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2010-11



**GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES
NEW DELHI**

Abbreviations

ADB	Asian Development Bank	INCGW	Indian National Committee on Ground Water
AIBP	Accelerated Irrigation Benefits Programme	INCH	Indian National Committee on Hydraulic Research
BB	Brahmaputra Board	INCID	Indian National Committee on Irrigation and Drainage
BCB	Bansagar Control Board	INCOH	Indian National Committee on Hydrology
BRB	Betwa River Board	ISRO	Indian Space Research Organisation
CADWM	Command Area Development & Water Management	ISRWD	Inter-State River Water Disputes
CCA	Culturable Command Area	JBIC	Japan Bank for International Cooperation
CEA	Central Electricity Authority	JCWR	Joint Committee on Water Resources
CGWB	Central Ground Water Board	JET	Joint Expert Team
CSMRS	Central Soil & Materials Research Station	JGE	Joint Group of Experts
cumec	cubic metre per sec	JRC	Joint Rivers Commission
cusec	cubic foot per sec	Kfw	Kreditanstalt fur Wiederaufbau
CWC	Central Water Commission	KWDT	Krishna Water Disputes Tribunal
CWPRS	Central Water & Power Research Station	MI	Minor Irrigation
CLA	Central Loan Assistance	MoU	Memorandum of Understanding
CRA	Cauvery River Authority	M & M	Major and Medium
CWDT	Cauvery Water Disputes Tribunal	Mha	million hectares
DPR	Detailed Project report	MoWR	Ministry of Water Resources
DSS	Decision Support System	NAPCC	National Action Plan on Climate Change
DRIP	Dam Rehabilitation and Improvement Project	NCA	Narmada Control Authority
EFC	Expenditure Finance Committee	NCSDP	National Committee on Seismic Design Parameters
ERM	Extension, Renovation and Modernization	NHDC	Narmada Hydro-electric Development Corporation
FPARP	Farmers' Participatory Action Research Programme	NLSC	National Level Steering Committee

FBP	Farakka Barrage Project	NLPMC	National Level Programme Monitoring Committee
FMP	Flood Management Programme	NPP	National Perspective Plan
FR	Feasibility Report	NWDT	Narmada Water Disputes Tribunal
FRL	Full Reservoir Level	NWM	National Water Mission
GFCC	Ganga Flood Control Committee	NPCC	National Projects Construction Corporation Ltd
GRA	Grievances Redressal Authority	NWDA	National Water Development Authority
HP	Hydrology Project	NCMP	National Common Minimum Programme
IBRD	International Bank of Reconstruction and Development	OFD	On Farm Development
IEC	Information, Education and Communication	PAC	Project Advisory Committee
INCGECM	Indian National Committee on Geotechnical Engineering and Construction Materials	PAF	Project Affected Families
PDS	Purpose Driven Studies	TAC	Technical Advisory Committee
PIM	Participatory Irrigation Management	TAMC	Technical Assistance and Management Consultancy
PSC	Permanent Standing Committee	TOR	Terms of Reference
RMIS	Rationalisation of Minor Irrigation Statistics	TB	Tungbhadra Board
RRR	Repair, Renovation and Restoration	UYRB	Upper Yamuna River Board
R&R	Rehabilitation and Resettlement	WAPCOS	Water and Power Consultancy Services (India) Ltd
RRSSC	Regional Remote Sensing Service Centre	WB	World Bank
SS	State Sector	WEGWIS	Web Enabled Ground Water Information System
SSCAC	Sardar Sarovar Construction Advisory Committee	WQAA	Water Quality Assessment Authority
SAC	Standing Advisory Committee	WRIS	Water Resources Information System
SCEC	Sub Committee on Embankment Construction	WUA	Water User Association
SSP	Sardar Sarovar Project		

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Chapter 1

An Overview

Water is one of the most precious natural resources, without which it is impossible to sustain life. India has 4% of water resources of the world, while it has to support 16% of world population and 15% of livestock.

The annual precipitation including snowfall, which is the main source of water in the country, is estimated to be of the order of 4000 Billion Cubic Metres (BCM). The estimated precipitation during the monsoon season (June to September) is of the order of 3000 BCM. The effect of global warming on hydrological cycle could result in further intensification of temporal and spatial variations in precipitation, snowmelt and water availability. The resources potential of the country, which occurs as natural run off in the rivers is about 1869 BCM, considering both surface and ground water as one system.

Due to various constraints of topography and uneven distribution of resources over space and time, it has been estimated that presently only about 1123 BCM of the estimated average runoff of 1869 BCM is utilisable. With increasing population, the per capita water availability has reduced to about one third since independence. Another important challenge is related to over-exploitation of ground water in some areas. At present, about 15% of the assessment blocks are over-exploited and about 14% of the assessment blocks fall in the category of critical and semi-critical blocks. There is also gap between the

irrigation potential created and utilized and at present, 15 % of the created irrigation potential remains unutilized. Further, irrigation infrastructure is not operating at desirable efficiency. Efficiency of surface water projects is about 35-40% and of ground water facilities is about 65%, which can, however, be increased to 60% and 75% respectively. There is also problem of water quality relating to geogenic, arsenic, fluoride, nitrate and iron contamination in ground water. Further, many areas of the country frequently suffer from floods, which cause substantial damages.

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 and 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 cooperation 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 carried out through its two attached offices (Central Water Commission and Central Soil and Materials Research Station), seven subordinate 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 bodies (societies) (National Water Development Agency and National Institute of Hydrology) and two public sector enterprises (Water and Power Consultancy Services (India) Limited and National Projects Construction Corporation Limited).

The Ministry was headed by Hon'ble Shri Pawan Kumar Bansal as the Union Minister of Water Resources upto 19th January 2011 and is now headed by Hon'ble Shri Salman Khurshid as the Union Minister of Water Resources with Hon'ble Shri Vincent H. Pala as the Minister of State for Water Resources. Shri Dhruv Vijai Singh is the Secretary in the Ministry after the retirement of Shri U.N Panjiar on 31st October, 2010 with Shri G Mohan Kumar as the Additional Secretary. The organisational chart of the Ministry is at **Annexure-I**. The staff strength of the Ministry and its organizations is at **Annexure-II**. The list of head of organizations under the Ministry of Water Resources is at **Annexure-III**.

There are 12 Wings in the Ministry, namely, Administration, Coordination, Integrated Finance & Accounts, Policy & Planning, Projects, Brahmaputra & Barak, Ganga, Indus,

Command Area Development & Water Management, Ground Water, Minor Irrigation Statistics and External Assistance.

The Ministry is implementing and monitoring 4 State Sector and 15 Central Sector Schemes. The State Sector Schemes implemented and monitored by the Ministry during 2010-11 include Accelerated Irrigation Benefits Programme (AIBP), Flood Management Programme (FMP), Command Area Development and Water Management (CADWM) and Repair, Renovation & Restoration (RRR) of Water Bodies.

The Central Sector Schemes implemented by the Ministry during 2010-11 include the Development of Water Resources Information System, Hydrology Project, Investigation of Water Resources Development, Research and Development, Information, Education and Communication, Infrastructure Development, Ground Water Management and Regulation, Dam Safety Studies and Planning, Flood Forecasting, River Management Activities in Border Areas and Farakka Barrage Project. In addition, works related to National Water Academy and Rajiv Gandhi Institute of Training and Research were also carried out. Consultations with the concerned State Governments were continued for implementing the schemes of River Basin Organisation for Mahanadi and Godavari river basins and for expediting Pagladia Project.

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

A summary of important audit observations printed in the report of the CAG of India Union Government (Civil) - No.4 of 2010-11- Performance Audit of Accelerated Irrigation Benefits Programme (AIBP) is at **Annexure-V**.

Major Achievements

- The State Governments have been provided an amount of Rs.43539.92 Crore as CLA/Grant under **Accelerated Irrigation Benefits Programme (AIBP)** since its inception till December, 2010 for 283 major/medium irrigation projects and 11704 surface minor irrigation schemes. Out of 283 projects, a total of 129 projects have been completed and out of 11704 surface MI schemes, 7987 schemes have been completed. The grant released during 2010-11 is of Rs. 1810.54 Crore up to 31st December 2010. This also includes Central Assistance of Rs. 324.79 Crore released to North Eastern States.

14 projects have been identified as **National Projects** for which Central assistance of 90% of cost of the project is provided. Out of these 14 projects, three projects viz., Gosikhurd (Maharashtra); Shahpur Kandi (Punjab) and Teesta Barrage Project (West Bengal) are under execution. During 2010-11 (till December 2010), an amount of Rs. 635.28 Crore has been released to Gosikhurd Project.

- Under the scheme of **RRR of water bodies**, as against the total budget provision of Rs. 600 crore for meeting the central component of funding, Rs.119 crore has been released to Govt. of Andhra Pradesh, Rs.7.33 crore to Govt. of Madhya Pradesh, Rs.29.08 crore to Govt. of Uttar Pradesh and Rs.25 crore to Govt. of Bihar under domestic support and Rs.117.81 crore under EAP component during 2010-11 (up to December 2010).
- Under the State Sector Scheme of **Command Area Development and Water Management Programme (CAD&WM)**, as against an outlay of Rs.499.00 Crore during 2010-11, central assistance amounting to Rs.121.66 Crore

(upto December 2010) has been released to States.

- 15 States viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, 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 56,934 Water Users' Associations have been formed in various States covering an area of 13.538 M.ha. in the command areas of irrigation projects.
- The 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 579 schemes of 9 States, namely, Bihar, Gujarat, Madhya Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Orissa and Uttar Pradesh have been approved for reclamation of 78.81 thousand hectre water logged area. Out of this, an area of 52.11 thousand hectre has been reported to be reclaimed by these States.
- Central Ground Water Board under their **Ground Water Exploration Programme** constructed 498 wells during 2010-11 (upto 31st December, 2010) to assess the ground water potential in different hydrogeological set up.
- The Central Ground Water Authority is regulating withdrawal of ground water by industries/ projects in 839 Over-exploited and 226 Critical Assessment Units.
- CGWA has notified 43 critical/ over-exploited areas in parts of NCT Delhi, Haryana, Punjab, Andhra Pradesh,

Rajasthan, MP, Gujarat, West Bengal, Uttar Pradesh and Diu for control and regulation of development of ground water resources.

- **Ground Water Legislation:** To enable the States to enact Ground Water Legislation, a Model Bill to Regulate and Control Development of Ground Water has been circulated by the Ministry of Water Resources to all the States/UTs. So far, 11 States/UTs viz. Andhra Pradesh, Goa, Tamil Nadu, Kerala, West Bengal, Himachal Pradesh, Bihar and Union Territories of Lakshadweep, Chandigarh, Dadra & Nagar Haveli and Puducherry have enacted and implemented ground water legislation. 18 States/UTs are at various stages of enactment of legislation.
- **Farmers Participatory Action Research Program (FPARP):** The Ministry of Water Resources, Government of India, has been implementing Farmers Participatory Action Research Program (FPARP) throughout the country with the help of 60 institutions viz. Agricultural Universities, ICAR Research Institutes, ICRISAT, WALMIS and NGOs in 25 States/UTs at the cost of Rs. 24.47 Crore with a view to demonstrating the technologies available to the farmers for increasing productivity and profitability of agriculture. In the first phase, which started in Rabi 2007-08, a sum of Rs. 21.5 crore were released and a total of 4912 demonstrations were completed and remaining are in progress. Considering the overall benefit of the program in terms of water saving, increase in yield leading to more crop per drop of water, MoWR has decided to extend the program to conduct additional 5000 demonstrations in Phase-2 at a cost of Rs.25 Crore during the remaining period of the XIth Five Year Plan i.e. 2010-11 & 2011-12. An amount of Rs. 9.35 Crore have been released for implementation of 1920 demonstrations by 23 institutes.
- **Demonstrative Projects on Artificial Recharge to Groundwater & Rainwater Harvesting:** Demonstrative projects on artificial recharge to Ground Water and Rain Water Harvesting have been approved and are being implemented in the States of Kerala, West Bengal, Punjab Arunachal Pradesh, Andhra Pradesh, Karnataka, Gujarat, Maharashtra, Chandigarh (UT), Madhya Pradesh, Jharkhand, Uttar Pradesh and Tamil Nadu during XIth Plan. A total amount of Rs. 4863.03 lakh has been approved and Rs. 3347.29 lakh has been released as on 31st December, 2010. 381 structures have been completed till December, 2010.
- **Web Enabled Ground Water Information System (WEGWIS):** A Web Enabled Ground Water Information System for dissemination of ground water related information has been developed by CGWB. This provides access to various thematic layers as well as the nation wide data base on ground water level and water quality generated by CGWB. This initiative will help in more effective sharing of information relating to ground water resource availability and water quality with user groups, planners and administrators.
- **MoU between CGWB and RITES:** A Memorandum of Understanding was signed between RITES and CGWB on May, 2010 relating to ground water modeling of the area around railway tunnel – 3 in Katra-Udhampur Section of USBRL Project, J&K. The objective of the collaborative study is to stimulate ground water flow regime in the aquifer system in the tunnel No. 3 on Udhampur-Katra Section of the USBRL project in Jammu & Kashmir.
- **MoU between CGWB & GSI:** A Memorandum of Understanding on "Geo-scientific data sharing and

Cooperation in the field of Ground Water, Sub-surface Geology & Hydrology" between Geological Survey of India and Central Ground Water Board was signed by Shri B.M. Jha, Chairman, CGWB and Shri N. Dutta, Director General, GSI on 8th July, 2010. The main objective of MOU is to facilitate sharing of geo-scientific data available with both the organizations for sustainable development of ground water resources, to integrate and synthesise the scientific data base available with both the organizations, training and capacity building of personnel of both organizations and to take up pilot projects in the field of Sub-surface Geology and Hydrology for ground water development.

- **Patal Saraswati Jalodgar Yojna:** A Memorandum of Understanding was signed between ONGC and CGWB on 22.12.2010 for deep ground water exploration. ONGC proposes to explore deep aquifers (more than 500 m), not explored till date. The main objective of the MoU is to explore new sources of ground water in the desert/drought prone areas of Gujarat, Rajasthan and Haryana.
- **Ground Water Management Studies:** An area of 1.60 lakh sq.Km was covered during pre-monsoon period and post-monsoon studies have been completed in 1.05 lakh sq.Km upto 31st December, 2010. The CGWB has explored aquifers in various States/UTs under its scientific exploratory drilling programs by utilizing remote sensing and geophysical techniques.
- A total of 353 **flood control/ river management schemes** from 22 States (with a total estimated cost of Rs.6796.93 Crore) have been approved under FMP for providing central assistance to States. A total central assistance of Rs.1571.06 Crore was released to States as on 31.03.2010. Further, central assistance amounting to Rs.756.30 Crore has been released to

States during the financial Year 2010-11 (upto 31.12.2010). A total of 117 schemes were completed by the State Governments as on 31.03.2010. In addition, 26 more schemes are reported to be completed upto 30th November, 2010.

- Three bank protection/ flood control works covering six locations on Mahananda river in West Bengal along international border with Bangladesh have been completed at a cost of Rs.32.71 Crore. 100% central assistance was provided by the Ministry of water resources for the above works. In addition, central assistance of Rs. 32.12 Crore has been released during 2010-11 to the State Government of West Bengal for undertaking ten more bank protection works along international border.
- During the flood season 2010 (May to Oct.), 7508 flood forecasts were issued which included 6489 level forecasts and 1019 inflow forecasts. Out of total 7508, 7368 forecasts (98.14%) were found within accuracy limit. These forecasts have been proved to be very useful in saving life and public properties as a result of timely action by the authorities.
- During the financial year 2010-11, an amount of Rs. 24.50 Crore has been provided under **Infrastructure Development Scheme**. The expenditure incurred upto January 2011, is Rs. 18.07 Crore on Land & Building and Rs. 2.7 Crore on Information Technology components of Central Water Commission/ Central Ground Water Board/ Ministry (Proper). Constructions of buildings and offices of Central Water Commission at Hyderabad, Jammu, Kolkata and Delhi Library have been completed.
- A new MoU upon provision of hydrological information of Sutlej/Langgen Zangbo river in flood season by China to India with a validity

of five years has been signed with China on 16.12.2010 during the visit of Hon'ble Prime Minister of China to India during December, 2010.

- **Ken-Betwa Link Project:** The DPR of Phase-I of the project was completed by NWDA in April, 2010 and submitted to Government of Madhya Pradesh and Uttar Pradesh in May, 2010. The status of the Ken-Betwa Link was further discussed by Secretary (WR) on 4.8.2010 during which it was decided that the survey & investigation(S&I) works of major/medium projects in Upper Betwa Sub-basin will be taken up by NWDA after firming up the feasibility of these projects. Series of Barrages on Betwa river and projects on tributaries of Betwa would be taken up thereafter. NWDA has taken up the work of preparation of DPR of Phase-II of Ken-Betwa Link Project.
- The Governments of Maharashtra and Gujarat have conveyed their concurrence for preparation of DPR of **Par – Tapi- Narmada and Damanganga – Pinjal links**. A MoU for preparation of DPRs of both these links was signed on 3.5.2010 by the Chief Ministers of Gujarat, Maharashtra and Union Minister of Water Resources in the presence of Prime Minister. The work of preparation of these DPRs was started by NWDA during January, 2009 and is planned to be completed by December, 2011.
- **Intra-State River Links:** NWDA has received 36 proposals from 7 States viz. Jharkhand, Maharashtra, Bihar, Gujarat, Orissa, Rajasthan and Tamil Nadu for Intra-State links. PFRs of the 12 Intra-State links (3 Jharkhand, 6 Bihar, 1 Orissa and 2 Maharashtra) have been completed and sent to the concerned States.
- **Project Appraisal:** During the year 2010-11, technical examination of 52 Water Resources projects (20 major irrigation, 14 medium irrigation and 18 flood protections) were completed and accepted by Advisory Committee. At present, 60 new irrigation schemes (29 major & 31 medium) as well as 12 revised schemes (10 major & 2 medium) are under different stages of appraisal.
- **Development of Water Resources Information System:** CWC and ISRO jointly undertook the work of development of Water Resources Information System (WRIS) during 11th Plan. The estimated cost of the project is Rs.78.3 Crore. An MoU was signed between the two parties in December, 2008 with 4 years time frame. The first full version of website of INDIA WARIS was launched by Hon'ble Minister, Water Resources on 07 December, 2010 in New Delhi. The URL of the website: www.india-wris.nrsc.gov.in can be seen for more details.
- **Dam Rehabilitation and Improvement Project (DRIP):** The Ministry of Water Resources plans to implement Dam Rehabilitation and Improvement Project (DRIP) with the assistance of the World Bank, which would be a six-year project commencing from January, 2011. The project would be implemented in four States, namely, Kerala, Madhya Pradesh, Orissa and Tamil Nadu. About 223 large dams in the four participating states which need rehabilitation and improvements would be included in the project.
- **Dam Safety Legislation:** Dam Safety Bill 2010 was introduced in the Parliament on 30th August, 2010. The Dam Safety Act on its approval will be initially applicable only to the States of West Bengal and Andhra Pradesh, besides Union territories, Central undertakings and private companies. However, provisions of this Legislation will apply to other States also if resolution to that effect is passed by all the houses of Legislatures of those States under Clause (1) of Article 252 of

the Constitution. The Bill has been referred to the Parliamentary Standing Committee on Water Resources for examination.

- **MoU between India and Australia:**

In pursuance to the Memorandum of Understanding (MoU) signed between Government of India and Government of Australia on 10.11.2009, a Joint Working Group (JWG) comprising equal number of members from each side was constituted. The Australian delegation visited India from 15.11.2010 to 19.11.2010 for the first meeting of the JWG. After detailed deliberations between the members of the Indian and Australian side of the JWG, an Action Plan to enhance cooperation in the field of water resources development and management through sharing of policy and technical experience of water management has been signed on 19.11.2010.

- **WAPCOS Ltd** handled 616 projects during the period ending 31.12.2010 as compared to 512 projects for the corresponding period ending 31.12.2009. The Company achieved turnover of Rs. 254 Crore for the period ending 31.12.2010 as against the corresponding previous year figure of Rs. 190 Crore. The Current year achievement shows an increase of 34% over the last year.

- **Information, Education and Communication (IEC):** During 2010-11 (upto 31st December, 2010), Central Ground Water Authority organized 13 Mass Awareness Programs for ground water conservation, artificial recharge and ground water protection at Bengaluru, Bhubaneswar, Dehradun, Bhopal, Chennai, Raipur and Hyderabad. 10 Ground Water Management training programs were also organized in different parts of the country for designing rain water harvesting structures for augmenting water at

Bengaluru, Bhubaneswar, Guwahati, Dehradun, Bhopal, Chennai and Hyderabad. In addition, 2 workshops were organized at Guwahati and Dehradun.

- A national painting competition on water conservation themes was organized by Ministry of Water Resources through CGWB in association with BEE for students of 4th, 5th and 6th standards from all over the country. Over 2.6 lakh students participated in the competition. Selected students, about 50 from each State, participated in the State Regional Offices of CGWB on the occasion of Bal Diwas. Cash prizes and certificates were awarded to the first three winners from each region alongwith 10 consolation prizes. The State level prize winners finally participated at the national level competition held at Delhi on 21st January 2011.
- Ministry of Water Resources launched Electronic Media Campaign w.e.f. 10th September, 2010 through DD-National, DD-News, Regional Channels of Doordarshan and National News, FM Stations and 188 local radio stations of All India Radio spread all over the country for telecasting and broadcasting of the video/audio spots on the necessity of water conservations and its management.
- The Ministry of Water Resources participated in the 30th India International Trade Fair organized at ITPO in Pragati Maidan, New Delhi from 14th November, 2010 to 27th November, 2010 in which a pavilion was put up. The theme of the pavilion was "Efficient Use of Water – Key to Prosperity". The pavilion carried different exhibitory materials viz., central diorama, working models, transslides, banners, posters, booklets, pamphlets etc.



The Union Minister for Water Resources and Minority Affairs, Shri Salman Khurshid and the Union Minister for Parliamentary Affairs, Science & Technology and Earth Sciences, Shri Pawan Kumar Bansal presented the awards to the winners of the "National Level Painting Competition on Water Conservation for School Children", organized by the Ministry of Water Resources, in New Delhi on January 21, 2011.

Important Developments/ Conferences/ Meetings

- The 4th meeting of the Expert Level Mechanism between India and China on trans-boundary rivers was held from 26th to 29th April, 2010 at New Delhi. In the meeting, the issues on provision of flood season hydrological data, emergency management and other issues regarding trans-border rivers were discussed. An Implementation Plan upon provision of hydrological information of the Yaluzangbu/Brahmaputra river in Flood Season by China to India was also signed.
- 3rd meeting of Indo-Nepal Joint Committee on Inundation and Flood Management (JCIFM) was held from 14.05.2010 to 19.05.2010. During the meeting, field visit was also undertaken to see the progress of work of embankment construction along Kamla, Bagmati and Lalbakeya rivers in Nepal.
- The 105th Meeting (Annual) of the Permanent Indus Commission (PIC) was held from 30.05.2010 to 02.06.2010 in New Delhi. It finalized arrangements for communication of flood data by India to Pakistan from 1st July to 10th October, 2010. The Commission also resolved the issues raised by Pakistan on the design of Uri-II and Chutak hydroelectric plants and initial filling of Baglihar in a cooperative spirit. The 106th Meeting of PIC was held from 21.7.2010 to 24.7.2010 at Lahore in Pakistan. India arranged the 112th Tour of Permanent Indus Commission (PIC) to lower reaches of River Chenab during 19.2.2011 to 23.2.2011.
- A Court of Arbitration (CoA) on Kishenganga Hydroelectric Project, J&K has been constituted on the request of Pakistan under the relevant provisions of Indus Water Treaty 1960. The CoA held its 1st meeting on 14th January 2011 in The Hague, Netherland. Indian delegation was led by Secretary (WR).
- Hon'ble Minister (WR) and Secretary (Water Resources) visited Kuttanad, Kerala on 4th & 5th September, 2010 to take part in the launching of works by Government of Kerala for the cultivators

of the region under the Central Government assisted package.

- Indian delegation headed by Shri Vincent H. Pala, Hon'ble Minister of State for Water Resources participated in the World Water Week-2010 at Stockholm, Sweden from 5th to 11th September, 2010. Two oral presentations (i) 'fluoride distribution and occurrence of fluorosis in central Rajasthan (India) and developing an alternative low cost defluoridation technique' and (ii) 'impact of urbanization and industrialization on water resources management in Tirumanimuttar Watershed, Tamil Nadu, India' were made while five poster presentations on (i) 'sustainable use of deep fresh groundwater in thickly populated east coastal tracts of India', (ii) 'alternative arsenic-safe aquifers for sustainable drinking water in Gangetic Plain – a case study from Bihar', (iii) 'issues and challenges in geogenic contamination of ground water in India, special reference to arsenic and fluoride', (iv) 'optimal ground water pumping from skimming wells for drinking water supply' and (v) 'study of transport behavior of arsenic and evaluation of remedial options using groundwater transport model – a case study in West Bengal, India' were displayed during the event.
- Meeting of the Standing Committee on Water Resources- Examination of subject "Depletion of Ground Water Level" and briefing of Status of interlinking of rivers including Inter State Links was held at Parliament House, New Delhi on 7th April, 2010.
- A meeting under the Chairmanship of Secretary (Water Resources) was held on 16.4.2010 in New Delhi to review the progress on anti erosion scheme at Rohmoria area in Dibrugarh district of Assam. This is one of the infrastructure projects being monitored by the Delivery Monitoring Unit (DMU) of PMO through Ministry of Development of North-Eastern Region (DoNER). The scheme for taking up emergent works by State Government of Assam has been cleared by Technical Advisory Committee of Ministry of Water Resources on 28.1.2010 for Rs. 59.91 Crore. Considering the emergent nature of works, it was decided that Water Resources Department, Government of Assam will take up the implementation of the scheme at the earliest.
- To review the National Water Policy, a consultation meeting with Hon'ble Members of the Parliamentary Standing Committee on Water Resources, Consultative Committee for Ministry of Water Resources and Parliamentary Forum on Water Conservation and Management was held on 28th July 2010 at New Delhi. A Brain Storming Session with the academia, experts & professionals and consultation meeting with NGOs was also organized on 26th October 2010 and 11-12 January, 2011 at New Delhi, respectively.

Chapter 2

National Water Policy

The Ministry of Water Resources adopted National Water Policy first in 1987, which was subsequently revised and adopted by the National Water Resources Council in its 5th meeting held on 1st April 2002.

Recognizing water as a precious national asset, the National Water Policy - 2002 embodies the Nation's resolve that National Perspectives would govern planning, development and management of water resources. The policy recognizes the drainage basin as the basic unit of planning, development and management of water resources and calls for appropriate measures to optimize utilisation of this resource. The salient features of the National Water Policy – 2002 are as under:

- Water is a precious natural resource, a basic human need and national perspectives should govern precious national asset and its planning, development and management.
- A well-developed information system for water related data at national/state level should be established with a network of data banks and data bases integrating and strengthening the existing Central and State level agencies.
- Water resources development and management will have to be planned for a hydrological unit such as a River Basin or sub-basin. Appropriate river basin Organisations should be

established for the planned development and management of the river basins.

- Water should be made available to water short areas by transfer from other areas including transfer from one river basin to another, after taking into account the requirements of the areas/basins.
- Planning of water resources development projects should, as far as possible, be for multipurpose projects with an integrated and multi-disciplinary approach having regard to human and ecological aspects including those of disadvantaged sections of the society.
- In the allocation of water, first priority should be given for drinking water, followed by irrigation, hydro-power, ecology, agro industries and non-agricultural industries, navigation and other uses, in that order.
- The exploitation of ground water should be regulated with reference to recharge possibilities and consideration of social equity. The detrimental environmental consequences of over-exploitation of ground water need to be effectively prevented.
- Careful planning is necessary to ensure that construction and rehabilitation activities proceed simultaneously. A skeletal national policy on resettlement & rehabilitation

needs to be formulated such that project affected persons share the benefits through proper rehabilitation.

- Adequate emphasis needs to be given to the physical and financial sustainability of existing water resources facilities. There is need to ensure that the water charges for various uses should be fixed such as to cover at least the operation and maintenance charges initially and a part of the capital costs subsequently.
- Management of the water resources for diverse uses should incorporate a participatory approach by involving users and other stakeholders alongwith various governmental agencies in an effective and decisive manner.
- Private sector participation should be encouraged in planning, development and management of water resources projects for diverse uses, wherever feasible.
- Both surface water and ground water should be regularly monitored for quality. Effluents should be treated to acceptable levels and standards before discharging them into natural streams. Minimum flow should be ensured in the streams for maintaining the ecology.
- Efficiency of utilization should be improved in all the diverse uses of water and conservation consciousness should be promoted through education, regulation, incentives and disincentives.
- There should be a Master Plan for flood control and management for each flood prone basin. In flood control and management, the strategy should be to reduce the intensity of floods.
- Land erosion by sea or river should be minimized by suitable cost-effective measures. Indiscriminate occupation of and economic activity in coastal areas and flood plain zones should be regulated.

- Needs of drought-prone areas should be given priority in the planning of projects for development of water resources. These areas should be made less vulnerable through various measures.
- The water sharing/distribution amongst the states should be guided by a national perspective with due regard to water resources availability and needs within the river basin.
- Training and research efforts should be intensified as an integral part of water resources development.

National Water Resources Council was set up by the Government of India in March, 1983 as an apex body to evolve National Policy for development and use of water resource.

Review of National Water Policy

The National Water Policy states that it may be revised periodically as and when need arises. Further, the National Action Plan on Climate Change (NAPCC) states that "the National Water Policy would be revisited in consultation with States to ensure basin level management strategies to deal with variability in rainfall and river flows due to climate change". Ministry of Water Resources has initiated the consultation process with various stakeholders for review of National Water Policy. National Water Policy has been reviewed and discussed with the representatives of State Governments during the meeting of the National Water Board held on 18th September 2009. A consultation meeting with Hon'ble Members of the Parliamentary Standing Committee on Water Resources, Consultative Committee for Ministry of Water Resources and Parliamentary Forum on Water Conservation and Management was held on 28th July 2010 at New Delhi. A Brain Storming Session with the academia, experts and professionals was also organized on 26th October 2010 at New Delhi. A

consultation meeting with NGOs was held on 11-12 January, 2011 at New Delhi. The review of National Water Policy is in progress.

National Water Mission

National Water Mission is one of the eight missions envisaged under the National Action Plan on Climate Change launched by the Hon'ble Prime Minister on 30th June 2008. The draft Mission Document for National Water Mission has been drafted by Ministry of Water Resources in consultation with stakeholders including experts, academic institutions, NGOs etc. for consideration of the Prime Minister's Council on Climate Change.

The main objective of the National Water Mission (NWM) relates to conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management.

Five goals identified under the National Water Mission are as under:

- Comprehensive water data base in public domain and assessment of the impact of climate change on water resources
- Promotion of citizen and state actions for water conservation, augmentation and preservation
- Focused attention to vulnerable areas including over-exploited areas

- Increasing water use efficiency by 20%
- Promotion of basin level integrated water resources management

The comprehensive Mission Document for National Water Mission has been considered by the Prime Minister's Council on Climate Change and in-principle approval has been accorded on 28.5.2010.

Ministry of Water Resources has taken up studies under National Water Mission for the three distinct areas of concern from climate change point of view viz. (a) alterations of winter snow-pack dynamics from climate change; (b) basin/sub-basin where groundwater is major water resource; and (c) low lying coastal areas where sea level rise will have impacts on surface and groundwater. ADB is providing technical assistance to the studies for (i) preparing strategic framework for IWRM to address climate uncertainty; (ii) assessing the potential for improving water-use efficiency; and (iii) preparing road map for effective institutions, specialist training and awareness for the selected Basin/Sub-basin/area. Central Water Commission (CWC) alongwith Central Ground Water Board (CGWB) and National Institute of Hydrology (NIH) has been given the responsibility to operationalize the Technical Assistance. Climate Change Directorate is functioning as Project-Directorate for these studies. The identified Basins/Sub-basins for detailed study are tabulated as under:

Sl. No.	Category	Sub-Basin	Focal state	Associate States
1	Snow fed	Satluj	Punjab	Himachal Pradesh
2	Groundwater	Chambal Sub-basin	Madhya Pradesh	Rajasthan
3	Coastal	Cauvery Delta	Tamil Nadu	Puducherry

Establishment of Chairs in Academic Institutes

Professorial Chairs in four IITs and two NITs have been established with the objective to carry out studies on water resources with special emphasis on

assessment of effect of climate change on it and adaptation strategies in respect of planning, design and management of water resources systems of different Basins as given below:-

Name of Institute	Name of Chair	Name of Chair-professor
NIT, Srinagar	Sheikhul Alam Sheikh Nuruddin Chair for Water Resources (for Indus Basin)	Selection in process
IIT, Roorkee	Bharat Singh Chair for Water Resources (for Indus Basin)	Selection in process
NIT, Patna	Dr. Rajendra Prasad Chair for Water Resources (for Ganga Basin)	Dr. Vivekanand Singh Associate professor
IIT, Kanpur	Sir M.Visvesvarayya Chair for Water Resources (for Ganga Basin)	Prof. Rajesh Srivastava
IIT, Guwahati	Bimla Prasad Chaliha Chair for Water Resources (for Brahmaputra Basin)	Prof.Arup Kumar Sarma
IIT, Kharagpur	Brahmaputra Chair for Water Resources (for Brahmaputra Basin)	Prof.Subhasish Dey, Prof. D.J. Sen

CWC has also started working on assessment of basin-wise water situation in the country using modern technology and methods including mathematical modeling with the help of

NRSC, Hyderabad. The models so developed would also generate various scenarios corresponding to varied projected climatic conditions.

Chapter 3

Major Programmes

MAJOR PROGRAMMES (STATE SECTOR)

ACCELERATED IRRIGATION BENEFITS PROGRAMME

The Accelerated Irrigation Benefits Programme (AIBP) was conceived in the year 1996 in order to provide financial assistance to States to complete various ongoing projects in the country so that envisaged irrigation potential of the project could be created and thereby irrigation could be extended to more areas. Since its formulation, the terms of the programme have been widened and liberalized over time.

As per the present pattern of assistance under the AIBP, the Centre is providing grant to the irrigation projects as an incentive to the States for creating irrigation infrastructure in the country. The AIBP is also meeting the demands of the Bharat Nirman, which, inter-alia, includes a component on irrigation. The projects included in the Prime Minister's relief package for agrarian distressed districts of Andhra Pradesh, Karnataka, Kerala and Maharashtra are also receiving financial assistance under the programme.

As on date, major, medium and Extension, Renovation and Modernization (ERM) projects are eligible for Central Assistance (90% of the project cost as grant in the case of Special Category States and 25% of project cost as grant in the case of Non-special category States) under AIBP. The surface water minor irrigation schemes of Special Category

States as well as such schemes benefiting drought prone/ tribal area in Non-Special Category States are also eligible for Central Assistance (90% of the project cost as grant) under AIBP. The balance cost of the project as State's share is to be provided by the State Government.

283 major/medium irrigation projects and 11704 surface water minor irrigation schemes have been included under AIBP so far for which total central assistance in the form of Loan/Grant amounting to Rs.43539.9156 Crore has been released till December 2010. The grant released during 2010-11 is of Rs.1810.543 Crore up to December 2010. This also includes Central Assistance of Rs.324.794 Crore released to North Eastern States during the year 2010-11. Cumulative grant released since inception of the AIBP till December 2010 to the North Eastern States is Rs.3231.096 Crore. State-wise details of Central Assistance released under AIBP till December 2010 are given in **Table-I**. Out of these 283 major/medium projects, a total of 129 projects have been completed. Upto March 2009, irrigation potential of 54.86 lakh ha from major/medium projects and 4.54 lakh ha from surface minor irrigation schemes have been created. During 2009-10, irrigation potential of 9.82 lakh ha has been created from major/medium/minor irrigation projects under AIBP.

Table-I

Central Assistance released under the AIBP during 1996-97 to 2010-11 (31.12.2010)

(Rs. Crore)

SI No	State	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Grand Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	Andhra Pradesh	35.25	74.00	79.67	65.02	95.02	281.66	33.19	205.53	87.55	311.38	843.42	987.77	855.18	1300.73		5255.36
2	Arunachal Pradesh	0.00	0.00	0.00	7.50	7.50	15.00	1.50	20.00	10.00	18.00	27.00	47.18	33.96	30.78	18.00	236.42
3	Assam	5.23	12.40	13.95	14.54	24.08	14.52	16.27	19.20	16.93	34.93	30.27	77.34	405.95	589.97	47.16	1322.75
4	Bihar	13.50	5.15	36.19	129.70	151.78	3.42	14.48	74.64	37.22	16.24	3.23	62.24	109.70	77.91	18.42	753.81
5	Chhattisgarh	0.00	4.50	9.50	10.52	13.93	48.20	104.00	74.63	2.93	7.66	10.71	96.96	193.04	60.89	23.84	661.31
6	Goa	0.00	5.25	0.00	3.50	61.65	58.00	0.00	2.00	0.65		1.91	32.48	39.23	20.25		224.92
7	Gujarat	74.77	196.90	423.82	272.70	421.85	581.69	1000.33	650.36	530.50	339.60	121.89	585.72	258.61	6.08		5464.82
8	Haryana	32.50	12.00	0.00	0.00	0.00	0.00	18.00	7.74	11.14	6.00	3.17	0.00	0.00	0.00		90.54
9	Himachal Pradesh	0.00	6.50	5.00	11.05	18.02	3.24	8.15	14.69	3.69	30.08	3.93	114.05	119.32	90.68		428.39
10	J & K	1.30	0.00	0.00	4.68	10.46	11.07	35.00	21.55	12.74	36.69	37.77	199.23	393.07	171.73	27.31	962.59
11	Jharkhand	0.00	8.89	11.64	14.35	5.72	10.82	9.67	1.83	21.29	5.04	1.29	9.22	3.72	0.00	78.57	182.04
12	Karnataka	61.25	90.50	94.50	157.14	171.00	492.50	620.85	266.48	396.30	140.78	160.37	349.90	442.42	823.83		4267.81
13	Kerala	3.75	15.00	0.00	0.00	22.40	11.28	5.67	31.00	49.44	9.36	16.65	0.00	0.90	3.81	5.85	175.10
14	Madhya Pradesh	63.25	110.00	81.25	95.33	151.33	215.41	220.00	568.64	516.70	168.10	48.31	500.35	473.78	758.75		3970.98
15	Maharashtra	14.00	55.00	50.86	49.88	97.02	39.10	133.13	164.40	529.29	167.38	465.52	972.25	2257.83	1395.39	959.18	7350.23
16	Manipur	4.30	26.00	10.78	21.81	1.50	9.36	19.50	15.50	13.00	75.70	156.30	103.99	221.67	42.54	148.21	870.16
17	Meghalaya	0.00	0.00	0.00	2.69	5.51	4.47	1.50	1.09	1.74	1.58	0.75	1.16	24.80	22.50	45.04	112.84
18	Mizoram	0.00	0.00	0.00	1.43	1.43	2.00	0.75	9.30	5.00	9.32	14.24	34.34	50.72	36.45	39.20	204.17
19	Nagaland	0.00	0.00	0.00	2.73	5.00	5.00	2.66	8.00	4.00	8.00	10.60	40.51	48.60	57.29		192.38
20	Orissa	48.45	85.00	71.50	90.25	100.32	168.48	179.57	154.69	24.22	151.37	133.88	624.36	724.44	871.57	71.49	3499.59
21	Punjab	67.50	100.00	0.00	42.00	55.62	113.69	36.66	0.00		26.32		13.50	9.54	22.05		486.88
22	Rajasthan	2.68	42.00	140.05	106.67	78.47	96.32	174.39	499.84	352.90	90.30	11.60	156.53	178.62	157.58		2087.92
23	Sikkim	0.00	0.00	0.00	1.36	0.00	2.40	0.75	0.75	0.75	0.91	3.32	3.24	0.00	2.60	14.07	30.16
24	Tripura	3.77	5.10	3.98	34.65	13.88	21.06	13.39	13.38	11.00	32.00	22.51	8.10	43.18	36.21		262.21
25	Tamil Nadu	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00	0.00	0.00		20.00
26	Uttar Pradesh	43.50	78.00	76.50	286.00	315.90	354.69	359.00	274.79	175.92	133.13	81.90	150.69	315.47	238.08	170.33	3053.90
27	Uttarakhand	0.00	0.00	0.00	0.00	0.00	0.00	25.16	25.55	38.99	80.44	84.73	265.65	371.66	127.01	135.76	1154.95
28	West Bengal	5.00	20.00	10.00	25.00	26.83	38.61	28.13	3.14	13.46	0.03	6.70	8.95	22.81	0.91	8.10	217.67
	Total	500.00	952.19	1119.18	1450.48	1856.20	2601.98	3061.70	3128.70	2867.34	1900.31	2301.97	5445.71	7598.22	6945.59	1810.54	43539.92

Of the 11704 surface MI schemes included in the AIBP, 7987 MI schemes are reported as completed. The performance of completion of projects under AIBP has been consistently improving during last several years.

PRIME MINISTER'S PACKAGE FOR AGRARIAN DISTRESSED DISTRICTS

During 2006-07, a large number of cases of suicide of farmers were reported from several districts of Andhra Pradesh, Karnataka, Kerala and Maharashtra. Prime Minister announced a relief package for these districts which also included financial assistance to 65 selected major/medium projects under AIBP.

So far, central assistance amounting to Rs.5155.13 Crore has been provided for 40 major/medium projects of the PM package which also included central assistance of Rs.6 Crore released during 2010-11.

NATIONAL PROJECTS

The Union Cabinet in its meeting held on 7th February 2008 approved proposal of the Ministry of Water Resources on Implementation of National Projects with central assistance of 90% of the cost of the project. A new project fulfilling the following criteria will be eligible for consideration for inclusion in the scheme of National Project with the approval of the Union Cabinet:

(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 interlinking projects.

(iii) Intra-state projects with additional potential of more than 2 lakh ha. and with no

dispute regarding sharing of water and where hydrology is established

The guidelines for implementation of National Projects were issued on 26th February, 2009. For Gosikhurd Project of Maharashtra which has been declared as National Project, grant amounting to Rs.1805 Crore has been released under AIBP since 2008-09 till date. During 2009-10, grant amounting to Rs.10.80 Crore has also been released to Shahpur Kandi Project of Punjab which has also been declared as National Project.

BHARAT NIRMAN: IRRIGATION SECTOR

Irrigation is 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) in four years from 2005-06 to 2008-09.

The targets of irrigation potential and its creation from 2005-06 to 2010-11 are given in **Table- 2**.

Table- 2

		(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	0.22 (upto Sept., 2010)

REPAIR, RENOVATION AND RESTORATION (RRR) OF WATER BODIES

Government of India approved a pilot scheme for Repair, Renovation and Restoration (RRR) of 1098 water bodies in 26 districts of 15 States with an outlay of

Rs. 300.00 crore to be shared by Centre and the State in the ratio of 3:1 during X Plan period. Repair, Renovation and Restoration work has been completed in 1085 water bodies and works have been dropped in 13 water bodies due to administrative reasons under the pilot scheme.

Government of India has approved two schemes on repair, renovation and restoration of water bodies (i) one with external assistance with an outlay of Rs. 1500 crore and (ii) with domestic support with an outlay of Rs. 1250 crore for implementation during XI Plan Period.

Under the scheme covered by external assistance, the Government of India provides assistance to the extent of 25% and borrows necessary funds as loan from World Bank. 75% State share is to be borrowed from the World Bank by Concerned State.

Under the scheme with domestic support, funding is also in the ratio of 25:75 (Centre: State) for non-special category States and in the ratio of 90:10 for special category States (North Eastern States including Sikkim, HP, Uttarakhand, J&K and undivided Koraput, Bolangir and Kalahandi (KBK) districts of Orissa), drought prone/naxal affected/ tribal areas. These schemes were approved during the end of financial year 2008-09. Public water bodies are covered under the scheme. The scheme of RRR of water bodies with domestic support envisages convergence with the Mahatma Gandhi National Rural Employment Guarantee Act of Ministry of Rural Development for which joint guidelines have been issued.

During the year 2010-11, a total budget provision of Rs. 600 crore has been kept for meeting the central component of funding under the scheme of RRR of water bodies.

As against this, Rs.189 crore has been released to Govt. of Andhra Pradesh, Rs.7.33 crore to Govt. of Madhya Pradesh, Rs.29.08 crore to Govt. of Uttar Pradesh and Rs.25 crore to Govt. of Bihar under domestic support up to February 2011 and Rs.117.81 crore (up to December, 2010) against EAP component.

Under the scheme of RRR of water bodies with external assistance, World Bank Loan Agreement has been signed with Tamil Nadu for Rs. 2182 crore to restore 5763 water bodies having a CCA of 4 lakh hectares, with Andhra Pradesh for Rs. 835 crore for restoration of 3000 water bodies with a CCA of 2.5 lakh hectares, with Karnataka for Rs. 268.78 crore for restoration of 1224 water bodies with CCA of 0.52 lakh and with Orissa for Rs.448 crore for restoration of 900 water bodies having CCA of 1.2 lakh hectares.

Farmers' Participatory Action Research Programme (FPARP)

The Ministry of Water Resources has been implementing Farmers Participatory Action Research Programmes (FPARPs) through 60 identified institutes (Agricultural Universities, ICAR Research Institutes, ICRISAT and WALMIs etc) in 25 States/UTs at the cost of Rs. 24.4685 Crore with a view to demonstrate the technologies available to the farmers for increasing productivity and profitability of agriculture. In the first phase which started in Rabi 2007-08, a total of 4912 demos have been completed upto December 2010. Technologies, namely, Micro irrigation system (drip & sprinkler irrigation), Water conservation (Jalkund, Storage tanks, percolation tanks, Check dams, recharging wells etc.), Crop diversification and multiple use of water, System of Rice Intensification (SRI), In-situ soil moisture conservation, micro-nutrient

management etc. envisaged are demonstrated to the farmers.

As per preliminary reports, the impact of technologies demonstrated have shown a substantial water saving as well as increase in yield varying from wheat (5 to 66.67%), vegetables (20.94 to 50%) and paddy (8.1 to 65%). The yield improvement of the crops ranges between 4.3 to 43% for wheat, 5 to 55 % for vegetables and 8 to 62% for paddy. The water saving through micro irrigation is reported from 10% to 80%, System of Rice Intensification (SRI) – 14.24% to 54%, Land leveling / configuration – 0.4% to 42.2%, Pit method / paired row planting of Sugarcane - 5.41% to 46.7% etc.. Farmers also have shown their interest to support the programme in view of the benefits accruing to them.

The programme is being monitored by the CGWB and CWC through their regional offices throughout the country. Independent evaluation of the programme has been initiated through a identified independent agency for the completed demos by MoWR.

Considering the overall benefit of the programme in terms of water saving, increase in yield leading to more crop per drop of water etc., Ministry of Water Resources has considered for expansion of FPARP for conducting 5000 additional demonstrations at a cost of Rs. 25 Crore during remaining period of XIth Five Year Plan i.e. year 2010-11 & 2011-12. An amount of Rs. 9.35 Crore have been released for implementation of 1920 demonstrations by 23 institutes.

COMMAND AREA DEVELOPMENT AND WATER MANAGEMENT (CADWM)

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 15.00 million hectare. After inclusion of new projects, deletion of completed projects and clubbing of some projects, there are now 146 projects under implementation. The programme was restructured and renamed as Command Area Development and Water Management (CADWM) Programme w.e.f. 1-4-2004. Now, the scheme is being implemented as a State Sector Scheme during the XI Five Year Plan (2008-09 to 2011-12).

Programme Components

The components of the CADWM 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, and also land levelling and shaping and realignment of field boundaries, with a minimum beneficiary contribution of 10%.
To provide central assistance for development of infrastructure to facilitate use of sprinkler/drip irrigation systems as an alternative to construction of field channels. The assistance under this item will be limited to construction of stilling tank, pump house and laying of conveyance pipes up to farmers' fields. The cost norms as applicable for OFD works will also be applicable for such works.

- 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 with a minimum beneficiary contribution of 10% including use of location specific bio-drainage techniques to supplement conventional techniques for reclamation of waterlogged area;
- f) Trainings/adaptive trials/demonstrations through Water and Land Management Institutes (WALMI) and other Central/State institutions and monitoring & evaluation of the programme with 75% funding from Government of India;
- g) Warabandi [with requisite funds for hardware activities under item(c) and software activities under item (f)]
- h) One time functional Grants to Water Users' Associations; and
- i) Establishment cost -20% of the expenditure on items (b), (c), (d) and (e).

The following broad provisions have been made in the programme during XI Five Year Plan:

i) To promote water use efficiency in irrigation, financial assistance is provided to the States for development of infrastructure to facilitate use of sprinkler / drip irrigation as an alternative to construction of field channels. 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. The cost norms as applicable for On-Farm Development (OFD) works will also be applicable for such works.

ii) Any new project under the Programme is included only in lieu of completion/deletion of an on-going project in a particular State except for the projects included in the Prime Minister's package for agrarian distressed districts, projects benefiting the drought prone areas, tribal areas, projects in the States having irrigation development below the national average and projects located in special category States/areas, namely, NE States, Uttarakhand, Himachal Pradesh, Jammu and Kashmir and Kalahandi-Bolangir-Koraput (KBK) districts of Orissa.

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

- a. 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' Association (WUAs);
- b. 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 its inception;
- c. iii) A minimum of 10% beneficiary contribution is mandatory in the construction of on-farm-Development (OFD) works and reclamation of waterlogged areas to ensure increased beneficiary participation and thereby improve the quality of works;
- d. iv) Central assistance for correction of system deficiencies upto 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.

Programme Implementation

The Command Area Development and Water Management Wing of the Ministry of Water Resources coordinates and monitors 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 Centre and State/farmers for all the components 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. for which the funding pattern is 75:25 basis between the Centre and States. A minimum of 10% contribution by the beneficiary farmers is mandatory for execution of on farm development works and reclamation of water logged areas. There is also a provision of one time functional grants at the rate of Rs 1000/- per ha (450:450:100 as Centre: State: Farmers) to the registered Water Users' Associations. The interest released from this fund is utilized to upgrade the irrigation system and infrastructure developed under this Programme.

Targets under Command Area Development and Water Management Programme:

The approved outlay for the Command Area Development and Water Management Programme during the XI Five Year Plan (2008-09 to 2011-12) is Rs.1600 Crore. The details of physical targets for the period 2010-11 as per XI Plan estimate are as in **Table-3**.

Table-3

(Million hectares)		
Sl. No.	Items	Target (2010-11)
1.	OFD works (field channels and land levelling, shaping and realignment of field boundaries, where necessary).	0.35
2.	Field , intermediate and link drains	0.14
3.	Correction of system deficiencies in systems of the capacity upto 4.25 cumec. (150 cusec)	0.026
4.	Reclamation of waterlogged areas	
	Sub-surface drainage	0.002
	Surface / bio-drainage	0.020

However, the State Governments fix their own targets according to availability of funds and other factors.

Financial Achievements:

Central Assistance of Rs.4266.09 Crore has been released to States under the CAD Programme since its inception in 1974-75 to March, 2010. The continuation of CADWM scheme has been approved as State Sector Scheme since the year 2008-09. During the year 2009-10, an amount of Rs.413.70 Crore was released to States. An outlay of Rs.499.00 Crore has been provided under the State Sector Scheme for implementation of the programme during 2010-11, whereas

central assistance amounting to Rs. 222.36 Crore has been released to States upto January, 2011. The details of central

assistance released upto 2009-10 are as in **Table-4**.

Table-4
Central Assistance released under CADWM Programme

(Rs. Crore)

Period	Outlay approved by Planning Commission	BE Allocation	Releases	% Releases w.r.t. BE Allocation
IX Plan	1000	825.72	751.66	91.0
X Plan	1208	969.80	818.57	84.4
XI Plan				
2007-08	300	300	277.14	92.4
2008-09	350	350	324.29	92.7
2009-10	400	400	413.70	103.4

Physical Achievements

The core components of physical works are construction of field channels and field drains and implementation of warabandi

(rotational water supply). The cumulative progress of works on these components upto March, 2009 and achievements during 2009-10 are given in **Table-5**.

Table-5

(Million hectare)

Item of work	Cumulative achievement since beginning upto March, 1997	Achievement during IX Plan	Achievement during X Plan	Achievement during 2007-08	Achievement during 2008-09	Cumulative achievement since beginning up to March 2009	Achievement during (2009-10)
Field Channel	13.95	1.80	2.31	0.394	0.430	18.884	0.384
Field Drains	0.77	0.35	0.64	0.069	0.130	1.959	0.094

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. The Ministry of Water Resources 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 579 schemes of 9 States, namely, Bihar, Gujarat, Madhya Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Orissa and Uttar Pradesh have been approved for reclamation of 78.81 thousand hectre water logged area. Out of this, an area of 52.11 thousand hectre has been reported to be reclaimed by these States.

Participatory Irrigation Management (PIM)

National Water Policy 2002 stresses participatory approach in water resources management. It has been recognised that participation of beneficiaries will help greatly in the optimal upkeep of irrigation system and effective utilisation 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.1000/- per ha. to be shared by the Centre, State and Farmers @ Rs.450 : 450 : 100 respectively is being paid to outlet level Water Users Associations' as incentive, the interest from which is to be used for maintenance.

As a result of various conferences / seminars organised by the Ministry, there has been an increased consciousness in States about the need for actively involving farmers in management of irrigation systems. Accordingly, 15 States viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, 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 56,934 Water Users' Associations have been formed in various States covering an area of 13.538 M.ha. under various commands of irrigation projects.

Under the restructured "Command Area Development & Water Management (CADWM) 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. Apart from this, farmers will have to contribute

10% cost of the works in the form of cash/labour in the construction of OFD works and reclamation of water logged areas.

FLOOD MANAGEMENT PROGRAMME – STATE SECTOR SCHEME

A restructured scheme, namely, "Flood Management Programme" amounting to Rs. 8,000 Crore has been approved 'in principle' by the Cabinet, under the State Sector in XIth Plan by amalgamating the following four on-going schemes of Xth Plan.

1. Critical anti-erosion works in Ganga Basin States – a Centrally Sponsored Scheme (CSS)
2. Flood control works in Brahmaputra Valley States – a State Sector Scheme (SS)
3. Critical anti-erosion works in coastal and other than Ganga Basin States – a State Sector Scheme (SSS)
4. Improvement of drainage in the critical areas of the country – a State Sector Scheme (SSS).

The re-structured scheme would cover all on-going and new works related to river management, flood control, anti-erosion, drainage development, flood proofing including flood prone area development programme to be implemented by the State Governments in their respective States with central assistance. Central Assistance to the State Governments has also been proposed for the first time for restoration of damaged flood management works, based upon the recommendations of Task Force on Flood Management/Erosion Control-2004.

Based on the approval of the Cabinet, detailed revised guidelines for providing central assistance to the State Governments were issued on 5.8.2009 by the Ministry of Water Resources. Further, as directed by Cabinet, an Empowered Committee under the Chairmanship of Secretary (Expenditure), Ministry of Finance has been constituted for examining and approving the proposals submitted by the State Governments to ensure cost effective solutions.

Six meetings of the Empowered Committee have been held so far and a total of 353 flood control/ river management schemes from 22 states (with a total estimated cost of Rs.6796.93 Crore) have been approved under FMP for providing central assistance to States. A total amount of central assistance of Rs.1571.06 Crore was released to States as on 31.03.2010. Further, central assistance amounting to Rs.756.30 Crore has been released to States during the financial Year

2010-11(upto 31.12.2010). A total of 117 schemes were completed by the State Governments as on 31.03.2010. In addition, 26 more schemes are reported to be completed during 2010-11 (upto 30th November, 2010). State-wise details of the schemes included under FMP and funds released during XIth Plan are given in **Table-6**. State-wise details of schemes completed as on 31.03.2010 and during 2010-11 (upto November, 2010) are given in **Table-7**.

Table-6

**State-Wise Schemes included under "Flood Management Programme"
and Funds Released during XI Plan**

(Rs. Crore)

Sl. No.	State	Schemes Included under FMP			Funds Released during XI Plan (upto 31.12.2010)		
		Nos.	Total Cost	Central Share	Released upto 31.03.2010	2010-11	Total
1	Arunachal Pradesh	11	67.80	61.02	29.33	-	29.33
2	Assam	85	817.79	736.01	320.73	63.86	384.59
3	Bihar	41	1226.51	919.88	374.83	119.49	494.32
4	Goa	2	22.73	17.05	4.22	-	4.22
5	Gujarat	1	7.94	5.96	0.00	-	0.00
6	Haryana	1	173.75	130.31	46.91	-	46.91
7	Himachal Pradesh	2	218.94	197.04	43.20	33.75	76.95
8	Jammu & Kashmir	20	308.79	277.91	77.95	24.90	102.85
9	Jharkhand	1	20.12	15.09	10.53	-	10.53
10	Kerala	2	143.61	107.71	0.00	22.43	22.43
11	Manipur	22	109.34	98.41	24.32	-	24.32
12	Mizoram	2	9.13	8.22	0.00	2.06	2.06
13	Nagaland	5	13.90	12.51	9.68	-	9.68
14	Orissa	70	204.02	153.02	71.77	-	71.77
15	Puducherry	1	139.67	104.75	0.00	-	0.00
16	Punjab	4	142.38	106.78	34.59	-	34.59
17	Sikkim	24	86.21	77.59	45.72	-	45.72
18	Tamil Nadu	5	635.54	476.66	1.11	58.71	59.82
19	Tripura	11	26.57	23.92	7.98	8.24	16.22
20	Uttar Pradesh	21	557.19	417.89	134.19	61.19	195.37
21	Uttrankhand	5	42.92	36.83	16.39	6.09	22.48
22	West Bengal	17	1822.08	1366.57	232.48	354.75	587.23
	Total	353	6796.93	5351.13	1485.91	755.47	2241.38
	Spilled over works of X Plan				85.15	0.83	85.98
	Grand Total			5351.13	1571.06	756.30	2327.36

Table-7**State-Wise FMP Schemes Completed during XI Plan (upto 30.11.2010)**

Sl. No.	State	Schemes Completed		
		As on 31.03.2010	2010-11	Total
1	Arunachal Pradesh	1	-	1
2	Assam	27	8	35
3	Bihar	22	4	26
4	Goa	-	1	1
5	Manipur	9	3	12
6	Nagaland	3	-	3
7	Orissa	39	3	42
8	Sikkim	6	4	10
9	Uttar Pradesh	3	2	5
10	Uttrankhand	1	-	1
11	West Bengal	6	1	7
	Total	117	26	143

Restoration of Sunderbans Embankments Damaged by Cyclone AILA

The scheme, namely, "Project for reconstruction, remodeling and improvement of embankments in Sunderban and adjoining areas in the districts of North and South 24 Parganas of West Bengal, damaged by severe cyclone 'AILA' " was cleared at an estimated cost of Rs.5032 Crore by the Advisory Committee of MoWR in its 102nd meeting held on 28.01.2010. The Planning Commission accorded Investment Clearance to the scheme for Rs. 1339.50 Crore only vide its letter dated 12.03.2010 based upon concurrence of the State Finance Department for the works to be completed up to 31st March,2011.

On receipt of the Investment Clearance from the Planning Commission, an advance of Rs. 187.50 Crore was released to the State Government of West Bengal vide Ministry of Finance order dated 12.03.2010 for taking up the aforesaid works. The scheme has been formally considered by the Empowered

Committee on Flood Management (ECFM) in its 6th meeting held on 12.07.2010 and approved for providing central assistance under FMP at a total cost of Rs. Rs.1339.50 Crore (Central Assistance: Rs. 1004.62 Crore).

The Government of West Bengal has set up a dedicated Project Management Unit headed by Chief Engineer, Irrigation and Waterways for the implementation of the scheme. The "Consulting Engineering Services (India) Private Limited" is engaged as Project Management Service Provider to assist the Irrigation and Waterways Department in preparation of bid documents, evaluation of bids, quality control works and overall monitoring of the project. A length of 263 km embankments has been taken up for reconstruction in the 1st phase of the project.

The acquisition of land for the 1st phase works is under progress and is likely to be completed soon. The tenders have also been invited for first phase of the project and the works are planned to be awarded very shortly.

Flood Management Works



The State Government has utilized a total amount of Rs 294.61 Crore (Central Share: Rs. 187.50 Crore and State Share: Rs. 107.11 Crore) till November 2010. Second instalment of central assistance amounting to Rs. 338.25 Crore only has also been released by the Ministry of Finance on 12.11.2010.

The Planning Commission has now accorded Investment Clearance to the Scheme for total cost of Rs. 5032 Crore vide its letter dated 02.07.2010 based upon concurrence of the State Finance Department and the works are proposed to be completed by 31st March, 2013. Second phase of the project would be placed before Empowered Committee for

consideration in the next meeting for inclusion under Flood Management Programme.

MAJOR PROGRAMMES (CENTRAL SECTOR)

RIVER MANAGEMENT ACTIVITIES AND WORKS RELATED TO BORDER AREAS – A CENTRAL SECTOR SCHEME

A Central Sector Scheme has been formulated to cover 10 on-going works/ schemes of X plan (with 100% central assistance) alongwith some new works detailed as in **Table-8**.

Table-8

1	Survey & Investigations of Kosi High Dam
2	Pancheshwar Multipurpose Project
3	Maintenance of flood protection works of Kosi & Gandak Project
4	Extension of embankments on Lalbakeya, Kamla, Bagmati & Khando rivers
5	Hydrological observations of rivers originating from Bhutan
6	Joint observations on rivers common to Bangladesh and neighbouring countries
7	Flood forecasting on rivers common to India and Nepal
8	Ganga Flood Control Commission
9	Grant in aid to Brahmaputra Board
10	New Scheme for Majuli Island in Assam, Dibang Project etc

In addition to above works, new works on common/ border rivers comprising of river management, flood control and minor irrigation schemes / works, especially with Bangladesh are proposed under the scheme. It will also include any new works proposed on common/border rivers on the western sector i.e. Indus river system in XI Plan. Such works are proposed to be funded with 100% central assistance.

Three bank protection/ flood control works covering six locations on Mahananda river in West Bengal along international border with Bangladesh have been completed at a cost of Rs.32.71 Crore. 100% central assistance

was provided by the Ministry of water resources for the above works. In addition, central assistance of Rs. 32.12 Crore has been released during 2010-11 to the State Government of West Bengal for undertaking ten more bank protection works along international border.

GROUND WATER MANAGEMENT & REGULATION

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

Powers & Functions

The Authority has been conferred with the following powers:

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

Regulatory Measures

- The Central Ground Water Authority is regulating withdrawal of ground water by industries/ projects in 839 Over-exploited and 226 Critical Assessment Units. List of these critical areas has been circulated to the State Pollution Control Boards and Ministry of Environment & Forests which refer the new industries/ projects to CGWA for obtaining permission.
- CGWA has notified 43 critical/ over-exploited areas in parts of NCT Delhi, Haryana, Punjab, Andhra Pradesh, Rajasthan, MP, Gujarat, West Bengal, Uttar Pradesh and Diu for control and regulation of development of ground water resources. For enforcement of the regulatory measures in these areas, concerned Deputy Commissioners/ District Magistrates have been directed under Section 5 of Environment (Protection) Act, 1986 to regulate ground water development in these notified areas.

Ground Water Legislation

To enable the States to enact Ground Water Legislation, a Model Bill to Regulate and Control Development of Ground Water has been circulated by the Ministry of Water Resources to all the States/UTs. So far the states of Andhra Pradesh, Goa, Tamil Nadu, Kerala, West Bengal, Himachal Pradesh, Bihar and Union Territories of Lakshadweep, Chandigarh, Dadra & Nagar Haveli and Pondicherry have enacted and implemented ground water legislation. 18 States/UTs are at various stages of enactment of legislation.

FLOOD FORECASTING

During XIth Plan, a Central Sector Scheme, namely, 'Flood Forecasting' was prepared by amalgamating two on-going schemes of Xth plan, namely, 'Establishment and Modernization of Flood Forecasting Network in India including Inflow Forecast' and 'Strengthening and Modernization of Flood Forecasting and Hydrological Observation Network in the Brahmaputra and Barak Basin'. Under the combined scheme, it is proposed (i) to modernize the flood forecasting network by installing automatic water level and rainfall sensors at all the observation sites and satellite based transmission system for getting real time flood data expeditiously and (ii) to develop appropriate software/models for flood/ inflow forecasting to reduce the time for analysis of data. It is also proposed to extend the flood forecasting network in uncovered areas and integrate with the network of State Governments/ Project Authorities/ National Disaster Management Authorities (MHA).

In the year 2010, a total of 7508 forecasts were issued by CWC to the State Governments/ Local Administration. These forecasts have been proved to be very useful in saving life and public properties as a result of timely action by the authorities.

RATIONALISATION OF MINOR IRRIGATION STATISTICS (RMIS) SCHEME

Keeping in view the recommendations of various forums and committees, especially the National Commission on Agriculture and Planning Commission about the inadequacy of data on the minor irrigation schemes, a Centrally Sponsored Plan Scheme "Rationalisation of Minor Irrigation Statistics (RMIS)" was launched in 1987-88 with 100% assistance to the States/UTs. The main objective of the RMIS Scheme is to build up a comprehensive and reliable database in the M.I. sector for effective planning and policy making.

In the MI census, detailed information on the five types of Minor Irrigation Schemes, namely, Dugwell, shallow Tube well, Deep Tubewell, Surface Flow and Surface Lift Schemes is collected. Besides this information on their performance in terms of irrigation potential created and utilized, their ownership, the social class and holding size of the owner, number of electrical/diesel devices used for lifting water etc. 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, wind mills is also collected in the MI Census.

So far, three MI Censuses have been conducted with reference years 1986-87, 1993-94, 2000-01 and the reports relating to them have been brought out. The work relating to fourth MI Census with reference 2006-07 is in progress.

The first census with reference year 1986-87 was conducted in all the States/ UTs except Rajasthan. The national level report of the census was published in November 1993. In addition to various information collected during the census, the number of schemes

out of use over a period and the area covered by the minor irrigation as supplementary source of irrigation were also collected.

The second census of minor irrigation works, with reference year 1993-94, was initiated in September 1994 in 29 States/UTs. The census work could not be completed in the States of Gujarat, Karnataka, Maharashtra and Tamil Nadu due to some administrative problems. The report on second census of minor irrigation works was published in March 2001.

The third census of Minor Irrigation works with reference year 2000-01 was conducted in 33 States/UTs. UTs of Lakshadweep and Daman and Diu did not take up the census work. The work was completed in all the States by June 2005 and All India Report was released in November 2005.

HYDROLOGY PROJECT PHASE II (HP-II)

Hydrology Project Phase I (HP-I) was taken up to establish a sound hydrological data base for comprehensive planning, development and management of water resources by development of the Hydrological Information System (HIS) consisting of reliable, comprehensive and timely hydrological and hydro-meteorological data; including their processing and storage facilities. HP-I was implemented from December 1995 to December 2003. The project cost (as implemented) for HP-I was Rs. 605.28 Crore. The source of funding was in the form of loan from International Development Association (IDA).

HIS developed during HP-I had the limitation in terms of both geographical coverage and analytical usage. To fill this gap, Hydrology Project Phase II (HP-II) was started in April 2006. Thus, HP-II is the follow-up of HP-I.

The total estimated cost of the project is Rs. 631.83 Crore (US \$ 135.01 Million), out of which World Bank funding is for US \$ 104.98 Million in the form of loan from International Bank for Reconstruction and Development (IBRD) and the balance amount is to be funded by Govt. of India. The loan agreement was signed in January 19, 2006. The period of implementation of the project is six years and will be closed in June 2012. The Ministry of Water Resources, Govt. of India is the nodal agency for implementation of the project. For this purpose, a Project Co-ordination Secretariat (PCS) has been established in MoWR.

The objective of HP-II 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 improved productivity and cost effectiveness of water related investments.

HP-II is being implemented in 13 States viz. Andhra Pradesh, Chhattisgarh, Goa, Gujarat, Himachal Pradesh, Kerala, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Puducherry, Punjab and Tamil Nadu and 8 Central Organisations viz. Bhakra Beas Management Board (BBMB), Central Pollution Control Board (CPCB), Central Water Commission (CWC), Central Ground Water Board (CGWB), Central Water & Power Research Station (CWPRS), National Institute of Hydrology (NIH), India Meteorological Department (IMD), and Ministry of Water Resources (MoWR).

The project is being implemented with the help of following consultancies:

1. Technical Assistance and Management Consultancy (TAMC)
2. Decision Support System-Planning (DSS-P)
3. Decision Support System-Real Time (DSS-RT)
4. Hydrological Design Aids (Surface Water)

The main activities accomplished during the year 2010-11 are:

1. The Implementing Agencies (IAs) have progressed well on the institutional strengthening by procuring hardwares/software and up-gradation of infrastructure. Good progress has been made by some of IAs in the area of awareness raising also through hydrological data user groups, workshops, public programmes and website development.
2. Under Decision Support System-Planning (DSS-P), the data base development of Bhima basin has been completed and the development of Generic Model is nearing completion. The States have collected most of the data and made available to Consultants for development of customized models for the selected basins in their States. Seven scientists of NIH were deputed for training in DHI Denmark during October-November 2010. Besides 10 officers from State Implementing Agencies and CPCB attended the training course in DSS-P at DHI Denmark.
3. Under Decision Support System –Real Time (DSS-RT), the Consultants have submitted the Report on specifications for Database, Hardware, Modeling Software and Data Acquisition System (DAS) equipment. The Bids for procurement of Data Acquisition System have been opened and are under evaluation by BBMB.
4. Under Hydrological Design Aids-Surface Water, the Consultants have submitted State-of-Art Report on the Hydrological Design Aids and further have submitted the Inception Reports for development of design aids.
5. 41 Purpose Driven Studies, 21 related to Surface Water and 20 related to Ground Water have been approved so far and work on these is under progress.

6. Under Horizontal Expansion, new States are progressing well in identifying HIS network and developing it with equipments of latest technology. State Data Centres and Water Quality Laboratories have been completed in Himachal Pradesh and Goa and are under progress in Puducherry.
7. Central Ground Water Board (CGWB) has installed 18 Piezometer wells in Goa and 9 Piezometer wells in Punjab State for ground water monitoring.
8. Request of Proposal (RFP) document for procurement of consultancy for development of e-GEMS has been prepared by Central Ground Water Board and forwarded to the World Bank for prior review.
9. The Management Information System (MIS) for monitoring and implementation of the project has been made operational.
10. Workshops and trainings were organized by implementing agencies for capacity building.

INFRASTRUCTURE DEVELOPMENT SCHEME

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, (ii) Land & Building of Central Water Commission, (iii) Information Technology Development Plan of Ministry of Water Resources, and (iv) Up-gradation and modernization of computerization and information system of Central Water Commission for implementation during XI Five Year Plan.

The total outlay of fund during the XIth Plan (2007-12) for I.D. Scheme is Rs. 115 Crore. Out of this, Rs. 99 Crore is meant for purchase of Land and construction/modernization of buildings/ offices and Rs. 16

Crore is meant for development of Information Technology in the Ministry and its attached/ subordinate offices.

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), Central Water Commission and Central Ground Water Board have been included under the ambit of the scheme. It also aims at integrating and streamlining existing scattered information systems into unidirectional dynamic E-governance mode.

During the financial year 2010-11, an amount of Rs. 24.50 Crore has been provided under the scheme and the expenditure incurred upto January 2011, is Rs. 18.07 Crore on Land & Building and Rs. 2.7 Crore on Information Technology components of Central Water Commission/ Central Ground Water Board/ Ministry (Proper). Constructions of buildings and offices of Central Water Commission at Hyderabad, Jammu, Kolkata and Delhi Library have been completed. Minor works of fire fighting, water connection etc. are in progress. The construction of office/residential complexes at Jammu, Guwahati, modernization of CWC and Ministry (Proper) are in full swing.

Central Ground Water Board has taken up construction of boundary wall of Ambala and earth filling work on the land and 90 % work has been completed. Construction works at Guwahati, Bangalore and Bhopal are in progress. Besides, construction of Divisional Workshop & Store Building at Guwahati is almost at completion stage.

Purchase of computers, hardwares and networking components are made on regular basis for strengthening e-governance agenda of the Government and for establishing web-based data base system.



Shri Pawan Kumar Bansal, former Hon'ble Minister (Water Resources) along with other dignitaries on the dias on the occasion of World Water Day – 2010

INFORMATION, EDUCATION AND COMMUNICATION (IEC)

Celebration of World Water Day

In consonance with the United Nations General Assembly's Resolution adopted on 22.12.1992 declaring 22nd March as World Water Day, Ministry observed World Water Day on 22.3.2010 on the theme of Water Quality. The main function was organised at A.P. Shinde Symposium Hall, NASC Complex, Pusa, New Delhi. Various technical sessions on water related topics were organized viz. (i) Ground Water Quality-Challenges and Opportunities, (ii) Farmers Participatory Action Research Programme (iii) Corporate Social Responsibility and Capacity Building for Civil Social Engagement in Water Sector, (iv) Ground Water Resources Management and Food Security and (v) Ground Water

Management in the context of National Action Plan on Climate Change.

On this occasion, Hon'ble Minister of Water Resources dedicated the web based Ground Water Information System to the Nation. The National Water Award and the Ground Water Augmentation Awards were also distributed by the Hon'ble Minister (WR).

India International Trade Fair – 2010

The Ministry of Water Resources participated in the 30th India International Trade Fair (IITF) at Pragati Maidan, New Delhi during the period 14th to 27th November, 2010 on the theme "Efficient use of Water, Key to Prosperity". Models on the activities of CWC, CWPRS, NIH, CSMRS, CGWB and other organisations of the Ministry were exhibited to depict wide variety of subjects concerning their activities to spread awareness amongst

masses for water conservation and management. The interactive touch screens and pantomime shows were also arranged for

the visitors specially children to generate water literacy among them.



Shri Vincent H. Pala, Hon'ble Minister of State for Water Resources lighting the Invocation Lamp at the inauguration of the pavilion of MoWR at IITF - 2010

Painting Competition

A three tier painting competition on water conservation themes was organised by the Ministry for the students of 4th, 5th and 6th standards in 21 States/UTs of the country. The objective of organising the painting competition was to engage the attention of children towards the need of water conservation and to inculcate in them the habit of judicious use of water right from their formative years. In the school level competition, 267527 students from 5070 schools participated. Out of these, 50 students from each State/UT were selected by the jury for competing at the State Level.

The State Level competition was organised on 14.11.2010 in the State Capitals. Out of 50 students, the jury selected 13 students for the 1st, 2nd and 3rd prize and 10 consolation prizes. The first, second and third prize winners were given cash prizes of Rs. 10,000/-, Rs. 8,000/- and Rs. 5,000/- respectively and certificates. Ten consolation prize winners were given cash prizes of Rs. 1,000/- each and certificates.

The first three winners of the State Level Painting Competition were invited for on the spot National Level Painting Competition organized at CSMRS, New Delhi on 21.1.2011

on the theme "Water in Environment" and a total of 63 students participated. The paintings were evaluated by a panel of jury consisting of eminent artists from the Lalit Kala Academy and other experts.

The winners were awarded a cash prize of Rs. 1 lakh (1st prize), four second prizes of Rs.50,000/- each, eight third prizes of Rs. 25,000/- each and ten consolation prizes of Rs.10,000 each, along with a certificate and a memento.



Shri Salman Khurshid, Hon'ble Minister (Water Resources), Shri Pawan Kumar Bansal, Union Minister for Parliamentary Affairs and Science & Technology, Shri Vincent H. Pala, Minister of State for Water Resources along with other dignitaries and participants of the 1st National Painting Competition

Electronic Media Campaign

An Electronic Media Campaign was initiated on National, Regional and DD news channels of Doordarshan w.e.f. 10.9.2010 for 70 days to telecast video spots on water conservation and also on Radio on National News, Primary Channel/LRS(188 stations), Vividh Bharti National (40 stations), 22 FM Channels and 31 Stations of Regional News of All India Radio w.e.f. 10.09.2010 for 54 days to broadcast audio spots on water conservation to spread awareness about necessity and desirability of conservation

and judicious use of water. After expiry of the paid campaign, the electronic media campaign with free bonus airtime is being run on various channels of Doordarshan.

Participation in Fairs and other Events

The Ministry participated through CWC in the Thrissurpuram festival held in Kerala on May, 2010 by raising a grand pavilion and depicting models to educate the public about various means of conservation of water and creating water

literacy on other aspects of water through banners, posters, translites etc.

Apart from this, the Ministry also participated in the Science and Technology Expo held at Nainital, Uttarakhand from 4th – 6th June, 2010; the 14th National Exhibition on the theme of 'Striving Towards a Glorious India' held at Kolkata from 3rd to 7th September, 2010, 4th International Trade Festival at Guwahati from 29th Decemebr 2010 to 10th January 2011 and various other fairs & exhibitions through the regional offices of CWC.

Mass Awareness Programmes and Water Management Training Programmes

A workshop on 'Integrated Water Resources Management' was organised at Shillong from 4th to 5th October, 2010. Several other workshops on the water related theme have been organized by the field offices of CWC and CGWB on behalf of the Ministry throughout the country to create awareness on various water related regional problems and their feasible solutions. Also Mass Awareness Programmes and Water Management Training Programmes have been organised at various places throughout the country by field offices of CGWB.

Chapter 4

Initiatives in North-East

North Eastern Region with its geographical area of 26.52 million hectare is endowed with enormous water resources. The combined annual flow of Brahmaputra and Barak rivers, before entering into Bangladesh, is 586 BCM, which is the highest among all rivers 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.

Brahmaputra Board

The important schemes under implementation by Brahmaputra Board in North-Eastern Region is as follows: -

(A) Protection of Majuli Island, Assam:

Majuli is a chronically flood and erosion effected island in river Brahmaputra. The Brahmaputra Board took up anti-erosion works at Majuli Island in the year 2003-04 as immediate measures at an estimated cost of Rs. 5.92 Crore and completed in 2004-05. These works were followed by regular protection works under Phase-I and works are nearing completion (estimated cost Rs. 56.07 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. 115.03 Crore) combined together.

The Government of India constituted a Standing Committee comprising reputed Experts from Government and non-Government agencies in December 2007 to review and suggest measures for protection of Majuli Island. The Standing Committee has visited Majuli Island six times. Based on their site visits, the Standing Committee has been making suitable recommendations for the works to be undertaken on specific locations by Brahmaputra Board and State Government of Assam. Brahmaputra Board has been carrying out the works recommended by the Standing Committee.

(B) 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 phases of works viz. Phase-I (Rs.10.47 Crore), Phase-II (Rs.4.95 Crore) and Phase-III (Rs.8.47 Crore) have been completed. The Phase-IV works (Rs. 23 Crore) are under progress.

(C) Drainage Development Scheme:

The Brahmaputra Board has taken up the execution of 7 Drainage Development Schemes (DDS) viz. Harang (Rs. 30.49 Crore), Barbhag (Rs. 7.23 Crore), Amjur (Rs.18.84 Crore), Jengrai (Rs.1.49Crore), Jakaichuk (Rs. 2.96 Crore), East of Barpeta (Rs. 1.34 Crore) and Singla (Rs. 3.54 Crore).

Central Water Commission

CWC has two regional Chief Engineer Offices i.e. the Chief Engineer, Brahmaputra & Barak Basin Organisation at Shillong looking after the 7 North Eastern States and Chief Engineer, Teesta Basin Organisation at Siliguri looking after the States of Sikkim and West Bengal in addition to survey & investigation works in Bhutan.

CWC is involved with the following activities of Water Resources development in North-Eastern Region

(i) Design Consultancy for Water Resources Development Projects:

CWC has a dedicated design unit for East and North East region to undertake design and consultancy for Multipurpose, Irrigation, Water Supply and Hydro Electric Projects. Design Consultancy is provided by CWC for the following Water Resources Development Projects in North-East region:

Arunachal Pradesh

1. Kameng HE Project

Assam

1. Barbhag Drainage Development Scheme- Sluice Regulator
2. Amjur Drainage Development Scheme
3. Pagaladiya HE Project

Manipur

1. Thoubal M.P. Project
2. Dhoithabi Barrage Project

Meghalaya

1. Myntdu HE Project
2. Ganol HE project
3. New Umtru HE Project

Tripura

1. Kalasi Barrage
2. Champaichera Dam Project
3. Howrah Dam Project

(ii) Preparation of Detailed Project Reports for Water Resources Development Projects

The work of preparation of Detailed Project Reports (DPRs) of following projects in North-East region is under progress:

1. Suntaly H.E. Project
2. Kalez Khola H.E. Project
3. Kundil Irrigation Project

(iii) Hydrological Observation and Flood Forecasting Services:

CWC has a large network of hydrological observation sites for collection of hydrological data and for issue of flood forecasts in North East region. At present, CWC has 137 hydrological observation sites in the North East region and issues flood forecasts for 26 sites in the NE Region including Sikkim.

To make the flood forecasts more accurate, effective and timely, the modernization activities are being taken up on a continuous basis. As part of modernisation of Flood Forecasting activities, 19 telemetry stations have been installed in the region to improve lead time accuracy and presentation. Telemetry stations involve installing sensor based instrumentation and acquisition of data i.e. water level, rainfall and other meteorological data through satellite based communication system.

(iv) Monitoring of projects

(a) Major/ medium irrigation projects

The projects getting funds through AIBP are being monitored by CWC.

The Major / Medium Irrigation/ ERM projects in North-East region being monitored by CWC under AIBP are as under:

Assam

1. Dhansiri Irrigation Project (major)
2. Champamati Irrigation Project (major)
3. Buridehing Lift Irrigation Project (medium)
4. Pahumara Irrigation Project (medium)
5. Modernisation of Jamuna Irrigation Scheme (major/ ERM)
6. Borolia Medium Irrigation Project (medium)

Manipur

1. Thoubal Multipurpose Project (major)
2. Khuga Multipurpose Project (major)
3. Dolaithabi Barrage Project (medium)

Meghalaya

1. Rongai Valley Irrigation Project (medium)

Tripura

1. Gumti Irrigation Project (medium)
2. Manu Irrigation Project (medium)
3. Khowai Irrigation Project (medium)

(v) Farmers Participatory Action Research Programme (FPARP)

The Ministry of Water Resources, Government of India is implementing Farmers Participatory Action Research Programme (FPARP) throughout the country for demonstrating that it is now possible to increase the yield and income per drop of water through combination of water, variety and agronomic practices. Three institutes, namely, Assam Agriculture University, Jorhat, WM Division ICAR Research Station for NEH Region, Umroi Road, Umiam, Meghalaya and NERIWALM, Tezpur were awarded the work in phase-I beginning from Rabi season 2007. The monitoring of this scheme is being carried out by CWC and CGWB. The demonstrations as approved by MoWR have been completed by institutes.

In the 2nd Phase, the proposals received from Assam Agricultural University, Jorhat, and ICAR Research Station NEH region, Umroi (Meghalaya) are under consideration. The details of technologies proposed to be demonstrated to farmers by these institutes are given in **Table-9**.

Table-9

Sl. No.	Name of Institute	Description of Technologies to be Demonstrated
1.	Assam Agriculture University, Jorhat, Assam	<ul style="list-style-type: none"> • Integration of rain water harvesting and micro irrigation for increasing productivity of high water crop • SRI • Application of treadle pump for irrigation • Multiple use of water • Improvement of traditional rain water harvesting structure • Soil moisture conservation
2.	WM Division ICAR Research Station for NEH Region, Umroi Road, Umiam, Meghalaya	<ul style="list-style-type: none"> • Conservation agriculture in Maize/Rice based cropping system • Rooftop water harvesting • Multiple use of water • SRI • Raised and sunken bed

Central Ground Water Board (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 the North Eastern Region in the year 2010-11 up to 31st December 2010 are given in **Table-10**.

Table-10

Sl.	Activities	Achievements
1.	Ground Water Management Studies	10674 Sq. km (Pre-monsoon) 3960 Sq.Km. (Post-monsoon)
2.	A. Ground Water Exploration B. Construction of Piezometers through Outsourcing	14 wells drilled in North Eastern Region Revised budget is being prepared for keeping provision for payment to WAPCOS for construction of Piezometers
3.	Water Quality Analysis	303 samples analyzed for basic constituents and 350 samples have been analyzed for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc.
4.	Geophysical Studies	Carried out VES (Vertical Electrical Sounding) – 5 and Sub-surface borehole logging – 3 (350 VES conducted in Meghalaya)
5.	Ground Water Regime Monitoring	Pre-monsoon, Monsoon & Post-monsoon water level monitoring completed
6.	Short Term Water Supply Investigation	48 nos.
7.	Artificial Recharge and Rainwater Harvesting (AR&RWH)Studies	Demonstrative project on AR&RWH are being implemented in Arunachal Pradesh and 36 structures amounting to Rs.259.668 Crore were approved. As on 31.12.2010, fund to the tune of Rs.181.767 lakh has been released
8.	State Hydrogeological Atlas	Hydrogeological Atlas of Meghalaya finalized
9.	Ground Water Year Books	Ground Water Year Book of NE State issued
10.	State Chemical Quality Report	State Chemical Quality Report of NE State issued

Central Soil and Materials Research Station (CSMRS)

Kopili H E Project, Assam

Located on the river Kopili in the North Cachar Hills district of Assam, the Kopili Hydroelectric Project was the maiden venture of NEEPCO when it came into existence in 1976.

Investigations were taken up for this project in order to study the effect of acidic reservoir water having pH values varying from 2.76 to 5.98 at various components of the dam. The following investigations were done:

- Nondestructive tests to evaluate the general condition of the concrete

- Extracation of cores for determining its comprehensive strength and mechanical properties
- Corrosion studies

Central Water and Power Research Station (CWPRS)

The following studies, pertaining to the North-Eastern regions, are in progress:

Hydraulic Model Studies for:

- Power House tailrace joining works with river & Spillway Aerator, Subansiri Lower HE Project, Arunachal Pradesh
- Diversion Channel; Teesta Low Dam Project Stage IV, Sikkim

- Original Design of Umtra Dam Spillway, Meghalaya
- Pare Dam Spillway, Arunachal Pradesh

National Projects Construction Corporation Ltd (NPCC)

The presence of NPCC in NE Region dates back to almost 33 years in all the eight States of NE Region. The major works taken up are in the fields of Irrigation, Building, Hydro power, Tourism, Roads & Bridges etc. NPCC executes project worth Rs.150 Crore every year for Assam Rifles. NPCC is executing more than Rs. 3000 Crore of works for Indo-Bangla Border Fencing, road works & Flood lighting in the States of Tripura, Mizoram, Meghalaya and Assam.

Chapter 5

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 water of inter-state rivers and river valleys. In view of the Sarkaria Commission recommendations, the said act has been amended. The amended Act came into force from 6th August 2002. The amendments include time frame for constitution of the Inter-State Water Disputes Tribunals and prescribes 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 TRIBUNALS

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 valley thereof. The term of CWDT has been extended by the Govt. upto 02.11.11 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 have 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".

Time provided under Section 5(3) proviso has been extended upto 2nd November, 2011.

Monitoring of the Implementation of Interim Order of CWDT

Under the provisions of Section 6 A of the ISWD Act, 1956, the Central Government has notified Cauvery Water (implementation of the Order of 1991 and all subsequent Related Orders of the Tribunal) Scheme, 1998, consisting of Cauvery River Authority (CRA) and Monitoring Committee (MC). The Cauvery River Authority consists of the Prime Minister as Chairperson and Chief Ministers of the basin States as Members. The Monitoring Committee consists of Secretary, MoWR as Chairperson, Chief Secretaries, Chief Engineers of the basin States and Chairman, Central Water Commission as Members. The Authority is required to give effect to the implementation of the Interim Order dated 25th June, 1991 of the Tribunal and its related subsequent orders. The CRA has held 6 meetings so far. Last meeting of CRA was held on 10.2.03. The CMC has held 25 meetings so far and its last meeting was held on 24th August, 2010. During the Water Year 2010-11, starting from June, 2010, as per the Interim Order, an inflow of 193.59 TMC was required at Mettur up to 30th December, 2010. Against this, an inflow of 169.14 TMC has been received at Mettur up to 30th December, 2010

Expenditure incurred by the Tribunal

		(Rs. lakh)
i)	Budget Allocation for 2009-10	160.00
ii)	Expenditure incurred by the Tribunal during 2009-10	215.42
iii)	Cumulative Expenditure up to 3/10	1545.73
iv)	Expenditure from 04/10 to 12/10	181.54
v)	Cumulative Expenditure upto 12/2010	1727.27

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. The term of KWDT has been extended upto 01.04.09 as per the provisions of ISRWD Act, 1956. Meanwhile, in the Writ Petition filed by the Govt. of A.P., Hon'ble Supreme Court has ordered that the effective date of constitution of the tribunal will be 01.02.06. 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 of the Tribunal made available on 30th December, 2010 are under consideration.

In terms of Section 5(3) of the Inter-State River Water Disputes Act, a reference again, if any, at the instance of the Central Government or the party States for seeking any guidance or requiring any explanation upto consideration of the decision is awaited, for which a period of three months is provided under the aforesaid provision.

Expenditure incurred by the Tribunal

		(Rs. lakh)
i)	Budget Allocation for 2010-11	176
ii)	Expenditure incurred by the Tribunal upto December, 2010	131
iii)	Cumulative Expenditure upto December, 2010	779

Vansadhara River Water Dispute

The State of Orissa sent a complaint to the Central Government under Section 3 of the Inter-State River Water Disputes (ISRWD) Act, 1956 regarding water disputes between the Government of Orissa and Government of Andhra Pradesh pertaining to inter-State river Vansadhara for constitution of a Inter-State

Water Disputes Tribunal for adjudication. The main grievance of the State of Orissa relates to adverse effect of the executive action of Government of Andhra Pradesh in undertaking the construction of the flood flow canal at Katragada and failure of Government of Andhra Pradesh to implement the terms of inter-State agreement relating to use, distribution and control of waters of inter-State river Vansadhara and its valley. It also raised the issue of scientific assessment of available water in Vansadhara at Katragada and Gotta Barrage and the basis for sharing the available water.

Secretary (MoWR) convened an inter-State meeting on 24.4.2006 at New Delhi to explore the possibility of finding out negotiated settlement of the dispute. In the meeting, both the States agreed that yield of the river is to be shared between Orissa and Andhra Pradesh on 50:50 basis. Both States also agreed that CWC will re-assess the yield of the Vansadhara basin by utilizing the yield series upto 2005 for which necessary utilization data shall be furnished by the concerned State Governments expeditiously.

An inter-State meeting in this regard was convened on 2.3.2007 by the Additional Secretary, MoWR with the Principal Secretaries of two States. Divergent views emerged to the meeting and it was felt appropriate to request Secretary, MoWR to hold another meeting with the Chief Secretaries of the States. The said meeting could not take place due to inability shown by Chief Secretary of the Government of Orissa. Meanwhile, a writ petition has been filed by Orissa in this regard.

In the hearing dated 6.2.2009, the Hon'ble Supreme Court directed Central Government to constitute a water dispute tribunal within a period of six months from the date and refer to it the dispute relating to Vansadhara river. Cabinet in its meeting dated 25th June, 2009 approved the proposal of constitution of a

tribunal. As the process of constitution of tribunal is time consuming, the Hon'ble Court was prayed to grant 6 months time above than what was granted in court order dated 6th February, 2009. The Hon'ble Court granted time upto February, 2010 for constitution of tribunal. The tribunal was notified on 24.2.2010.

Expenditure incurred by the Tribunal

		(Rs. lakh)
i)	Budget Allocation for 2010-11	200
ii)	Expenditure incurred by the Tribunal upto December, 2010	37
iii)	Cumulative Expenditure upto December, 2010	37

Mahadayi/Mandovi River Water Dispute

In July, 2002, the State Government of Goa made a request under Section 3 of the Inter-State River Water Disputes Act, 1956 (as amended) for constitution of the tribunal under the said Act and referred the matter for adjudication and decision of dispute relating to Mandovi river. The issues mentioned in the request included the assessment of available utilisable water resources in the basin at various points and allocation of this water to the 3 basin States keeping in view the priority of the use of water within basin as also to decide the machinery to implement the decision of the tribunal etc. The Hon'ble Union Minister for Water Resources convened an inter-State meeting on 4.4.2006 at the level of Chief Ministers of the States of Goa, Karnataka and Maharashtra. The Government of Goa wanted constitution of tribunal and reference of the dispute to the same. Accordingly, the MoWR concluded that the dispute contained in the request of State of Goa of July, 2002 cannot be resolved by negotiation and initiated further action in the matter as per the

provisions of Inter-State River Water Disputes Act, 1956.

Meanwhile, Government of Goa filed a Suit in the Supreme Court for setting up of Water Disputes Tribunal for adjudication of the above river water dispute and an Interlocutory Application (IA) for stay in construction activities in September 2006. The Suit with the Application was listed on a number of occasions before the Hon'ble Court. In its hearing on 30.4.2008, the Hon'ble Supreme Court passed the Order that as per the statement made by the State Govt. of Karnataka, in its counter affidavit filed on 27.9.2006, the State Government of Karnataka will not actually utilize the waters under Kalsa Banduri Project till next date of hearing.

The Cabinet on 10th December, 2009 approved the constitution of the Tribunal.

Cabinet Committee of Accommodation (CCA) in its meeting dated 6th October, 2010 approved location of Headquarter of Mahadayi Tribunal at New Delhi. The Tribunal has been notified on 16.11.2010.

RAVI & BEAS WATERS TRIBUNAL

The Ravi & Beas 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 from the Central Government and references received from Govts. 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 upto 5th February, 2010. The Tribunal's hearings have become dependant on the outcome of a Presidential Reference related to Punjab Termination of Agreement Act, 2004.

Chapter 6

Co-operation with Neighbouring Countries

The three major river systems of India, namely, Ganga, Brahmaputra and Indus cross international borders. This Ministry is responsible for strengthening international co-operation on matters relating to these rivers by way of discussions with neighbouring countries concerning river waters, water resources development projects and operation of international treaties relating to water.

INDIA-BANGLADESH COOPERATION

Indo-Bangladesh Joint River 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 which is headed by Water Resources Ministers 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/ Ganges Waters at Farakka

A Treaty was signed by the Prime Ministers of India and Bangladesh on 12th December 1996 for 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. Joint Committee meeting was held in September, 2010. The Treaty is being implemented to the satisfaction of both the countries since 1997.

Cooperation in Flood Forecasting

India is providing flood data of Farakka and Sahibganj for Ganga (from 15th June to 15th October) and flood data of Pandu, Goalpara and Dhubri for Brahmaputra and of Silchar for Barak during monsoon period (from 15th May to 15th October) to Bangladesh for use of their flood forecasting and warning arrangements, besides the data of river Teesta, Manu, Gumti, Jaladhaka and Torsa, etc. The flood forecasting information from India during the monsoon is being supplied free of cost. This has enabled the Civil and Military authorities in Bangladesh to take precautionary measures and shift the population affected by flood to safer places. Flood data of above sites was communicated to Bangladesh on continuous basis during the Monsoon of the year 2010.

INDIA-BHUTAN COOPERATION

A scheme titled "Comprehensive Scheme for Establishment of Hydro-meteorological and Flood Forecasting Network on rivers Common to India and Bhutan" is in operation. The network consists of 33 Hydro-meteorological/meteorological stations located in Bhutan and are being maintained by the Royal Government of Bhutan with funding from India. 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 scheme. 26 meetings of JET have been held so far after its reconstitution in 1992. The last (26th) meeting was held on 5-6th March 2011 at Guwahati, India.

The matter relating to problem of floods created by the rivers originating from Bhutan and flowing to India was taken up with the Royal Government of Bhutan. A Joint Group of Expert (JGE) on Flood Management has been constituted between India and Bhutan 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. Three meetings of JGE have been held so far.

In accordance with the decision taken during the first meeting of JGE held in Bhutan from 1st to 5th November, 2004, a joint Technical Team (JTT) on Flood Management between the two Countries was constituted. JTT held its first meeting in April, 2005 and submitted its report in January, 2006. The report of JTT was considered in the 2nd meeting of JGE held on February, 26-27, 2008 at New Delhi. JGE reconstituted JTT with Chief Engineer, CWC, Shillong as its team leader (Indian Side). The 1st meeting of reconstituted JTT

was held in Bhutan on 13 -16 September, 2010. The recommendations made therein were considered in the 3rd meeting of JGE held on 7-9th February, 2011 in Bhutan.

INDIA –CHINA COOPERATION

In the year 2002, the Government of India entered into an MoU with China for provision of hydrological information on Yaluzangbu/Brahmaputra river in flood season by China to India. In accordance with the provisions contained in the MoU, the Chinese side provided hydrological information (Water level, Discharge and Rainfall) in respect of three stations, namely, Nugesha, Yangcun and Nuxia located on river Yaluzangbu/Brahmaputra from 1st June to 15th October every year, which is utilized in the formulation of flood forecasts by the Central Water Commission. This MoU expired in 2007.

The Hon'ble President of the People's Republic of China paid a state visit to the Republic of India from 20 to 23 November, 2006. During the visit, it was agreed to set up an Expert Level Mechanism (ELM) to discuss interaction and co-operation on provision of flood season hydrological data, emergency management and other issues regarding trans-border rivers as agreed between them. Accordingly, the two sides have set up the Joint Expert Level Mechanism. The Expert Group from Indian side is led by Joint Secretary level officers. Four meetings of ELM have been held so far.

The first meeting of the Joint Expert Level Mechanism was held on 19-21 September 2007 at Beijing, wherein the issues related to bilateral cooperation on exchange of hydrological information between the two countries were discussed. The 2nd meeting of Expert Level Mechanism (ELM) on Trans-Border Rivers was held from 10-12 April 2008 at New Delhi. During the meeting, work regulations of the Expert Level Mechanism

were agreed and signed by the two sides. It has been agreed that the Expert Level Mechanism shall meet once every year, alternatively in China and India. The 3rd meeting of the Expert Level Mechanism (ELM) was held at Beijing from 21st to 25th April 2009 which helped in understanding of each other's position for smooth transmission of flood season hydrological data.

MoU on River Brahmaputra

A new Memorandum of Understanding (MoU) upon Provision of Hydrological Information of the Brahmaputra/Yaluzangbu river in Flood Season by China to India with a validity of five year was signed with China on 05.06.08 during the visit of Hon'ble External Affairs Minister of India to Beijing from June 4-7, 2008. The Implementation Plan between the Bureau of Hydrology & Water Resources, Tibet Autonomous Region, the People's Republic of China and the Central Water commission, Ministry of Water Resources, the Republic of India upon provision of Hydrological Information of the Yaluzangbu/Brahmaputra river in Flood Season by China to India was signed during the 4th meeting of Expert Level Mechanism on Trans-Border river held from 26th to 29th April, 2010 in New Delhi. The 5th meeting of ELM is scheduled to be held in April, 2011.

MoU on River Satluj

Another Memorandum of Understanding was signed during the visit of the Chinese Premier to India in April, 2005 for supply of hydrological information in respect of Satluj (Langqen Zangbu) in flood season. Chinese side is providing hydrological information in respect of their Tsada station on river Sutlej (Langqen Zangbu) from the monsoon of 2007. Implementation Plan was signed in this regard during April, 2008. The MoU in respect of Sutlej River expired in April, 2010. A new MoU upon provision of hydrological information of Sutlej/Langqen Zangbo river in

flood season by China to India with a validity of five years has been signed with China on 16.12.2010 during the visit of Hon'ble Prime Minister of China to India during December, 2010.

INDIA – NEPAL COOPERATION

Pancheshwar Multipurpose Project (5600 MW)

Pancheshwar Multipurpose Project is the central piece of Mahakali (Sarda) Treaty of 1996 between India and Nepal. Required field investigations for the proposed 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 costs and benefits, location of re-regulating structure, stage based development, etc. are proposed to be discussed with the Government of Nepal, in the 1st meeting of Indo- Nepal Joint Ministerial Level Commission on Water Resources (JMCWR), headed by Ministers of Water Resources of India and Nepal.

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

In order to undertake the joint investigations of Sapta Kosi High Dam Multipurpose Project and Sun Kosi Storage cum Diversion Scheme,

a Joint Project Office (JPO) was set up in Nepal in August, 2004 to take up field investigations and preparation of Joint DPR. It was to complete the works by February, 2007. However, due to frequent strikes/bandhs, the investigations have been delayed. Field works of Sapta Kosi High Dam Multipurpose Project continues to be suspended. The tenure of JPO-SKSKI was extended to June, 2010 to complete field investigation and preparation of DPR at a revised cost of Rs. 74.86 Crore and it was subsequently extended to August, 2010.

During the 2nd meeting of Indo- Nepal Joint Standing Technical Committee (JSTC) held on 30-31 March, 2010 at Kathmandu (Nepal), the Nepalese side informed that the process for the establishment of the police posts at Barahachetra and Chatara was at an advanced stage and that Government of Nepal had issued necessary directives to the concerned agencies for providing mobile armed security during the field works. The Nepalese side further stated that since required security arrangement at the project site is now available, the field works may be resumed at the earliest.

Kamla and Bagmati Multipurpose Projects

To carry out the feasibility level study of Kamala Dam Project and preliminary study of Bagmati Project in Nepal, JPO-SKSKI established for Sapta Kosi High Dam Multipurpose Project has also been entrusted to undertake these works simultaneously. These studies are likely to be completed along with the preparation of DPR of Sapta Kosi High Dam Multipurpose Project and Sun Kosi Storage cum Diversion Scheme.

Joint Team of Experts (JTE)

A Joint Team of Experts was originally constituted in 1991, for the investigation and studies of Kosi High Dam Project. Subsequently, the mandate of the JTE was

modified to investigation and studies of all joint projects with Nepal other than Pancheshwar Project. This team is headed by Member (RM), Central Water Commission from Indian side. 9th meeting of the JTE was held on 1-2 August, 2010. During the meeting, the Indian side conveyed concern at the very slow progress of works at various sites due to uncertain security situation at those sites. The Nepalese side expressed that in view of the improved security situation, it should be possible to expedite the field investigation works.

Joint Committee on Inundation and Flood Management (JCIFM)

JCWR during its 4th meeting decided to constitute a Joint Committee on Inundation and Flood Management (JCIFM), which will replace the earlier bilateral committees, namely, SCIP, HLTC, JCFM, SCEC and SCFF. Composition of JCIFM was also decided by JCWR. 3rd meeting of JCIFM was held from 14-19 May, 2010.

Joint Committee on Kosi & Gandak projects

A Joint Committee on Kosi and Gandak Projects (JCKGP) was constituted as per decision taken in the 1st meeting of JCWR, by dissolving the Co-ordination Committee on Kosi Project and Co-ordination Committee on Gandak Project. During the 3rd meeting of JCWR, JCKGP was empowered with financial and functional authority and Principal Secretary (WRD), Government of Bihar has been made the leader of the Indian side. 4th meeting of JCKGP was held at Kathmandu (Nepal) on 17-18 June, 2010.

INDO-PAKISTAN CO-OPERATION

Under the Indus Waters Treaty 1960, India and Pakistan each have created a permanent post of Commissioner for Indus Waters. Each Commissioner is the

representative of his Government for all matters arising out of the Treaty and is to serve as the regular channel of communication on all matters relating to implementation of the Treaty. The two Commissioners together form the Permanent Indus Commission.

The Commission has undertaken 112 tours of inspection and held 106 meetings so far, in both the countries as a whole.

In fulfillment of the requirements of Indus Waters Treaty, the daily gauge discharge data of hydrological sites of six basins, namely, The Indus, The Jhelum, The Chenab,

The Ravi, The Beas and The Sutlej of Indus system is sent to Pakistan every month and also received from it.

Irrigated cropped area statistics for Indus, Jhelum & Chenab basins for the crop year 2009-10 were also sent to Pakistan in November 2010.

Flood flow data for agreed sites on the rivers Ravi, Sutlej, Tawi, and Chenab was also communicated by India to Pakistan for their benefit through telephone during the period from 1st July to 10th October, 2010, to undertake advance flood relief measures.

Chapter 7

External Assistance in Water Resources Sector

The 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 of the country.

The World Bank continues to be the primary source of external assistance in the water resources sector. Assistance is also being availed from multilateral/bilateral agencies and countries.

There are 19 on-going externally aided projects in various States with assistance from different funding agencies, viz. World Bank (11), Asian Development Bank (2) and other bilateral agencies, namely, Japan Bank for International Cooperation (JBIC) (5)

and Kreditanstalt für Wiederaufbau (KfW), Germany (1).

Out of 11 on-going externally aided projects assisted by World Bank, 3 relates to water sector restructuring in the States of Madhya Pradesh, Rajasthan and Uttar Pradesh; 4 relates to community based tank management in the States of Andhra Pradesh, Karnataka (Phase I & Phase II) and Orissa; 2 relates to water sector improvement in the States of Maharashtra and Andhra Pradesh; 1 relate to irrigated agriculture modernization and water bodies restoration and management of Tamil Nadu and 1 relate to Hydrology Project (Phase II) which covers 13 States. A brief status of World Bank assisted ongoing external aided projects is given in **Table-11**.

Table -11 World Bank Assisted Ongoing Projects

S.No.	State	Name of Projects	Date of Agreement/ Completion	Amount of Assistance (US \$ million) (IBRD/IDA)	Cumulative Disbursement upto 31.12.2010 (US \$ million)
1	Madhya Pradesh	Madhya Pradesh Water Sector Restructuring Project 4750-IN	30.11.2004/ 31.3.2011	394(IBRD)	151.32
2	Rajasthan	Rajasthan Water Sector Restructuring Project 3603-IN	15.3.2002/ 31.3.2013	119.0(IDA)	110.07
		Additional Financing Rajasthan Water Sector Restructuring Project 4709-IN	21.5.2010/ 31.03.2010	19.00(IDA)	0
3	Uttar Pradesh	UP Water Sector Restructuring Project 3602-IN	08.3.2002/ 31.10.2010	111.00(IDA)	107.97

Table-11-World Bank Assisted On-going Projects

4	Maharashtra	Maharashtra Water Sector Improvement Project 4796-IN	19.8.2005/ 31.03.2012	325.00(IBRD)	179.31
5	Andhra Pradesh	Andhra Pradesh Water Sector Improvement Project 7897-IN	14.08.2010/ 31.07.2016	450.60(IBRD)	41.13
6	Karnataka	Karnataka Community Based Tank Management Project.4872-IN	02.11.2007/ 31.01.2012	32.00(IBRD)	2.49
		Karnataka Community Based Tank Management Project 3635-1-IN	02.11.2007/ 31.01.2012	32.00(IDA)	2.42
		Karnataka Community Based Tank Management Project.3635-IN	04.06.2002/ 31.1.2012	75.02(IDA)	52.06
7	Andhra Pradesh	Andhra Pradesh Community Based Tank Management Project 4857-IN	8.6.2007/ 31.12.2012	94.50(IDA)	18.83
		Andhra Pradesh Community Based Tank Management Project 4291-IN	8.6.2007/ 31.12.2012	94.5(IBRD)	19.10
8	Orissa	Orissa Community Tanks Management Project 7576-IN	27.01.09/ 31.08.2014	56.00(IDA)	2.48
		Orissa Community Tanks Management Project 4499-IN	27.01.09/ 31.08.2014	56.00(IBRD)	2.67
9	Tamil Nadu	Tamil Nadu Irrigated Agriculture Modernization and Water Bodies Restoration and Management Project 4846 (IBRD)	12.2.2007/ 31.3.2013	335.00(IBRD)	50.93
		Tamil Nadu Irrigated Agriculture Modernization and Water Bodies Restoration and Management Project. 4255-IN (IDA)	12.2.2007/ 31.3.2013	150(IDA)	109.66
10	Multi-State*	Hydrology Project (Phase-II) 4749-IN	19.1.2006/ 30.6.2012	104.98(IBRD)	33.09

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

A brief status of Asian Development Bank, JICA and KFW (Germany) assisted ongoing external aided projects are given in **Table-12**, **Table- 13** and **Table-14** respectively.

Table-12
Asian Development Bank Assisted On-going Projects

S. No.	State	Name of Projects	Date of Agreement/ Completion	Amount of Assistance (US\$ million)	Cumulative Disbursement upto 31.12.2010 (US \$ million)
1	Chhattisgarh	2159-IND Chhattisgarh Irrigation Development Project	20.03.2006/ 31.03.2013	46.11	23.34
2	Orissa	2444-IND Orissa Integrated Irrigated Agriculture and Water Management Investment Project	25.02.2009/ 30.09.2013	16.5	1.46

Table-13
JICA Assisted On-Going Projects

S. No.	State	Name of Projects	Date of Agreement/ Completion	Amount of Assistance (JPY million)	Cumulative Disbursement upto 31.12.2010 (JPY million)
1	Andhra Pradesh	IDP-155 Kurnool-Cuddapah Canal Modernization Project-II	31.03.2004/ 18.06.2012	4773	3125.88
2	Andhra Pradesh	IDP-181 Andhra Pradesh Irrigation & Livelihood Improvement Project	30.03.2007/ 11.07.2016	23974	2141.74
3	Orissa	Rengali Irrigation Project (IDP-210, IDP-210A)	31.03.2010/ 24.11.2015	3072	0.00
4	Orissa	Rengali Irrigation Project (IDP-154)	31.03.2004/ 31.05.2011	6342	6203.19
5	Rajasthan	IDP-161 Rajasthan Minor Irrigation Improvement Project	31.03.2005/ 28.07.2015	11555	91.92

Table-14
Kreditanstalt fur Wiederaufbau (KfW), Germany

S No	State	Name of Project	Date of Agreement/ Completion	Amount of Assistance Donor Currency (Million)	Cumulative Disbursement upto 31.12.2010 (Million)
1	Maharashtra	Minor Irrigation Project	<u>01.06.2000</u> 30.06.2011	EURO 17.01	EURO 13.17

Projects under Pipeline- World Bank

Out of 3 externally aided projects under pipeline assisted by World Bank, 1 relates to Dam Rehabilitation and Improvement Project in 4 States, 1 relates to Accelerated Development of Minor Irrigation Project (ADMI) in West Bengal and 1 relates to Water Sector Improvement in the State of Orissa. The brief details are given below:

(i) Dam Rehabilitation and Improvement Project –Date of proposal: 7th May, 2003

The total project cost of the project is estimated at Rs 2100 Crore (US\$437.5 million). Out of which, 80% will be financed by the World Bank, while balance of 20% will be financed by the respective States and the Central Government. The Loan Negotiation with the World Bank and participating States has been completed. Agreement with the World Bank is expected to be signed shortly.

About 223 large dams in the four participating States, namely, Orissa, Kerala, Madhya Pradesh and Tamil Nadu, which have substantial need for rehabilitation and improvements would be included in the project.

(ii) West Bengal Accelerated Development of Minor Irrigation Project (ADMI) –Date of proposal: 17th January, 2007

The total cost of the project is Rs. 1143.00 crore. The World Bank loan for the project is about US \$ 250 million, to be shared equally under International Development Association (IDA) and the International Bank of Reconstruction and Development (IBRD). The contribution of Government of West Bengal will be US \$ 50 million. The proposed project will support the development of about 4,700 minor irrigation schemes throughout 18 districts of the States. The command area of scheme varies from 5 to 50 hectare and the total command area to be brought under irrigation is about 1.19 lakh hectare. Till December 2010, US \$ 0.43

million has been disbursed under the Project Preparation Fund signed on 19.05.2008.

(iii) Orissa Water Sector Improvement Project (OWSIP) – Date of proposal: 16th May, 2007

The total estimated cost of the project is US \$ 350 million, out of which loan amount will be US \$ 300 million. The balance amount of US \$ 50 million will be provided by the State Government. The main components of the project are (i) Institutional Modernization & Capacity Building ;(ii) Improving the sustainable productivity of existing assets and (iii) Preparation of future water investments. The State Government of Orissa has been working out details of the sub-projects, keeping in the view the funds available under different schemes of Govt. of India, viz. A.I.B.P., FMP, NABARD etc.

Projects under Pipeline – ADB

A brief status of projects under pipeline with Asian Development Bank assistance is given below:

(i) Sustainable Coastal Protection and Management Project

The total estimated cost of Sustainable Coastal Protection and Management Project is US\$ 411.4 million, out of which US\$ 250.0 million will be financed by Asian Development Bank (ADB), US\$ 126.6 million will be funded by concerned State Governments and balance amount of US\$ 34.8 million will be funded through private sectors and others sources. The project has been planned in 3 phases (i.e. 3 projects). In Phase-I, 4 sub- projects, viz. Mirya Bay in Maharashtra, Ullal in Karnataka and Coco and Colva Beaches in Goa are included.

The loan negotiation meeting for Sustainable Coastal Protection and Management Project with ADB for 3 States of Maharashtra, Karnataka and Goa was held from August 30 - September 1, 2010.

TAC approval of the subprojects, namely, Mirya Bay in Maharashtra and Ullal in Karnataka is under process in CWC.

(ii) North- Eastern Integrated Flood and River Bank Erosion Management Project (Assam)(AIFRERMIP)

The total cost of AIFRERMIP over the period of 2010-17 is about US \$ 150 Million. The financing pattern for AIFRERMIP is 80:20 between ADB and the Government. The Multi-Tranche Financing Facility (MFF) loan of this project of \$ 120 million was approved on 19th October, 2010 and its project-I for \$ 56.9 million was approved on 25th October, 2010. The MFF aims to improve the reliability of flood and reiverbank erosion risk management systems in flood prone areas in Assam, focusing on three selected sub-projects having existing flood embankments that are deteriorated and threatened by river bank erosion.

Bilateral Cooperation/ Signing of MoUs

– Memorandum of Understandings (MoUs) were signed by WAPCOS, a Public Sector Enterprise under the aegis of the Ministry of Water Resources with the Government of Lao PDR and the Royal Govt. of Cambodia in the field of Water Resources Management on 09.06.2010 and 10.06.2010 respectively. Draft MoUs between the Govt. of Republic of India and Royal Govt. of Bhutan and the Govt. of the Kingdom of Morocco in the Water Resources Sector are under consideration.

Pursuant to Memorandum of Understanding between the Government of India and Government of Australia signed on 10.11.2009, a Joint Working Group (JWG) having equal members from each side was formed in 2010 and the first meeting of JWG was held during 15-19 November, 2010 in New Delhi wherein an Action Plan charting out various activities for cooperation on Water Resources Management between India and Australia was signed on 19.11.2010.

Bilateral Cooperation with African Countries - The first India-Africa Forum Summit (IAFS) was held in April, 2008 and the Union Cabinet approved the following with regard to Ministry of Water Resources:

- a) Preparation of Strategy Paper on Integrated Water Resources Development and Management by WAPCOS, initially for 5 countries and to be extended to other countries later on; and
- b) Conducting 7 specialized training courses.

Funds for these activities will be provided by Ministry of External Affairs under its ITEC programme.

On (a) above, WAPCOS has submitted a proposal for preparation of Strategy Paper on river basins in Chad, Bubyie in Zimbabwe, Limpopo in Mozambique and Sankuru in DR Congo and is under consideration of Ministry of External Affairs.

Regarding (b), seven training courses on seven different specialized modules relating to water resources management for African engineers were prepared by seven Institutes, namely, National Water Academy, Pune; National Institute of Hydrology, Roorkee; Central Ground Water Board; Central Water and Power Research Station; Central Soil and Materials Research Station; Deptt. of Water Resources, IIT, Roorkee and Deptt. of Hydrology, IIT, Roorkee.

Under ITEC programme for African nationals, during the current year, National Water Academy, Pune conducted training programme, namely, "Preparation of Detailed Project Report for River Valley Projects" from 14-25 February, 2011 and Rajiv Gandhi National Ground Water Training and Research Institute, Faridabad conducted "Training Course on Ground Water Management and Modelling" from 03-07 March, 2011.

Chapter 8

Research and Development

The Ministry of Water Resources (MoWR) has three research organizations viz. Central Water and Power Research Station (CWPRS), Central Soil and Materials Research Station (CSMRS) and National Institute of Hydrology (NIH) which 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 with the objective of improving the present practices in planning, design and operation of water resources projects.

Promotion of Research in Water Sector

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, recognised 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, five Indian National Committees (INCs), namely, INCH (Hydraulics), INCOH (Hydrology), INCID (Irrigation & Drainage), INCGE (Geo-Technical Engineering) and INCCMS (Construction Materials & Structures) had been constituted to provide necessary technical and advisory support for the implementation of R&D programme. In September 2008, these INCs were reconstituted. The INCGE and INCCMS were merged into a single INC, namely, Indian National Committee on Geo-Technical Engineering and Construction Materials (INCGECM) and a new Indian National Committee on Ground Water (INCGW) has been constituted. Thus, the total number of INCs remains five. 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 Hydraulic Research (INCH)

The Indian National Committee on Hydraulic Research (INCH) was constituted in 1990, the apex body in Hydraulics with the responsibility of coordinating various research activities in the field of management of floods, hydraulic structures, river and

estuarine hydraulics, river morphology, ground water hydraulics, instrumentation for seismic and geophysical measurements, open channel flow, pipe flow, hydraulic machinery, city water supply and ports and harbours. The secretariat of INCH, earlier located at CWC, New Delhi, has now been shifted to CWPRS, Pune with effect from September 2008. As on February 2011, 17 research schemes are under implementation and 1 has been completed successfully during 2010-11.

Indian National Committee on Hydrology (INCOH)

The Indian National Committee on Hydrology (INCOH) constituted in the year 1982, is the apex body in Hydrology, with the responsibility of coordinating various research activities in the field of meteorology, surface water hydrology, evaporation control, instrumentation, real time systems, application of GIS and remote sensing. The secretariat of INCOH is located at National Institute of Hydrology, Roorkee.

In pursuance of its objectives, the Committee brought out 29 state-of-art reports in hydrology in the country up to March 2010 and 1 state-of-art report on reservoir sedimentation was completed during 2010-11.

The Committee is participating in the activities of International Hydrological Programme (IHP) of United Nation's Educational, Scientific and Cultural Organisation (UNESCO) by organizing regional courses and workshops.

As on February 2011, 17 research schemes are under implementation. The 3 research schemes have been completed during 2010-11.

Indian National Committee on Irrigation and Drainage (INCID)

The Indian National Committee on Irrigation & Drainage (INCID) was constituted in 1990, the

apex body in Irrigation and Drainage with the responsibility of coordinating various research activities in the field of irrigation, drainage, agronomy, water management, environmental impact and socio-economic aspect of water resources projects, plasticulture development, geo-textiles. This is working as National Committee for India for the International Commission on Irrigation & Drainage (ICID). INCID contributes to various ICID meetings/ workshops/ conferences and to other international conferences. INCID is also involved in bringing out technical publications in the form of manuals, reports, bulletins and seminar proceedings etc. As on February 2011, 42 research schemes are under implementation and 3 research schemes have been completed.

Indian National Committee on Geotechnical Engineering and Construction Materials (INCGECM)

The two National Committees on Geotechnical Engineering (INCGE) and Construction Materials and Structures (INCCMS) constituted in 1991 and 1992 respectively have been merged and reconstituted as Indian National Committee on Geotechnical Engineering and Construction Materials (INCGECM) in September 2008. The apex body in geotechnical engineering and construction materials is responsible for coordinating various research activities in the field of rock mechanics and tunneling technology; soil mechanics and foundation engineering; construction materials, concrete technology and structural engineering. Its secretariat is located at CSMRS, New Delhi. As on February 2011, 16 research schemes are under implementation.

Indian National Committee on Ground Water (INCGW)

Considering the importance of various issues related to ground water, a new committee viz. Indian National Committee on Ground Water (INCGW) with responsibility of

coordinating various research activities in the relevant field has been constituted in September 2008. So far, the activities pertaining to research in ground water were being coordinated by INCOH through its Research Committee on Ground Water. The secretariat of INCGW is located at CGWB, Faridabad. The research schemes pertaining to ground water which, so far, were being dealt by INCOH, have now been brought under INCGW. As on February 2011, 12 research schemes were under implementation. 4 research schemes have been completed during 2010-11.

17th Meeting of the Standing Advisory Committee (SAC)

The 17th meeting of the Standing Advisory Committee (SAC) of MoWR for Research & Development was held in October 2010. A total of 22 research proposals including 8 deferred proposals were considered by the Committee. 12 research proposals were approved for funding under the R&D Programme. 6 research proposals were deferred for consideration in the next

meeting of SAC with the direction that the views / observations of DST/CSIR/concerned State Governments/ Organizations should be obtained. 3 research proposals were not accepted for funding. In respect of 1 proposal of NIH, it was decided that they may take up this scheme under their own plan allocation.

New Activities Proposed during XI Plan

With a view to addressing the research problems in proper perspective, the State Government institutions such as engineering / irrigation research institutions, Water and Land Management Institutes are being actively involved in (a) efficiency studies for completed major and medium irrigation projects; (b) effect of climate change on water resources and studies in respect of vulnerability assessment and adaptation; (c) reservoir sedimentation studies; (d) post-facto evaluation and management plan for optimal benefit from the resources; and (e) initiation of benchmarking of irrigation projects for performance improvement.

Chapter 9

Organizations and Institutions

ATTACHED OFFICES

CENTRAL WATER COMMISSION

Central Water Commission is an attached office of the Ministry of Water Resources with its Head Quarters at New Delhi. It is a premier Technical Organisation in the country in the field of Water Resources since 1945. The Commission is 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 Organisations, each headed by a Chief Engineer.

Activities

The activities of CWC may be summarized as follows:

- Flood Forecasting and Assistance to State Govts. in Flood Management
- Collection and Analysis of Hydrological Data
- Techno-Economic Appraisal of Projects
- Monitoring of Projects and Projects receiving Central Assistance
- Design of Projects
- Surveys, Investigations and Preparation of DPR
- Studies on Environmental and Socio-Economic Issues
- Studies Related 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 at present operates National Network of about 878 Hydrological Observation Stations covering gauge, discharge, silt and water quality. The basic data collected by field units are processed and validated at Sub-Divisions, Divisions and Circle level using Surface Water Data Entry System (SWDES) software. The authenticated data in the form of Water Year Book, Sediment Year Book and Water Quality Year Book is then transmitted to CWC (HQ) for storage, updating, retrieval, etc. The dissemination of data to bonafide users are processed as per the data request received in regional offices of CWC as well as at Head Quarters by P&D Unit as per norms and guidelines. Under Hydrology Project, five Regional Data Centres have been set up at Nagpur, Bhubaneshwar, Hyderabad, Gandhinagar and Coimbatore for storage of data. At National Surface Data Storage Centre (NSWDC), New Delhi data of above regions of CWC is stored and combined catalogue of metadata is hosted on website. Besides the data of the above regions, data from other regions are

also received and stored at NSWDC, New Delhi.

Hydrology Project-II

The Hydrology Project Phase-II envisages establishment of Hydrological Information System on the pattern of HP-I in 4 new States, namely, Punjab, Himachal Pradesh, Goa and Puducherry and vertical extension in existing 9 States and Central agencies for utilization of HIS resources created during HP-I.

Central Water Commission's component for Hydrology Project Phase-II consists of two major components, namely, Institutional Strengthening and Vertical Extension. Under the Institutional Strengthening, it is proposed to increase awareness for data dissemination and knowledge sharing, providing logistical support, etc. Under the Vertical Extension component, the major activity envisaged by the Central Water Commission is Development of Hydrological Design Aids including standardization of methodology/ protocols.

The estimated cost of the proposal is Rs. 24.9 Crore without contingencies and Rs. 29.63 Crore with contingencies.

Assessment of Basin-wise Water Situation

CWC has also started working on assessment of basin-wise water situation in the country using modern technology and methods including mathematical modelling with the help of NRSC, Hyderabad. The models so developed would also generate various scenarios corresponding to varied projected climatic conditions.

Snowmelt Runoff Forecasting in Himalayan River Basins and Monitoring of Glacial Lakes and Water Bodies

CWC is extending & modernizing its field data collection activities under "Snowmelt runoff

forecasting in Himalayan River Basins". The activities proposed include Snowmelt Runoff Forecasting in the Himalayan River Basins in Chenab, Beas, Yamuna, Ganga and Satluj with the help of Remote Sensing inputs and by continuing field observations at existing and proposed new observatories.

Another work has been taken up for "Studies and Monitoring of Water Bodies and Glacial Lakes in the Himalayas affecting India". The work has been proposed to be taken up with the help of NRSC. The objectives of the study are:

1. To prepare inventory of Glacial Lakes/Water Bodies in the Himalayan Region of the Indian River Basins using Satellite Remote Sensing Techniques.
2. Monitoring of these Glacial Lakes/Water Bodies on monthly basis from June to October for five years.

Water Quality Monitoring

Central Water Commission is monitoring water quality at 371 key locations covering all the major river basins of India. It has a three-tier laboratory system for analysis of the parameters. The level-I Laboratories are located at 258 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 24 level-II Laboratories located at selected Divisional Headquarters to analyse 25 physico-chemical characteristics and bacteriological parameters of river water. 4 Level-III/II+ Laboratories are functioning at Varanasi, Delhi, Hyderabad and Coimbatore where 41 parameters including heavy elements/toxic parameters and pesticides are analysed periodically. The data generated are computerized in the database system and disseminated in the form of hydrological yearbook, status reports and bulletins. Water Quality year books are

published and WQ bulletins are issued regularly.

Flood Forecasting and Inflow Forecasting

(i) Flood Forecasting & Warning Services

For techno – economic reasons, flood management measures, wherever planned and executed in our country, have been only against the flood of certain magnitude while floods of higher magnitude do occur creating havoc. Accordingly, flood forecasting and warning system has been planned parallel to structural measures of flood management, as advance knowledge of incoming floods plays an important role in reducing flood damage and better planning of rescue/relief operations. Flood forecast (Level forecast and Inflow forecast) also helps in optimum regulations (of multipurpose) reservoirs with or without flood cushion.

Flood Forecasting activities in India in a scientific manner made a beginning in 1958. This service has since been expanded by CWC to cover almost all major flood prone inter-State river basins of India. At present, 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, Orissa, Tripura, Uttarakhand, 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 every year by the Central Water Commission during flood season. 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.

(ii) Flood Forecasting Performance during 2010

During the flood season 2010 (May to Oct.), 7508 flood forecasts were issued which included 6489 level forecasts and 1019 inflow forecasts. Out of total 7508, 7368 forecasts (98.14%) were found within accuracy limit of $\pm 20\%$. During the flood season, the real time hourly data of over 250 stations (most of flood forecasting stations and few base stations), hourly gauge and rainfall data of about 100 telemetry stations under KGBO, Hyderabad were collected through web and telemetry data of Chambal Divisions, Jaipur was collected through VSAT which were compiled, analyzed and were used to generate flood report of the regions. During the flood season of 2010 (May to October), all the 175 flood forecasting stations including 28 inflow forecasting stations were operational from the flood forecasting point of view.

During the flood season of 2010 (May to October), out of 147 level forecasting stations, unprecedented flood situations (where the highest flood level attained during the flood season exceeded their respective previous H.F.L.) were witnessed at 7 Flood Forecasting stations viz. Karimganj on river Kushiya in Karimganj district of Assam, Basua on river Kosi in Supaul district of Bihar, Haridwar, Kannauj, Ankinghat, Kanpur on river Ganga in Dehradun district of Uttarakhand, Kannauj district & Kanpur district respectively of Uttar Pradesh, Moradabad on river Ramganga in Moradabad district of Uttar Pradesh.

(iii) Flood Bulletins

Central Water Commission has been issuing Daily Flood Bulletins and Special Flood Bulletins during the flood season every year based on the information collected from affected State Governments and its own field formations. During the year 2010, 105 Orange Bulletins (High flood situation) were

issued twice daily and 107 Red Bulletins, all on 3 hourly basis, when Unprecedented Flood situation occurred, on various rivers, as per Standard Operating Procedure (SOP), issued by NDMA. In addition, 169 daily flood situation summary (daily bulletins) were issued, which included both level and inflow forecasts information. During Flood season of 2010, flood forecast and bulletins were also transmitted through e-mails and sms to the concerned user agencies from CWC HQ as well as from each Division.

(iv) Communication System for Flood Forecasting

Central Water Commission is operating about 550 wireless stations covering almost all river basins to transmit and receive the data from across the country. Telephone, FAX and E-mail links are also available at all the divisional control rooms and central flood control room under FFM Directorate, CWC. The Central Control Room at Delhi operates on all week days including holidays. Round the clock operation is also made in case of high floods in rivers. The data received in Central Flood Control Room are passed on to various users, Disaster Management Wing through Phone/Fax/E-mail/sms daily.

(v) Modernization of Flood Forecasting Services

The Central Water Commission is making a constant endeavor in updating and modernizing the forecasting services. The forecasting of flood involves a number of stages: 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.

The work of supply, installation, testing, commissioning and maintenance of real time data equipment work on Turnkey basis was

awarded under the scheme “Establishment & Modernization of Flood Forecasting Network in India including Inflow Forecast”. The telemetry systems at 168 telemetry stations in different river basins are as follows:

* Godavari basin	63 stations
* Krishna basin	41 stations
* Brahmaputra basin	21 stations
* Damodar basin	20 stations
* Yamuna basin	15 stations
* Mahanadi basin	8 stations

The modeling centers will be at Dibrugarh (Assam), New Delhi (UYD), Agra, Hyderabad (LKD), Hyderabad (LGD), Kurnool, Bhadrachalam, Guwahati, Asansol and Maithon where the hourly data will be transferred from existing earth stations located at Jaipur (Rajasthan) and Burla (Orissa) through VSAT. The work has been completed for 166 Telemetry Stations. The work of remaining two Telemetry Stations is likely to be completed during the year 2010-11. During XI plan period, installation of 222 Telemetry Stations, 1 Earth Station and 10 Modelling Centres are in progress.

Techno Economic Appraisal of Flood Management Schemes

During 2010-11, a total of 90 Flood Management Schemes from the States of Andhra Pradesh, Assam, J&K, Karnataka, Delhi, Orissa, Punjab, Himachal Pradesh, Chhatisgarh, Tamil Nadu, Tripura, Uttar Pradesh and the U.T. of Puducherry were received in Central Water Commission. Out of which, 15 schemes have been cleared by CWC, 54 schemes are under correspondence, Project Reports for 5 schemes were not found technically sound and 16 schemes are under appraisal in CWC.

Survey and Investigation

More than 200 Irrigation and Hydro-Electric Projects have been investigated by CWC and the Detailed Project Reports (DPR) have been

prepared. At present, 14 projects (12 in India and 2 in Nepal) are under investigation by CWC.

CWC has also carried out investigation of more than 30 projects in the neighbouring countries in Bhutan, Myanmar and Nepal.

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 aggravating mainly due to large quantity of silt/sediment being carried and deposited in its down stream reaches. The special behaviour of the river needs to be thoroughly understood for evolving effective strategies to overcome the problem posed by it.

Morphological study of six rivers was proposed in 10th Plan, out of which morphological studies of three rivers, namely, Ghaghra, Satluj and Gandak rivers were taken up during 10th Plan period. The final draft report of Ghaghra and Satluj was submitted by NIH, Roorkee during December 2009 and was examined in the CWC. The comments/corrections were communicated to NIH, Roorkee for incorporating in the final report. For river Gandak, the interim report has been submitted by CWPRS, Pune, The preparation of final report for these three rivers has spilled over to 11th Plan.

During 11th Plan, morphological studies of seventeen rivers were taken up under the Plan Scheme, ‘R&D Programme in Water Sector’. The rivers are Ganga (Allahabad to Buxer), Sharda, Rapti, Yamuna, Brahmaputra, Subansiri, Pagladia, Mahanadi, Kosi, Bagmati, Mahananda, Tapi, Krishna, Tungbhadra, Ghaghara, Satluj and Gandak.

Two main components of the proposed works during 11th Plan are –

- i) Morphological study using remote sensing images and other historical information like topo-sheets etc. and preparation of comprehensive report;
- ii) Collection of field data like cross-sections of river, discharge and silt data etc. for studies in future.

The EFC Memo for the 'R&D Programme in Water Sector' was approved during February

2008 at Rs. 295 Crore, out of which the component for morphological study is Rs. 21.18 Crore.

Coastal Erosion

The Indian coastline is extending to a length of about 7516 km. Almost all the maritime States/UTs are facing coastal erosion problem in various magnitudes. Consolidated status of coastal erosion and protection in India is given in **Table 15**.

Table-15

Coastal Length (km) given by NHO	Coastline Affected by Erosion(km)	Coastline Protected (km)	Coastline yet to be Protected (km)
7516.60	1660.26	812.59	849.90

Coastal Protection and Development Advisory Committee (CPDAC)

Considering the need of overall planning and cost effective solution to the coastal problems, the Govt. of India has constituted Coastal Protection and Development Advisory Committee (CPDAC) under the Chairmanship of Member (RM), CWC.

Hydrological Studies

Detailed Hydrological studies are carried out by the Central Water Commission at various stages of projects for assessment of quantity of available water and its time distribution, estimation of design flood, sediment transport and its distribution pattern in the reservoir. These details are essentially required to:

- (i) Carry out optimum planning for the available water resources;
- (ii) Design the structure from safety consideration; and
- (iii) Estimate the life of reservoir.

CWC has been associated in the hydrology related studies in respect of majority of the projects in the country.

These studies are made in connection with technical examination of Detailed Project Reports and other special studies/consultancy work. 151 projects were dealt by CWC during the year 2010-11 from hydrology point of view, out of which 9 projects were dealt as consultancy work and 142 projects were dealt for original hydrological studies/ review work.

For estimation of design storm, the work of preparation of new PMP Atlases and updation of existing PMP Atlases as listed below has been taken up under the Scheme "Dam Safety Studies and Planning".

(a) Preparation of New PMP Atlases for Ganga River Basin and Brahmaputra River Basin.

(b) Updation of six PMP Atlases for Cauvery and other East Flowing Rivers, Godavari and East Flowing Rivers, Mahanadi and Adjoining

River Basins, Chambal, Betwa, Sone and Mahi Basins, Narmada, Tapi, Sabarmati, Banas and Luni River Systems and Rivers of Saurashtra and Kutch Region, West Flowing Rivers of Western Ghats. The work has been awarded and is being monitored by HSO Unit of D&R Wing. The Inception Report (1st Report) has been received in December, 2010.

Design

The Central Water Commission is associated, one way or the other, in the 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 the 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.

At present, CWC is carrying out design consultancy in respect of 98 projects out of which 61 projects (including 11 from North Eastern region) are at construction stage while the remaining 37 projects (including 8 from North Eastern region) are at investigation/ DPR stage. Technical examination for 57 projects was also carried out during the year 2010-11. In addition to above, special studies have been carried out and special problems handled in respect of 10 projects during the year.

Dam Safety

As per National Register of Large Dams – 2009, there are 4711 existing large dams in the country. In addition, 390 large dams are under various stages of construction. About 70% of these dams are more than 20 years

old. Appropriate measures for the maintenance of such structures are critical for their safety.

National Committee on Dam Safety (NCDS)

The Govt. of India constituted the National Committee on Dam Safety (NCDS) in October, 1987 under the Chairmanship of Chairman, CWC to oversee dam safety activities in various States and suggest improvements to bring dams safety practices in line with the latest state-of-art practices. The 30th meeting of NCDS was held on 27th August, 2010 in which major dam safety issues, the necessity of Dam Safety Act, preparation of Emergency Action Plan, setting up of hydrological study units etc. were discussed.

Dam Rehabilitation and Improvement Project (DRIP)

The Ministry of Water Resources (MoWR), Government of India, plans to implement Dam Rehabilitation and Improvement Project (DRIP) with the assistance of the World Bank, which would be a six-year project commencing from January, 2011. The project would be implemented in four States, namely, Kerala, Madhya Pradesh, Orissa and Tamil Nadu. About 223 large dams in the four participating States which need rehabilitation and improvements would be included in the project. The project may include some more States at a later date keeping in view the preparedness of such States and the implementation experience gained in four States. Development of appropriate institutional mechanisms for the safe operation and maintenance of all large dams would also be taken up in these States. In addition, strengthening of the institutional set up for national level dam safety surveillance and guidance would be taken up in the Central Water Commission (CWC) under MoWR. The project implementation agencies for DRIP would be the owners of dams i.e.

Water Resources Departments (WRD) and State Electricity Boards (SEB) in the four participating States. The overall implementation of the project would be coordinated by the Central Water Commission, Government of India. The total project cost is estimated as Rs 2100 Crore (US\$437.5 million). Out of the total estimated cost, 80% cost will be financed by the World Bank while balance 20% will be financed by the respective States and the Central Government. The loan negotiation has been completed with the World Bank and the participating States. Agreement with the World Bank is expected to be signed shortly.

Technical Examination of Projects for Seismic and Foundation Aspects

Detailed Project Reports of 13 river valley projects in various States, namely, Arunachal Pradesh, Himachal Pradesh, Uttarakhand, Sikkim, Manipur, Mizoram, Jammu & Kashmir & Bhutan were examined and conditionally cleared with respect to investigation related to foundation engineering.

Dam Break and Glacial Lake Outburst Flood (GLOF) Studies

Dam Break Analysis is carried out to prepare the inundation map and emergency action plan in the unlikely event of dam distress or dam failure. It estimates the maximum water level at the down stream locations of the dam in the event of hypothetical failure of the dam. The dam break analysis is being carried out in CWC on consultancy basis using one dimensional Mathematical Model.

GLOF studies are being carried out to account for the flood, resulting from the breach of moraine dams. The glacier lakes are formed by accumulation of glacier melt behind the moraine dams formed by glacial movements or some other natural phenomenon.

During the year, Dam Break study of Neyyar Irrigation Project, Kerala and the GLOF

studies for Tawang-stage I&II, Arunachal Pradesh were carried out. Further it is proposed to carry out Dam break/routing studies for Nuclear Power Corporation of India Ltd. for their sites at Mihivi in Gujarat and Kovvade in Andhra Pradesh, Matatilla Dam in U.P. and GLOF studies in respect of Sapta Kosi & Sun Kosi Project (Nepal), Arun - III Project (Nepal), Amochu Reservoir Scheme HEP (Bhutan) etc.

Dam Safety Legislation

Dam Safety Bill 2010 was introduced in the Parliament on 30th August, 2010. The Dam Safety Act on its approval will be initially applicable only to the States of West Bengal and Andhra Pradesh, besides Union Territories, Central Undertakings and Private Companies. However, provisions of this Legislation will apply to other such States also if resolution to that effect is passed by all the houses of Legislatures of those States under Clause (1) of Article 252 of the Constitution. The Bill has been referred to the Parliamentary Standing Committee on Water Resources for examination.

Environmental Management and Rehabilitation & Resettlement

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 multidisciplinary Committee. NEMCRVP has representatives of Ministries of Environment & Forests, Agriculture & Co-operation, Tribal Affairs and Water Resources, besides Planning Commission.

The 10th meeting of Environmental Assessment & Management of Water Resources Projects, Sectional Committee WRD-24 was held under the Chairmanship of

CE (EMO) on 16.7.2010 at New Delhi. Comments on Draft Indian Standard for Guidelines for Assessment of the Environment Health Impacts of River Valley Projects, Doc. WRD 24 (490) have been sent to Bureau of Indian Standards, New Delhi. The National Green Tribunal Act 2010 has been circulated to all Chief Engineers of CWC. Comments on Proceedings of the 13th meeting of WRDC have been sent to Bureau of Indian Standards, New Delhi.

The Rehabilitation and Resettlement (R&R) aspects of displaced/affected persons of Water Resources Projects are monitored by the Rehabilitation and Resettlement Directorate of Central Water Commission. In respect of 264 existing ongoing major & medium reservoir projects, data on rehabilitation measures have been collected and a data base has been generated and updated.

Environmental Impact Assessment

Central Water Commission (CWC) has taken up Cumulative Impact Assessment for Subansiri and Siang Sub Basins based on the recommendation of an Inter-Ministerial Group, 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".

Central Water Commission plays a facilitatory role in Environmental Clearance of River Valley and HE Projects by Ministry of Environment and Forests (MOEF). Projects that are to be discussed in the monthly meetings of Expert Appraisal Committee (EAC) of the MoEF are examined beforehand in CWC and comments if any, are forwarded to MoEF. Chief Engineer (EMO), CWC is a Member of the Expert Committee for River Valley and HE Projects constituted by MOEF, which recommends environmental clearance to these projects. In addition to the above, a Screening Committee headed by Chief

Engineer (Project Appraisal) accords "In Principle" clearance to irrigation projects, for preparation of Detailed Project Reports (DPR) of the projects.

Application of Remote Sensing Techniques in Water Resources Sector

The progress of work done during 2010-11 by Remote Sensing Directorate, CWC for the components in two different plan schemes during 11th Five Year Plan Period is as under:

(A) "Estimation of Sedimentation in Reservoirs using Remote Sensing Technique" under the scheme "Research & Development Programme in Water Sector".

Satellite Remote Sensing based Reservoir Sedimentation study (In-house) of 1 reservoir is under progress and Spill over studies (2009-10) of 3 reservoirs have been completed. The work of sedimentation assessment using Remote Sensing technique for 30 reservoirs has been awarded to Maharashtra Engineering Research Institute (MERI), Nashik during May, 2010 with one year as the completion period.

(B) "Creation of Watershed Maps and Geographic Information System" under the scheme "Development of Water Resources Information System".

CWC & ISRO have jointly undertaken the work of development of Water Resources Information System (WRIS) during 11th plan. The estimated cost of the project is Rs.78.32 Crore. An MoU was signed between the two parties in December, 2008 with 4 years time as the completion period. The First full version of website of INDIA WRIS has been launched by Hon' ble Minister of Water Resources on 07 Dec, 2010 in New Delhi. The URL of the website: www.india-wris.nrsc.gov.in can be seen for more details.

Project Appraisal

CWC has so far appraised more than 1641 projects since 1961. The appraisal of the project ensures that the project proposal is in tune with the overall development plan; the basic planning of the project is reliable and investigations are as per established norms. It is also ensured that international/ inter-state agreements or tribunal awards for utilization of water are duly followed and the lay out and design of the project are optimal.

During the year 2010-11, technical examinations of 52 Water Resources projects (20 major irrigation, 14 medium irrigation and 18 flood protections) were completed and accepted by Advisory Committee. At present, 60 new irrigation schemes (29 major & 31 medium) as well as 12 revised estimates (10 major & 02 Medium) are under different stages of appraisal.

Apart from the above, civil components of hydroelectric projects are also appraised in Project Appraisal Organisation, Central Water Commission. During the year 2010-11, appraisal of four hydroelectric projects having total installed capacity of 1310 MW have been completed so far.

Project Monitoring

Central Water Commission monitors the progress of selected ongoing irrigation projects. Each project under general monitoring is visited by the monitoring team at least once in a year and detailed monitoring report is prepared and issued to all concerned for necessary action. During 2010-11, CWC is carrying out general monitoring of 82 ongoing major, medium and Extension, Renovation and Modernization (ERM) projects.

The above 82 ongoing projects include 12 major pre-fifth / fifth Plan projects which have been put under vigorous monitoring i.e. which will be visited frequently or at least twice a year for achieving their completion during the XI Plan period i.e. by March, 2012.

The major, medium and selected minor surface water irrigation projects receiving Central Assistance under Accelerated Irrigation Benefits Programme (AIBP) are also monitored by CWC. As part of AIBP monitoring, the projects are inspected twice a year and monthly expenditure reports and the Management Information System Reports giving physical & financial status of AIBP projects on quarterly basis are obtained from the Project Authorities for review. The recommendations of CWC form the basis for release of funds by the Ministry of Water Resources/ Ministry of Finance. CWC is monitoring 175 major and medium projects under AIBP.

Guidelines for Water Audit and Water Conservation

Water Audit is an important tool of water management and improving the Water Use Efficiency in various sectors of its use. Central Water Commission and Central Ground Water Board under Ministry of Water Resources have brought out "General Guidelines for Water Audit and Water Conservation" related to all sectors of water use including irrigation. Aims & objectives of these guidelines are to introduce, standardize and popularize the water audit system for conservation of water in all sectors of water use and improvement in water use efficiency. The guidelines stipulate for adoption of water audit in all sectors of water use i.e. irrigation, domestic and industrial for judicious and efficient use of fresh water resources. These guidelines have been sent to all the State Governments for formulating their own region-specific, project-specific, system-specific or service-specific guidelines.

Study of Water Use Efficiency in Irrigation Systems

Irrigation Sector is the biggest consumer of fresh water (assessed to be about 78% by the year 2010) and any improvement in the efficiency of irrigation projects will be like creating a new source of water supply which can be gainfully utilized to meet various competing demands of water. Presently, water use efficiencies in various sectors of its use are generally low and there is a need and scope to improve the same. It is, therefore proposed to carryout Water Use Efficiency of all Major & Medium Projects in the country in a phased manner. The objective of water use efficiency studies of irrigation projects is to make assessment of present day status of efficiencies in the following components:

- i) Reservoir Efficiencies (Inflow and release pattern)
- ii) Conveyance Efficiency
- iii) On farm Application Efficiency
- iv) Drainage Efficiency
- v) Irrigation Potential Created and Utilized

So far 43 Major and Medium Irrigation Projects across the country have been taken up for these studies. Out of 43 studies, 30 studies have been completed. These included twenty in Andhra Pradesh, six in Uttar Pradesh, two in Haryana and two in Punjab. The studies of 13 Projects, five in Bihar and Jharkhand and eight in North Eastern States are in advance stage of completion. Draft Final Reports of nine projects out of these thirteen projects have been received, which are under examination in CWC and likely to be finished during 2010-11. The studies of 50 Projects are proposed to be taken up during 2010-11 for which necessary action has already been initiated.

These studies are being carried out by CWC under Plan Scheme of Ministry of Water Resources on 'R&D in Water Sector'.

Performance Evaluation of completed Irrigation Projects

CWC has been entrusted with Post Project Performance Evaluation Studies (PES) of completed Major and Medium irrigation Projects covering System Performance, Agro-economic, Socio-economic and Environmental Impact Assessment Studies.

During 2010-11, Final Reports of Performance Evaluation studies pertaining to six projects, namely, Samrat Ashok Sagar Irrigation Project (Madhya Pradesh), Kodayar Irrigation Project (Tamil Nadu), Itiadoh Irrigation Project (Maharashtra), Nanak Sagar Irrigation Project (Uttar Pradesh), Sukla Irrigation Project (Assam) and Salki Irrigation Project (Orissa) were finalized as per comments / observations of Technical Advisory Committee. These reports have been forwarded to the respective State Governments for taking necessary action as per findings & recommendations of studies.

Capacity Survey of Important Reservoirs in the country

Capacity survey of reservoirs has been a continuing scheme, hitherto known as 'Hydrographic Survey of 30 major reservoirs', initiated during VIII Plan and continued through IX and X Plan. Up-to the end of X Plan, a total of 26 reservoirs were covered under the scheme. Out of which, survey of 23 reservoirs have been completed in all respects and report finalization of 3 reservoirs have been carried over to the first year of XIth Plan.

During XIth Plan, a SFC Memo for covering 20 more reservoirs under Capacity Survey at an estimated cost of Rs. 410.00 lakhs was sanctioned on 20th February 2008 by the Ministry. Out of these 20 reservoirs, work of carrying out capacity survey of 10 reservoirs was commenced in December, 2010.

Policy and Planning

Basin Planning & Management Organization (BPMO) under Water Planning & Projects Wing of CWC is acting as the Nodal agency in providing technical inputs related to water policy and planning aspect to the Ministry and functions as technical Secretariat for National Water Board.

Joint Operation Committee of Rihand Reservoir

23rd meeting of Joint Operation Committee (JOC) for Rihand reservoir was held under the Chairmanship of Member (WP&P), CWC on 19.10.2010 to finalise the operation plan for the year 2010-11 for Rihand reservoir to meet irrigation requirement at Indrapuri Barrage (Bihar) and Hydropower Generation plan of Uttar Pradesh Power Corporation Limited and Uttar Pradesh Jal Vidyut Nigam Limited.

Delhi Mumbai Industrial Corridor (DMIC)

Chairman, CWC is special invitee on the Committee to look into the availability of water in Delhi-Mumbai Industrial Corridor (DMIC) region. BPMO provided detailed observations on the background note on water supply projects in DMIC region prepared by Delhi-Mumbai Industrial Corridor Development Corporation Limited.

Interaction with Ministry of Agriculture

Central Water Commission is represented in the Crop Weather Watch Group meetings of Ministry of Agriculture in which the water storage status of 81 important reservoirs, being monitored by CWC, is appraised.

CENTRAL SOIL AND MATERIALS RESEARCH STATION (CSMRS)

The Central Soil and Materials Research Station, an attached office of the Ministry of Water Resources located in New Delhi, deals

with field and laboratory investigations, basic and applied research on problems in geotechnical engineering, concrete technology, construction materials, water quality, instrumentation and associated environment issues having direct bearing on the development of irrigation and power in the country and functions as an adviser and consultant in the above fields to various projects and organizations in India and abroad. Broadly, the spheres of activities are:

- Soil mechanics and foundation engineering including soil dynamics, geotextiles, soil chemistry and rockfill technology
- Concrete technology and drilling technology
- Rock mechanics including instrumentation, engineering geophysics and numerical modeling
- Concrete chemistry, electronics and information technology

To monitor and guide the activities of the Research Station, a Governing Council headed by Secretary, Ministry of Water Resources and a Standing Technical Advisory Committee headed by Member (D&R), Central Water Commission are in place.

Consultancy works in respect of engineering materials for over 50 river valley projects and other civil engineering structures has been handled successfully. The work comprised field and laboratory investigations for soil, rock, geosynthetics, water and other construction materials. Further, quality control aspects of ongoing projects and instrumentation formed a part of the works undertaken.

Institutional Co-operation Programme between CSMRS and NGI (2006-2010) on "Safety Evaluation and Risk Assessment for Ageing Dams in India"

CSMRS-NGI Institutional Co-operation Programme on "Safety Evaluation and Risk

Assessment for Ageing Dams in India" (2006-2010) was signed between NGI and CSMRS on 27th December, 2006 and ended on 30th November, 2010. A workshop on "Dam Safety Evaluation and Risk Assessment" was organized under this project during 31st August to 1 September, 2010 at CSMRS, New

Delhi. A total of 50 special invited delegates attended the workshop. The failure mode effect analysis and event tree analysis of the Warasgaon Dam, Pune, Maharashtra were discussed during the workshop.



Workshop on "Dam Safety Evaluation and Risk Assessment", 31st August to 1st September 2010 at CSMRS, New Delhi

The benefits of this project are as under:

- Case histories of two dams namely, Warasgaon and Manikdoh, Maharashtra were taken up with the concurrence of the State Government.
- Manual on the methodology of risk assessment
- Enhancing the capabilities in the newly established Numerical Modelling unit of CSMRS
- Training of CSMRS officers in the field of Numerical Modelling including Risk Assessment.
- Dissemination of information through workshops/conferences

SUB-ORDINATE OFFICES

CENTRAL GROUND WATER BOARD (CGWB)

Central Ground Water Board (CGWB) 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) Training and Technology Transfer. Each wing is headed by a Member. The administrative and financial matters of the CGWB are dealt by the Director (Administration) and Finance & Accounts Officer (FAO) 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. Ground Water Management Studies
2. Geophysical Studies
3. Water Quality Analysis
4. Estimation of Ground Water Resource
5. Central Ground Water Authority
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 www.cgwb.gov.in. The portal contains publications, downloads of manual/guides/reports, state ground water profiles, district brochures, Ground Water Information System (GWIS) and Right to Information (RTI) etc.

Achievements of CGWB during 2010-11

- 1. Ground Water Management Studies:** An area of 1.60 Lakh sq. km was covered during pre-monsoon period. In post-monsoon period, studies have been completed in 1.05 lakh sq. km. up to 31st December 2010. The CGWB has explored aquifers in various States/UTs under its scientific exploratory drilling programmes

by utilizing latest studies and technologies which includes remote sensing and geophysical techniques.

During financial year 2010-11 (up to 31.12.2010), the CGWB under their Ground Water Exploration Programme, constructed 498 wells (EW-239, OW-96, PZ-163) including 26 high yielding wells to assess the ground water potential in different hydrogeological set up. Priority was accorded to drought affected and tribal areas, hard rock areas, pollution affected areas etc. Out of 498 bore wells constructed, 65 wells and 181 wells are constructed for exploration in tribal and drought prone areas, respectively.

The Board is monitoring the ground water levels in the country four times a year (Jan/May/Aug/Nov) through a network of 15640 Ground Water Observation Wells.

- 2. Geophysical Studies:** The Board undertakes geophysical studies as an integral part of its activities to support and supplement ground water management studies, ground water exploration and short-term water supply investigations to demarcate bedrock configuration and thickness of overburden, saline -fresh water interface etc. During 2010-11 (up to 31st December, 2010), carried out 1099 vertical electrical soundings, 5.73 line kilometer resistivity profiling and geophysical logging of 64 bore holes have been conducted in various parts of the country.
- 3. Water Quality Analysis :** 13463 samples have been analyzed during the year 2010-11 (up to 31st December, 2010), out of which 10596 samples were analysed for basic constituents, 2404 samples for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc, 463 samples for organic and specific constituents.

4. Estimation of Ground Water Resource based on GEC-1997

Methodology: The Dynamic Ground Water Resource of the country was jointly estimated by respective State Ground Water Departments and Central Ground

Water Board during the year 2004. The ground water resource is estimated as on March, 2004. The Report on "Dynamic Ground Water Resources of India" (as on March, 2004) was printed and circulated to all concerned. Brief details are given in **Table-16**.

Table-16

Dynamic Ground Water Resources of India (2004)

i.	Annual Replenishable Ground Water Resources	433 (bcm/yr)
ii.	Net Annual Ground Water Availability	399 (bcm/yr)
iii.	Annual Ground Water Draft for Irrigation, Domestic & Industrial	231 (bcm/yr)
iv.	Stage of Ground Water Development	58%
v.	Categorization of Blocks/Mandals/Talukas	
	Total Assessment Units	5723
	Safe	4078
	Semi-critical	550
	Critical	226
	Over-exploited	839
	Saline	30

The CGWB in association with State Ground Water Organizations is reassessing replenishable ground water resources as on 2008-09 which will enable identification of 'Over-exploited', 'Critical' and 'Semi-critical' areas of the country for implementation of suitable ground water regulation and management measures.

5. Rajiv Gandhi National Ground Water Training and Research Institute (RGNTRI):

Rajiv Gandhi National Ground Water Training & Research Institute (RGI) under CGWB has been established at Raipur (Chhattisgarh) to conduct training courses for CGWB and other Central / State Government Organizations,

Universities, Institutes etc. RGI imparts training at the induction, mid-career, and senior management levels in all relevant aspects of hydrogeological investigations, exploration, assessment, development and management of ground water. During the year 2010-11 (upto 31.12.2010), 23 training programmes were conducted by RGI and 480 trainees were trained.

6. Web Enabled Ground Water Information System (WEGWIS):

A Web Enabled Ground Water Information System for dissemination of ground water related information has been developed by CGWB. The Ground Water Information System provides access to various thematic layers as well as the nation

wide data base on ground water level and water quality generated by CGWB. This initiative will help more effective sharing of information relating to ground water resource availability and water quality with user groups, planners and administrators.

7. Enactment of Legislation on Ground Water by States/UTs:

The Ministry of Water Resources has circulated a Model Bill to all the States/Union Territories to facilitate regulation and control of development and management of ground water and enactment of a suitable legislation on the lines of the Model Bill. Ministry of Water Resources has been persuading the States/UTs for early enactment of law on ground water. So far, ground water legislation has been enacted by 11 States/Union Territories. 18 States/UTs are at various stages of enactment of legislation.

CENTRAL GROUND WATER AUTHORITY:

In pursuance of the order passed by the Hon'ble Supreme Court of India, Central Ground Water Board has been constituted as Central Ground Water Authority (CGWA) under sub-section (3) of Section 3 of the Environment (Protection) Act, 1986 vide notification No. S.O. 38 (E) dated 14.01.97 for the purpose of regulation and control of ground water management and development in the country.

The Central Ground Water Authority is functioning under the administrative control of the Government of India in the Ministry of Water Resources with its Headquarters at Delhi. CGWA is headed by the Chairman and 14 other members from different Ministries/Department/Organisations/Institutions of Government of India including all the 4 Members of CGWB. 5 additional members, one each member from Department of

Legislative, Department of Legal Affairs, Central Public Health & Environmental Engineering Organization under Ministry of Urban Development, National Commission for Women and Department of Drinking Water Supply under Ministry of Rural Development have been approved recently for inclusion in the composition of CGWA.

The Authority performs the following functions:

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

Decentralization of Powers and Functions of CGWA

As part of streamlining the regulatory function of "Central Ground Water Authority (CGWA)", District Magistrates have been appointed as authorized officers for grant of permission for extraction of ground water for drinking/domestic uses in 36 out of 43 blocks/talukas notified by CGWA in 10 States for ground water regulation. They have been advised to process requests for grant of permission for extraction of ground water for drinking/domestic purposes in notified areas as per guidelines issued by CGWA. Central Ground Water Authority has also framed revised guidelines for grant of NOC for

ground water abstraction by industries/ projects in the country.

The detailed activities and achievements of CGWA have been put on the website of CGWB at http://cgwb.gov.in/GroundWater/gw_regulation.htm

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, Isotope studies, Demarcation of Fresh- Saline Water Interface, Mining Hydrogeology, Studies on Arsenic in Ground Water, Remote Sensing etc. and the collaborating institutions include NIH, NGRI, NLC, RSMML and BIT Mesra. These studies have helped in better understanding and solving various problems in the ground water sector. The Board, with the help of its multidisciplinary scientific activities, provides assistance to the State Governments through recommendations for better ground water development and management practices

Table-17

Sl. No.	State	No. units for which subsidy released	Subsidy released (Rs. in Crore)	Fund released under IEC (Rs. in Crore)	Fund released to Ministry for awareness (DAVP) (Rs. in Crore)	Operating cost availed by NABARD @ 1% of net subsidy released (Rs. In Crore)	No. of dug well recharge structures completed
1.	Gujarat	141381	48.41	3.25	0.2224065 & 0.0192882	0.4841	7136
2.	Karnataka	72148	26.68	2.00		0.2668	12254
3.	Madhya Pradesh	93857	40.14	2.00		0.4014	11339
4.	Maharashtra	44632	14.04	2.00		0.1404	38023
5.	Rajasthan	91162	30.48	2.00		0.3048	4312
6.	Tamil Nadu	276256	103.83	5.75		1.0383	21049
Total:		719436	263.58	17.00	0.2417	2.6358	94113

During the year 2010-11, CGWB has signed three MoUs in the field of ground water with country's premier institutes as indicated below:-

(i) Geological Survey of India (GSI) under Ministry of Mines on "Geo-scientific Data Sharing and Cooperation in the field of Ground Water, Sub-surface Geology & Hydrology"

(ii) Oil and Natural Gas Corporation (ONGC) on Patal Saraswati Jalodgar Yojna (A Deep Ground Water Project)

(iii) Rail India Technical and Economic Services (RITES) on Ground Water Modeling of the area around Railway Tunnel – 3 in Katra-Udhampur Section of USBRL Project, J&K.

Initiatives Taken for 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 has implemented a scheme on "Artificial Recharge to Ground Water through Dug Wells" in 6 States, namely, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Gujarat & Madhya Pradesh with the objective to recharge rain runoff generated in agricultural fields through existing dugwells in areas underlain by hard rock terrain and having majority of Over-exploited, Critical and Semi-critical assessment units. The approved cost of the scheme was Rs.1798.71 Crore for implementation during 2007-2008. Under the scheme, as on 30.11.2010, funds amounting to Rs. 283.457 Crore, including Rs. 263.58 Crore as subsidy to beneficiaries, Rs. 17 Crore for IEC/Capacity Building activities and Rs. 0.2417 Crore to the Ministry for awareness under the scheme and an amount of Rs. 2.6358 Crore (i.e 1 % of net subsidy amount of Rs. 263.58 Crore released) to NABARD as operating cost have been incurred. The state-wise progress made by the participating states is given in **Table-17**.

The proposal for extension of the scheme during the remaining period of XI Plan is under consideration.

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

The CGWB is implementing demonstrative projects on artificial recharge to Groundwater and Rain Water Harvesting in the states of Kerala, West Bengal, Punjab, Arunachal Pradesh, Andhra Pradesh, Karnataka, Gujarat, Maharashtra, Madhya Pradesh, Jharkhand, Uttar Pradesh, Tamil Nadu and UT of Chandigarh during XI Plan. A total of

1075 structures amounting to Rs.4863.03 lakh have been approved and Rs.3347.30 lakh have been released to the States as on 31st December 2010.

CENTRAL WATER AND POWER RESEARCH STATION

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.

Organisation

CWPRS provides specialised services through physical and mathematical model studies in river training and flood control, hydraulic structures, harbours, coastal protection, foundation engineering, construction materials, pumps and turbines, ship hydrodynamics, hydraulic design of bridges, environmental studies, earth sciences and cooling water intakes. The major disciplines of CWPRS are (i) River Engineering; (ii) Reservoir & Appurtenant Structures; (iii) Coastal Engineering including Mathematical Modelling Centre; (iv) Foundation & Structures including Applied Earth Sciences; and (v) Instrumentation, Calibration and Testing Facility

CWPRS has made significant strides in the application of remote sensing techniques for providing solutions to river and coastal engineering problems. The requirement of

accurate and reliable instrumentation for data acquisition and control systems for physical model studies/ prototype measurements is met by in-house development. CWPRS, with an interdisciplinary approach in its activities, thus represents unique services available to the country and the ESCAP region.

Research Activities

CWPRS undertakes assignments on a *no-profit no-loss* basis. During 2010-11 (upto 31st December, 2010), more than 100 new research studies, pertaining to the three major sectors, namely, water resources, energy and water borne transport - were awarded by various project authorities to the institution. During the current year, till 31st December 2010, more than 70 technical reports based on applied research studies were submitted to various project authorities.

Dissemination of Technical Information

- A total of 40 staff members participated, and 80 papers presented, in various Conferences/ Workshops/ Seminars/ Courses/ Training programmes.
- CWPRS officers delivered 45 technical lectures in different training courses organised by the National Water Academy, Pune and other institutions.

GANGA FLOOD CONTROL COMMISSION

Ganga Flood Control Commission, a subordinate office of the Ministry of Water Resources was established in 1972 with its headquarters at Patna. The Commission has been assigned the task of preparing comprehensive plans for flood management of the river systems in the Ganga basin, phasing/sequencing of programme of implementation, monitoring, performance evaluation of various flood management schemes, assessment of adequacy of waterways under road and rail bridges and

providing technical guidance on flood management to the basin States, namely, West Bengal, Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, Chhattisgarh, Madhya Pradesh, Delhi, Haryana and Rajasthan. The Commission also accords technical clearance of flood management schemes of the Ganga basin.

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 basin States are part time members / permanent invitees. Some of the important activities of GFCC during 2010-11 are as under:

Maintenance of Flood protection works of Kosi and Gandak Projects

The Flood Protection works on river Kosi and Gandak are done based on site inspection after every flood season and on the recommendations of Kosi High Level and Gandak High Level Committees respectively. The reimbursement of expenditure incurred for maintaining the flood protection works executed in Nepal portion is done by Government of India based on the recommendations of KHLC/ GHLC. The Committees inspected the sites on rivers Kosi and Gandak after monsoon of 2010, in the month of November, 2010 and December, 2010 respectively and suggested protective measures.

Updating of Comprehensive plan for flood management

Comprehensive plans for flood management of all the 23 river systems of the Ganga basin were prepared between 1975 and 1990. Comprehensive Plans for all the 23 river systems have been updated.



(BREACHED KOSI EMBANKMENT)



(RESTORED KOSI EMBANKMENT)

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; 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.



(FARAKKA BARRAGE)

Keeping in view the severe erosion problems in river Ganga – Padma in the upstream(u/s) and downstream(d/s) reaches and its possible effect on the barrage and its appurtenant works, the jurisdiction of Farakka Barrage was extended from Rajmahal (40km u/s of the Farakka Barrage) in Sahebganj district in Jharkhand to Jalangi town (80 km d/s of the Barrage) in Murshidabad district of West Bengal in 2005 and anti-erosion works on Ganga – Padma including its tributaries were undertaken.

During 2009-10, Farakka Barrage Project Authority (FBPA) completed the anti-erosion works in a length of more than 2.8 km at a cost of Rs. 46 crore.

Farakka Barrage Project Authority has completed the anti-erosion works in a length of 700 m at Manikchak Ghat and in a length of 430 m at Birnagar on the upstream of Barrage on left bank of river Ganga in Malda District (West Bengal) at a total cost of Rs. 17.0 crore during 2010-11 (up to November, 2010).



CANAL HEAD REGULATOR-AT FARAKKA

SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE

Composition and Functions

The Sardar Sarovar Construction Advisory Committee (SSCAC) was constituted by the Government of India in 1980 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 (Hydro Power works) of the Sardar Sarovar Project. The Secretary, Ministry of Water Resources, Government of India is the Chairman of the Committee. 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 relevant officers from 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 Chief Engineer belonging to the Central Water Engineering (Group-A) Service.

The 77th meeting of the SSCAC was held on 7th May 2010 at New Delhi.

The Sardar Sarovar Construction Advisory Committee has a sub-committee, named as Permanent Standing Committee (PSC). The 99th meeting of PSC of SSCAC was held on 8th September 2010 at Indore.

Revised Cost Estimate of SSP

Revised cost estimate of Sardar Sarovar Project amounting to Rs 39240.45 Crore (at 2008-09 price level) has been accorded investment clearance by Planning Commission and considered this estimate acceptable in the State Plan in May 2010. SSCAC in its 77th meeting on 7th May 2010, concurred with the cost of Unit-I for Rs 8930.53 Crore and Unit-III for Rs 2910.89 Crore.



Progress of Main Dam Works

The construction of the main spillway portion of the dam has been held up for over five years due to the writ petition filed by Narmada Bachao Andolan in the Supreme Court of India. 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 Sub-Group, the Environmental Sub-Group and in consultation with the Grievances Redressal Authorities (GRA's) of Gujarat, Maharashtra and Madhya Pradesh.

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.

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.

Power Generation

Total of 17924.61 million units (M.U.) energy were generated from both the power houses till December 2010, out of which 2854.79 M.U. was generated during 2010-11.

Progress of Irrigation Bye-Pass Tunnel (IBPT)

IBPT works were completed in May 2008. Wet testing of gates was done during September 2010.

The dam has overflowed this year from 10th September to 19th September and maximum water level attained was 123.810 m.

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 1990. The Resolution was in accordance with an agreement reached between the Governments of Madhya Pradesh, Uttar Pradesh and Bihar on the 16th September 1973 for sharing the waters of Sone River and the cost of the Bansagar Dam.

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 of 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.

The benefits and cost of the dam, including land acquisition and rehabilitation, are shared by Madhya Pradesh, Uttar Pradesh and Bihar in the ratio of 2:1:1 respectively. The project with the updated revised cost estimate of Rs. 1582.94 Crore (Price level 2009) has been accepted by the Advisory Committee of Ministry of Water Resources in its 102nd meeting held on 28th January 2010.

Benefits from the Project

Irrigation Benefits-

- (i) Annual irrigation in M.P. (in the districts of Rewa, Sidhi, Satna and Shahdol). 2.49 lakh hectare
- (ii) Annual irrigation in U.P. (in the districts of Mirjapur and Allahabad) 1.5 lakh hectare
- (iii) Annual irrigation in Bihar 0.94 lakh hectare towards stabilizing irrigation through old Sone Canal system.

Power Benefits-

- (i) Power generation in Madhya Pradesh 425 MW

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 Radial Crest Gates and Stop-Log Gates have also been fully completed by June, 2006. All construction sluices have been plugged and gates lowered. Works on installation of Irrigation Sluice Gates have been fully completed. Work on all the six Saddles have also been fully completed.

The dam at its full height has submerged 336 villages. Approximately 1.5 lakh PAP's of 54,686 families have been affected. Total 58,753.40 hectare land is coming under submergence, out of which 37,090.40 hectare is private land, 17,185 hectare is revenue land and 4,478 hectare is forest land. The Private land of 37,090.40 hectare has been fully acquired along with the property compensation.

Budget & State Shares

The State Government of Madhya Pradesh, Uttar Pradesh and Bihar fund the project in the ratio of 2:1:1. The details of share due/ received in relation to the expenditure incurred of Rs 1513.89 Crore as on 31.12.2010 is in **Table-18**.

Table-18

(Rs Crore)

Total Expenditure	Share Due Share Received			Balance Share		
	M.P.	U.P.	BIHAR	M.P.	U.P.	BIHAR
Up to 31.03.2010: 1488.97	<u>744.484</u> 834.107	<u>372.242</u> 265.299	<u>372.242</u> 389.562	(+) 89.623	(-) 106.943	(+) 17.320
During 2010-11 up to Dec., 2010: 24.92	<u>12.46</u> (-) 9.58	<u>6.23</u> 34.50	<u>6.23</u> 0.00	(-) 22.04	(+) 28.27	(-) 6.230
Total as on 31.12.2010: 1513.89	<u>756.944</u> 824.527	<u>378.472</u> 299.799	<u>378.472</u> 389.562	(+) 67.583	(-) 78.673	(+) 11.090

UPPER YAMUNA RIVER BOARD

Introduction

“Upper Yamuna” refers to the reach of Yamuna from its origin at Yamunotri to Okhla Barrage at Delhi. An 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 a “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 Uttarakhand State in 2000, the resolution was modified to include Uttarakhand 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).

Organization

The Board comprises of Member (WP&P), Central Water Commission as its 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.

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; controlling the ground water extraction; co-ordination of the Constitution of all projects in the basin, integrated operation of all the projects, watershed development and catchment area treatment plans.

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 has constituted Water Accounting Committee to prepare Water Accounting Manual for UYRB. The Committee is likely to submit draft Manual shortly. The Board has also awarded Surface Water - Ground Water Interaction Study in Palla region of Yamuna River to the National Institute of Hydrology (NIH), Roorkee.

The Board has held 37 meetings so far. The last meeting was held on 21st June, 2010. In this meeting, it was decided that to constitute a committee under the Chairmanship of Chief Engineer, BPMO, CWC to verify the calculations made by UYRB, of actual utilization of Yamuna waters by various States. The committee has submitted its report to the Chairman of the Board. It was also decided to constitute another committee under the Chairmanship of Chief Engineer, BPMO, CWC to discuss the distribution of Yamuna waters from Renuka Dam with the basin States. The committee has obtained the views of basin States on the issue and has submitted its report to the Chairman of the Board.

Following the complaints from Rajasthan that it is not getting its due share of Yamuna water from Okhla barrage at its border, the Member-Secretary, UYRB inspected Agra Canal, Gurgaon feeder, Gurgaon canal and Rajasthan link canal on 6th March, 2010 and recommended certain measures to address Rajasthan's complaint. A meeting of Chief Engineers of the concerned States was also convened by the Member-Secretary, UYRB on 22nd June, 2010 wherein it was decided to take necessary steps to stop theft/illegal lifting of water from Gurgaon canal by Haryana farmers.

Pursuant to the decision taken in the 3rd UYRC meeting held on 12th April, 2006, a Steering Committee had been constituted to expedite construction of Kishau, Renuka and Lakhwar-Vyasi storage projects in Upper Yamuna basin. The committee held its 3rd meeting on 20th July, 2009 during which the basin States agreed to the implementation of storage projects pending agreement on sharing of cost and benefits and meanwhile efforts may continue to arrive at a consensus on sharing of cost and benefits.

REGISTERED SOCIETIES

NATIONAL WATER DEVELOPMENT AGENCY

National Water Development Agency (NWDA) was established in July, 1982 as a registered Society under the Societies Registration Act, 1860 under the Ministry of Water Resources for carrying out various technical studies to establish the feasibility proposals of National Perspective Plan. The NWDA is fully funded by Government of India through Grants-in-aid.

The NPP would give additional benefits of 25 million ha of irrigation from surface water and 10 million ha of irrigation from ground water, thereby raising the ultimate irrigation potential from 140 million ha to 175 million ha and generation of 34 million KW of power,

apart from the incidental benefits of flood control, navigation, water supply, fisheries, salinity and pollution control in various States.

Organizational Set-up

The NWDA is headed by the Director-General of the rank of Additional Secretary to Govt. of India. The Headquarters of the Agency is at New Delhi. Chief Engineer (Hq), Director (Tech) and 7 Superintending Engineers alongwith other staff assist Director General, NWDA at Headquarter. 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/Assistant Engineer.

Major Activities

Inter Basin Water Transfer

The National Water Development Agency has been carrying out studies of National Perspective Plan (NPP) for water resources development. The NPP comprises of two components, namely, (a) Peninsular Rivers Development Component and (b) Himalayan Rivers Development Component. Out of identified 16 water transfer links under Peninsular Component, Feasibility Reports (FRs) of 14 links have been completed. DPR of one link, namely, Ken-Betwa has been completed. The work of preparation of DPR of Par-Tapi-Narmada & Damanganga – Pinjal Link is in progress. NWDA had identified 14 water transfer links under Himalayan Component. Out of this, FRs of 2 links (Indian Portion) have been completed and survey & investigations and other works of 6 more links have also been completed.

Consensus Group headed by Chairman, CWC

The Consensus Group constituted under Chairman, CWC 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 interbasin water transfer of NWDA has held 9 meetings so far.



Shri A.K.Bajaj, Chairman Central Water Commission chairing 2nd meeting of the Committee to monitor and supervise the overall work for preparation of Detailed Project Report of Par-Tapi- Narmada and Damanganga-Pinjal link Projects held on 31.08.2010 at New Delhi. Sitting to the right of Chairman is Shri A.D. Bhardwaj, Director General, NWDA and sitting to the left is Shri R.C. Jha, Member (WP&P), CWC, Ministry of Water Resources.



Shri U.N. Panjiar, Secretary (WR) chairing 55th meeting of the Governing Body of NWDA held on 21.10.2010 at New Delhi. Sitting to the left of Chairman is Shri A.K.Bajaj, Chairman Central Water Commission and sitting to the right are Shri A.D. Bhardwaj, Director General, NWDA & Member-Secretary of the Governing Body and Shri A.B.Pandya Commissioner (PR), Ministry of Water Resources.



30th Annual General Meeting of NIH Society held on April 6, 2010, at Roorkee

Committee of Environmentalists, Social Scientists and other Experts

The Ministry of Water Resources 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. 8 meetings of this Committee have been held so far. Last meeting was held on 5th March, 2010.

Intra-State links

NWDA has received 31 proposals from 7 States viz. Jharkhand, Maharashtra, Bihar, Gujarat, Orissa, Rajasthan and Tamil Nadu. Nine PFRs of the Intra-State links were completed during 2009-10.

NATIONAL INSTITUTE OF HYDROLOGY

The 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.

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 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 (Sagar), 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: i. Environmental Hydrology, ii. Ground Water Hydrology, iii. Hydrological Investigations, iv. Surface Water Hydrology, and v. Water Resources Systems. The Institute has a Research Coordination and Management Unit (RCMU), which provides the interface with various research and academic institutions.

Major Research Areas (XI Plan)

(i) Hydrology of extremes; (ii) Impact of climate change on water resources; (iii) Groundwater modeling and management; (iv) Sustainable water systems management; (v) Surface water modeling and regional hydrology; and (vi) Environmental hydrology.

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.

Technical Publication

The research output of the Institute is published in the form of reports and peer reviewed scientific papers. During the year 2010-11, the Institute has published 120 papers in reputed international and national journals and proceedings of international and national conferences and symposia. About 30 studies have been completed during the year.

The Institute prepared a vision document on 'Mitigation and Remediation of Ground Water Arsenic Menace in India'. The document presented status of arsenic menace in India, availability of scientific knowledge base, understanding and technologies, preventive and corrective measures taken so far and results thereof, and possibility of employing success stories of one place to another region.

Technology Transfer

One of the main objectives of the Institute is to transfer the developed technology 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 25 training programmes during the year for field engineers, scientists, researchers, etc.

Capacity Building Activities

Seven scientists of the Institute were trained at DHI, Denmark, during Oct 26- Nov 12, 2010, to acquire in-depth knowledge about the Decision Support System (Planning) for Integrated Water Resources Development and Management.

IEC Activities

Mass awareness programmes were organized at various locations in the country. The topics covered in these programmes included water conservation, flood management/ flood preparedness, water quality, etc.

STATUTORY BODIES

BRAHMAPUTRA BOARD

The Brahmaputra Board was constituted in 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 has been functioning since January 11, 1982 with its headquarters at Guwahati, Assam. The jurisdiction of the Board includes the States of Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, Sikkim and a part of West Bengal falling within the Brahmaputra Basin.

Organisation

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.

Major Functions

The main function of the Board as per the Act is survey and investigations 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.

Activities of Brahmaputra Board

- **Master plans:** Brahmaputra Board has completed 44 Master Plans out of 57 in Brahmaputra & Barak valley. These Master Plans have been sent to State Government for implementation.
- **Survey, Investigation & Preparation of DPR for Multipurpose Project:** Preparation of DPR for 7 projects are in various stages of investigation.

Drainage Development Schemes (DDS): The Board has completed the DPRs of 21 Drainage Development schemes. Out of these, 11 schemes were technically cleared and other are under modifications.

NARMADA CONTROL AUTHORITY

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 Narmada Water Disputes Tribunal (NWDT) under Clause-XIV of its final order.

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, one full time Executive Member and three full time Members appointed by the Central Government and four part time Members one each nominated by each party States as Members.

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

Meetings of Narmada Control Authority

83rd meeting of NCA was held on 25th October 2010.

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.

The Environment Sub-group held their 48th meeting on 1st April 2010, wherein it was decided that subject to fulfillment of certain conditions, the construction of spillway piers to full height, bridge and installation of gates (to be kept in raised position) could be undertaken.

Resettlement and Rehabilitation (R&R) Activities

(A) Sardar Sarovar Project (SSP)

The progress of R&R activities 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 the NCA. The progress of Sardar Sarovar Project has been indicated in **Table-19**.

Table-19

Sardar Sarovar Project (SSP) Progress of R&R (Upto 30th November 2010)

	Total Project Affected Families (PAFs)	Total PAFs Resettled	Balance Families to be Resettled
Total	46714	46429	285

(B) Indira Sagar Project

In pursuance to the direction of Hon'ble High Court and decisions of R&R Sub-group of

NCA from time to time, the NCA is coordinating with GRA-ISP, NVDA and NHDC, and NCA's R&R officials are also undertaking field visits.

(C) Court Cases

Following court cases are in sub-judice state

Sardar Sarovar Project

- IA No.18-22 in Writ Petition No. 328 of 2002 and Contempt Petition No.18 in Hon'ble Supreme Court.
- Writ Petition No. 14765 of 2007 in the Hon'ble High Court of Madhya Pradesh, Jabalpur (M.P.).

Indira Sagar Project

- Special Leave to Appeal (Civil) 935 of 2007 in the Hon'ble Supreme Court of India.

Indira Sagar & Omkareshwar Canal Projects

- Special Leave Petition No.34065 of 2009 (SLP), in the Hon'ble Supreme Court of India.

The W.P. No. 6056 of 2009 filed by Narmada Bachao Andolan (NBA) against the State Government of Madhya Pradesh & Others regarding Indira Sagar (ISP) and Omkareshwar (OSP) Canal Projects. The Petition has been disposed off on 11.11.2009 with, inter-alia, direction to NCA to monitor environment and R&R activities and submit quarterly reports in the Hon'ble High Court. The NCA is complying with the directions.

During the year 2010-11 (April 2010 to Dec. 2010), 1572.50 MUs power was generated from Indira Sagar Project and 725.13 MUs power was generated from Omkareshwar Project.

Modernization of Hydrometeorological Network based on GSM communication technology is in process.

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 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 ha. in Uttar Pradesh and 1.21 lakh ha. in Madhya Pradesh with power generation of 45 MW through Rajghat Hydro Electric Project at the toe of dam on left flank. The costs as well as benefits of the project are to be 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. State Compensation in M.P. area has been completed. In U.P., the District Administration, Lalitpur had paid the land compensation of 25 villages and for balance 13 villages, the land

properties are being acquired through mutual negotiation by the Betwa River Board. The filling of reservoir upto FRL of R.L. 371.00 M. may not be possible till the acquisition of land and property of balance 13 submergence villages is completed.

Planning and Present Status of Rajghat Power House Works

The total expenditure incurred on civil works of Rajghat Power House till June, 2008 was Rs. 63.15 Crore.

The three units of Power House have been tested and commissioned during 1999-2000. Total 1320 lakh units were generated in the year 2009-10.

O & M Estimate of Rajghat Dam Project during Transition Period

The State of U.P. has paid only Rs. 23.40 Crore and M.P. has paid only Rs. 24.90 Crore against their due share of Rs. 38.52 Crore each upto November, 2010.

Utilization of Present Storage

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

FRL of the reservoir is 371.00 m. Reservoir has been filling up gradually upto 370.20 m. during the last 10 years.

Financial position of B.R.B.

The financial position of Rajghat Dam and Rajghat Power House Project is given in **Table-20**.

Table-20
Rajghat Dam
(Rs Crore)

S.No.	Item	U.P.	M.P.	Total
1.	Apportioned cost as per revised cost estimate	150.30	150.30	300.600
2.	Gross expenditure upto September, 2010	-	-	362.53
3.	Balance available with BRB in September, 2010	-	-	3.56

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. 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 into the reservoir from June 2010 to December 2010 was 9766.379 Million Cubic Meters (Mcum) (344.897 Thousand Million Cubic feet (TMCft).)

The utilization of Water by the States of Karnataka and Andhra Pradesh till end of December 2010 was 1820.147 Mcum (64.278 TMCft) and 1010.117 Mcum (35.672 TMCft) respectively as against the likely abstraction of 4898.806 Mcum (173.000 TMCft) for the water year 2010-2011. Evaporation losses from June, 2010 to December, 2010 were 157.300 Mcum (5.555 TMCft) to be shared by Karnataka and Andhra Pradesh in the ratio of 12.5 :5.5. A total quantity of 4225.971 Mcum (149.239 TMCft) of water has out flowed over spillway including 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 178 million units of power generation is envisaged during the water year 2010-2011. Against this, the power generated till the end of December 2010 was 125.39 million units. The power generated is shared between the States of Karnataka and Andhra Pradesh in the ratio of 20:80.

Mini Hydel Power Plant

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 has been commissioned on 27-10-2004. The mini Hydel plant comprised 3 units of 2.75 MW each and generated 21.900 million units upto December 2010. The Power generated are purchased by the Transmission Corporations of Karnataka and Andhra Pradesh in the agreed ratio of 20:80.

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 reared in the Board's Fish Farm to meet the demand of the public and for stocking in the Reservoir to increase the bio mass. The fishing rights of the Reservoir was auctioned for the year 2010-11 to a local Fishermen's Cooperative Society for Rs.74.61 lakh. In order to facilitate preservation of fish catch, the Board is running an Ice-cum-Cold Storage Plant. Quality fishnets are also manufactured in the Fish Net Making Plant run by Board.

Board Meeting

During the year, the Tungabhadra held 3 meetings till the end of December, 2010.

Chapter 10

Public Sector Enterprises

WAPCOS LIMITED

Introduction

WAPCOS Limited is a Schedule 'B' "MINI RATNA Category-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. WAPCOS comply with the Quality Assurance requirements of ISO 9001: 2008 for Consultancy Services.

Financial Status

Authorized Capital of the Company is Rs. 2.00 Crore. The President has approved the proposal to increase the same from Rs. 2.00 Crore to Rs. 3.00 Crore by issuance of the bonus shares of Rs.1.00 Crore. In the year 2009-10, the Company achieved a turnover of Rs. 30,214.07 Lakh as against the previous year's figure of Rs. 20,507.29 Lakh. The net profit of the Company was Rs.3003.09 Lakh in 2009-10 as compared to Rs. 1376.18 Lakh in the previous year.

Fields of Specialisation

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 objects clause of its Memorandum of Association to provide concept to commissioning services for developmental projects in India and Abroad.

Registration with International Organisations and Operations Abroad

WAPCOS is registered with various international funding agencies like World Bank/International Bank for Reconstruction and Development, African Development Bank, Asian Development Bank, Food and Agriculture Organization, International Fund for Agricultural Development, United Nations Development Programme, World Health Organization, West African Development Bank, Indian Technical and Economic Cooperation (ITEC) Programme, Overseas

Economic Cooperation Fund, Japan Bank for International Cooperation (JBIC) etc. WAPCOS is currently engaged in providing consultancy services in Afghanistan, Bangladesh, Bhutan, Cambodia, DR Congo, Laos, Myanmar, Nepal, Nigeria, Rwanda, Taiwan and Zimbabwe.

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED (NPCC)

National Projects Construction Corporation Limited, a Government of India Enterprise under the aegis of the Ministry of Water Resources, was established on 9th Jan 1957, to carry out infrastructure work and other related activities for development of the nation. NPCC is an ISO 9001-2000 certified Public Sector Company.

Financial Status

The Company achieved a turnover of Rs. 993.91 Crore in 2009-10 as compared to previous year's turnover of Rs. 828.88 Crore.

The Company also registered net profit of Rs. 31.28 Crore in 2009-10.

The Government has approved the revival proposal for conversion of the Govt. of India principal amount of Rs. 219.43 Crore and the cumulative interest due & accrued on it as on the date of conversion to equity capital and further written down to 10% of value. As a result, the authorized share capital of the Company is Rs. 700 crore and its paid up capital is Rs. 94.53 crore now.

Fields of Specialization

Main fields of specialization of the Company cover Townships & other Residential Buildings, Institutional Buildings, Office Complexes, Roads, Bridges & Fly-overs, Hospitals and Health Sector Projects, Surface Transport Projects, Thermal Power Projects, Hydro-Electric Power Projects, Dams, Barrages & Canals, Tunnels and Underground Projects, Real Estate Works etc.

Chapter 11

Training

National Water Academy and Other Training Activities

National Water Academy, functioning at Pune, is a centre of excellence for imparting in-service training primarily to engineers of Irrigation and Water Resources Departments of Central and State Governments and also other Water Resources engineers, including those from other developing countries. Its mandate also includes capacity building among NGOs, school teachers, media personnel, farmers etc. In 2009 NWA opened a new chapter by making available its expertise and facilities to water resources technocrats and Managers from other countries as well.

In the year 2010-11, NWA took following initiatives

- a) One day off-campus Workshop on E-Governance at New Delhi on 19th May 2010.
- b) Off-campus Refresher course on HYMOS (for officers of Govt. of Karnataka) during 8-10 November 2010. .
- c) Off campus training programme on "Environmental Aspects of Water Resources Project for the W.R. Engineers of Shillong.
- d) Off-campus training programme for WAPCOS Officers at Gurgaon.

Since its inception in the year 1988, NWA has conducted a total of 342 training programmes (up to December 2010) and trained 8059 officers.

In addition, the Training Directorate, CWC (HQ) in collaboration with various field organizations of CWC have organized 13 courses on various topics related to Water Resources Development. About 273 officials of various State Government and Central Government Organizations/ Departments have undergone training through these courses.

During the year 2010-11, 29 training programs (up to December 2010) consisting of total 39 weeks of training at NWA, Pune and 13 short term courses at CWC Headquarters at New Delhi were organized.

Human Resources Development

As part of developing the human resources, 38 officials of the Ministry were sent on training in various institutes like Institute of Secretariat Training and Management, Engineering Staff College of India etc., to enhance their capabilities and skills.

Chapter 12

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) (a) & (b) of the Act, all the 17 manuals in respect of Ministry (proper) and its organisations have been placed in the Ministry's website. Appointment of Central Public Information Officers in respect of the Ministry and its organisations have also been made in terms of section 5 (1) and (2) of the said Act. These have been hosted in the website of the Ministry and the concerned organisations.

The Coordination Section, Ministry of Water Resources, Room No. 19, Ground Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi has been assigned the task of accepting applications and the fees under the RTI Act

and forwarding the applications to the concerned CPIOs and making proper entries of all the applications and the fee received. The requisite fee for providing information under RTI Act, 2005 can be paid either through Demand Draft/ Postal Order issued in favour of Pay & Accounts Officer, Ministry of Water Resources, or by Cash.

During the year 2009-10, 21 applications were received under RTI Act-2005. All applications were dealt within time and the requisite information was provided to the requesters.

The particulars of Appellate Authorities and Central Public Information Officers in respect of Ministry of Water Resources are given at **Annexure-V**.

Chapter 13

Role of Women in Water Resources Management

Role of women in water resources management and conservation has been duly recognized. The National Water Policy 2002 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 1987 (and also 2002), 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 in April, 1987 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.

Madhya Pradesh has 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.

Chapter 14

Progressive use of Hindi

Effective measures have been taken for the progressive use of Hindi for official purposes during the year. Efforts were also made to ensure compliance of various orders/instructions issued by the Department of Official Language.

During the period under review, the second sub committee of the Parliamentary Committee on Official Language inspected 5 offices viz.(i) Jhelam Sub Division-II, Cenral Water Commission, Srinagar (ii) Central Ground Water Board, Jamnagar House, New Delhi (iii) Ganga Flood Control Commission, Patna (iv) Central Soil and Materials Research Station, New Delhi (v) Chief Engineer, Monitoring (south) Organization, Bangalore. During these inspection meetings, the Committee suggested various measures for progressive use of Hindi.

Keeping in view the importance of inspection of the work done in Hindi in the various sections and offices of the Ministry, 14 Sections and three offices of the Ministry were inspected. During these inspections concerned officers and staff were encouraged to do their official work more and more in Hindi.

The Official Language Implementation Committee of the Ministry under the Chairmanship of Joint Secretary (Administration) has been meeting 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.

It is the policy of the Government of India to promote use of Hindi through inspiration and incentives. In order to motivate staff to do their work in Hindi, incentive schemes of the department of Official Language have been implemented.

Under Hindi Teaching Scheme of the Department of Official Language, officers and employees are nominated for training in Hindi, Hindi Stenography and Hindi typing.

In order to encourage the use of Hindi in the official work of the Ministry, appeals were issued by the Hon'ble Union Minister of Water Resources and Secretary, Ministry of Water Resources on 07 September, 2010 and 01 September 2010 respectively. Hindi Fortnight was also organized in the Ministry during September, 2010. The activities and competitions like Rajbhasha Quiz, Hindi Noting & Drafting, Hindi Essay, Hindi Typing, Sulekh, Hindi Debate and Hindi Poetry Recitation were organized. First, Second and Third prizes of Rs. 5000/-, RS.3000/ and Rs. 2000/- respectively were given for each of these competitions. Two consolation prizes of Rs. 1000/- each were also given for each of these competitions. Officers and employees of the Ministry enthusiastically participated in

these competitions. The prizes were given by Secretary (WR) to meritorious participants.

Hindi Salahakar Samiti was reconstituted on 1.10.2008. Thereafter due to the change in the structure of Lok Sabha, the constitution of the Samiti also changed. Now the Samiti has been constituted after including the names of new members in it and a resolution in this regard has been issued on 23.12.2010.

Chapter 15

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 posts by direct recruitment/deputation / promotion, termination of probation, confirmation, grant of financial upgradation under 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 case, leave of all kinds, forwarding of applications etc., are also dealt with.

The Scheduled Caste/Scheduled Tribe/Other Backward Class's Cell also forms part of the Administration Section. It renders secretariat assistance to Liaison Officer for Schedule Caste/Schedule Tribe and Liaison Officer for Other Backward Class in discharging their functions on various matters relating to reservation for

Scheduled Caste/Schedule Tribe / Other Backward Class in Government services and carrying out inspections of reservation rosters and on allied matters in respect of various organizations of the Ministry. During the year 2010-2011 (upto 31.12.2010), the Liaison Officer of the Ministry also carried out inspection of the reservation roster & allied matters in respect of 4 organizations of the Ministry. The cell also advises on allied matters in respect of various organizations of the Ministry.

Monitoring of Reservation for SC/ST/OBC

The Scheduled Caste / Scheduled Tribe and Other Backward Classes (SC/ST/OBC) Cell also forms part of the Administration Section. It renders secretariat assistance to Liaison Officers for SC/ST and for OBC in discharging their functions on various matters relating to reservation for SC/ST/OBC in Government services and carrying out inspections of reservation rosters. During the year 2010-2011 (upto 31.12.2010), the Liaison Officer of the Ministry also carried out inspection of the reservation roster & allied matters in respect of 4 organizations of the Ministry. The cell also advises on allied matters in respect of various organizations of the Ministry.

Complaints Committee on Sexual Harassment of Women Employee.

In accordance with the guidelines laid down by the Hon'ble Supreme Court of India to prevent sexual harassment of women employees, a Committee is already functioning to look into the complaints of the women working in the main secretariat of the Ministry. The Committee has been reconstituted on 8th October, 2009 with the following composition:-

- (i) Smt. Mamta Saxena,
DDG, Chairperson
- (ii) Shri N.K. Gupta,
Under Secretary (Admn), Member
- (iii) Smt. Neelam Sharma,
Section Officer (E-I), Member

The Committee submits its finding to the Joint Secretary (Admn.) for necessary action. The Committee holds its meetings from time to time and meets the women employees in the main Ministry and its organizations in Delhi to find out if they have any complaints regarding sexual harassment. During the year 2009-10, the Committee received no complaint from the women employees working in the Ministry proper. Similar Committees have already been constituted in the organizations under this Ministry.

Redressal of Staff Grievances

A Grievances Redress 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, Deputy Secretary (Coordination), 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.

During the period from 1st January, 2010 to 31st December, 2010, this Ministry received 48 grievances both directly from the petitioners and through Deptt. of AR & PG, Pension & Pensioner's Welfare and President's Secretariat etc. Out of these 48 grievances, 13 grievances have been disposed off. Further, Centralized Public Grievances Redress Mechanism (CPGRAM) software developed by Deptt. of AR & PG, is regularly monitored in the Ministry and 72% grievances received through CPGRAM have been disposed off. As the Ministry has no interaction with the public, no Public Grievance Petition has been received directly from citizens during the period.

Chapter 16

Vigilance

The vigilance matters relating to this Ministry and its organisations are handled by the Vigilance Division of this Ministry which functions under the guidance, supervision and control of a part time Chief Vigilance Officer of the level of Joint Secretary assisted by a Deputy Secretary and the Vigilance Section. 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 organisations under the Ministry, including PSUs, are dealt with by the Division.

In matters pertaining to the vigilance, the Vigilance Division functions as a link between the Ministry and the Central Vigilance Commission and other authorities. This Division tenders advice, wherever required, on vigilance matters to the Attached and Subordinates Offices, PSUs, Statutory Bodies, Registered Societies etc. under the administrative control of the Ministry, in consultation with CVC and other agencies/departments.

The Division monitors the disciplinary cases and related matters of the organisations under the Ministry through periodical returns prescribed by CVC/CBI, DoPT, etc. and also updates the status of disciplinary cases in the Monitoring and Management

Information System devised by DoPT. 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 25th October to 1st November, 2010. Preventive vigilance inspection under CVC instruction has been organised in respect of officers of CWC and WAPCOS during December 2010.

The Vigilance Division is also responsible for calling for the Annual Property Returns of all Group 'A' and 'B' Officers and monitoring them. Annual Property Returns for the year ending 2010 have been called for and after the returns are received, the same are being computerized.

Chapter 17

Appointment of Disabled Persons

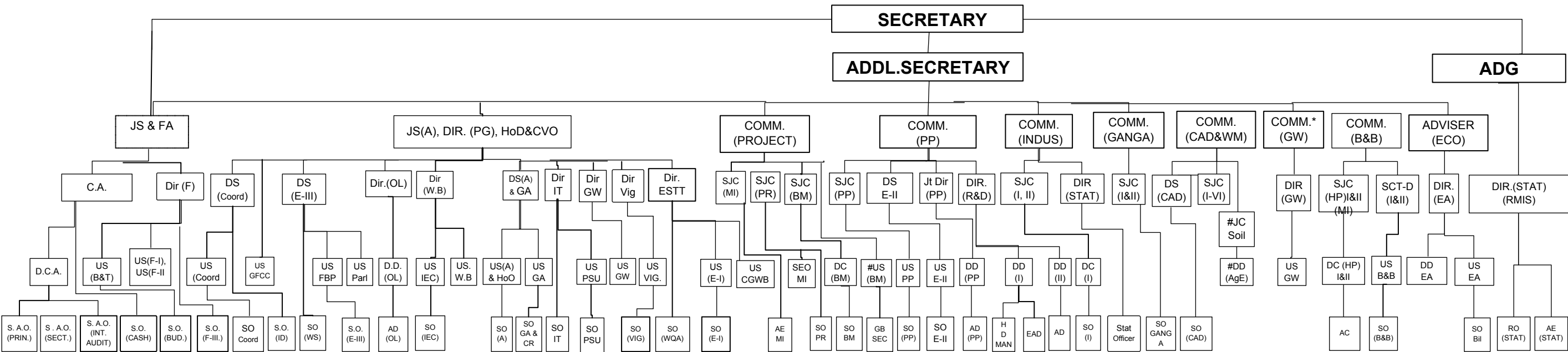
Monitoring of Reservation for Differently Abled Persons

Monitoring of the recruitment of Differently Abled Persons 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% for each Orthopaedic, Blind & Hearing Handicapped) are reserved to be filled up from Differently Abled Persons. The Differently Abled 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.

ANNEXURES

Organisational Chart of Ministry of Water resources

Annexure-i



Legends:

A	Administration	DD	Deputy Director	I	Indus	RO	Research Officer
AC	Assistant Commissioner	DIR	Director	INT AUDIT	Internal Audit	SAO	Senior Accounts Officer
AD	Assistant Director	DO	Desk Officer	JC	Joint Commissioner	SC	Scheduled caste
ADDL	Additional	DS	Deputy Secretary	JD	Joint Director	SCT	Scientist
AE	Assistant Engineer	E	Establishment	JS	Joint Secretary	SECT	Secretariat
AEA	Additional Economic Advisor	EA	External Assistance	LO	Liaison Officer	SGO	Staff Grievances Officer
AgE	Agricultural Engineering	EAD	Extra Assistant Director	MI	Minor Irrigation	SJC	Senior Joint Commissioner
BIL	Bilateral Aid	ER	Eastern Rivers	O&M	Organisation and Methods	SO	Section Officer
BM	Basin Management	ESTT	Establishment	P	Projects	ST	Scheduled Tribe
BUD	Budget	F	Finance	Parl	Parliament	STAT	Statistics
C&E	Coordination & Evaluation	FA	Financial Advisor	PP	Policy & Planning	T	Technical
C	Coordination	FT	Foreign Training	PPP	Public Private Partnership	US	Under Secretary
CA	Controller of Accounts	GA	General Administration	PR	Projects	VIG	Vigilance
CAD	Command Area Development	GB-FBP	Ganga Basin-Farakka Barrage Project	PRIN	Principal	WB	World Bank
CGWB	Central Ground water Board	GW	Ground Water	R&D	Research & Development	WeM	Web Master
COMM	Commissioner	HoD	Head of Department	RMIS	Rationalisation of Minor Irrigation Statistics	WM	Water Management
CVO	Chief Vigilance Officer	HoO	Head of Office			WO	Welfare Officer
DC	Deputy Commissioner	HP	Hydrology Project				
DCA	Deputy Controller of Accounts						

* Additional Charge

Vacant

Staff Strength of Ministry of Water Resource and its Organisations

Sl. No.	Name of Office	Group A					Group B									
							(Gazetted)					(Non Gazetted)				
		Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Ministry of Water Resources	78	10	4	-	3	54	10	1	1	6	107	17	3	-	4
2	Controller of Accounts, Ministry of Water Resources	2	1	-	-	-	81	7	-	-	1	-	-	-	-	-
3	Central Water Commission	491	66	34	4	44	411	77	13	3	2	941	122	25	7	25
4	Central Soil & Materials Research Station	60	10	2	1	3	35	4	2	-	-	36	4	-	-	6
5	Central Water & Power Research Station	138	21	6	2	13	66	13	4	2	8	179	25	6	6	14
6	Central Ground Water Board	382	50	16	-	26	297	42	18	-	20	168	27	9	2	14
7	Farakka Barrage Project	16	2	1	-	1	21	5	2	1	1	37	6	1	-	2
8	Ganga Flood Control Commission	19	-	-	-	-	12	1	-	-	-	2	-	1	-	-
9	Bansagar Control Board	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-
10	Sardar Sarovar Construction Advisory Committee	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Brahmaputra Board	80	3	1	-	-	-	-	-	-	-	-	-	-	-	-
12	Betwa River Board	11	-	-	-	-	19	-	-	-	-	17	-	-	-	-
13	Narmada Control Authority	30	3	1	-	-	37	6	-	-	6	-	-	-	-	-
14	National Water Development Agency	64	4	-	-	-	62	10	-	-	1	16	3	-	-	-
15	National Institute of Hydrology	71	9	2	1	7	-	-	-	-	-	48	5	-	-	1
16	Water & Power Constultancy Services (I) Ltd.	318	43	6	3	28	59	9	3	2	2	25	2	1	-	1
17	National Projects Construction Corporation Ltd.	330	18	1	-	2	-	-	-	-	-	216	15	-	-	-
	Total	2096	240	74	11	127	1154	184	43	9	47	1793	226	46	15	67

*In group C post, two physically handicapped employees is also SC, OBC

**In group D post, one physically handicapped employee is Visually Handicapped

Staff Strength of Ministry of Water Resource and its Organisations

Sl. No.	Name of Office	Group C					Group D					Grand Total				
		Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC
1	2	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	Ministry of Water Resources	170	64	10	7	25	9	3	-	-	-	414	104	18	8	41
2	Controller of Accounts, Ministry of Water Resources	97	27	8	-	15	20	11	2	-	4	200	47	10	-	19
3	Central Water Commission	1387	262	101	16	40	-	-	-	-	-	3230	527	173	30	111
4	Central Soil & Materials Research Station	115	27	8	2	3	84	32	5	2	3	330	77	17	4	15
5	Central Water & Power Research Station	561	108	45	22	24										
6	Central Ground Water Board	1718	340	127	8	108	1123	278	63	5	97	3688	737	234	15	265
7	Farakka Barrage Project	280	44	15	1	19	149	27	1	0	2	503	84	20	2	25
8	Ganga Flood Control Commission	41	9				15	5	1	2	1	89	15	2	2	1
9	Bansagar Control Board	9	-	-	-	-	7	-	-	-	-	19	-	-	-	-
10	Sardar Sarovar Construction Advisory Committee	5	1	-	1	-	4	2	-	-	2	13	3		1	2
11	Brahmaputra Board	381	51	30	4	40	161	25	11	5	6	622	79	41	9	53
12	Betwa River Board	75	7	-	-	-	1	1	-	-	-	123	8	-	-	-
13	Narmada Control Authority	90	18	7	3	10						157	27	8	3	16
14	National Water Development Agency	334	50	19	5	15	118	36	10	2	1	594	102	29	7	17
15	National Institute of Hydrology	74	16	-	1	4	41	17	-	-	5	234	47	2	2	17
16	Water & Power Constultancy Services (I) Ltd.	64	14	2	1	8	41	18	4	1		507	86	16	7	39
17	National Projects Construction Corporation Ltd.	197	27	3	5	2	88	10	2	-	-	830	70	6	5	4
	Total	5598	1065	375	76	313	1861	465	99	17	121	11553	2013	576	95	625

*In group C post, two physically handicapped employees is also SC, OBC

**In group D post, one physically handicapped employee is Visually Handicapped

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 Dhruv Vijai Singh, Secretary Tel No. 23710305, 23715919 Fax. 23731553
	Attached Offices	
1.	Central Water Commission, Room No. 326, Sewa Bhawan, R.K. Puram, New Delhi	Shri A.K. Bajaj, 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, 26967980 Fax: 26853108
	Subordinate Offices	
3.	Farakka Barrage Project, P.O. Farakka Barrage, Distt. Murshidabad-742212 (W.B.)	Shri Kashindra Yadav, General Manager Tel. No. 03485-253644
4.	Ganga Flood Control Commission, Sinchai Bhawan, III floor, Patna-800015	Shri A.K. Ganju, Chairman Tel. No. 0612-2222294
5.	Central Water and Power Research Station, P.O. Khadakwasla, Pune-411024	Dr. I.D. Gupta, Director Tel. No. 020-24380511/ 24380652 Fax: 020-24381004
6.	Central Ground Water Board, Jamnagar House, New Delhi	Dr. S. C. Dhiman, Chairman Tel. No. 0129-24190750, 129 – 2425870 Fax: 23382051 & 95129-2412524
7.	Bansagar Control Board, Samab Colony, Rewa (Madhya Pradesh)	Shri S. K. Haldar, 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	Shri H.K.Sahu, Secretary Tel. No. 26108590 Fax: 26195289
	Public Sector Undertakings	
10.	Water and Power Consultancy Services (India) Limited, 5 th Floor, 'Kailash', 26, Kasturba Gandhi Marg, New Delhi-110001	Shri R.K.Gupta, Chairman & Managing Director Tel. No. 23313881/23313502 Fax: 23313134
11.	National Projects Construction Corporation Limited, Plot No. 67-68, Sector-25, Faridabad (Haryana)	Shri A.K. Jhamb, Chairman & Managing Director, Tel. No. 95129-2231269
	Autonomous Bodies	
12.	National Institute of Hydrology, Jal Vigyan Bhawan, Roorkee-247667 (Uttarakhand)	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 R.C.Jha, Director General Tel. No. 26519164 Fax: 26960841
	Statutory Bodies	
14.	Narmada Control Authority, BG-113, Scheme No. 74-C, Vijay Nagar, Indore-452010	Shri Chetan Pandit, Executive Member Tel. No. 0731-557276
15.	Brahmaputra Board, Basistha, Guwahati	Shri Shankar Mahto, Chairman Tel. No. 0361-2301099/ 2302527 Fax: 0361-2301099/ 2307454/ 2308588
16.	Betwa River Board, Nandanpura, Jhansi-284003	Shri S.K.G.Pandit, Chief Engineer & Secretary Tel. No. 0510-2480173
17.	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt: Bellary, Karnataka State, PIN: 583225	Shri V.N. Wakpanjar, Chairman Tel. No. 040-23308640 Fax: 040-23308642

Annexure- IV

BUDGET AT A GLANCE (SECTOR-WISE)

(Rupees in crore)

Sl No.	Sector/ Organisation /Scheme	Actuals 2009-10		BE 2010-11		RE 2010-11		BE 2011-12		Total B.E . 2011-12
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
I.	Secretariat-Economic Services									
1.	Ministry of Water Resources	0.00	27.51	0.00	24.52	0.00	56.63	0.00	57.17	57.17
2.	Ravi-Beas Waters Tribunal	0.00	1.17	0.00	1.04	0.00	0.90	0.00	0.97	0.97
3.	Cauvery Water Disputes Tribunal	0.00	2.15	0.00	1.93	0.00	2.26	0.00	2.36	2.36
4.	Krishna Water Disputes Tribunal	0.00	1.79	0.00	1.76	0.00	1.63	0.00	1.78	1.78
5.	Vansadhara Water Dispute Tribunal	0.00	0.00	0.00	2.00	0.00	1.19	0.00	4.16	4.16
6.	Mahadayi Water Disputes Tribunal	0.00	0.00	0.00	0.00	0.00	0.83	0.00	3.54	3.54
	Total : Secretariat-Economic Services	0.00	32.62	0.00	31.25	0.00	63.44	0.00	69.98	69.98
II.	Major & Medium Irrigation Central Water Commission									
1.	Direction & Administration	0.00	25.56	0.00	20.90	0.00	22.59	0.00	23.82	23.82
2.	Data Collection	0.00	82.02	0.00	65.13	0.00	86.70	0.00	87.75	87.75
3.	Training	0.00	0.38	0.00	0.32	0.00	0.33	0.00	0.35	0.35
4.	Research	0.00	2.90	0.00	1.84	0.00	2.37	0.00	2.54	2.54
5.	Survey & Investigation	0.00	9.52	0.00	5.02	0.00	5.54	0.00	5.69	5.69
6.	Consultancy	0.00	25.45	0.00	18.84	0.00	22.23	0.00	23.83	23.83
7.	Contribution to international bodies Seminars and conferences on water resources on water.	}								
8.	Exhibition and Trade Fair		0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01
9.	Modernization of equipment CWC Offset Press		0.00	0.14	0.00	0.01	0.10	0.00	0.09	0.09
10.	Cell for monitoring externally aided projects	0.00	0.32	0.00	0.24	0.00	0.27	0.00	0.29	0.29
11.	Water Planning Wing	0.00	0.63	0.00	0.65	0.00	0.98	0.00	1.04	1.04
12.	Hydrological observations in Chenab basin	0.00	1.38	0.00	1.06	0.00	1.86	0.00	2.06	2.06
13.		0.00	2.08	0.00	1.70	0.00	1.97	0.00	2.02	2.02

SI No.	Sector/ Organisation /Scheme	Actuals 2009-10		BE 2010-11		RE 2010-11		BE 2011-12		Total B.E . 2011-12
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
14.	National Water Academy	2.53	0.00	4.00	0.00	3.00	0.00	3.00	0.00	3.00
	Total : CWC	2.53	150.38	4.00	115.72	3.00	144.96	3.00	149.50	152.50
15.	Central Soil and Materials Research Station	0.00	7.63	0.00	5.92	0.00	7.80	0.00	8.31	8.31
16.	Central Water & Power Research Station	0.00	36.12	0.00	25.47	0.00	33.06	0.00	35.67	35.67
17.	National Institute of Hydrology	0.00	10.04	0.00	6.50	0.00	9.80	0.00	8.50	8.50
18.	Sardar Sarovar Construction Advisory Committee	0.00	0.90	0.00	0.63	0.00	0.74	0.00	0.81	0.81
19.	Bansagar Control Board	0.00	0.21	0.00	0.20	0.00	0.23	0.00	0.24	0.24
20.	Sutlej Yamuna Link Canal Project	0.00	0.00	0.00	20.00	0.00	8.94	0.00	2.06	2.06
21.	Upper Yamuna River Board	0.00	0.53	0.00	1.82	0.00	1.82	0.00	1.90	1.90
22.	Research and Development Programme	32.85	0.00	54.00	0.00	42.00	0.00	46.19	0.00	46.19
23.	Development of Water Resources Information System	63.10	0.00	66.00	0.00	41.42	0.00	58.94	0.00	58.94
24.	Hydrology Project	21.54	0.00	53.00	0.00	31.00	0.00	80.00	0.00	80.00
25.	Investigation of Water Resources Development Schemes	37.01	0.00	54.00	0.00	46.00	0.00	54.00	0.00	54.00
26.	Information, Education and Communication	10.85	0.00	15.00	0.00	14.10	0.00	25.00	0.00	25.00
27.	River Basin Organization/ Authority	0.00	0.00	0.50	0.00	0.01	0.00	4.00	0.00	4.00
28.	Dam Safety Studies and Planning	0.34	0.00	1.50	0.00	1.00	0.00	3.00	0.00	3.00
29.	Infrastructure Development	1.28	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00
	Total: Major & Medium Irrigation	169.50	205.81	250.93	176.26	181.53	207.35	277.13	206.99	484.12
III.	Minor Irrigation									
1.	Central Ground Water Board	0.00	108.81	0.00	98.31	0.00	102.29	0.00	105.02	105.02
2.	Rajiv Gandhi NGWTRI	1.78	0.00	6.00	0.00	3.40	0.00	3.00	0.00	3.00

SI No.	Sector/ Organisation /Scheme	Actuals 2009-10		BE 2010-11		RE 2010-11		BE 2011-12		Total B.E . 2011-12
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
3.	Ground Water Management and Regulation	68.82	0.00	100.00	0.00	78.00	0.00	120.00	0.00	120.00
4.	Development of Water Resources Information System	0.00	0.00	0.00	0.00	0.07	0.00	0.06	0.00	0.06
5.	Infrastructure Development	2.15	0.00	10.50	0.00	10.00	0.00	11.40	0.00	11.40
	Total : Minor Irrigation	72.75	108.81	116.50	98.31	91.47	102.29	134.46	105.02	239.48
IV.	Flood Control									
	Central Water Commission									
1.	Flood Data Collection	0.00	65.35	0.00	53.77	0.00	69.76	0.00	72.39	72.39
2.	Payment to Government of Bhutan for maintenance of flood forecasting and warning centres	0.00	1.06	0.00	1.02	0.00	1.02	0.00	1.08	1.08
3.	Strengthening and moderni-zation of flood forecasting and hydrological network in Brahmaputra and Barak Basin	0.00	2.12	0.00	1.95	0.00	1.60	0.00	1.88	1.88
	Total : CWC	0.00	68.53	0.00	56.74	0.00	72.38	0.00	75.35	75.35
4.	Emergent Flood Protection Measures in Eastern and Western Sectors	0.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	3.00
5.	Pagladia Dam Project	0.00	0.00	0.50	0.00	0.01	0.00	0.01	0.00	0.01
6.	Flood Forecasting	17.38	0.00	36.00	0.00	25.00	0.00	36.00	0.00	36.00
7.	River Management Activities and Works related to Border Areas	159.46	0.00	199.00	0.00	188.49	0.00	188.00	0.00	188.00
8.	Infrastructure Development	4.25	0.00	15.00	0.00	11.50	0.00	14.00	0.00	14.00
	Total : Flood Control	181.09	71.53	250.50	59.74	225.00	75.38	238.01	78.35	316.36
V.	Other Transport Services									
1.	Farakka Barrage Project	68.95	32.62	82.00	33.10	62.00	33.82	70.40	35.29	105.69
2.	Jangipur Barrage	0.00	2.21	0.00	2.27	0.00	2.34	0.00	2.46	2.46
3.	Feeder Canal	0.00	3.86	0.00	4.07	0.00	4.74	0.00	4.64	4.64
	Total : Transport	68.95	38.69	82.00	39.44	62.00	40.90	70.40	42.39	112.79

SI No.	Sector/ Organisation /Scheme	Actuals 2009-10		BE 2010-11		RE 2010-11		BE 2011-12		Total B.E . 2011-12
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	Services									
	TOTAL: (I to V) *	492.29	457.46	700.00	405.00	560.00	489.36	720.00	502.73	1222.73
VI.	AIBP and other Water Resources Programme **	8524.39	0.00	11500.00	0.00	9500.00	0.00	12620.00	0.00	12620.00
	GRAND TOTAL	9016.68	457.46	12200.00	405.00	10060.00	489.36	13340.00	502.73	13842.73

Source of financing: *Demand No.104 – Ministry of Water Resources for 2011-2012 (excluding AIBP)

** Details shown in Demand No. 35- Ministry of Finance (Transfers to State and Union Territory Governments).

Summary of important audit observations printed in the report of the CAG of India Union Government (Civil) - No.4 of 2010-11 Performance Audit of Accelerated Irrigation Benefits Programme (AIBP)

1. Successive Modifications in AIBP

The scope and coverage of AIBP, as well as funding pattern, were altered successively through six sets of modifications to the AIBP guidelines between October 1996 and December 1996. Reform measures introduced under AIBP, viz. the concept of reforming States and the "fast track" approach for speedy completion of projects, were not satisfactory, and were subsequently abandoned.

2. AIBP's Role in Overall Creation and Utilization of Irrigation Potential

Although AIBP was a significant factor in the reported creation of Irrigation Potential (IP) in the major, medium, and ERM sector (especially since 2003-04), project-wise data regarding actual utilization of potential reportedly created was not furnished either by the Ministry of Water Resources (M/o WR) or the Central Water Commission (CWC). Consequently, the contribution of AIBP to IP which was actually utilized could not be ascertained in audit.

The role of AIBP in the Minor Irrigation (MI) sector is relatively small. However, the Ministry did not maintain project-wise details of IP created and utilized under AIBP MI projects and could only furnish lump sum figures of IP created and utilized on a year-wise and State-wise basis. In the absence of detailed data, the authenticity of creation and

utilization of Irrigation Potential' under individual AIBP MI projects could not be verified.

3. Poor Progress in Completion of Projects

Of the 253 major, medium and ERM projects sanctioned under AIBP between October 1996 and March 2008, only 100 projects were reported as -completed. However, of the 70 major and medium 'project with our audit sample, while 21 projects were reported as completed, 12 of these "reportedly complete" projects were found to be actually incomplete or noncommissioned. Most 'of the major and medium projects also suffered from cost and time overruns. As regards minor irrigation projects while about 37 per cent of the projects ,sanctioned under.AIBP were reportedly complete, the authenticity of -completion of individual MI projects, as reported by the Ministry, could not be verified in the absence of detailed project-wise data with the Ministry.

4. Short creation of Irrigation Potential Non-utilization of created Irrigation Potential

Out of 41 major, 29 medium and 346 minor irrigation projects, the targeted irrigation potential was not created in 25 major, 19 medium and 189 minor irrigation projects; even the IP reported as created was not being utilized fully. In addition to delayed work execution, one of the main reasons for short creation/ non-utilization of IP was due to splitting a single irrigation project into two or more projects for approval under AIBP, or dividing a project into AIBP and non-AIBP components; even if the

concerned AIBP project was completed, irrigation potential was incapable of being actually utilized due to non-completion / non-functional state of the linked projects.

5. Deficiencies in Planning and Approval of AIBP Projects

Preliminary reports, were deficiently prepared in 14 out of 28 major/ medium projects approved during 2003-08; they were prepared without survey and investigation (and were based exclusively on desk study) or did not assess the anticipated benefits and expected outcomes.

Detailed Project Reports (DPRs) in 37 out of 70 test checked major/ medium projects were found to be deficient in several aspects. As regards minor irrigation projects, DPRs for 112 out of 364 test-checked minor irrigation projects were not prepared/ made available and the projects were cleared on the basis of "concept papers" or simple project proposals.

The Benefit Cost Ratio (BCR), was either not assessed at all or overstated in 28 major/ medium and 177 minor irrigation projects. Further, in 12 major/ medium and 119 minor irrigation projects, the proposed -cropping pattern was not adapted in consultation with the State Agriculture Department and were not based on soil surveys of the command area, casting further doubts on the calculated BCR and the -economic viability of projects approved under AIBP.

6. Poor Project Execution

One of the main deficiencies in project .execution was incorrect phasing of project implementation. There were numerous instances of incorrect phasing of project components e.g. dam section incomplete,

but main/ branch canals 'Complete or nearly complete; main/ branch canals completed, but work of distributaries and water courses not taken up; main and branch canals-constructed in patches, with gaps (particularly in the initial reaches).

7. Poor Financial Management

Between 75 to 85 per cent of the AIBP grants released during 2005-06 to 2007-08 were released to just six States (Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, and Orissa), without corresponding performance in terms of project completion.

Majority of Gol sanctions for release of funds were issued at the fag end of the financial year (last quarter/ March). Further, State Governments did not release the Gol funds in entirety or delayed such release to the implementing agencies well beyond the stipulated period of 15 days, short release of funds amounting to Rs 116 Crore were detected. There was a substantial' "rush of expenditure" on AIBP projects in the last quarter/ month (March) of the financial year, which was also indicative of poor financial management.

In three States (Gujarat, Himachal Pradesh and Karnataka), the second installment for the State was irregularly released by the Gol before submission of the Utilization Certificates (UCs) for the first installment. Further, audited Statements of Expenditure in support of the UCs for each project were not being sent by 12 States.

In Sardar Sarovar Project (SSP), Gujarat, the State Government overstated expenditure incurred out of AIBP Central Loan Assistance during 2003-05 by Rs. 1158 Crore, which was evidently diverted to works not covered under AIBP. Even the

utilization certificates provided by the Sardar Samvar Narmada Nigam Limited (SSNNL) for utilization of funds of Rs. 675.20 Crore provided by Gol for irrigation benefits to Drought Prone Areas (DPA) were irregular.

8. Poor Contractual Management

Audit scrutiny revealed grant of undue benefits to contractors amounting to Rs. 186.89 Crore in 14 States, as well as cases of unauthorized/ irregular expenditure of Rs. 403.83 Crore in 17 States. In addition, other cases of irregular contractual management were also detected in 12 major/ medium and 28 minor irrigation projects.

9. Monitoring and Evaluation

The Central Water Commission (CWC) was required to carry out monitoring visits to major/ medium projects at least twice a year. However, it was found that the actual percentage of monitoring visits ranged from 66 to 73 per cent during 2002-08. As regards monitoring of minor irrigation projects, a "sample" of such project was to be checked by the cwc. However, it was found that CWC had made monitoring visits to only 57 minor irrigation projects in 10 States, which constituted a negligible proportion of the 8699 minor irrigation projects sanctioned under AIBP. The monitoring of AIBP projects at the State and Project levels was also deficient.

Annexure- VI

List of CPIOs and Appellate Authorities in Ministry of Water Resources (Proper)

S. No.	Name & Designation of CPIO appointed (Shri/Smt/Kum)	Name of the Section/ Desk/ work	Name & Designation of the Appellate Authority appointed (Shri/Smt/Kum)
1.	D.K. Paliwal, Under Secretary (Public Sector Undertaking & Public Private Partnership)	Public Sector Undertakings Section & Public Private Partnership Cell	Srikanta Panda, Director (PSU & IT)
2.	Surendra Kumar, Section Officer (Information Technology Cell)	Information Technology Cell	
3.	N.K. Gupta, Under Secretary (Administration)	Administration Section & SC/ST/OBC Cell	Ram Sharan, DS(A & GA)
4.	A.D. Chawla, Under Secretary (General Administration)	General Administration Section	
5.	K. Rajappa, Under Secretary (E-I)	Establishment I Section	Dr. P.K. Mehrotra Director (E)
6.	Vineeth Abraham, Under Secretary (CGWB)	Central Ground Water Board Desk	
7.	Anil Bajpai, Section Officer	Water Quality Issues	
8.	K.K. Sharma, Section Officer (Vigilance)	Vigilance Section	S.V. Singh, DS (Vigilance)
9.	Rajendra Kumar Ojha, Under Secretary (GW)	Ground Water Desk	Rajeev Kumar, Director (GW)
10.	P.S. Chakraborty, Under Secretary (WB)	Water Bodies	Charul Baranwal, Director (Water Bodies & IEC)
11.	Shashi Pal, Under Secretary (Information, Education and Communication)	Information, Education and Communication Cell	
12.	Dalbir Kaur, Section Officer (WS)	Internal Work Study Unit	Ram Swarup, Deputy Secretary (E-III)
(A)	N.K. Gupta, Under Secretary	Establishment matters of Farakka Barrage Project	
13.	A.C. Trivedi, Section Officer (E-III)	Establishment matters of Brahmaputra Board	
14.	Jeetendar Chadha, Under Secretary (Parl)	Parliament	

15.	Karam Bir Singh, Deputy Director (OL)	Official Language	Netra Singh Rawat, Joint Director (OL)
16. (A)	Suresh Vij, Section Officer (ID)	Infrastructure Development	Khatchin Langel, DS (Coord)
(B)	Jeetendar Chadha, Under Secretary (GFCC)	Administrative matters of GFCC	
17.	T.K. Gupta, Under Secretary (Coord)	Coordination	
18.	N. Mukherjee, Sr. Joint Commissioner (B&B)	Hydrology Project matters of Brahmaputra & Barak Wing	Narender Kumar, Commissioner (B&B)
19.	R.K. Sund, Under Secretary (B&B)	Matters of Brahmaputra & Barak Wing other than Hydrology Project	
20.	A.S.P. Sinha, Sr. Joint Commissioner (Ganga)	Ganga Wing	S.P. Kakran, Commissioner (Ganga)
21.	Vinay Kumar, Sr. Joint Commissioner (PP)	Policy and Planning Section	M.E. Haque, Commissioner (PP)
22.	Lalan Prasad Sharma, Under Secretary (E-II)	Establishment-II Section	Anoop Seth, Dir (E-II)
23.	M.C. Chand, Deputy Secretary (CAD)	Command Area Development and Water Management Wing	G.S. Jha, Commissioner (CADWM)
24.	Bhupinder Singh, Sr. Joint Commissioner (BM)	Projects Wing - Basin Management Section except those of Inter-Linking Rivers/ National Water Development Agency	A.B. Pandya, Commissioner (PR)
26.	Asit Chaturvedi, Deputy Commissioner (BM)	Projects Wing – works relating to Inter-Linking of Rivers/ National water Development Agency	
27.	Shri V. B. Nandanwar, Section Officer (BM)	Projects Wing – works relating to Ganga Basin Section, Sardar Sarovar Construction Advisory Committee and Narmada Control Authority	

28.	Anant Ram, Section Officer (Projects)	Project Section excluding Sardar Sarovar Construction Advisory Committee and Narmada Control Authority	V.K. Nagpure, Sr. Joint Commissioner (PR)
29.	Anil Kumar, Assistant Engineer (MI)	Minor Irrigation	S.L. Jain, Sr. Joint Commissioner (MI)
30.	Rajesh Kumar, SO (Indus)	Indus Wing	G. Aranganathan, Commissioner (Indus)
31.	Mamta Saxena, DDG (MI Stats)	Minor Irrigation Statistics	Vijay Kumar, Additional Director General
32.	S.K. Thakur, Director (Finance)	Finance Wing – Finance Desks and Budget Section	Ananya Ray, JS & FA
33.	V.K. Balayan, Under Secretary (EA)	External Assistance Desks including Foreign Training	Vijay Kumar, Advisor (Eco)
34.	R.K. Saxena, Asstt Controller of Accounts	Matters related to Principal Accounts Office and Pay & Accounts Office (Sectt.) and Cash Section	Hemant Jain, Controller of Accounts
35.	Kanta Arora, Asstt Controller of Accounts (CWC)	Matters related to Pay & Accounts Office (CWC) and Pay & Accounts Office (CSMRS)	
36.	G.D. Prashad, Sr. Accounts Officer (FBP)	Matters related to Pay & Accounts Office (FBP)	
37.	J. Thothadhri, Sr. Accounts Officer (CWPRS)	Matters related to Pay & Accounts Office (CWPRS)	
38.	D.P. Sharma, Sr. Accounts Officer (CGWB)	Matters related to Pay & Accounts Office (CGWB)	

LIST OF POSTAL ADDRESSES OF DIRECTORS OF PUBLIC GRIEVANCES/ STAFF GRIEVANCES IN THE MINISTRY OF WATER RESOURCES AND ITS VARIOUS ORGANISATIONS

S. No.	Name of the Organization	Address	Name & Designation of P.G./ S.G.Officer
1.	Ministry of Water Resources	Room No.623, Shram Shakti Bhavan, New Delhi-110001 (Tele No. 23714734)	Shri Khatchin Langel, Deputy Secretary (Coord) & Director (P&SG)
2.	Narmada Control Authority	Narmada Sadan, Sector-B, Scheme No. 74, Vijay Nagar, Indore – 452010(MP) (Tele No. 0731-2554477)	Shri Mukesh Kumar Chauhan, Secretary and Grievance 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. Haldar, Secretary & 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 Ram Avatar, Pay & Account Officer & Public Grievance Officer
5.	Central Ground Water Board	CGWB, CHQ, Faridabad (Tele No. 95129- 2413050) Fax No.95129-2419059 CGWB, CHQ, Faridabad (Tele No.95129-2415024 & (Fax No. 95129-2412524)	Shri U.V. Singh, LIO & Staff 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)	Shri S.L. Gupta, CRO & 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 K. Vohra, 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 B. Vijayakumar, 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 D.K Tiwary, 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 S.K. Gangwar, Director (Adm) & Director (Staff Grievances & Public Grievances)
11.	National Institute of Hydrology	Jal Vigyan Bhawan, Roorkee-247667 (Uttarakhand) (Tele No. 01332-276414)	Shri Bhism Kumar, Scientist F & Chairman (Grievance Cell)
12.	National Projects Construction Corporation Limited	NPCC Ltd., Plot No. 67-68, Sector 25, Faridabad (HNA) (Tele No. 0129-2234760)	Shri K.K Gupta, Chief Manager (HR) and Director (Staff Grievances) Shri K.K.Sharma, Joint GM, Director (Public Grievances)
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) & Director (Staff Grievances)
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 R.K. Suryawanshi, Deputy Secretary & Director (Grievances)
15.	Water & Power Consultancy Services (India) Ltd.	76-C, Institutional Area, Sector-18, Gurgaon-122015 (Tele No. 0124-2348022)	Shri S.K. Ahuja, Director (Staff/Public Grievances)
16.	Brahmaputra Board	Basistha, Guwahati – 29 (Tele No.0361-2300128) (Fax No. 0361-2308588)	Shri Naveen Kumar,CE(P &O) (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 Tele.-26174147	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 N.M.Krishnanunni, Secretary & Director of Grievances