Government of India has awarded the construction of BOP works in extreme difficult area of Tripura-50 posts, Mizoram- 21 posts, Assam- 6 posts, Meghalaya- 17 posts & West Bengal- 94 posts for monitoring the border activities by BSF.

Indira Gandhi National Tribal University (IGNTU)

NPCC is also creating infrastructure & regional centre of IGNTU, Manipur costing about Rs. 66 crore, which is on the verge of completion.

Jawahar Navodaya Vidyalaya (JNV)

NPCC is also building the infrastructure for Jawahar Navodaya Vidyalaya in the extremely difficult location of Lawngtalai Lunglei, Kolasib in the State of Mizoram & Bagmara of Meghalaya.

National Institute of Electronics & Information Technology (NIELIT) Works:-

NPCC is also playing a major role for creating infrastructure for 10 extension centres & 1 centre of NIELIT in the N.E. States of Mizoram, Nagaland, Manipur, Arunachal Pradesh, Meghalaya and Assam to develop the skills of information technology and overall capacity of the people for faster socio-economic development.

Assam Rifles' Works

Construction of complete establishment of Assam Rifles in all the States of North East with administrative block, hospitals, all types of residential quarters, barracks, posts, recreation centres, library buildings, museum building, MT park, etc.

Development of North-Eastern States

NPCC has also constructed the following major projects for the development of North Eastern States:

Gomti Hydro Project, Maharani Barrage, Khowai Barrage, Manu Barrage, Kalashi Barrage, Tripura Tribal Area Autonomous District Council works, Khuga Dam in Manipur, College of Fisheries under Central Agriculture University, IGNOU Works, Singda Dam, Loktak River valley Project and Dolaithabi River Valley Project, etc.

CGWB

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 CGWB in the North Eastern region during 2013-14 are given in Table-26 below:

Table-26

-	Major Achievements of the North-Eastern Region				
SI.	Activities	Achievements			
1.	Data Generation for Aquifer Mapping				
		The entire energy was serviced by establishing law			
a	Identification of Aquifer on available	The entire area was covered by establishing key			
	1:250 K and Data Gap Assessment	observation wells & springs & water levels were			
		avisting CMMM Sub surface data has been			
		existing GWWW. Sub- surface used has been according to according the second			
h	Ground Water Exploration (Perchales)	16 wells drilled in North Eastern region			
U	Ground Water Exploration (Borenoles)	To wells drilled in North-Lastern region			
С	Geophysical Studies	115 Vertical Electrical Sounding and 1 bore			
		noie logging completed.			
d	Water Quality Analysis	193 samples analyzed			
е	Ground Water Regime Monitoring	Monitoring of water level from GWMS for the months of			
	5 5	March, August, November, 2013 completed.			
	Establishment of Additional Wells	42			
	Participatory Ground Water Monitoring	73 GWMW completed till date			
f	No. of Short Term Water Supply	39			
	Investigation				
g	Artificial Recharge Studies : On-going	i) Arunachal Pradesh: Work completed.			
_	Projects	ii)Nagaland: Completed.			
h	Ground Water Resources Assessment	Data collection under progress			
	(As on 31-03-2012)				
2	Issuance of District Brochures	All District Brochures submitted to CHQ			
2	Cround Water Year Books	Cround Water Veer Deak of NE States submitted 8			
3		Under issuance			
4	State Level Painting Competition	A th State Level Painting Competition successfully			
-	State Level I anting competition	competed in the region.			
5	No. of GW Regulation Received	34			
_					

Major Achi et .

Brahmaputra Board

Master Plans

The important activities of Brahmaputra Board in North-Eastern region are as follows:-

Brahmaputra Board carried out the detailed planning and documentation of the water resources of North-East region and prepared the Master Plans. It has completed preparation of 57 Master Plans.

Protection of Majuli Island, Assam

Majuli is a chronically flood and erosion affected island in river Brahmaputra. The Brahmaputra Board took up anti-erosion works at Majuli Island in 2003-04, as immediate measures, at an estimated cost of Rs. 5.92 crore and completed the same in 2004-05. These works were followed by regular protection works under Phase-I; completed in April, 2011 at an estimated cost of Rs.53.40 crore. The Brahmaputra Board also executed emergent works (Rs. 4.99 crore) for protection of Majuli Island on the recommendations of Standing Committee of Experts in 2008. The Board is presently executing the Phase-II and Phase-III works (Rs.115.99 crore) combined together and the works are likely to be completed during the current financial year.

Anti-Erosion work at Dhola-Hatighuli

In order to bring the Lohit and Dibang rivers to their original courses, the works were taken up by Brahmaputra Board in phases in 2003-04. These works viz. Phase-I (Rs. 10.47 crore), Phase-II (Rs. 4.95 crore) and Phase-III (Rs. 8.47 crore), were completed by 2007-08. The Phase-IV works (revised cost of Rs. 54.43 crore) are under advanced stage of completion.

Over all achievement / Reclamation of land mass of Majuli Island

During the period, from 1963 to the year 2004, there has been year after year loss of land mass of Majuli Island. Since the year 2004, with regular implementation of antierosion/ bank protection measures by Brahmaputra Board, the total area of Majuli Island has increased to about 21.67 sq km within 10 years (2004-2014) as per the satellite imagery data of Feb, 2014.

Drainage Development Schemes (DDS)

- Preparation of DPRs: The Board has completed 24 Nos. of the DPRs of Drainage Development schemes out of 41 identified Drainage Development Schemes (DDS).
- (ii) Execution of Drainage Development Scheme: The Brahmaputra Board has taken up the execution of Drainage Development Schemes (DDS). At present 4 Nos. of DDS namely viz. Barbhag (Rs. 7.23 crore) ,Amjur (Rs. 14.15 crore) , Jengrai (Rs. 1.49 crore) and Jakaichuk (Rs. 2.96 crore) are under execution.

Survey, Investigation & Preparation of DPR for Multipurpose Project

The Board has completed 5 DPRs for multipurpose projects (Siang Single Stage, Subansiri Single Stage in Arunachal Pradesh, Tipaimukh in Manipur and Mizoram, Pagladiya in Assam and Bairabi in Mizoram).

Preparation of DPR for 5 Projects, namely, Noa-Dehing, Jiadhal, Kulsi, Killing and Simsang are in various stages of investigation / preparation.

The North-Eastern Hydraulic & Allied Research Institute (NEHARI)

The Institute was established near Guwahati with facilities of Hydraulic Modeling, Soil Testing, Concrete and Rock Mechanics Laboratory in association with CSMRS, CWPRS. The Board has successfully carried out sample testing as requested by various organizations like NEEPCO, CWC, NEC, NHPC, and State Government of Assam, Manipur, Meghalaya and Mizoram for their on-going projects. So far, NEHARI has completed physical model studies of (i) Jiadhal river (ii) river Brahmaputra from Porvita to South Salmara (iii) Majuli Island and (iv) Kameng river (JiaBharali in Assam).

Pagladiya Dam Project

The project meant for flood moderation to benefit an area of 40,000 ha., irrigation to 54,160 ha. And incidental power generation of 3 MW was proposed across Pagladiyariver at Thalkuchi in Baska district which falls under Bodoland Territorial Autonomous Districts (BTAD) in Assam. The project envisaged construction of 25 m high and 21 km long earth dam with a concrete spillway. The Government of India sanctioned the project in January, 2001 at an estimated cost of Rs. 542.90 crore for construction by Brahmaputra Board.

The works carried out since 2001 are as follows:

• Pre-construction survey, investigation, studies, design, drawings, etc.

- Taking possession of land (956 ha) for Resettlement & Rehabilitation (R&R) purpose.
- Construction of project roads, offices, etc.
- Preparation of technical specifications & tender document.
- Pre-qualification of contractors for main works.

The work is held up due to (i) Zirat Survey (property assessment) of the Project Affected Families (PAF) for finalizing the Resettlement and Rehabilitation (R&R) Plan and (ii) land allotment / acquisition for R&R and project construction.

Other Schemes

Two anti-erosion schemes – (a) Kalair-Alga and Masalabari and (b) Masalabari in Dhubri district, Assam and other at Balat in Maghalaya are planned to be taken up during the current working season.

Raised Platform

Five Raised Platforms at Selekapathlighat, Tulsimukh Kochgaon, Atoichuk, Dakhinpat and Kharkharijan were constructed during this year. With the above, total number of Raised Platforms constructed are 16.

Monitoring and Appraisal of Schemes under Flood Management Programme -A State Sector Scheme under Central Plan - Brahmaputra and Barak Valley

Brahmaputra Board undertook appraisal and monitoring of schemes under FMP for all North-Eastern States including Sikkim and North Bengal and recommended to Government of India for release of fund. An amount of Rs. 1063.56 crore was released by Government of India (during XI Plan) to State Governments on the basis of recommendation of Brahmaputra Board. During XII plan, 151 schemes have been received from State Governments and out of this, 100 schemes have been appraised by Brahmaputra Board.

Chapter 10

Training

National Water Academy (NWA)

National Water Academy, Pune imparts training on almost all facets of Water Resources Development and Management covering the areas of planning, design, evaluation, construction, operation and monitoring of water resources projects and also the application of high-end technology in water sector. Initially, it was set up to provide training to primarily in-service engineers and water professionals of various Central and State agencies. However, subsequently, the programs at NWA were opened to all stakeholders of water sector including those from NGOs, Media, Private Sector Organizations, Academic Institutions, PSUs, Individuals and Foreign Nationals also.

National Water Academy has also forayed into custom-designed programs, meeting specific requirement of client organizations, both at its campus and off-campus at the client locations. NWA has also taken initiative into the field of 'Distance Learning Program' in association with World Meteorological Organisation (WMO).

In the year 2013-14, NWA took following initiatives :

- a) Water Conservation Day One day Awareness Program on Water Conservation Year -2013 was organized at NWA on 14th June 2013.
- b) NWA conducted International Distance Learning Program on "Basics of Hydrological Sciences" in association with World Meteorological Organisation (WMO) during 8th July to 23rd August 2013. 43 officers from 14 Asian countries participated in this training program.
- c) Training program on e-Water Sources was conducted at NWA during 18-29 November 2013. 24 participants from various organizations attended this program.
- d) Training program on Water Law was conducted at NWA during 27-29 November 2013. Various legal aspects related to water resources sector were covered during this program. 18 officers from various organizations attended this program.
- e) The NWA celebrated 25 years of its academic excellence on Wednesday, 10 July 2013 at Khadakwasla, Pune. A souvenir depicting the journey of growth of NWA was released at the hands of Hon'ble Union Minister of Water Resources.
- f) NWA Off-campus training program on "Increasing Water Use Efficiency (WUE) under National Water Mission" was conducted at NERIWALM, Tezpur during 20-

24 May 2013 specifically for the officers of North Eastern States. The Program had participation of 33 officers from 6 North Eastern State.

Since its inception in the year 1988, NWA has conducted a total of 463 training programmes (up to March 2014) and trained a total of 10864 officers (up to March, 2014).

During the year 2013-14, 37 training programs up to March 2014 were conducted at National Water Academy, CWC, Pune and a total of 837 officers trained (up to March, 2014).

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

Rajiv Gandhi National Ground Water Training & Research Institute (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 2013-14 (up to 31.3.2014) 32 Tier I (National Level), 36 Tier II (State Level) and 97 Tier III (Block Level) training programmes were conducted by RGNGWTRI. 14284 (Tier I -486, Tier II -1112 & Tier III -12686) trainees were trained.

NERIWALM

The North Eastern Regional Institute of Water and Land Management (NERIWALM) is a premier institute of NE Region of India established on 23rd December, 1989 at Dolabari, Tezpur (Assam) by the North Eastern Council (NEC), Ministry of DONER, Govt. of India as an autonomous Registered Society under the Societies Registration Act 1860. The Institute has been transferred to the Ministry of Water Resources, Govt. of India w.e.f. 1st April, 2012. The uniqueness of the Institute lies in its catering to the needs of all the NE States, namely, Arunachal Pradesh, Assam, Manipur Meghalaya, Mizoram, Nagaland, Tripura including Sikkim for capacity building in the field of water and land management for water and land resources management. Its sphere of activities normally cover the professionals/govt. officials working in the Departments of irrigation, water resources, agriculture & horticulture, soil & water conservation, rural development etc., members of Water User's Associations (WUAs), farmers and NGOs associated with water land resource management.
CSMRS

CSMRS has conducted 15 training programmes and imparted practical training to Engineers/ Scientists from State Governments, Engineering Colleges, Students and other Stakeholders in the field of Water Resources and Hydro Power Development.

Institute had organized training programmes covering various subjects related to water and land resources management like, Water Use Efficiency in Irrigation Projects, Irrigation Water Management including Command Area Development activities, Participatory Irrigation Management (PIM), Preparation of DPR for Irrigation Projects, Rain Water Harvesting, Soil and Water Conservation, Crop Planning and Cropping System Management, System of Rice Intensification (SRI), Multiple Cropping System, Organic Farming System, Gender Participation in Agriculture and Irrigation Sectors, Entrepreneurship Development for the Unemployed Youth, Social Mobilization for Natural Resource Management etc.

Research and Studies

The Institute has been conducting many research studies since its inception and also undertaking studies on its own and sponsored by different Ministries and Organizations like CWC, MOWR, DST, Ministry of Agriculture, ICAR, Brahmaputra Board, State Water Resource Department and Department of Agriculture of Arunachal Pradesh, ARIAS Society of Department of Agriculture, Govt. of Assam, Department of Agriculture of Mizoram government, IFCD of govt. of Nagaland.

(A) Programmes under TSP

For the first time, the Institute has been allotted grant under Tribal sub-plan (TSP), 2013-14 considering that most of the States of NE region of the country are inhabitated by tribal people. The following program has been proposed under TSP grant during 2013-14:-

One Field Research on water and land management in Tribal Areas belonging to BTAD, Assam has been initiated, which will be continued for at least 3 years.

Implementation of Training Policy of MoWR

The Ministry is also in the process of formulating its own training policy in consonance with National Training Policy of DoP&T to impart training to all levels of the employees.

Human Resource Development and Capacity Building

The Human Resource Development (HRD) and Capacity Building scheme of the Ministry of Water Resources is a new scheme formed by merging three on-going publicity and training schemes, namely, (i) Information, Education & Communication (IEC), (ii) National Water Academy (NWA), (iii) Rajiv Gandhi National Ground Water Training Institute (RGI) and introducing two new components, viz. (iv) Strengthening of North Eastern Institute of Water and Land Management (NERIWALM) and (v) Implementation of Training policy of MoWR. The total financial outlay for the scheme is Rs. 351 crore during XII plan period (2013-14 to 2016-17).

Transparency

The Right to Information Act, 2005

The Right to Information Act, 2005 came into effect from 12.10.2005. As provided under Section 4(1) (b) of the Act, all the 17 manuals in respect of Ministry (Secretariat) and its Organizations were prepared and have been placed in the Ministry's website http://www.mowr.gov.in. Appointment of Central Public Information Officers (CPIOs) have been made in terms of Section 5 (1) and (2) of the said Act and hosted on the website of the Ministry and concerned Organizations.

The Coordination Section of Ministry of Water Resources, Room No. 19, B-wing, Ground Floor, Shram Shakti Bhawan, Rafi Marg, New Delhi has been assigned the task of accepting applications and the fees under the RTI Act. The RTI petitions are forwarded to the concerned CPIOs and the fees are deposited with the DDO, MoWR. The requisite fees for providing information under RTI Act, 2005 can be paid either through Demand Draft/ Postal Order issued in favour of Pay & Account Officer, Ministry of Water Resources, or by cash.

During the financial year 2013-14, a total of 567 applications were received under the RTI Act-2005. All applications were dealt within time and the requisite information was provided to the applicants.

Role of Women in Water Resources Management

Role of women in water resources management and conservation has been duly recognized. The National Water Policy while stressing on participatory approach in water resources management, specifically provides for necessary legal and institutional changes to be made at various levels for the purpose of ensuring appropriate role for women.

In pursuance of the provisions in the National Water Policy, farmers are to be involved progressively in various aspects of management of irrigation systems, particularly in water distribution and collection of water charges. The Ministry of Water Resources, while issuing guidelines, specifically emphasized that the States consider representation of women in the Water Users' Associations (WUAs) at all levels. As a result, many States have amended their Irrigation Acts or came out with Specific Acts on Participatory Irrigation Management.

Considering the importance of women in terms of their numerical strength and the significant contribution they make to the agricultural labour force, there is a need to encourage participation of women in management of water resources. Water Users' Associations can contribute significantly in this regard and bring in a new culture among the water users.

In recent past, some of the States such as, Madhya Pradesh have attempted to ensure that all farm owners, be it men or women, are made rightful members of the outlet committees. Efforts have also been made to ensure that where there are no women members, at least one woman from the area must be taken even if she is not a land owner. Further, at least one woman shall be nominated to the Governing Body of the Association.

Progressive Use of Hindi

Effective measures have been taken for progressive use of Hindi for official purposes in various sections and attached and subordinate offices of the Ministry. Efforts were also made to ensure compliance of various orders/instructions issued by the Department of Official Language.

The second Sub-committee of the Parliamentary Committee on Official Language inspected 6 offices of the Ministry of Water Resources, viz.(i) Central Ground Water Authority, New Delhi (ii) WAPCOS Limited, Kolkata (iii) CWC (Hq.), New Delhi (iv) Director (M&A), CWC, Jaipur (v) CGWB, Chennai (vi) NWDA, Executive Engineer (Investigation Division), Chennai during the financial year. During these inspections, the Parliamentary Committee on Official Language suggested various measures for progressive use of Hindi. The Committee also inspected Ministry of Water Resources on 13.01.2014 and suggestions relating to identification of additional section for doing the entire work in Hindi and issuance of copies of compilation of the President's orders on the first eight reports of the Committee of Parliament on Official Language to all officers, sections and subordinate organizations have been complied with.

To encourage and promote the work in Hindi in the various sections and offices of the Ministry, 8 sections and 6 offices of the Ministry were also inspected. During these inspections, concerned officers and staff were encouraged to progressively increase their official work in Hindi and also comply with the instructions issued by the Department of Official Language from time to time. The meeting of Hindi Advisory Committee of Ministry of Water Resources under the Chairmanship of Honourable Minister of Water Resources was held on 14.08.2013.

The meetings of Official Language Implementation Committee of the Ministry under the Chairmanship of Economic Advisor and In-charge Official Language, Ministry of Water Resources have been convened regularly. In these meetings, the Committee reviews the progress made in the use of Hindi in the Ministry as well as in its various offices and pinpoint shortfalls in relation to targets prescribed by Department of Official Language. The measures are also suggested for removal of the shortfalls.

Incentive schemes like "Rajbhasha Vaijayanti Puraskar Yojana" and "Incentive schemes for doing Work in Hindi" are implemented in the Ministry for promoting the implementation of Official Language Policy. "Rajbhasha Vaijayanti Puraskar Yojana" is for promoting the Hindi work in attached and subordinate organizations of the Ministry. The winners are selected after evaluating total work in Hindi of the organizations. The office, which gets the first prize is given shield and certificate; second and third prize winning offices are given cups and certificates.

Under the "Incentive schemes for doing Work in Hindi", provision has been made to give cash awards each year to the officers and employees on the basis of the work done by them in Hindi. Only those officers/employees in MoWR are eligible for award who writes at least twenty thousand words in a year.

The following cash awards are given under the scheme:

First prize (two prizes)	– Rs 2000/-each
Second prize (three prizes)	– Rs 1200/-each
Third prize (five prizes)	– Rs 600/-each

Under Hindi Teaching Scheme of the Department of Official Language, two employees were nominated for training in Hindi typing.

In order to encourage the use of Hindi in the official work of the Ministry, Message and Appeal were issued by the Hon'ble Union Minister of Water Resources and Secretary, Ministry of Water Resources on 03.09.2013 and 02.09.2013 respectively.

Hindi Fortnight was also organized in the Ministry from 09.09.2013 to 23.09.2013. The competitions like Rajbhasha Quiz, Hindi Noting & Drafting, Hindi Essay, Hindi Typing, Hindi Essay (only for MTS and equivalent), Hindi Debate and Hindi Poetry Recitation were organized. Officers and employees of the Ministry enthusiastically participated in these competitions. First, Second and Third prizes of Rs. 4000/-, Rs.2500/ and Rs. 1500/- respectively were given for each of these competitions. The prizes were given to 49 meritorious participants.

Two Hindi workshops were organized on 18.07.2013 and 06.01.2014 in the Ministry. The workshop organized on 18.07.2013 focused on imparting knowledge of typing Hindi on computers. Thirty eight officers/employees participated in this workshop. The workshop organized on 06.01.2014 emphasised on more and more use of Hindi in day to day official work. Thirty three officers/employees participated in this workshop.

Staff Welfare

Administration Wing

The Administration Section of the Ministry is primarily responsible for the establishment, personnel and administrative matters of the officers and staff of the Ministry (Proper) besides being the cadre controlling authority of posts borne on CSS/CSSS/CSCS sanctioned in the ministry (Proper) and those in Central Water Commission and Central Soil & Materials Research Station. Other aspects of the administration like filling up of recruitment/deputation/promotion, termination posts by direct of probation, confirmation, grant of financial upgradation under Modified Assured Career Progression Scheme, release of annual increments, pay fixation, maintenance of Confidential Reports, sanction of TA/LTC advance, House Building Advance, Motor Car/Scooter/Cycle advances, GPF advances/withdrawals, framing/amendment of recruitment rules, finalization of pension/family pension cases, leave of all kinds, forwarding of applications etc., are also dealt with.

Monitoring of Reservation for SC/ST/OBC

The Scheduled Castes/Scheduled Tribes and Other Backward Classes (SC/ST/OBC) Cell also forms part of the Administration Section. It renders secretarial assistance to Liaison Officers for SC/ST and OBC in discharging the functions on various matters relating to reservation for SC/ST/OBC in Government Services and carrying out inspections of reservation rosters.

The Cell is regulating and monitoring the status of filling up the backlog vacancies for SCs/STs/OBCs in its attached/subordinate offices and taking corrective measures wherever found necessary. Liaison officer carries out inspections in respect of attached/subordinate offices for supervising/rectifying deficiencies for correct implementation of reservation roster.

Complaints Committee on Sexual Harassment of Women Employees

In compliance with the guidelines laid down by the Hon'ble Supreme Court of India on prevention of sexual harassment of women employees, a Committee is functioning to look into the complaints of the women working in the Main Secretariat of the Ministry. The composition of the Committee is as below:-

(i)	Smt. Sudha Midha, ADG (Stat.)	-	Chairperson
(ii)	Shri L.P. Sharma, Under Secretary (Admn.)	-	Member
(iii)	Smt. Neelam Sharma, Section Officer (E-I)	-	Member

The Complaints Committee shall be deemed to be the inquiring authority appointed by the disciplinary authority for the purpose of CCS (CCA) Rules, 1965 and its reports are to be treated as enquiry report. It will examine the complaints made against sexual harassment by women employee(s) and, if necessary, conduct an enquiry. On completion of the same, the Committee will submit its findings to the Joint Secretary (Admn.), MoWR for further necessary action.

During the year ending 31st March 2014, no complaint on sexual harassment of women employees was received by the Committee. Similar Committees have already been constituted in the organizations under this Ministry.

Redressal of Public/Staff Grievances

A Grievances Redressal Cell was set up in the Ministry of Water Resources, which entertains the grievances of employees/officers working in various organizations under the Ministry. Shri Khatchin Langel, Director (Administration), has been designated as Director (Public & Staff Grievances) and all grievances are to be disposed off within a period of 60 days. Most of the grievances received are related to service matters, payment of pensionary benefits etc. Further, Centralized Public Grievances Redress and Monitoring System (CPGRAMS) software developed by Department of AR & PG, is regularly monitored in the Ministry.

During the period from 01st April, 2013 to 31st March, 2014, a total number of 416 grievance petitions were received in this Ministry. Besides, 202 grievance petitions were carried forward, which were pending at the end of 31 March, 2013. Out of total 618 pending grievance petitions, 488 were settled during the above period.

Vigilance

The Vigilance Division functions under the guidance, supervision and control of a parttime Chief Vigilance Officer of the level of Joint Secretary assisted by a Director. Various aspects pertaining to vigilance cases of all the employees of the Ministry (Proper) and all Group A and B officers of the attached/subordinate offices as well as Group-A officers of other organizations under the Ministry, including PSUs are dealt with by the Vigilance Division of the Ministry.

The Vigilance Division functions as a link between the Ministry and the Central Vigilance Commission and other authorities in the matters pertaining to vigilance. This Division tenders advice, wherever required, on vigilance matters, to the Attached and Subordinate Offices, PSUs, Statutory Bodies, Registered Societies etc. under the administrative control of the Ministry, in consultation with CVC and other agencies/departments.

This Division monitors the disciplinary cases and related matters of the organizations under the Ministry through periodical returns prescribed by CVC, DoPT, etc. The Division prepares the "List of Officers of Doubtful Integrity" and the "Agreed List" in consultation with CBI.

This year, Vigilance Awareness Week was observed by the Vigilance Division from 28th October, 2013 to 2nd November, 2013. Preventive Vigilance Inspection as well as Surprise Vigilance Inspection of four organisations under the purview of the Ministry were carried out during 2013-14, with a view to check various irregularities and identify corruption prone areas.

The Vigilance Division also collects, monitors and computerizes Annual Property Returns of all Group 'A' and 'B' officers.

Appointment of Disabled Persons

Monitoring of Reservation for Physically Handicapped

Monitoring of the recruitment of physically handicapped is being done to ensure fulfillment of 3% quota for the category by the Ministry as well as various organisations under it. Periodic reports on the progress made are being sent regularly to the Ministry of Social Justice & Empowerment. Accordingly, 3% of posts/vacancies (1% each for Orthopaedic, Blind & Hearing Handicapped) are reserved to be filled up from physically handicapped persons. The physically handicapped persons are given facilities, concessions and relaxations at the time of test/interview as per the rules on the subject matter. The posts identified to be filled up by the disabled persons in Groups A,B, C & D categories as per the revised list of posts notified by the Ministry of Social Justice and Empowerment, are filled up as per the requirement of the different offices under this Ministry. The relevant reservation rosters as prescribed by the Government are also maintained for planning the reservation of disabled persons.

					Mission Director
Dir Sic (I-III) Dr Dir Dr Dir DD (I) DD (II) DD (I) DD (II) AD SO (Pen. Riv.)	Comm. (Indus) SIC (I, II) DC (I) SO (I) AC (Ganga)	Comm. (Ganga) SJC (I-IV) AD SO Head D'Man	Comm. (B&B) S(C (HP) (& II) (& II) (& II) (& II) (& II) SC (HP) (& II) (Economic Adviser DS Dir (oL) (ew) DD (cL)** SO AD (1&(1)) (EW) (OL)	Adv. (Tech/ NWM)*#* NW

(This is an excel sheet it contains entire chart)

Annexure - II

	STAFF IN POSITION IN THE MINISTRY OF WATER RESOURCES AS ON 31.1.2013																		
	Grou	ЪА							Group E	3						C	Group	С	
						Gazet	ted				Non	-Gaze	tted						
Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total		ST	PH	OBC
88	10	4	1*	7	54	8	6		1	117	17	6	3	12	168	67	8	7	21
* Also	* Also belongs to ST category																		

Annexure – III

List of Addresses of Heads of Organisations under the Ministry of Water Resources

S. No.

Name of the Organisation

Head of the Organisation

Government of India Ministry of Water Resources, Room No. 412, IV Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi-110 001	Shri Alok Raw Tel No. 23710 Fax. 23731553	at, Secretary 305, 23715919
Attached Offices		
1.	Central Water Commission, Room No. 326, Sewa Bhawan, R.K. Puram, New Delhi	Shri A.B. Pandya, Chairman Tel. No.26108855 Fax: 26108614
2.	Central Soil and Materials Research Station, Room No. 309, Hauz Khas, New Delhi-110016	Shri. Murari Ratnam, Director Tel. No. 26961894, 26967985 Fax: 26853108
Subordinate Offices		
3.	Farakka Barrage Project, P.O. Farakka Barrage, Distt. Murshidabad-742212 (W.B.)	Shri S.K. Haldar, General Manager Tel. No. 03485-253644 Fax: 03485-253608
4.	Ganga Flood Control Commission, Sinchai Bhawan, III floor, Patna-800015	Shri A.K. Jain, Chairman Tel. No. 0612-2217294 Fax: 0612-2217960, 2217895
5.	Central Water and Power Research Station, P.O. Khadakwasla, Pune-411024	Shri S. Govindan, Director Tel. No. 020-24380552/ 24103500 Fax: 020-24381004
6.	Central Ground Water Board, Jamnagar House, New Delhi	Shri Shushil Gupta, Chairman Tel. No. 0129-2477100 Fax: 0129 2477200
7.	Bansagar Control Board, Samab Colony, Rewa (Madhya Pradesh)	Shri S.K. Kamboj, Secretary Tel. No. 07662-226318
8.	Sardar Sarovar Construction Advisory Committee, Narmada Bhawan, A Block, IV Floor, Vadodara-390001	Shri N.K Bhandari, Secretary Tel. No. 0265-2421438 Fax 0265-2437262

9.	Upper Yamuna River Board 202, "S", Sewa Bhawan, R.K. Puram, New Delhi-110016	Shri. A. Mahendran, Chairman Tel. No. 26108590 Fax: 26195289
Public Sector Undertakings		1 20170207
10.	Water and Power Consultancy Services (India) Limited, 5 th Floor, 'Kailash', 26, Kasturba Gandhi Marg, New Delhi-	Shri S.K. Haldar, General Manager Tel. No. 03485-253644 Fax: 03485-253608
11.	National Projects Construction Corporation Limited, Plot No.67-68, Sector-25, Faridabad (Haryana)	Shri H.L. Chkaudhary, Chairman & Managing Director, Tel. No. 95129-2231269
Autonomous Bodies		
12.	National Institute of Hydrology, Jal Vigyan Bhawan, Roorkee-247667 (Uttaranchal)	Dr. R.D. Singh,Director Tel. No. 01332-272106 Fax: 01332-272123/273976
13.	National Water Development Agency, 18-20, Community Centre, Saket, New Delhi- 110017	Shri S. Masood Husain, Director General Tel. No. 26519164 Fax: 26513846
Statutory Bodies		
14.	Narmada Control Authority, BG-113, Scheme No.74-C, Vijay Nagar, Indore-452010	Shri A. Mahendran, Executive Member Tel. No. 0731-257276
15.	Brahmaputra Board, Basistha, Guwahati	Shri C.K Agrawal, Chairman Tel. No. 0361- 2301099/2302527 Fax 0361-2301099/2308588
16	Betwa River Board, Nandanpura, Jhansi-284003	Shri R.S. Ram, Chief Engineer Tel. No. 0510-2480210
17.	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt:Bellary, Karntaka State, PIN : 583225	Shri K.S. Jacob, Chairman Tel. No. 040-23308640 Fax 040-23308642

Annexure-IV

BE, RE & Actual Expenditure under Central Sector Schemes during the 12th Plan, 2012-13 & 2013-14 (Rs. crore)

14						(N	S. CIULE)	
Sl. No.	Schemes	XII Plan	2	2012-13			2013-14	
		outlay	BE	RE	Actual	BE	RE	Actual
1	2	3	4		5	6		7
1	Development of Water Resources Information System	2247.00	85.00	40.00	37.98	150.00	43.00	41.19
2	Flood Forecasting	794.00	48.00	30.00	25.15	150.00	25.00	22.98
3	Hydrology Project	120.00	70.00	43.72	37.85	70.00	50.00	38.76
4	GW Management & Regulation	3539.00	318.00	180.0 0	116.10	275.00	140.00	71.67
5	Research & Developement (2552 NE Part and 2701)	360.00	100.00	35.00	31.36	50.00	35.00	30.17
6	HRD /Capacity Building	610.00	100.00	38.90	17.19	94.00	31.50	23.96
а	Information, Education and Communication	230.00	25.00	25.00	7.99	40.00	20.00	15.14
b	National Water Academy	50.00	5.00	4.40	3.06	5.00	4.50	3.86
С	RGN Ground Water Training Institue	100.00	15.00	9.00	6.14	9.00	7.00	4.96
d	Capacity building programme	230.00	55.00	0.50	0.00	40.00	0.00	0.00
е	Training of MoWR officers	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Infrastructure	337.00	55.00	15.00	9.85	50.00	20.00	9.00
	Development							
8	River Basin	1280.00	200.00	134.0	134.66	200.00	150.00	148.46
а	River Basin	5.00	0.00	0.00	0.00	1.00	0.00	0.00
b	Investigation of Water Resources Development Schemes	517.90	100.00	57.40	58.66	90.00	65.00	63.46
С	Re-Structuring of CWC	249.00	10.00	0.00	0.00	9.00	0.00	0.00
d	Brahamaputra Board	508.10	90.00	76.68	76.00	100.00	85.00	85.00
9	River Management Activities and Works related to Border Rivers	763.00	125.00	30.00	26.00	125.00	67.00	17.00
10	Farakka Barrage Project	558.00	75.00	100.0 0	73.56	150.00	115.00	89.82

11	Implementation of National Water Mission (New)	1390.00	200.00	0.25	0.00	110.00	2.00	0.71
12	Irrigation management programme (New)	6000.00	100.00	0.75	0.24	40.00	0.10	0.00
13	Dam Rehabilitation Improvement Project (DRIP)	120.00	24.00	2.30	0.42	36.00	9.00	4.60
14	Bodwad Parisar Sinchan Yojana	0.00	0.00	0.00	0.00	0.00	12.40	0.00
15	Impact Assessment Study	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	EAT				0.52			
	Sub Total I	18118.00	1500.00	650.0 0	510.36	1500.00	700.00	498.32
	Centrally Sponsored Scheme							
	i) AIBP	55200.00	9969.50		5904.13	8750.00		3216.90
	ii) CAD &WM	15000.00	811.65		365.19	1911.00		179.97
	iii) RRR	6235.00	1000.00		40.44	700.00		37.97
	iv) FMP	10000.00	1152.00		193.85	1600.00		379.00
	v) Ground Water Development in Eastern & North Eastern Region	5000.00						
	Sub Total II	91435.00	12933.15	0.00	6503-61	12961.0 0	0.00	3813.84
		51400.00	12000.10	650.0	0000.01	14461.0	0.00	3010.04
	GRAND TOTAL	109553.00	14433.15	0	7013.97	0	700.00	4312.16

BUDGET AT A GLANCE (SECTOR-WISE)

(Rs. crore)

SI	Sector/	Actu	uals	BE 20	13-14	RE 20	13-14	BE 2014	-2015*	Total
No.	Organisation /Scheme	2012	-13							B.E . 2014- 15
	,	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
١.	Secretariat-									
	Economic Services									
1.	Ministry of Water	0.00	44.77	0.00	38.41	0.00	51.96	0.00	41.70	41.70
	Resources									
2.	Ravi-Beas Waters	0.00	0.40	0.00	0.48	0.00	0.39	0.00	0.56	0.56
	Tribunal									
3.	Cauvery Water	0.00	1.55	0.00	2.24	0.00	1.52	0.00	2.10	2.10
	Disputes Tribunal									
4.	Krishna Water	0.00	1.85	0.00	1.95	0.00	2.13	0.00	2.30	2.30
	Disputes Tribunal									
5.	Vansadhara Water	0.00	2.72	0.00	4.22	0.00	3.00	0.00	3.63	3.63
	Dispute Tribunal									
6.	Mahadayi Water	0.00	1.23	0.00	3.59	0.00	2.52	0.00	2.78	2.78
	Disputes Tribunal									
	Total SES	0.00	52.52	0.00	50.89	0.00	61.52	0.00	53.07	53.07
н.	Medium Irrigation									
	Central Water									
	Commission									
1.	Direction &	0.00	27.51	0.00	31.41	0.00	28.90	0.00	31.03	31.03
	Administration									
2.	Data Collection	0.00	88.39	0.00	95.02	0.00	82.53	0.00	96.79	96.79
3.	Training	0.00	0.31	0.00	0.42	0.00	0.32	0.00	0.39	0.39
4.	Research	0.00	1.77	0.00	2.01	0.00	2.02	0.00	2.35	2.35
5.	Survey &	0.00	8.23	0.00	6.04	0.00	5.84	0.00	7.09	7.09
C	Investigation	0.00	20.00	0.00	20.62	0.00	26.05	0.00	20.24	20.24
6.	Consultancy	0.00	28.68	0.00	29.63	0.00	26.95	0.00	28.34	28.34
7.	Contribution to									
	International									
0	bodies Cominana and		0.00	0.00	0.02	0.00	0.01	0.00	0.01	0.01
δ.	Seminars and	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.01	0.01
	conferences on	J								
	water resources	-								
٥	Exhibition and	0.00	0.14	0.00	0.16	0.00	0 17	0.00	0.20	0.20
5.	Trade Fair	0.00	0.14	0.00	0.10	0.00	0.17	0.00	0.20	0.20
10	Modernization of	0.00	0.28	0.00	0.20	0.00	0.26	0.00	0.31	0.31
10.	equinment CWC	0.00	0.20	0.00	0.29	0.00	0.20	0.00	0.51	0.51
	Offset Press									
	0.130111035									

* Provisional subject to approval by Parliament.

SI	Sector/	Acti	uals	BE 20	13-14	RE 20	13-14	BE 2014	-2015*	Total
No.	Organisation /Scheme	2012	-13							B.E . 2014- 15
		Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
11.	Cell for monitoring externally aided	0.00	1.14	0.00	1.26	0.00	0.85	0.00	0.98	0.98
12.	Water Planning Wing	0.00	1.58	0.00	1.93	0.00	1.58	0.00	1.83	1.83
13.	Hydrological observations in	0.00	2.20	0.00	2.38	0.00	2.70	0.00	2.93	2.93
	Total CWC	0.00	160.23	0.00	170.57	0.00	152.13	0.00	172.25	172.25
14	Central Soil and	0.00	9.87	0.00	12.01	0.00	9.45	0.00	10.83	10.83
15.	Materials Research Station Central Water & Power Research Station	0.00	33.91	0.00	44.10	0.00	44.88	0.00	48.11	48.11
16.	National Institute of Hydrology	0.00	10.32	0.00	9.65	0.00	12.80	0.00	14.00	14.00
17.	Sardar Sarovar Construction Advisory Committee	0.00	0.76	0.00	0.88	0.00	0.77	0.00	0.91	0.91
18.	Bansagar Control Board	0.00	0.19	0.00	0.25	0.00	0.29	0.00	0.35	0.35
19.	Sutlej Yamuna Link Canal Project	0.00	0.00	0.00	5.79	0.00	0.80	0.00	15.00	15.00
20.	Upper Yamuna River Board	0.00	0.87	0.00	1.40	0.00	1.40	0.00	1.40	1.40
21.	Krishna River Management Board	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00*	0.00*
22.	Godavari River Management Board	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00*	0.00*
23.	Research and Development	31.37	0.00	50.00	0.00	35.00	0.00	50.00	0.00	50.00
24.	Development of Water Resources	38.30	0.00	149.98	0.00	43.00	0.00	225.38	0.00	225.38
25	Hydrology Project	37.90	0.00	70.00	0.00	50.00	0.00	31.38	0.00	31.38
26.	Infrastructure Development	1.41	0.00	2.55	0.00	1.30	0.00	2.90	0.00	2.90
27.	Human Resource Development/ Capacity Building	11.09	0.00	85.00	0.00	24.50	0.00	43.00	0.00	43.00
28.	River Basin Management	58.67	0.00	100.00	0.00	65.00	0.00	107.00	0.00	107.00
29.	Implementation of National Water Mission	0.00	0.00	110.00	0.00	2.00	0.00	40.00	0.00	40.00

* Additional funds amounting Rs. 2.00 crore (Rs. 1.00 crore for each of the two Boards) have been sought from Ministry of Finance. Their response is awaited.

SI No.	Sector/ Organisation /Scheme	Actu 2012-	uals -13	BE 20	BE 2013-14 RE 2013-14 BE 2014-2015*		-2015*	Total B.E . 2014- 15		
		Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
30.	Irrigation	0.24	0.00	40.00	0.00	0.10	0.00	1.00	0.00	1.00
	Management Programme									
31.	Dam Rehabilitation and Improvement Programme	0.43	0.00	36.00	0.00	9.00	0.00	30.00	0.00	30.00
32.	Bodwad Parisar Sinchan Yojana	0.00	0.00	0.00	0.00	12.40	0.00	200.00	0.00	200.00
33.	AIBFMP (Impact Assessment Studies)	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	50.00
34	Accelerated Irrigation Benefit Programme & Flood	0.00	0.00	0.00	0.00	0.00	0.00	10492.22	0.00	10492.22
	Management Programme (AIBEMP)									
35.	Polavaram Multi	0.00	0.00	0.00	0.00	0.00	0.00	250.00	0.00	250.00
	Total Medium	179.41	216.15	643.53	244.65	242.30	222.52	11522.88	262.85	11785.73
	Irrigation									
1	Ninor Irrigation	0.00	110 65	0.00	124 21	0.00	177 27	0.00	126.25	126.25
1.	Water Board	0.00	118.05	0.00	134.31	0.00	127.32	0.00	130.35	130.35
2.	Ground Water	118.28	0.00	275.00	0.00	140.00	0.00	325.00	0.00	325.00
	Management and Regulation									
3.	Development of Water Resources Information System	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.02
4.	Infrastructure	3.45	0.00	28.00	0.00	7.70	0.00	48.60	0.00	48.60
5.	Human Resource	6.09	0.00	9.00	0.00	7.00	0.00	7.00	0.00	7.00
	Development/ Capacity Building									
	Total : Minor	127.82	118.65	312.02	134.31	154.70	127.32	380.62	136.35	516.97
	Irrigation									
IV.	Flood Control									
1.	Central Water Commission	0.00	71.36	0.00	74.72	0.00	72.59	0.00	79.88	79.88
2.	Payment to Govt. of Bhutan for	0.00	0.00	0.00	1.20	0.00	0.23	0.00	1.18	1.18

SI	Sector/	Actı	uals	BE 20	13-14	RE 201	13-14	BE 2014-2015*		Total
No.	Organisation /Scheme	2012	-13							B.E . 2014- 15
	,	Plan	Non-	Plan	Non-	Plan	Non-	Plan	Non-	
			Plan		Plan		Plan	-	Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	maintenance of									
	flood forecasting									
	and warning									
2	Strongthoning	0.00	2 7 2	0.00	2 04	0.00	2 71	0.00	2 72	2 72
5.	and	0.00	2.75	0.00	5.04	0.00	2.71	0.00	5.25	5.25
	modernization of									
	flood forecasting									
	and hydrological									
	network in									
	Brahmaputra and									
	Barak Basin									
	Total : CWC	0.00	74.09	0.00	78.96	0.00	75.53	0.00	84.29	84.29
4.	Emergent Flood	0.00	2.49	0.00	3.00	0.00	3.00	0.00	3.00	3.00
	Protection									
	Measures in									
	Eastern and									
-	Western Sectors	25.21	0.00	150.00	0.00	25.00	0.00	100.00	0.00	100.00
5. 6	Pivor	25.21	0.00	125.00	0.00	25.00	0.00	175.00	0.00	100.00
0.	Management	25.55	0.00	125.00	0.00	07.00	0.00	175.00	0.00	175.00
	Activities and									
	Works related to									
	Border Areas									
7.	Infrastructure	4.99	0.00	19.45	0.00	11.00	0.00	28.50	0.00	28.50
	Development									
8.	River Basin	76.00	0.00	100.00	0.00	85.00	0.00	143.00	0.00	143.00
	Management									
	Total : Flood	132.19	76.58	394.45	81.96	188.00	78.53	446.50	87.29	533.79
	Control									
۷.	Other Transport									
	Services									
1.	Farakka Barrage	73.57	40.79	150.00	56.17	115.00	41.71	150.00	44.00	194.00
2	Project	0.00	2.07	0.00	2 5 6	0.00	2 22	0.00	2.46	2.46
2.	Jangipur Barrage	0.00	2.07 5.25	0.00	2.30 6.01		2.22 7 1 9	0.00	2.40 7 20	2.40 7 20
5.	Total · Transport	73.57	48.11	150.00	64.74	115.00	51.11	150.00	53.84	203.84
	Services	,	.0.11	100.00	0		01.11	200100		
	TOTAL:	512.99	512.01	1500.00	576.55	700.00	541.00	12500.00	593.40	13093.40
	(I to V) \$									
VI.	AIBP and other	6503.58	0.00	12962.00	0.00	6162.00	0.00	0.00	0.00	0.00
	Water Resources									
	Programme									
	GRAND TOTAL	7016.16	512.01	14462.00	576.55	6862.00	541.00	12500.00	593.40*	13093.40*

Source of financing : \$ Demand No.106 – Ministry of Water Resources for 2014-2015. *Figures will be available in Demand No.36-Ministry of Finance (Transfer to State and Union Territory Governments). The scheme has since been included in the Demand of MoWR w.e.f. 2014-15

*An additional requirement of Rs.6.24 crore under various schemes as well as for the two Boards of MoWR under Non-Plan for committed liabilities during 2014-15 has been requested to MoF. Their response is awaited.

1			
Name & Designation of CPIO appointed	Name of the Section/ Desk/ work	Name & Designation of theAppellateAuthority	
(S/Shri/Smt)		appointed (S/Shri/Smt/Kum)	
L.P. Sharma, Under Secretary (Admn) Arun Kumar, Under Secretary (Coord)	Administration Section & SC/ST/OBC Cell Coordination Section	Khatchin Langel, DS (Coord & Admn)	
R.K. Ojha, Under Secretary (Parliament)	Parliament	Ram Swarup, Director (E-III & Parliament) except for establishment matters of FBP	
Secretary (E-III)	Establishment III Section		
Ashok Kumar Gupta, Under Secretary (ID)	Infrastructure Development	Prabhat Tyagi, Director	
Narendra Singh, Under Secretary (E-I & Vig)	Establishment I and Vigilance Sections	(Vigilance & Estt) includin establishment matters of FBP	
Vineeth Abraham, Under Secretary (CGWB)	Central Ground Water Board Desk	Charul Baranwal, Director (GW Estt & GA)	
Rajendra Kumar Ojha, Under Secretary (GA)	General Administration & CR Sections		
Shashi Pal, Under Secretary (PSU & PPP)	Public Sector Undertakings Section and PPP Cell	R.K. Gupta, Director (GW & e- Gov.)	
Nandanan. N, Under Secretary (GW)	Ground Water Desk		
Ashok Kumar Gupta, Under Secretary (e-Gov.)	e-Governance Cell		
V.K. Balayan, Under Secretary (EA & WS)	External Assistance Desks including Foreign Training & Bilateral issues and Internal Work Study Unit	M.R. Jogesh, Deputy Secretary (EA & WS)	
B.L. Meena, Under Secretary (B&B)	Water Quality Issues	Ravindra Singh, Director (Water Quality)	

ShashiPal,UnderSecretary(Information,EducationandCommunication)	Information, Education and Communication Cell Establishment-II Section	Ashok Gupta, Director (IEC & E-II) Ramesh Babu
Director (OL)		Aniyeri, Director (OL)
Avanish Kanth, Sr. Hydrogeologist	Hydrology Project matters of Brahmaputra & Barak Wing	Anuj Kanwal, Sr. Joint Commissioner (B&B)
B.L. Meena, Under Secretary (B&B)	Matters of Brahmaputra & Barak Wing other than Hydrology Project	
Munni Lal, Sr. Joint Commissioner (Ganga)	Ganga Wing	N.K. Mathur, Commissioner (Ganga)
Ravish Ali, Under Secretary (PP)	Policy and Planning Section	
Ajay Kumar, Under Secretary (E-IV)	Matters related to NCA, NWA, BCB, BRB, SSCAC, Tungabhadra Board and establishment matters of NWDA	M.K. Sinha, Sr. Joint Commissioner (PP)
Jani Ram Boro, Sr. JC (SPR)	State Projects Wing – for CAD related matters	Pradeep Kumar, Commissioner (SPR)
Asit Chaturvedi, Deputy Commissioner (BM)	River Basin Management, Administration of UP, Bihar, MP Reorganization Act, Inter State Water Disputes Act, Inter State Water Disputes Tribunal, technical matters of NWDA and Inter-linking of Rivers	S.K. Gangwar, Sr. JC (BM)
Anant Ram, Section Officer (Projects)	Project Section	T.D. Sharma, Sr. Joint Commissioner (PR)

S.K. Dahiya, Under Secretary (Pen. River)	Peninsula River Wing	Reading Shimray, Sr. JC (Pen. River)
Anil Kumar, Assistant Engineer (MI)	Minor Irrigation	S.L. Jain, Sr. Joint
Ashok Kaushik, Under Secretary (WB)	Water Bodies	Commissioner (MI)
S.P. Abraham, Sr. Joint Commissioner (Indus)	Indus Wing	G. Aranganathan, Commissioner (Indus)
Mamta Saxena, DDG (MI Stats)	Minor Irrigation Statistics	Sudha Middha, Additional Director General
Vijay Srivastava, Under Secretary (Finance)	Finance Wing – Finance Desks and Budget Section	S.K. Thakur, Director (Finance)
Joginder Singh, Director (National Water Mission)	National Water Mission	M. Satyanarayana, Advisor (Coord & Monitoring)
K.K. Pandey, Assistant Controller of Accounts	MattersrelatedtoPrincipalAccountsOfficeand CashSection	
Bishwanath Das, Sr. Accounts Officer (FBP)	Matters related to Pay & Accounts Office (FBP)	
D.D. Gaikwad, Sr. Accounts Officer (CWPRS)	Matters related to Pay & Accounts Office (CWPRS)	
D.P. Sharma, Sr. Accounts Officer (CGWB)	Matters related to Pay & Accounts Office (CGWB)	Alok Ranjan, Controller of
Shalabh Kumar, Assistant Controller of Accounts (CWC)	Matters related to Pay & Accounts Office (CWC)	Accounts
Vijay Pal, Pay & Accounts Officer	Matters related to Pay & Accounts Office (CSMRS)	

Note : In case work of any CPIO/ Appellate Authority is changed due to transfer/ retirement/ any other reasons and a new official joins in place of the existing CPIO/ Appellate Authority, he/ she would automatically be the CPIO/ Appellate Authority of the allotted work. In case any CPIO/ Appellate Authority proceeds on leave/ training, the concerned Link Officer or the officer who is entrusted with the charge of the post of the concerned Division/ Branch Head would automatically be the CPIO/ Appellate Authority of the allotted work.

List of Postal Addresses of Public/ Staff Grievance Officers in the Ministry of Water Resources and Its Various Organizations

S. No.	Name of the Organization	Address	Name & Designation of P.G./ S.G. Officer
1.	Ministry of Water Resources	Room No.425, Sham Shakti Bhavan, New Delhi-110001 (Tele No. 23714734)	Shri Khatchin Langel, Deputy Secretary (Admn.) & Director (PG & SG)
2.	Narmada Control Authority	Narmada Sadan, Sector-B, Scheme No. 74, Vijay Nagar, Indore – 452010(MP) (Tele No. 0731-2554477)	Shri Naresh Lall, Secretary and Grievance Redressal Officer
3.	Bansagar Control Board	Bansagar Control Board, Samab Colony, Rewa (MP) (Tele No. 07662-226318), 0755-2762059 (Fax No. 07662-242433 –Fax No. 0755-2558264)	Shri S.K. Kamboj, Director (Monitoring), CWC, Bhopal & Director (Staff Grievances)
4.	Betwa River Board	O/o Pay & Account Officer, Betwa River Board, Nandanpura, Jhansi-284003 (U.P) (Tele No. 0510-2480279)	Shri O.P. Kalra, Pay & Account Officer & Public Grievance Officer
5. (Central Ground Water Board	CGWB, CHQ, Faridabad (Tele No. 95129- 2419075) Fax No.95129- 2419059, 2419084)	Shri U.V. Singh, LIO & Staff Grievances Officer
		CGWB, CHQ, Faridabad (Tele No.95129-2415024 & (Fax No. 95129-2412524)	Dr. S.K. Jain, Sr. Hg. Scientist 'D' & Public Grievances officer
6.	Central Soil and Materials Research Station	Room No. 309, CSMRS, Olof Palme Marg, Hauz Khas, New Delhi – 110 016 (Tel No.26562114, 26850025)	Shri Mahavir Dixit, Scientist 'D' & Director (Grievances)
7.	Central Water Commission	Room No. 313(S), Sewa Bhawan, R.K. Puram, New Delhi-110066 (Tele No. 26187232) (Fax No. 26195516)	Shri A.K. Srivastava, Secretary & Grievances Officer

8.	Central Water & Power Research Station	Central Water & Power Research Station, P.O. Khadakwasla Research Station, Pune – 411024 (Tele No. 020-24103236) (Fax No. 020-24381004)	Shri T. Nagendra, Joint Director & Chairman (Grievance Cell)
9.	Farakka Barrage Project	P.O. Farakka Barrage, Distt. Murshidabad, West Bengal- 742212 (Tele No. 03485 – 253285) (Fax No. 03485-253608)	Shri Rajesh Kumar, Superintending Engineer (Coord.) & Director (Staff Grievances)
10.	Ganga Flood Control Commission	Ganga Flood Control Commission, Sinchai Bhawan, IIIrd Floor, Patna-800015 (Tele No. 0612-2233591) (Fax No. 0612-2222294)	Shri Ravi Bhushan Kumar, Director (Admn.) & Director (Staff Grievances & Public Grievances)
11.	National Institute of Hydrology	Jal Vigyan Bhawan, Roorkee- 247667 (Uttaranchal) (Tele No. 01332-276414)	Dr. J.V. Tyagi, Scientist F, Public Grievance Officer & OIC, Staff Grievances
12.	National Projects Construction Corporation Limited	NPCC Ltd., Plot No. 67-68, Sector 25, Faridabad (HNA) (Tele No. 0129-2234760) (FAX No0129- 4067915, 2230 891)	Shri A.K Gupta, GGM (HR) and Director (Staff Grievances) Shri K.K.Sharma, GGM (CMW), Member (Staff Grievances Redressal Grievance Committee)
13.	National Water Development Agency	18-20, Community Centre, Saket, New Delhi-110017 (Tele No. 26852735) (Fax No. 26960841)	Shri R.K. Jain, Chief Engineer (HQ) & Grievance Officer
14.	Sardar Sarovar Construction Advisory Committee	Sardar Sarovar Construction Advisory Committee, Narmada Bhavan, "A" Block 4 th Floor, Vadodara – 390001 (Tele No. 0265-2421272) Fax No. 0265-2437262 (Telefax)	Shri Sushil Kumar, Deputy Secretary (Grievances)
15.	Water & Power Consultancy Services (India) Ltd.	76-C, Institutional Area, Sector- 18, Gurgaon-122015 (Tele No. 0124-2348022, 2397392, 2349448, 2399220)	Shri S. Vijaya Rao, Director (Staff/Public Grievances)
16.	Brahmaputra Board	Basistha, Guwahati – 29 (Tele No.0361-2300128) (Fax No. 0361-2308588)	Shri G.P Singh, Secretary & Director (Staff/Public Grievances)

17.	Upper Yamuna River Board	Upper Yamuna River Board, Wing No. 4, Ground Floor, West Block No. 1,R.K. Puram, New Delhi-110066 (Tele26174147, 26184025)	Shri H.K. Sahu, Member Secretary & Director of Grievances
18.	Tungabhadra Board	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt: Bellary, Karnataka State, PIN: 583225 Phone-08394-259113	Shri D. Ranga Reddy, Secretary & Director of Grievances