ANNUAL REPORT

2009-10

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES
NEW DELHI

Abbreviations

ADB	Asian Development Bank
AIBP	Accelerated Irrigation Benefit Programme
BB	Brahmaputra Board
BCB	Bansagar Control Board
BRB	Betwa River Board
CADWM	Command Area Development & Water Management
CCA	Culturable Command Area
CEA	Central Electricity Authority
CGWB	Central Ground Water Board
CSMRS	Central Soil & Material Research Station
cumec	cubic metre per sec
cusec	cubic foot per sec
CWC	Central Water Commission
CWPRS	Central Water & Power Research Station
CLA	Central Loan Assistance
CRA	Cauvery River Authority
CWDT	Cauvery Water Disputes Tribunal
DPR	Detail Project report
DSS	Decision Support System
DRIP	Dam Rehabilitation and Improvement Project
EFC	Expenditure Finance Committee
ERM	Extension, Renovation and Modernization
FPARP	Farmers' Participatory Action Research Programme
FBP	Farakka Barrage Project
FMP	Flood Management Programme
FR	Feasibility Report
FRL	Full Reservoir Level
GFCC	Ganga Flood Control Committee
GRA	Grievances Redressal Authorities
HP	Hydrology Project
IBRD	International Bank of Reconstruction and Development
IEC	Information, Education and Communication
INCGECM	Indian National Committee on Geotechnical Engineering and Construction Materials
INCGW	Indian National Committee on Ground Water
INCH	Indian National Committee on Hydraulic Research
INCID	Indian National Committee on Irrigation and Drainage
INCOH	Indian National Committee on Hydrology
ISRO	Indian Space Research Organisation
ISRWD	Inter-State River Water Disputes
JBIC	Japan Bank for International Cooperation
JCWR	Joint Committee on Water Resources
JET	Joint Expert Team
JGE	Joint Group of Experts
JRC	Joint Rivers Commission
Kfw	Kreditanstalt fur Wiederaufbau
KWDT	Krishna Water Disputes Tribunal
MI	Minor Irrigation
MoU	Memorandum of Understanding
M & M	Major and Medium
Mha	million hectares
MoWR	Ministry of Water Resources
NAPCC	National Action Plan on Climate Change
NCA	Narmada Control Authority
NCSDP	National Committee on Seismic Design Parameters
NHDC	Narmada Hydro-electric Development Corporation
NLSC	National Level Steering Committee
NPMC	National Level Programme Monitoring Committee
NPP	National Perspective Plan
NWDT	Narmada Water Disputes Tribunal
NWM	National Water Mission
NPCC	National Projects Construction Corporation Ltd
NWDA	National Water Development Authority
NCMP	National Common Minimum Programme
OFD	On Farm Development
PAC	Project Advisory Committee
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 Sorovar 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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AN OVERVIEW

Ministry of Water Resources, Government of India is responsible for development, conservation and management of water as a national resource; overall national perspective of water planning and coordination in relation to diverse uses of water; general policy, technical assistance, research and development, training and matters relating to irrigation and multi-purpose projects, ground water management; conjunctive use of surface and ground water, command area development, flood management including drainage, flood-proofing, water logging 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, seven subordinate offices, seven statutory bodies, two autonomous bodies (societies) and two public sector enterprises.

The Ministry is headed by Hon'ble Shri Pawan Kumar Bansal as the Union Minister of Water Resources since 18th June, 2009 with Hon'ble Shri Vincent H. Pala as the Minister of State for Water Resources. Shri U.N. Panjiar functioned as the Secretary in the Ministry with Shri S. Manoharan as the Special Secretary. The organisation 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 5 State Sector and 15 Central Sector Schemes. The State Sector Schemes implemented and monitored by the Ministry during 2009-10 include Accelerated Irrigation Benefits Programme (AIBP), Flood Management Programme (FMP), Command Area Development and Water Management (CADWM), Repair, Renovation and Restoration (RRR) of Water Bodies and Artificial Recharge to Ground Water through Dugwells.

The Central Sector Schemes implemented by the Ministry during 2009-10 include the Development of Water Resources Information System, Hydrology Project, Investigation of Water Resources Development Schemes, 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**.

Major Achievements

- The State Governments have been provided an amount of Rs.38573.22 crore as CLA/Grant under **Accelerated Irrigation Benefit Programme (AIBP)** since its inception till date for 274 major/medium irrigation projects and 10236 surface minor irrigation schemes. The grant released during 2009-10 is of Rs. 3689.41 crore up to 31st December 2009. This also includes Central Assistance of Rs. 546.61 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. During 2009-10, an amount of Rs. 720 crore has been released to Gosikhurd Project as National Project till December 2009.

- Central assistance of Rs. 197.00 crore was released to States during the year 2009-10 upto December 2009 under **Command Area Development & Water Management (CAD&WM) Programme**.

- **Under the Scheme of Artificial Recharge to ground water through Dug wells**, net releases of funds by NABARD as on 31st December, 2009 is Rs. 223.62 crore including Rs. 206.38 crore as subsidy to beneficiaries, Rs. 17 crore for IEC/Capacity Building activities and Rs. 0.24 crore for advertisement through DAVP have been released to the concerned States
- Under the Central Sector Scheme "Ground Water Management and regulation, during 2009-10, project proposals for construction of a total of 382 recharge structures have been received from the States of Tamil Nadu, Andhra Pradesh and Karnataka. An amount of Rs. 6.55 crore has been approved by MOWR. 1st installment amounting to Rs. 4.58 crore was released upto December 2009.
- During the financial year 2009-10, the Central Ground Water Board (CGWB) under their Ground Water Exploration Programme, constructed 495 wells including 20 high yielding wells constructed up to 31st December 2009 to assess the ground water potential in different hydrogeological set up. 11997 samples have been analyzed during the year up to 31st December 2009, out of which 10419 samples were analysed for basic constituents, 1079 samples for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc, 499 samples for organic and specific constituents.
- **Under Flood Management Programme,** central assistance amounting to Rs. 905.82 crore has been released to States during XIth Plan upto 31.12.2009. This includes Central assistance amounting to Rs. 236.92 crore released to States during current financial year 2009-10, till December 2009.
- During the monsoon period of the year 2009, 3991 forecasts were issued by CWC to the State Government /local administration.
- During the year 2009, data entry work and validation of 4th Minor Irrigation Census data remained in progress in States/UTs. Evaluation study of the **RMIS scheme** was awarded to IASRI, Pusa, New Delhi. This study commenced in August, 2009 and is likely to be completed soon.

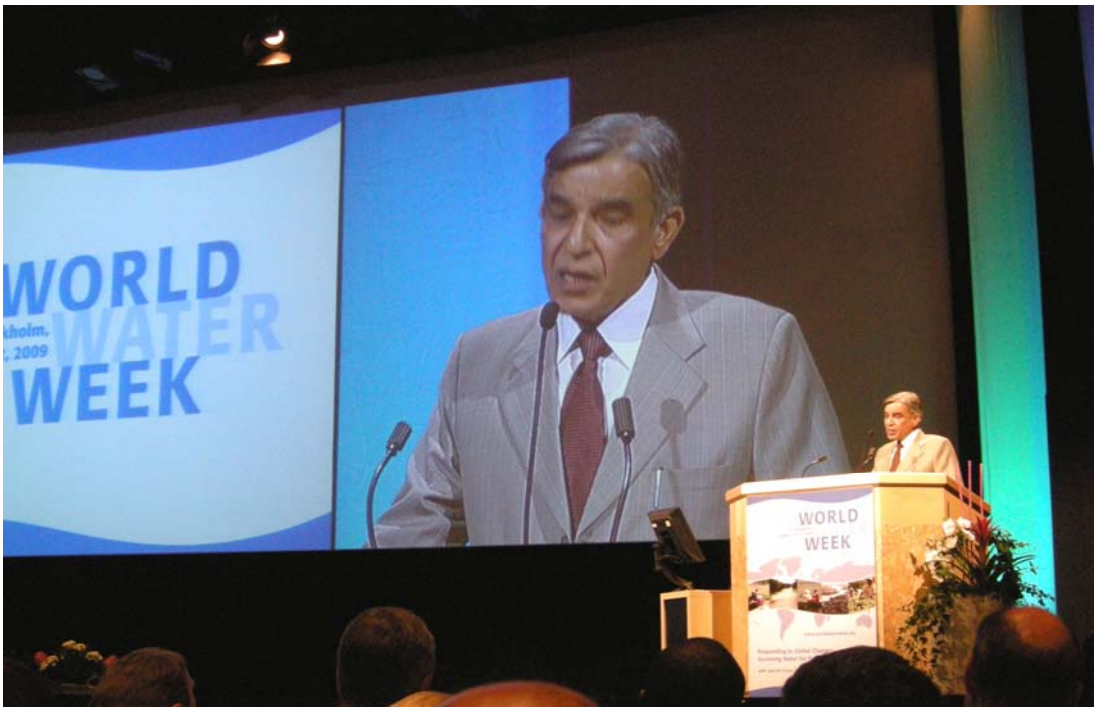
- Two Schemes on **Repair, Renovation and Restoration of Water Bodies** one with external assistance with an outlay of Rs. 1500 crore and the other with domestic support with an outlay of Rs. 1250 crore for implementation during XI Plan Period have been approved. Central assistance of Rs.197.32 crore has been released to the States during 2009-10 upto December 2009.
- **Under River Management Activities & Works Related to Border Areas Scheme,** Rs. 28.35 crore has been released by the Ministry to the Government of Bihar for the work of **Kosi breach closure** during 2009-10, till December 2009.
- The Governments of Maharashtra and Gujarat have conveyed their concurrence for preparation of DPR of **Par – Tapi- Narmada and Damanganga – Pinjal links**. The work of preparation of these DPRs was started by NWDA during January 2009 and are planned to be completed by December 2011.
- **For Farakka Barrage Project**, a total budget of Rs.70.00 crore has been provided during 2009-10, against which an expenditure of Rs.57.81 crore has been incurred up to 31st December 2009. During the year 2009-10, Farakka Barrage Project Authority completed the anti-erosion works in a length of 2655 m at a cost of Rs. 42.00 crore at Manikchak Ghat and in a length of 228 m at a cost of Rs. 3 crore at Panchanandpur of Malda district on upstream of barrage to save land and public property from heavy erosion by river Ganga.
- During the year 2009-10, technical examinations of 66 Water Resources projects (36 major irrigation, 21 medium irrigation and 9 flood protection schemes) were completed by Central Water Commission and accepted by Technical Advisory Committee upto December 2009. At present 193 new irrigation schemes (103 Major & 90 Medium) are under different stages of appraisal. CWC is carrying out monitoring of 199 major, medium and Extension, Renovation and Modernization (ERM) projects which inter-alia, includes monitoring of 165 AIBP assisted projects..
- The **Central Water Commission** (CWC) is monitoring the storage position of 81 important reservoirs in the country, of which 36 reservoirs have significant hydropower potential, with installed capacity of more than 60 MW each. Overall storage position in 81 reservoirs at the end of monsoon 2009 was 90% of the average of last 10 years.
- About 4095 samples collected from 371 observation sites on major rivers of India were analysed for water quality assessment upto December 2009 during the year 2009-10 by CWC
- During the period ending 31st December 2009, **WAPCOS Limited** handled 512 projects as compared to 458 projects for the corresponding period ending 31st December 2008. The Company achieved turnover of Rs. 205.00 crores for the period ending 31st December 2009 as against the previous year figure of Rs. 114.39 crores for the corresponding period.

Important Developments/ Conferences /Meetings

- In the last week of May 2009, **the Sunderbans area of West Bengal** was hit by a severe cyclone 'Aila' which damaged the Sunderbans embankments very badly. In order to assess the damage and suggest the remedial measures for restoration of the Sunderbans embankments, a Task Force was constituted by the Ministry of Water Resources with the approval of Hon'ble Prime Minister of India. The Task Force submitted its final report on

10.8.2009. In pursuance of the recommendations of the Task Force, a Detailed Project Report (DPR) for the repairs and restoration of 778 km length of the damaged embankments amounting to Rs.5344 crore has been cleared by TAC of Ministry of Water Resources and is awaiting investment clearance by the Planning Commission.

- Indian delegation headed by Hon'ble Union Minister of Water Resources participated in the World Water Week – 2009, held from 16th to 22nd August, 2009 at Stockholm, Sweden. **Posters on Inter-Basin Water Transfer, High Arsenic in Ground Water in West Bengal and its mitigation, Palla Well Field, Delhi – A Model of Sustainable Ground Water Development & management, Artificial Recharge to Ground Water in two different hydrogeological settings and Success Stories of Rainwater Harvesting & Artificial Recharge of Ground Water in Delhi** were displayed during the programme.



The Union Minister of Water Resources & Parliamentary Affairs , Shri Pawan Kumar Bansal addressing at the closing Plenary of the "World Water Week", in Stockholm (Sweden) on August 21, 2009.

- A workshop on "**Satellite Remote Sensing in Water Resources**" was inaugurated on 18th May, 2009 by Shri U.N. Panjiar, Secretary (WR). Experts / participants from various premier organizations and institutions related to the remote sensing field viz; NRSA, IIRS, JNU, DST, CGWB, CWC, NIH, NIC, RRSC, IARI etc and MoWR attended it. The workshop focused on source finding, tapping and management of water resources and the need to develop synergy and exchange of information within user organizations / Ministries related to geological, environmental, soil, climate, land use of any particular area.
- The Institution of Engineers (India) Roorkee Local Centre and National Institute of Hydrology, Roorkee organized a All India Workshop on "**Flood Risk Management**" at Roorkee during November 26-27, 2009. The course was primarily aimed to train the

personnel engaged in water resources development and management in the country, by providing the knowledge of Indian experience in managing floods, latest tools and techniques in flood risk management such as flood inundation modelling, flood risk mapping and flood hazard mapping.

- 60th International Executive Council Meeting of the International Commission on Irrigation and Drainage (ICID) was held at New Delhi during December 6-11, 2009. During this period, the **5th Asian Regional Conference was organized jointly by Ministry of Water Resources and International Commission on Irrigation & Drainage.** The Conference was inaugurated by the Hon'ble Prime Minister and about 800 delegates from 40 countries participated in the conference. Officers from various States Governments, Ministry of Water resources and its various organisation and other Central Ministries participated in the conference. The Union Minister of Water Resources and the Union Minister of State of Water Resources and Secretary (WR) also addressed the participants.
- Ministry of Water Resources participated in the 29th India International Trade Fair held at New Delhi from 14 to 27 November 2009 by way of raising a pavilion on the theme: **SAVE WATER – EVERY DROP COUNTS** in pursuance of the Prime Minister's call to the nation expressed in his Independence Day speech to develop Save Water as one of the national slogans. Several organizations under the Ministry also exhibited their Models and other materials to showcase their activities and achievements.
- The **Memorandum of Understanding** between the Government of India and Government of Australia on Cooperation in the field of Water Resources Management was signed on 10th November, 2009, which would be effective for a period of 5 years.
- Dr. Dipu Moni, Foreign Minister of the People's Republic of Bangladesh undertook an official visit to India from 7th to 10th September, 2009. During the visit, she also held bilateral talks with Hon'ble Union Minister of Water Resources & Parliamentary Affairs, Shri Pawan Kumar Bansal. Both sides recognized the need to expedite negotiations with a view to finalize an agreement for **sharing of waters of Teesta river**. Towards this end, they agreed to mandate their respective foreign offices to meet and discuss technical and other parameters of this issue. They agreed to immediately commence joint hydrological observations on the river. They also agreed to **undertake river bank protection works, dredging of Ichhamati river and minor irrigation/drinking water schemes on Feni river**.
- 5th Meeting of **India- Nepal Joint Committee on Water Resources** (JCWR) jointly chaired by Secretary's (Water Resources), India and Secretary(Energy), Nepal was held on November 20-22, 2009 at Pokhara (Nepal) to oversee the works of all existing bilateral technical bodies and expert groups in the field of water resources. During the meeting, JCWR finalized the Terms of Reference (TOR) of Pancheshwar Development Authority (PDA).
- The 3rd Meeting of **Expert Level Mechanism (ELM)** between India and China 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.

CHAPTER 1

MAJOR PROGRAMMES

MAJOR PROGRAMMES (STATE SECTOR)

ACCELERATED IRRIGATION BENEFITS PROGRAMME (AIBP)

The AIBP was conceived in the year 1996 with a view to provide financial assistance to States to complete various ongoing last mile irrigation 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.

The Accelerated Irrigation Benefits Programme (AIBP) extends financial assistance to the States for creation of irrigation potential by completion of identified ongoing irrigation projects. As per the present pattern of assistance under the AIBP, the Centre is providing central assistance to the, major, medium and Surface minor irrigation projects as an incentive to the States for creating irrigation infrastructure in the country. The AIBP also support irrigation component of the Bharat Nirman programme. The projects included in the Prime Minister's 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 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 under AIBP.

273 major/medium irrigation projects and 10278 surface water minor irrigation schemes have been included under AIBP upto 31st December 2009 for which total central of Rs. **38473.19** crore has been provided till December 2009 including release of Rs. 3689.41 crore during 2009-10 up to 31st December 2009. Cumulative central assistance released since inception of the AIBP till 31st December 2009 to the North Eastern States is Rs. 2647.68 crore including Rs 546.61 crore released during 2009-10 upto December 2009. State wise details of Central Assistance released under AIBP since inception till 31st December 2009 are given in Table-I. Out of these 273 Major/Medium projects, a total of 110 projects have been completed. Irrigation potential of 54.86 lakh ha from Major/Medium projects and 4.54 lakh ha from surface Water Minor irrigation schemes have been created upto March 2009. During 2008-09, irrigation potential of 6.55 lakh ha has been created from major/medium and minor surface irrigation projects under AIBP.

Of the 10278 surface Minor Irrigations schemes included in the AIBP till December 2009, 6998 Minor Irrigations schemes are reported as completed.

Table-1 Statewise details of Central Assistance(CA)/grant released under AIBP from 1996-97 to 2009-10 (as on 31.12.2009)

Sl. No.	State	Amount (in Rs. Crores)														Grand Total
		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	
1	Andhra Pradesh	35.2500	74.0000	79.6700	65.0150	95.0200	281.6600	33.1860	205.5300	87.5470	311.3815	843.4220	987.7692	855.1800	662.6610	4617.2917
2	Arunachal Pradesh	0.0000	0.0000	0.0000	7.5000	7.5000	15.0000	1.5000	20.0000	10.0000	18.0000	27.0000	47.1800	33.9580	0.0000	187.6380
3	Assam	5.2300	12.4000	13.9500	14.5400	24.0770	14.5210	16.2738	19.2015	16.9300	34.9332	30.2685	77.3380	405.9540	501.3894	1187.0064
4	Bihar	13.5000	5.1500	36.1850	129.6950	151.7750	3.4200	14.4805	74.6440	37.2150	16.2380	3.2300	62.2400	109.7029	18.6300	676.1054
5	Chhattisgarh	0.0000	4.5000	9.5000	10.5200	13.9300	48.2000	104.0000	74.6300	2.9250	7.6645	10.7050	96.9640	193.0402	60.8853	637.4640
6	Goa	0.0000	5.2500	0.0000	3.5000	61.6500	58.0000	0.0000	2.0000	0.6500		1.9100	32.4800	39.2300	0.0000	204.6700
7	Gujarat	74.7730	196.9000	423.8200	272.7000	421.8500	581.6900	1000.3300	650.3590	530.5000	339.6000	121.8885	585.7200	258.6100	0.0000	5458.7405
8	Haryana	32.5000	12.0000	0.0000	0.0000	0.0000	0.0000	18.0000	7.7350	11.1350	6.0000	3.1700	0.0000	0.0000	0.0000	90.5400
9	Himachal Pradesh	0.0000	6.5000	5.0000	11.0470	18.0150	3.2440	8.1500	14.6920	3.6900	30.0785	3.9300	114.0500	119.3178	32.4000	370.1143
10	Jammu & Kashmir	1.3000	0.0000	0.0000	4.6800	10.4600	11.0700	34.9990	21.5450	12.7445	36.6878	37.7716	199.2251	393.0661	54.5550	818.1041
11	Jharkhand	0.0000	8.8900	11.6400	14.3450	5.7150	10.8200	9.6700	1.8330	21.2850	5.0370	1.2900	9.2244	3.7200	0.0000	103.4694
12	Karnataka	61.2500	90.5000	94.5000	157.1400	171.0000	492.5000	620.8500	266.4780	396.2952	140.7759	160.3729	349.9000	442.4190	182.7980	3626.7790
13	Kerala	3.7500	15.0000	0.0000	0.0000	22.4000	11.2750	5.6650	31.0000	49.4400	9.3591	16.6468	0.0000	0.9045	3.8120	169.2524
14	Madhya Pradesh	63.2500	110.0000	81.2500	95.3250	151.3280	215.4100	220.0000	568.6400	516.7010	168.0966	48.3100	500.3450	473.7824	446.7544	3658.9924
15	Maharashtra	14.0000	55.0000	50.8600	49.8750	97.0200	39.1000	133.1341	164.3950	529.2860	167.3822	465.5213	972.2500	2257.8318	1057.6904	6053.3458
16	Manipur	4.3000	26.0000	10.7800	21.8100	1.5000	9.3600	19.5000	15.5000	13.0000	75.7035	156.3042	103.9870	221.6733	12.4113	691.8293
17	Meghalaya	0.0000	0.0000	0.0000	2.6938	5.5120	4.4700	1.5000	1.0880	1.7438	1.5750	0.7500	1.1600	24.8009	0.0000	45.2935
18	Mizoram	0.0000	0.0000	0.0000	1.4330	1.4330	2.0000	0.7500	9.3000	5.0000	9.3150	14.2354	34.3434	50.7176	32.8050	161.3324
19	Nagaland	0.0000	0.0000	0.0000	2.7300	5.0000	5.0000	2.6590	8.0000	4.0000	7.9987	10.5995	40.5100	48.5979	0.0000	135.0951
20	Orissa	48.4500	85.0000	71.5000	90.2500	100.3200	168.4750	179.5700	154.6850	24.2230	151.3742	133.8846	624.3590	724.4387	245.7401	2802.2696
21	Punjab	67.5000	100.0000	0.0000	42.0000	55.6200	113.6900	36.6600	0.0000		26.3166		13.5000	9.5400	0.0000	464.8266
22	Rajasthan	2.6750	42.0000	140.0500	106.6650	78.4670	96.3150	174.3850	499.8370	352.9040	90.2952	11.6000	156.5300	178.6200	157.5770	2087.9202
23	Sikkim	0.0000	0.0000	0.0000	1.3600	0.0000	2.4000	0.7500	0.7500	0.7500	0.9113	3.3236	3.2400	0.0000	0.0000	13.4849
24	Tripura	3.7730	5.1000	3.9750	34.6530	13.8830	21.0630	13.3947	13.3769	11.0000	31.9950	22.5131	8.1000	43.1750	0.0000	226.0017
25	Tamil Nadu	20.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				0.0000	0.0000	0.0000	20.0000
26	Uttar Pradesh	43.5000	78.0000	76.5000	286.0000	315.9000	354.6900	359.0000	274.7850	175.9200	133.1280	81.8954	150.6900	315.4732	173.1660	2818.6476
27	Uttarakhand	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	25.1625	25.5525	38.9917	80.4387	84.7298	265.6500	371.6580	45.2232	937.4064
28	West Bengal	5.0000	20.0000	10.0000	25.0000	26.8250	38.6080	28.1330	3.1440	13.4610	0.0287	6.7000	8.9500	22.8100	0.9144	209.5741
Total		500.0010	952.1900	1119.1800	1450.4768	1856.2000	2601.9810	3061.7026	3128.7009	2867.3372	1900.3142	2301.9722	5445.7051	7598.2213	3689.4125	38473.1948

Prime Minister's Package for Agrarian Distressed Districts

During 2006-07, a large number of farmers suicide cases 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.

Central assistance amounting to Rs.4509.42 crore has been provided for 38 major/medium projects included under Prime Minsiter's Package for Agrarian Distressed Districts of Andhra Pradesh, Karnataka, Kerala and Maharashtra. Central assistance of Rs.977.68 crore released during 2009-10 upto December 2009

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 inter-linking 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.

The Central Government has declared 14 water resource projects as National Projects. A list is given in **Table- 2**

Table 2

S.No.	Name of the Project	State	Envisage Benefits (Irrigation in hectare(ha), Power generation in Megawatt(MW)and storage in Million area ft.(MAF)
1	2	3	4
1	Noa Dehang Dam Project	Arunachal Pradesh	1) Irrigation Potential of 8000 ha 2) Hydel Power generation of 75 MW 3) Storage capacity of 0.26 MAF
2	Upper Siang Project	Arunachal Pradesh	1) Hydel Power generation of 9500 MW 2) Storage capacity of 17.50 MAF 3) Flood moderation

1	2	3	4
3	Kulsi Dam Project	Assam	1) Irrigation Potential of 23,900 ha 2) Hydel Power generation of 29 MW 3) Storage capacity of 0.28 MAF
4	Renuka Dam Project	Himanchal Pradesh	1) Drinking Water 2) Hydel Power generation of 40 MW 3) Storage capacity of 0.44 MAF
5	Gyspa Project	Himanchal Pradesh	1) Irrigation Potential of 0.50 lakh ha 2) Hydel Power generation of 240 MW 3) Storage capacity of 0.6 MAF
6	Kishau Project	Himachal Pradesh / Uttarakhand	1) Irrigation Potential of 0.97 lakh 2) Hydel Power generation of 600 MW 3) Storage capacity of 1.04 MAF
7	Bursar Project	Jammu & Kashmir	1) Indirect Irrigation Potential of 1.00lakh 2) Hydel Power generation of 1230 MW 3) Storage capacity of 1 MAF
8	Ujh Multipurpose Project	Jammu & Kashmir	1) Irrigation Potential of 0.32 lakh 2) Hydel Power generation of 280 MW 3) Storage capacity of 0.66 MAF
9	Ken Betwa Project	Madhya Pradesh	1) Irrigation Potential of 6.46 lakh 2) Hydel Power generation of 72 MW 3) Storage capacity of 2.25 MAF
10	Gosikhurd Project	Maharastra	1) Irrigation Potential of 2.50 lakh 2) Hydel Power generation of 3 MW 3) Storage capacity of 0.93 MAF
11	Shahpur Kandi Project	Punjab	1) Irrigation Potential of 3.80 lakh 2) Hydel Power generation of 300 MW 3) Storage capacity of 0.016 MAF
12	Second Ravi Beas link	Punjab	1) Harness Water flowing across border of about 3 MAF
13	Lakhvar Vyasi Project	Uttarakhand	1) Irrigation Potential of 0.49 lakh 2) Hydel Power generation of 420 MW 3) Storage capacity of 0.325 MAF
14	Teesta Barrage Project	West Bengal	1) Irrigation Potential of 9.23 lakh 2) Hydel Power generation of 1000 MW 3) Barrage

Out of these 14 projects, detailed project reports of nine projects, namely, Bursar, Second Ravi Beas Link, Ujh Multipurpose, Gyspa, Lakhwar Vyasi (revised), Kishau (revised), Nao Dehang, Kulsi and Upper Siang are under various stages of preparation. DPR of Ken Betwa Link Project was prepared and sent for concurrence of M.P. and U.P. Govts. The Government of U.P. and M.P. gave their comments on the DPR, which are under examination by NWDA.The DPR of Renuka Dam Project is under examination. Three projects in the above stated list, namely, Gosikhurd Project of Maharashtra, Shahpur Kandi Project of Punjab and Teesta Barrage Project of West Bengal were already approved projects and were being provided central assistance under

AIBP. During 2008-09, central assistance amounting to Rs.450.00 cr. was released for the Gosikhurd project. During 2009-10, central assistance amounting to Rs.720.00 cr. has also been released for the Gosikhurd 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 aims at creation of irrigation potential of 10 million hectare (Mha) in four years i.e., from 2005-06 to 2008-09. Creation of irrigation Potential of 7.31 Mha has been reported by States Government upto March 2009.The target for creation of Irrigation Potential during the year 2009-10 and 2010-11 is 3.50 million ha.

REPAIR, RENOVATION AND RESTORATION OF WATER BODIES

The Government of India sanctioned a Pilot Scheme for "National Project for Repair, Renovation & Restoration (RRR) of Water Bodies directly linked to Agriculture" in January, 2005 with an estimated cost of Rs.300.00 crore to be shared by Centre and State in the ratio of 3:1 and proposed to be implemented during the X Plan period. The objectives of the Scheme were to restore and augment storage capacities of water bodies, and also to recover and extend their lost irrigation potential. The Scheme has been approved for 26 district projects in 15 States, viz., Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu, West Bengal, Himachal Pradesh, J&K, Gujarat, Kerala and Maharashtra at an estimated cost of Rs.299.92 crore and Central Share of Rs.197.32 crore has been released to the states upto December 2009. These projects cover 1098 water bodies with total original culturable command area of 1.72 lakh hectares. The physical work for restoration has been completed in 1033 water bodies in 15 states upto 31st December 2009. The spillover activities are being continued in the states of Andhra Pradesh, Gujarat and Maharashtra during the current financial year i.e. 2009-10 also.

Government of India approved two schemes on repair, renovation and restoration of water bodies (i) one with external assistance with Central Government outlay of Rs. 1500 crore and (ii) the other with domestic support with Central Government outlay of Rs. 1250 crore for implementation during XI Plan Period. Under the scheme covered by external assistance, the GoI 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 States. Under the scheme with domestic support funding is in the ratio of 90:10 for special category States (NE States including Sikkim, HP, Uttarakhand, J&K and undivided Koraput, Bolangir and Kalahandi (KBK) districts of orissa) and drought prone/naxal affected/ tribal areas of non special catergory states and in the ratio of 25:75 (Centre: State) for projects benefiting other areas of non Special Category States. These schemes were approved during the end of financial year 2008-09. Public water bodies are covered under the scheme. A budget provision of Rs. 399.00 crore has been kept during 2009-10 for these schemes of RRR of water bodies with domestic support/external assistance. The scheme of RRR of water bodies includes the comprehensive improvement of water bodies, catchment area treatment, command area development and capacity building of stakeholders, increased availability of drinking water. The guidelines for the scheme of RRR of water bodies with domestic support have already been circulated to the State Governments.

Under the scheme with domestic support, a proposal for renovation of 578 water bodies at a cost of Rs. 181.74 crore from Government of Orissa was received. Expression of Interest have also been received from the state Governments of Madhya Pradesh, J&K, Bihar, Kerala, Chhattisgarh, Gujarat, Rajasthan, Himachal Pradesh, Tripura, Uttar Pradesh and Maharashtra.

Under the scheme of RRR of Water Bodies with external assistance, World Bank Loan Agreement has been signed with Tamil Nadu for Rs. 2182.00 crore to restore 5763 water bodies having a CCA of 4 lakh hectares, with Andhra Pradesh for Rs. 835.00 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 and with Orissa for Rs.448 crore for restoration of 900 water bodies having a CCA of 1.2 lakh hectares.

ARTIFICIAL RECHARGE TO GROUND WATER THROUGH DUG WELLS

The scheme of the Ministry of Water Resources on "Artificial Recharge to ground water through Dug wells" in 7 States, namely, Andhra Pradesh, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Gujarat and Madhya Pradesh was approved by the Union Cabinet on 15th November, 2007 as announced by the Finance Minister in his Budget speech on 28th February 2007. The scheme has been approved for a cost of Rs.1798.71 Crores with net cost of subsidy to Government in terms of civil works of Rs. 1499.27 Crores.

Under the scheme, as on 31st December 2009, net releases of funds by NABARD is Rs. 223.62 crore including Rs. 206.38 crore as subsidy to beneficiaries, Rs. 17.00 crore for IEC/Capacity Building activities and Rs. 0.24 crore for advertisement through DAVP have been released to the concerned States. The States have already started implementation of the scheme and (as on 31st December 2009) net subsidy has been released to a total number of 574685 beneficiaries. The State of Andhra Pradesh has identified the Nodal agency in November 2009. Funds to the State of Andhra Pradesh will be released after opening of separate bank accounts. State-wise details of release of funds are given below in **Table-3.**

Table-3

Sl. No.	State	No. units for which subsidy released	Subsidy released (Rs. in crore)	Fund released under IEC (Rs. in crore)	Total (Rs. in crore)
1	Andhra Pradesh	0	0.000	0	0
2	Gujarat	138397	47.370	3.25	50.62
3	Karnataka	73591	27.940	2.00	29.94
4	Madhya Pradesh	0	0.000	2.00	2.00
5	Maharashtra	41890	13.160	2.00	15.160
6	Rajasthan	59549	19.868	2.00	21.868
7	Tamil Nadu	261258	98.042	5.75	103.792
	Total :	574685	206.380	17.00	223.62*

*Rs. 0.24 crores has also been released for advertisement through DAVP.

Farmers' Participatory Action Research Programme (FPARP)

Ministry of Water Resources sanctioned Farmers' Participatory Action Research Programme at 5000 demonstration sites at a cost of Rs. 24.46 crore. This programme is being implemented in 375 districts of 25 States/UTs of the country with the help of 60 Agriculture Universities/ Indian Council of Agricultural Research Institutes / International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), Water and Land Management Institutes (WALMIs) and Non-Government Organizations (NGOs) to increase yield and income per drop of water. Each programme covers a minimum of one hectare and is implemented in a participatory mode with the farm family having a sense of ownership of the programme.

Programme was initiated during 2007-08 and till 31st December 2009 funds amounting to Rs. 18.92 crore have been released to the institutes. Out of 5000 demonstrations, a total of 4555 demonstrations have already been completed and 387 are under implementation. The remaining demonstrations have been taken up during the Rabi crop season 2009-10. The performance of the programme is being monitored by the field formations of CWC & CGWB.

Interim reports on the implementation of the FPARPs have indicated that there is an increase in yield and income with saving in water use.

Technologies being demonstrated under the programme are:

- SRI (System of Rice Intensification) cultivation in Rice.
- Improved irrigation methods – Micro irrigation methods (Sprinkler/Drip).
- Multiple cropping.
- Water harvesting technologies (Low Cost Micro Rain Water Harvesting Structure i.e Jalkund, Storage tanks, Percolation tanks, Check dams, Recharging Wells, etc).
- Reclamation of soils through - Drainage/Bio-reclamation.
- Soil & Water conservation measures.
- Improvement of water use efficiency through suitably improved crop rotations.
- Bio-farming Technology.
- Propagation of Aqua Culture Activities e.g. Fish Culture.
- Crop diversification & multiple use of water

COMMAND AREA DEVELOPMENT AND WATER MANAGEMENT

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 multidisciplinary 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. From 1974-75 till 31st December 2009, 314 projects with a CCA of 28.95 Million ha have been included under the programme. After inclusion of new projects, deletion of completed projects and clubbing of some projects, there are now 136 projects under implementation. The programme was restructured and renamed as Command Area Development and Water Management (CADWM) Programme w.e.f. 1st April 2004. Now scheme is being implemented as a State Sector Scheme during the XI Five Year Plan (2008-09 to 2011-12).

Programme Components

The admissible 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 of 10% beneficiary contribution.
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 10% beneficiary contribution including use of location specific bio-drainage techniques to supplement conventional techniques for reclamation of waterlogged area;
f) Warabandi [with requisite funds for hardware activities under item(c) and software activities under item (g)]
g) 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;
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 modifications 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 will not be admissible for sprinkler and drip irrigation systems (assistance for drip and sprinkler irrigation systems is available under the schemes of Ministry of Agriculture) but will be 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 is included under the Programme 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 distress 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, Uttrakhand, Himachal Pradesh, Jammu and Kashmir and Kalahandi-Bolangir-Koraput (KBK) districts of Orissa.

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

i) 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);
ii) WUAs have to be in position before Project Components are taken up so that beneficiaries are involved in the implementation of Programme activities, since inception;
iii) A minimum 10% beneficiary contribution is mandatory in the construction on farm Development works and reclamation of waterlogged areas to ensure increased beneficiary participation and thereby improve the quality of works;
iv) Central assistance for correction of system deficiencies up-to distributaries of 4.25 cumec (150 cusec) capacity has been linked to formation of Distributaries Committees and handing over of the distributaries to such Committees for maintenance in future.

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 fields units of Central Water Commission. The quality of works is ensured through monitoring, including field visits. Moreover, technical guidelines and manuals have been circulated to the States in this regard. Functionaries are trained on specific subjects from time to time, besides holding various meetings, workshops and seminars on different technical and managerial aspects.

Financing Pattern

The funding pattern for all the Programme components is on 50:50 sharing basis between the Centre and 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 the States. A minimum of 10% contribution by the beneficiary farmers is mandatory for execution of on farm development works and reclamation of waterlogged areas and also 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 will be utilized to upgrade the irrigation system and infrastructure developed under CADWM 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 2009-10 as per XI Plan estimate are in **Table-4.**

Table-4

(Million Hectares)

Sl.No.	Item	Target (as per XI Plan estimate)
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	0.0020
	Surface Bio-drainage	0.020

It is stated that the State Governments fix their own targets according to availability of funds and other factors.

Financial Achievements

An amount of Rs.3852.389 crore has been released to States as Central Assistance under the CAD Programme since its inception in 1974-75 upto March 2009. The continuation of CADWM scheme has been approved as State Sector scheme in October 2008. During the year 2008-09, an amount of Rs.324.29 crore was released to States. An outlay of Rs.400.00 crore has been provided under the State Sector Scheme for implementation of the programme during 2009-10, against which the central assistance amounting to Rs. 197.72 crore has been released to states upto 31st December 2009. The details of central assistance released so far i.e. upto 2008-09 are given in **Table-5**.

Table-5

Central Assistance released under CADWM Programme

(Rs. in crores)

Period	Outlay approved by Planning Commission	BE Allocation	Release	% 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

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 respective components during 2008-09 are given in **Table-6.**

Table-6

(Million hectare)

Item of work	Cumulative achievement since beginning upto March 1997	Achievement. during IX Plan	Achievement. during X Plan	Achievement. during 2007-08	Cumulative ach. since beginning up to March 2008	Achieve-ment. during 2008-09
Field Channel	13.95	1.80	2.31	0.394	18.454	0.430
Field Drains	0.77	0.35	0.64	0.069	1.829	0.130

Reclamation of Waterlogged 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, 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, 521 schemes of 9 States, namely, Bihar, Gujarat, Madhya Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Orissa and Uttar Pradesh have been approved for reclamation of 67688 ha. water logged area. Out of this, an area of 50,249 ha. has been reported to be reclaimed by these States.

Participatory Irrigation Management (PIM)

The National Water Policy 2002 stresses participatory approach in water resources management. It has been recognised that participation of beneficiaries will greatly help 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 Utter 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. Upto 31st December 2009, 56934 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 waterlogged areas.

FLOOD MANAGEMENT PROGRAMME (FMP)

A restructured scheme, namely, "Flood Management Programme" at a cost of Rs. 8,000 crore has been approved 'in principle' by the Cabinet, as a State Sector Scheme for implementation during XI Plan by amalgamating following four on-going schemes of X 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 (SS)
4. Improvement of Drainage in the critical areas of the country – a State Sector Scheme (SS).

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 5th August 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 of the proposals submitted by the State Governments to ensure cost effective solutions.

Flood Management Works (Orissa)

Turfing work on left embankment of river Tel

CWC officials visiting Spur at RD.3.27 km. of river Hansua near Bhatpada

An outlay of Rs 900.00 crore as central assistance has been provided during 2009-10 against which central assistance amounting to Rs. 236.92 crore (including spillover Rs. 1.3 crore) has been released to Satates upto December 2009

Five meetings of the Empowered Committee have been held upto December,2009 and a total of 310 flood control/ river management schemes from 19 states (with a total estimated cost of Rs.3230.03 crore) have been approved under FMP for providing central assistance to states as indicated in **Table- 7.**

Table-7

Summary of State-Wise Schemes included under the State Sector Scheme "Flood Management Programme" and Funds Released during XI Plan (upto 31st December 2009)

(Rs. in crore)

Sl. No.	State	Schemes Included under FMP			Funds Released (2007-10)	
		Nos.	Total Cost	Central Share	Nos.	Amount
1	Arunachal Pradesh	11	67.80	61.02	9	16.39
2	Assam	82	708.59	637.73	82	219.87
3	Bihar	34	840.52	630.39	34	226.55
4	Goa	1	8.84	6.63	1	1.82
5	Haryana	1	173.75	130.31	1	46.91
6	Himachal Pradesh	2	218.94	197.04	2	32.40
7	Jammu & Kashmir	19	211.33	190.20	14	36.77
8	Jharkhand	1	20.12	15.09	1	6.00
9	Manipur	12	39.64	35.68	12	17.16
10	Mizoram	2	9.13	8.22		--
11	Nagaland	5	13.90	12.51	5	6.95
12	Orissa	68	161.28	120.96	68	45.90
13	Punjab	4	142.38	106.78	2	27.35
14	Sikkim	24	86.21	77.59	24	15.76
15	Tamilnadu	1	12.41	9.31		--
16	Tripura	11	26.57	23.92	11	5.00
17	Uttar Pradesh	13	302.56	226.93	11	72.32
18	Uttrankhand	4	28.68	24.02	4	11.69
19	West Bengal	15	157.38	118.04	13	31.84
	Total	**310**	**3230.03**	**2632.37**	**294**	**820.67**
	Funds released towards spilled over works of X Plan					**85.15**
	Grand Total					**905.82**

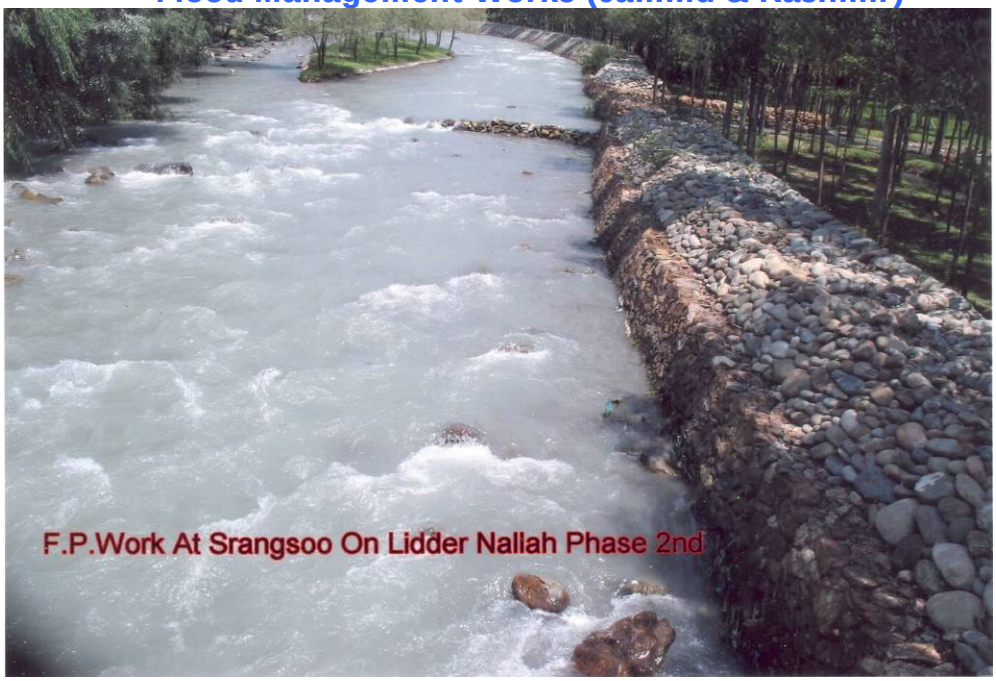
Restoration of Sunderbans Embankments damaged by Cyclone "AILA"

A total of 778 km embankments and sea dykes in Sunderbans area of West Bengal were severely damaged by the cyclone "AILA" in May 2009. 18 districts of West Bengal fell in the path of the cyclone, out of which four districts, namely, North 24 Parganas, South 24 Parganas, Purba Medinipur and Darjeeling were affected very severely. Flood embankments along the rivers and sea dykes in Sunderbans area hit by cyclone 'Aila' were breached at several places resulting in inundation of agricultural fields by the saline water. In order to assess the damages caused by the cyclone 'Aila" in Sunderbans area and suggest the remedial measures, a Task Force on "Restoration of Sunderbans Embankments damaged by the cyclone 'Aila" was constituted by Ministry of Water Recourses under the chairmanship of Er. S. K. Das, former Chairman, Central Water Commission (CWC), with the approval of Prime Minister.

The Task Force was asked to suggest short term and long-term remedial measures to prevent recurrence of embankment breaches and floods in future. The Task Force met total four times and its final and 4th meeting was held on 7th August 2009 in Kolkata. The Task Force submitted its final report on 10th August 2009.

As per the latest estimates, the repair and restoration of damaged embankments may require about Rs. 5344.00 crore as short term measures. The Government of West Bengal has already submitted the proposal to this Ministry. The proposal has been cleared by the Technical Advisory Committee of MoWR and awaiting investment clearance. An assistance of Rs.1000 crore has already been announced in the Finance Minister's budget speech in July 2009. Further, Planning Commission has been requested by MOWR to increase XI Plan outlay for the Flood Management Programme (FMP) scheme from Rs.2715 crore to Rs.8000 crore, with an additional outlay of Rs.1500 crore in the current financial year.

Flood Management Works (Jammu & Kashmir)



MAJOR PROGRAMMES (CENTRAL SECTOR)

RIVER MANAGEMENT ACTIVITIES AND WORKS RELATED TO BORDER AREAS

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 under:

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 included 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.

A breach occurred in the Eastern Afflux Bund of Kosi Barrage near Kusaha (Nepal) on 18th August 2008. Breach closure work was immediately undertaken by the Government of Bihar. The breached portion of the embankment has been restored to its original section before monsoon of 2009. For Breach Closure Works of Eastern Afflux Bund of Kosi Barrage in Nepal, an estimate amounting to Rs 143.42 crore was approved by the Technical Advisory Committee (TAC) of MOWR. An amount of Rs. 69.90 crore was released to Government of Bihar during 2008-09 and additional amount of Rs. 28.35 crore has been released during 2009-10. Government of Bihar has intimated that an amount of Rs. 114.95 crore has been incurred for the restoration work.

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/ overexploited 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.
- CGWA has notified 65 areas in the states of Andhra Pradesh, Haryana, Punjab, Madhya Pradesh, Tamil Nadu, Pondicherry, Maharashtra, Kerala, Karnataka, Gujarat NCT Delhi and Uttar Pradesh warranting urgent action for registration of existing ground water extraction

structures. Based on the data thus generated, action for notifying these areas for regulation has been initiated. MoWR is implementing a Plan Scheme "Ground Water Management & Regulation". An expenditure of Rs. 43.96 crore has been incurred under the scheme upto December 2009 out of the budget allocation of Rs. 70.00 crore for 2009-10.

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.

FLOOD FORECASTING

Two on-going schemes of X 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' of Central water Commission (CWC) have been amalgamated into a combined scheme, namely, "Flood Forecasting" during XI Plan. Under the new 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/ Projects Authorities and National Disaster Management Authorities, Ministry of Home Affairs.

During the monsoon period of the year 2009, 3991 forecasts were issued by CWC to the State Government /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. With a view to improve the forecast performance, plan Scheme " Flood Forecasting" is being implemented. An expenditure of Rs. 11.91 crore has been incurred under the scheme upto December 2009 out of the budget allocation of Rs. 25.00 crore during 2009-10.

DEVELOPMENT OF WATER RESOURCES INFORMATION SYSTEM

A new Plan Scheme "Development Water Resources Information System" has been taken up in the XI Five Year Plan w.e.f. 2007 which aims to develop information system on water resources at the national level. Under the scheme, it is proposed to set up a Data Bank as mandated by the Inter- State River Water Dispute (ISRWD) Act, 1956 for maintaining data on each river Basin including data regarding Water Resource, Land, Agriculture & related matters. The total allocation for the XI Plan period (2007-12) for setting up of Data Bank and Data Collection activities is Rs. 234.3 crores. During the year 2009-10 the expenditure amount to Rs 21.4 crore incurred during 2009-10 (upto 31st December 2009).

Watershed maps using satellite images and Geoographical Information System will be hosted for visual display of spatial information laid over watershed maps for pictorial understanding by planners' and managers involved in water resources development. The scheme, as a major part of it, includes the ongoing activities of the Plan viz. Collection of hydrological, sedimentation and water quality data from river basins, Monitoring the progress of implementation of water projects, Conduct of five yearly Minor Irrigation census and providing assistance to the Water

Quality Assessment Authority. These activities provide the core data input for the information system.

CWC & ISRO has jointly undertaken the work of Development of Water Resources Information System (WRIS) during 11th plan. The joint proposal of CWC and ISRO of the work "Generation of data base and implementation of web enabled water resource information system (India-WRIS) has been approved by Secretary, MoWR at an estimated cost of Rs. 78.32 crore. Rs. 38.00 crore has been paid to ISRO as the first instalment. Total 30 GIS layers are to be generated. The work is under progress. The website of India WRIS, www.india-wris.nrsc.gov.in has been launched on 10th December 2009.

Rationalisation of Minor Irrigation Statistics (RMIS) Scheme

A Central Sector Plan Scheme of "Rationalisation of Minor Irrigation Statistics (RMIS)" is under implementation since 7th Five Year Plan. Main objective of the scheme is to build comprehensive and reliable database in the Minor Irrigation Sector for future planning. For regular reporting, compilation of information and coordination of activities in respect of Statistical data on Minor Irrigation in States/UTs, Statistical Cells are functioning in the Nodal Departments of States /UTs with 100% grant-in-aid from the Government of India under the scheme. During 11th Five Year Plan, the RMIS scheme has been covered under the umbrella scheme 'Development of Water Resources Information System' of the Ministry.

Under the RMIS Scheme, there is a provision for conducting Census of Minor Irrigation projects on quinquennial basis. Detailed information on Irrigation sources, namely, Wells, Tube Wells, Surface flow and Surface lift schemes including the irrigation potential created and potential utilised through them is collected and compiled on systematic basis throughout the country. The report of the second and third Minor Irrigation (MI) censuses with reference years 1993-94 and 2001-01 are available on the Ministry's website http://mowr.gov.in. Fourth Minor Irrigation Census with reference year 2006-07 has been launched. Field Work of the Census has been completed in most of the States. Data entry work and validation is in progress in the States/UTs. The report on the 4th MI Census is scheduled to come out by the middle of 2010.

During Eleventh Five Year Plan, the RMIS scheme was converted to central sector as one of the component of Development of Water Resources Information System Scheme of Ministry of Water Resources. On the direction from Planning Commission, an evaluation study of the RMIS scheme was awarded to IASRI, Pusa, New Delhi. This study commenced in July 2009 and has been completed in December 2009. The report of the study is under finalization.

During the year under review, amounts of Rs 10.479 crore have been spent against the Budget provision of Rs. 10.94 crore on the scheme.

HYDROLOGY PROJECT-II

Hydrology Project Phase-II has been taken up with the assistance of International Bank of Reconstruction and Development (IBRD). Agreement for the Hydrology Project –II between the IBRD (World Bank) and Government of India was signed on 19th January 2006. The project has become effective from 5th April 2006. The duration of the project is six years. The cost of the project has been estimated at Rs.631.83 Crore and supported with a loan of US$ 104.98 Million

from IBRD. Ministry of Water Resources is the Nodal Agency for implementation of the project. A Project Coordination Secretariat has been established within MoWR for this purpose.

The objectives of the project is to extend and promote the sustained and effective use of Hydrological Information System (HIS) by all 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.

The project is being implemented in 13 States viz. Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu (old Hydrology Project-I states), Goa, Punjab, Pondicherry and Himachal Pradesh (new participating states) and eight Central Agencies viz. Central Water Commission (CWC), Central Ground Water Board (CGWB), India Meteorological Department (IMD), National Institute of Hydrology (NIH), Central Water and Power Research Station (CWPRS), Ministry of Water Resources (MoWR), Central Pollution Control Board (CPCB) and Bhakara Beas Management Board (BBMB).

The project is being implemented with the help of following consultants :-

(i) Technical and Management Consultants (TAMC)
(ii) Decision Support System (Planning)
(iii) Decision Support System (Real Time)
(iv) Hydrological Design Aids(Surface water)

The project is monitored by National Level Steering Committee (NLSC) headed by the Secretary, Ministry of Water Resources with State Secretaries/Principal Secretaries of the concerned Departments as members.

Twenty one proposals of surface water domain and nineteen proposals of ground water domain have been approved for Purpose Driven Studies (PDS) to be carried out by the participating agencies.

During the year 2009-10, the main activities undertaken in HP-II are as follows :-

(i) Mid Term Review was held during October 1-14, 2009. The World Bank expressed its general satisfaction over the progress of the project. The financial allocation of some of the states were increased at MTR stage and the resources were re-allocated amongst the implementing agencies to ensure their effective use.
(ii) Under the Decision Support System (Planning), the river basins for study in each state has been identified. Much of the requisite data has been collected for the study and provided to the consultant. The Bhima basin of Maharashtra has been selected for pilot studies.
(iii) Decision Support System Real Time (DSS–RT) Consultancy has been started in BBMB. The tasks of need assessment, specifications of data base development, hardware and model selection have been completed.
(iv) Hydrological Design Aids for Surface Water (HDA-SW) consultancy has been signed by CWC and consultants are in place.

(v) A website http://www.hydrology-project.gov.in has been developed, which provides information about Hydrology Project. The site also contains Management Information System which enables implementing agencies to fill in and submit their annual work plans and procurement plans online.

(vi) Workshops have been held by NIH, BBMB and PCS (MoWR) involving the implementing agencies on issues concerning to DSS (P), DSS(RT), procurements and purpose driven studies etc. to remove the bottlenecks and expedite the progress of the project.

INFRASTRUCTURE DEVELOPMENT SCHEME

Infrastructure Development 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. With the merger of above mentioned four schemes, implementation and monitoring of the above schemes have been streamlined and strengthened.

Out of the total outlay of Rs. 115 crores for the scheme, Rs. 99 crore is meant for purchase of land and construction of buildings including modernization of various offices and Rs. 16 crores is meant for development of information technology in the Ministry and its attached and 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) and Central Water Commission 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 2009-10, an amount of Rs. 15 crores has been provided under the scheme. upto 31st December 2009, an expenditure of Rs. 12.02 crores in Land & Building and Rs. 1.14 crores in Information Technology components of Central Water Commission/ Central Ground Water Board/ Ministry (Proper) has been incurred.

Construction of buildings for offices of Central Water Commission at Hyderabad, Jammu, Guwahati and Asansol has been undertaken during 2009-10, which are under progress. Besides, modernization of Head Quarter office of Central Water Commission at New Delhi is also under progress. Central Ground Water Board has taken up construction of office buildings at Guwahati, Bhopal, Bangalore and Jammu, which are under progress. Besides, construction of boundary wall at Ambala and Bhubaneshwar is under progress. Proposals for purchase of land at Ahmedabad and Chennai are in offing. Purchase of computers, hardwares and networking components are also made on regular basis for strengthening e-governance agenda of the Government and for establishing web-based data base system.

INFORMATION, EDUCATION AND COMMUNICATION (IEC)

During Apri-December 2009, the following major mass awareness activities were undertaken in pursuance of the objectives laid down in the Information Education and Communication Scheme and as per the approved media plan for the current year:

1. An electronic media campaign has been launched through telecast of Video spots on water conservation on the National, Regional and DD News Channels of Doordarshan with an outlay of Rs. 5.6 crore with a view to generate awareness amongst the masses for judicious use of the critical natural resource i.e. Water.

2. A workshop of "Satellite Remote Sensing in Water Resources" was held in the committee room of MoWR, New Delhi on 18th May 2009. The workshop was inaugurated by Shri U.N. Panjiar, Secretary (WR) in the presence of Shri S. Manoharan, Addl. Secy. (WR), Shri B. M. Jha, Chairman, CGWB , Shri R.M. Mishra, JS(A), MoWR and other dignitaries and experts/ participants from various premier organizations and institutions related to the remote sensing field viz. NRSA, IIRS, JNU, DST,CGWB,CWC, NIH, NIC, RRSC, IARI etc and MOWR. The workshop focused on source finding, tapping and management of water resources and the need to develop synergy and exchange of information within user organizations / Ministries as they are dependent on the information related to geological, environmental, soil, climate, land use of any particular area.

3. An advertisement was released in the SAR Economist and Annual Survey of the Environment -2009 Magazines propagating the Do's and Don'ts for conservation of water in the June 2009 Edition of these magazines.

4. Print media campaign was launched by publishing an advertisement in the month of July in various newspapers publishing from state capitals throughout the country to urge upon the masses to adopt rainwater harvesting during monsoon period for artificial recharge of ground water.

5. In pursuance of the President's speech to both houses of Parliament on 4th June 2009 to institutionalize quarterly reporting on flagship programmes in the form of Bharat Nirman Quarterly Reports, an advertisement highlighting various schemes/programmes of the Ministry and achievements there under was issued in various newspapers publishing from state capital of the country on the occasion of 63rd Independence Day on 15th August 2009.

6. Print media campaign was launched to popularize the initiatives taken by Ministry of Water Resources for promoting water conservation and water use efficiency as well as to propagate various measures for judicious use of water by way of an advertisement in various newspapers publishing from state capital of the country on the occasion of National Integration Day on 19th November 2009.

7. Ministry of Water Resources participated in the 29th India International Trade Fair held at New Delhi from 14 to 27 November, 2009 by way of raising a pavilion on the theme: **SAVE WATER - EVERY DROP COUNTS** in pursuance of Hon'ble Prime Minister's call to the nation expressed in his Independence Day speech to develop Save Water as one of the national slogans. Several organizations under the Ministry also exhibited their Models and other exhibitory materials to showcase their activities and achievements.

The Union Minister for Parliamentary Affairs and Water Resources, Shri Pawan Kumar Bansal lighting the lamp to inaugurate the Pavilion of Ministry of the Water Resources at India International Trade Fair (ITPF) 2009, in New Delhi on November 14, 2009.

The pavilion was inaugurated by Hon' ble Minister (WR) on 14th November 2009. The occasion was marked by the presence of Hon'ble MoS (WR), AS (WR), Heads of various organizations under the Ministry and Senior Officers of MoWR. The central diorama of the pavilion revolved around the concept that every drop of water is precious. The story of water was shown through the drop in the form of earth symbolizing eternal relationship between earth and water. Efficient use of water in

the irrigation sector was depicted through drip and sprinkler models. Conservation of water at individual and collective levels was shown in the form of rainwater harvesting, repair and renovation of small water bodies and check dams. Emphasis was also laid on recycling of water especially in the industrial sector. The overall message conveyed through the central diorama was that judicious use of water brings prosperity.

With a view to involve children in the cause of water conservation and management, a student corner was also provided in the pavilion where *nukkad natak*, bioscope shows and quiz show through touch screen on various aspects of water were organized throughout the duration of the fair to educate and sensitise them about water related issues in an interactive manner.

The pavilion had huge footfalls. The visitors signed the pledge to save water as every drop counts.

NATIONAL WATER MISSION

National Water Mission is one of the eight missions envisaged under the National Action Plan on Climate Change lauched 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) is conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources management.

Five goals identified for the National Water Mission are as under

- Comprehensive water database in public domain and reliable assessment of impact of climate change on water resources
- Promotion of citizen and state action for water conservation, augmentation and preservation
- Focused attention for over-exploited areas
- Increasing water use efficiency by 20%
- Promotion of basin level integrated water resources management

The draft Mission Document may be accessed from the website of Ministry of Water Resources.

National Workshop on "Impact of Climate Change on Water Resources", New Delhi on 21st July 2009

The National Institute of Hydrology, Roorkee organized a National Workshop on "Impact of Climate Change on Water Resources" at CSMRS Auditorium, New Delhi on 21st July 2009. The main objective of the workshop was to discuss the findings of the studies related to the Impact of Climate Change on Water Resources carried out by National Institute of Hydrology. The workshop was inaugurated by Shri U.N. Panjiar, Secretary, Ministry of Water Resources, Goverment of India. It was emphasized that the scientific studies should provide specific

conclusions which may be useful for planning the adaptation strategies in water sector under changing climatic conditions. It was informed that the Ministry of Water Resources has formulated National Water Mission document and briefly described the various activities and actions of Ministry of Water Resources in order to study the Impact of Climate Change on Water Resources. For this Workshop, the delegates from various Central and State Government organizations, academic institutions, research organizations, non- governmental organisations and individual experts were invited. About 200 delegates from various organizations attended the workshop.

National Symposium on Climate Change and Water Resources in India (CCWRIN) November 18-19, 2009, Roorkee.

The National Institute of Hydrology, Roorkee and Indian Association of Hydrologists jointly organized the "National Symposium on Climate Change and Water Resources in India (CCWRIN)" during November 18-19, 2009 at National Institute of Hydrology, Roorkee. Besides the focal theme, other related aspects of hydrology including water resources management, environmental and social aspects of water, Hydrological modeling, Remote sensing and GIS application in Water Resources etc. were also covered during the Symposium. About 100 participants who included researchers/ scientists, academicians/scholars, engineers, bureaucrats/ policy makers, planners, managers and non-governmental organizations (NGOs) participated in the National Symposium in order to interact and share their knowledge and experiences on the various water related issues with special emphasis on Climate Change.

Symposium was inaugurated by Professor S.C. Saxena, Director, IIT, Roorkee on 18th November 2009. There were 6 technical sessions wherein about 60 research papers and key note addresses were presented. Important recommendations were finalized during the symposium based on the presentations of various technical papers and useful interactions among the delegates.

CHAPTER 2

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 activities of Brahmaputra Board in North-Eastern Region are as follows:

A) Protection of Majuli Island, Assam: Majuli, the largest riverine island in the world is a chronically flood and erosion affected island in river Brahmaputra. The protection works of the island were taken up by Board as approved by Govt. of India on the request of Government of Assam as under:

The immediate relief works at a cost of Rs. 6.22 crore were completed in the year 2003-04 and protection works at critical locations at a cost of Rs. 5.00 crore were completed in the year 2008.

The protection works were further taken under a scheme to be executed in three phases. Phase-I works at a cost of Rs. 56 crore are presently under progress.

DPR for Phase II and III at an estimated cost of Rs. 115 crore has been techno economically cleared by CWC and works have been taken up by Brahmaputra Board.

B) Anti-Erosion work at Dhola-Hatighuli: The work of diversion of the river Dibang to its original course was taken up at a cost of Rs. 10.47 crores (Phase-I). The works for diversion of Lohit (combined with Noa-Dehing) were also taken up at a cost of Rs. 5.22 crores (Phase-II) & Rs. 9.27 crores (Phase-III). The works were planned in phased manner as per morphological studies and have been completed. Now the phase-IV at a estimated cost of Rs. 53 crore has been taken up.

C) Harang Drainage Development Scheme: The Scheme was cleared during 9th Plan and revised to Rs. 30.49 crores during 10th plan. On completion, this will benefit 11850 ha chronically drainage congested area in Barak Valley, Assam. The present progress is 97% and the balance works will be completed soon.

CENTRAL WATER COMMISSION (CWC)

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

(i) Preparation of Detailed Project Reports and Design Consultancy for Water Resources Development Projects

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 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.

(ii) Hydrological Observation and Flood Forecasting Services

CWC has a large network of collection of hydrological data and for issue of flood forecasts in North East region. At present, CWC has 136 hydrological observation sites in the North East region and issues flood forecasts for 32 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 modernization 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.

(iii) 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. Modernisation of Jamuna Irrigation Scheme (Major/ERM)
5. Borolia Medium Irrigation project (Medium)

Manipur

1. Thoubal Multipurpose project (Major)
2. Khuga Multipupose 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)

(b) Command Area Development and Water Management (CADWM) Projects

A large number of projects in NE Region are getting funds under CADWM programme. These projects are monitored by CWC.

List of the projects under CADWM are as given below:

Assam

1. Dekadong CAD Project
2. Kaldia CAD Project
3. Bordikarai CAD Project

Arunachal Pradesh

1. Cluster of 62 MI in 4 panchayats in the districts of Papumpare, namely, Sagalee, Mengio, Balijan and Itanagar
2. Cluster of 7 MI, namely, Kharsang, Jonglim, Pather, Changlang and Simrang, Kengkut, Simari and Panchao.
3. Cluster of 6 MI projects, namely, Remgong, Sireng, Soso, Korong and sibum, Along and Sipir

Manipur

1. Imphal Barrage
2. Thoubal Multipurpose
3. Cluster of 21 MI schemes in Bishnupur District
4. Cluster of 37 MI schemes in Thobal, Ukhrul, Chandel & Churachandrapur district.
5. Cluster of 28 MI schemes in East & West districts of Imphal.

Meghalaya

1. Cluster of 10 MI Schemes viz. Tienglam and Pdem etc.

Mizoram

1. Cluster of 40 M.I. projects consisting of 36 (29Flow and 7 Lift) Schemes in Aizawl district and 4 M.I. Flow Schemes in Lunglei district
2. Cluster of 60 M.I.schemes (Phase-III Aizawal, Lunglat and Chhimtuipui district)

Nagaland

1. Cluster of 11 M.I. projects in Medziphema bowl

Tripura

1. Cluster of 4 M.I. projects

(c) Farmers Participatory Action Research Programme (FPARP)

The monitoring of this scheme is being carried out by CWC and CGWB. The details of technologies being demonstrated to the farmers is in **Table-8.**

Table-8

S. No	Name of Institute	Description of Technology to be demonstrated
1	Assam Agriculture University Jorhat Assam,	Irrigation Management in: . autumn rice (ahu) . summer rice . rapeseed and mustard . tomato and potato . post flood rice
2.	North eastern Regional Institute of Water and Land Management, Kaliabhomore, Tezpur Assam,	. Azola bio fertilizer technology . Agriculture production in flood prone areas . Multiple cropping . Drip Irrigation . Small Irrigation development in Hilly terrain . On farm Irrigation water management . Watershed Level . water harvesting
3.	WM Division, ICAR Research Station for NEH Region, Umroi Road, Umiam, Meghalaya	. Low cost micro rainwater harvesting structures . Insitu residue management for carry over soil moisture for second crop under terraced situation

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 2009-10 up to 31st December 2009 are given in **Table-9**

Table-9

Sl.	Activities	Achievements
1.	Ground Water Management studies .	15325 Sq. km (Pre-monsoon) 2700 Sq.Km. (Post-monsoon)
2	A. Ground Water Exploration B. Construction of Piezometers through Outsourcing	12 wells drilled in North Eastern Region Assigned duties to officers for selection drilling sites, pin pointing of sites for construction of piezometers and officers visited field for tentative selection of sites.
3.	Water Quality Analysis	159 samples analyzed for basic constituents and 129 samples have been analyzed for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc.

Sl.	Activities	Achievements
4.	Geophysical Studies	Carried out VES (Vertical Electrical Sounding) – 4 and Sub-surface borehole logging – 5
5.	Artificial Recharge and Rainwater Harvesting Studies	1. Compilation report and utilization certificate submission by Water Resource Department, Govt. of Arunachal Pradesh. 2. SLTAC already constituted & DPR under preparation by PHED, Govt. of Mizoram.
6.	Monitoring of Farmers Participatory Action Oriented Research Programme (FPARP).	1.Field inspection of FPARP in Rabi 2008-09 implemented by AAU, Jorhat and NERIWALM, Tezpur, Assam was completed. 2.Prepared field inspection report & submitted. 3.Compiled information about FPARP implemented by AAU,Jorhat. 4.Release of balance payment of AAU, Jorhat, Assam

CENTRAL SOIL & MATERIAL RESEARCH STATION (CSMRS)

Myntdu Leshka H E Project, Meghalaya

Constitution materials survey followed by testing of materials for use in construction of dam, powerhouse and HRT, design of concrete mixes, pumped concrete and shotcrete. Assessing the performance of coatings and geomembrane for providing additional protection to the u/s face of dam coming in direct contact with acidic water.

Kopili H E Project, Assam

The concrete portion of the dam and powerhouse components have been badly affected by acidity. Following studies have been undertaken:

- Studies on quality of water in respect of acidity in the reservoir and catchment area.
- In-situ testing of concrete structure by non destructive method.

CENTRAL WATER & POWER RESEARCH STATION (CWPRS)

The following studies for various projects from the North-Eastern states are in different stages of progress:

A) Hydraulic model studies for:

- Power house tailrace joining works with river & spillway aerator, Subansiri Lower HE Project, Arunachal Pradesh
- Spillway and energy dissipation arrangements using 2-D sectional model for Umtru dam, Meghalaya
- Studies for spillway(s), stop-log gate, flushing of sediment from reservoir, and power intake structure for Siang lower H.E. project, Arunachal Pradesh
- Studies for spillway, power intake structures and flushing of sediment from reservoir of Pare H.E. project, Arunachal Pradesh

B) Mathematical model studies for

- Reservoir sedimentation for Siang lower H.E. Project, Arunachal Pradesh
- Studies for surge shaft and reservoir sedimentation for Pare H.E. project, Arunachal Pradesh

NATIONAL INSTITUTE OF HYDROLOGY

The North Eastern Region of the country comprising the seven States of the country are the store house of water. In consonance with the National Policy of disaster mitigation and management, a need was felt to give more emphasis on studies and research in areas related to natural calamities like floods and droughts. The major flood affected areas in the country lie in the Ganga, Brahmaputra and Barak basins. In this connection, the earlier existing North Eastern Regional Centre of the Institute at Guwahati was rededicated to serve as Flood Management Centre for the Brahmaputra Basin and was reoriented as Centre for Flood Management Studies for the Brahmaputra Basin.

The seven States of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura besides the hilly regions of West Bengal and Sikkim are serviced by the Centre. Also there are serious issues of large-scale soil erosion on hill slopes, which need to be tackled to save the land and people as well as irreparable damage to the infrastructure and ecology of the Region. The Centre has taken up a number of studies in consultation with States of the Region as well as Brahmaputra Board, CWC, CGWB, etc., so as to evolve preventive action. Important among them are: Representative basin studies in basins of Meghalaya and Assam, Groundwater quality studies in Assam; Surface runoff studies in the Bhrahmaputra River and Flood risk mapping in lower Assam. Earlier the infiltration studies, hydro-meteorological studies and geo-morphological studies of Dhudhnai basin were completed.

Some of the important study areas for the Centre are:

- Flood Estimation
- Flood Routing
- Non-structural measures of Flood Management
- Structural measures of Flood Management
- Flooding due to drainage congestion
- Integrated Watershed Management for Flood Control
- Development of Hydrological Data Base Management System
- Drainage congestion and erosion problems
- Fluoride level in Karbi-Anglong District of Assam
- Field and laboratories based studies
- Technology transfer activities and collaboration with various concerned local organisations

The Centre is involved in the following projects/studies for the year 2009-10:

i) Modelling non-point source pollution.
ii) Flash Flood Studies (Jiadhal Basin).
iii) Flood plain zoning/flood hazard mapping of rivers of Arunachal Pradesh.
iv) Phytoremediation: A plant based technology to clean-up the environment

v) Design of rainguage station network for Arunachal Pradesh

NATIONAL PROJECTS CONSTRUCTION CORPORATION LTD. (NPCC)

The presence of NPCC in NE Region dates back to almost 32 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.

The major Projects are:-

Assam Riffle works consisting of mainly residential & non-residential buildings in all the 8 States. NPCC executes project worth Rs.150 Crores every year for Assam Riffles.

NPCC is executing more than Rs. 2000 Crores of works for Indo Bangla Border Fencing, road works & Flood lighting in the States of Tripura Mizoram, Meghalaya and Assam. The projects are in very remote and difficult terrain.

NPCC has since become a legend in power projects and so also in river valley, multi-purpose projects e.g. Loktak, Singda, Khuga, Gumti, Dolaithabi, Maharani, Khowai & Manu etc.

NPCC's contribution for development of N.E. Region is remarkable high that too in very difficult areas viz. College of Fisheries, TTADC Complex, Kalsi Barrage, College of Horticulture & Transit camp for CRPF in Assam

CHAPTER 3

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 2 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 02.11.2010 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 2010 by which it is hoped that the Hon’ble Supreme Court would dispose of the appeal pending before it and thereafter, the Petitions filed before this Tribunal shall be listed for orders and finally to be disposed of accordingly.

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 a Scheme called 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 (CMC). 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 and Chief Engineers of the basin States as Members and Chairman, Central Water Commission also as Member. 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 10h February 2003. The CMC has held 24 meetings so far and its last meeting was held on 4th Decembr 2009. During the Water Year 2009-10, starting from June 2009, as per the Interim Order, an inflow of 183.22 TMC was required at Mettur up to 30th November 2009. Against this an inflow of 185.14 TMC has been received at Mettur up to 30th November 2009.

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 of Krishna and river valleys thereof. Meanwhile, in the Writ Petition filed by the Govt. of A.P., Hon'ble S.C. has ordered that the effective date of constitution of the tribunal will be 1st February 2006. Consequently, the term of the tribunal has been extended up to 31st January 2010 as per provisions of ISRWD Act, 1956.

Progress in Adjudication of the Dispute

The KWDT passed orders on 9th June 2006 on the Interim Relief Application filed by the party States of Maharashtra, Karnataka and Andhra Pradesh. The Tribunal in its hearing held in September and October 2006 has framed 29 issues adjudication of the dispute before it. Hearings of the Tribunal are continuing. Party States have so far filed 108 IAs.

Interlocutory Applications (IAs). 106 IAs filed so far have been disposed of by passing necessary orders after hearing the party states and rest of 2 are being heard.

Oral evidence of the Witnesses started during the previous years beginning with the State of Karnataka followed by the State of Maharashtra and Andhra Pradesh. Evidence of the three witnesses of the State of Karnataka, four witnesses of the State of Maharashtra and four witnesses of the state of Andhra Pradesh have been recorded. Evidence of the witnesses of the State of Andhra Pradesh is over. States of Karnataka and Maharashtra have concluded their arguments. The arguments on behalf of State of A.P. are continuing.

Expenditure incurred by the Tribunal	(Rs. lakhs)
i) Budget Allocation for 2009-10	140.00
ii) Expenditure incurred by the Tribunal upto November, 09	135.00
iii) Cumulative Expenditure up to November, 09	618.47

VAMSADHARA RIVER WATER DISPUTE

The State of Orissa has 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 Vamsadhara for constitution of a Inter-State Water Disputes Tribunal for adjudication. The main grievance of the State of Orissa in the complaint sent to the Central Government is basically adverse effect of the executive action of Govt. of Andhra Pradesh in undertaking the construction of the aforesaid flood flow canal at Katragada and failure of Govt. of Andhra Pradesh to implement the terms of inter-State agreement understanding etc. relating to use, distribution and control of waters of inter-State river Vamsadhara and its valley. It has also raised the issue of scientific assessment of available water in Vamsadhara at Katragada and Gotta Barrage and the basis for sharing the available water.

Secretary, Ministry of Water Resources convened an inter- State meeting on 24th April 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 reassess 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 2nd March 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 6th February 2009, the Hon'ble Supreme Court has 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 Vamsadhara river. Cabinet in its meeting dated 25th June 2009 has approved the proposal of constitution of a tribunal in this regard. 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 has granted time upto February 2010 for constitution of Tribunal. The tribunal has been notified on 24.2.2010.

MAHADAYI/MANDOVI RIVER WATER DISPUTE

In July 2002, the State of Govt., 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 refer 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 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 4th April 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, Govt. 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 has been listed number of occasions before the Court. In its hearing on 30th April 2008, the Hon'ble Supreme Court has passed the order that as per the statement made by the state Govt. of Karnataka, in its counter affidavit filed on 27th September 2006, the State Govt. of Karnataka will not actually utilize the waters under Kalsa Banduri Project till next date of hearing. Further, in the hearing dated 14th October 2008, the Hon'ble Supreme Court framed the issue in original suit No.4. Constitution of Tribunal is one of the issues framed by the Hon'ble Supreme Court.

A cabinet note for constitution of Tribunal in this regard was sent for consideration of cabinet. The cabinet considered the note on 26th February 2009 and the decision on the same was deferred.

A Cabinet note was again sent for constitution of Tribunal in this regard to the Cabinet Secretariat. The note was considered by the Cabinet on 10th December 2009 and the cabinet approved the constitution of Tribunal. Further action in this regard is being taken by the Ministry.

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 Governments of Punjab, Haryana and Rajasthan, seeking explanation/guidance on certain points in the report.

The period for forwarding of further report by the Tribunal has been extended upto 5th August 2010. The Tribunal's hearings have become dependant on the outcome of a Presidential Reference related to Punjab Termination of Agreement Act, 2004.

CHAPTER 4

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 and 36 JRC meetings have been held so far. The last meeting was held in September 2005. The 37th meeting is scheduled to be held at New Delhi from 17th to 20th March 2010.

Treaty on Sharing of Ganga/ Ganges Water at Farakka

A Treaty was signed by the Prime Ministers of India and Bangladesh on 12th December 1996 for the sharing of Ganga/Ganges waters at Farakka during the lean season. As per the Treaty, the Ganga/Ganges waters is being shared at Farakka (which is the last control point on river Ganga in India) during lean period, from 1st January to 31st May every year, on 10-daily basis as per the formula provided in the Treaty. The validity of Treaty is 30 years.The sharing of water as per the Treaty is being monitored by a Joint Committee headed by Members-JRC from both sides. Three meetings of the Joint Committee were held in this year. The Treaty is being implemented to the satisfaction of both the countries since 1997.

Sharing of Waters of River Teesta

A Secretary Level Meeting between India and Bangladesh on matters relating to water resources sector was held at New Delhi on 7th and 8th August, 2007. During the meeting both sides 'in principle' agreed on various pending issues and decided that these will be put up for consideration in the next JRC meeting for final decision, which is proposed to be held in India in due course.

Secretary (WR) level meeting was held between India & Bangladesh during 4-5 January, 2010. It was decided to execute the bank protection works on common/ border rivers from 1st February 2010 and complete in next 3 years. Similarly, it was also decided that India would carry out dredging of river Ichhamati at international boundary line from February 2010 under joint monitoring and as per modalities decided by the Technical Team on 1st January 2010 at Kolkata.

Cooperation in Flood Forecasting

India is providing the flood data of Farakka for Ganga (from 15th June to 15th October), and the 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

MEMBERS OF THE JOINT OBSERVATION TEAMS AT FARAKKA AND FORTY-SECOND (42nd) MEETING OF THE JOINT COMMITTEE

Visit to Joint Observation Site at Feeder Canal, Farakka

Exchanging of the Record of discussions of the 42nd Meeting of Joint Committee by Members, JRC

and warning arrangements, besides the data of river Teesta, Manu, Gumti, Jaladhaka and Torsa, etc. The transmission of flood forecasting information from India during the monsoon which is being supplied free of cost has enabled the civil and Military authorities in Bangladesh to take precautionary measures and shift the population affected by flood to safer places**.** During the flood season of 2009, a total of 396 flood messages were sent to Bangladesh.

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 35 hydro-meteorological/ meteorological stations located in Bhutan and 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.

The matter relating to problem of floods created by the rivers originating from Bhutan and coming to India was taken up with the Royal Government of Bhutan. A Joint Group of Experts (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. Two meetings of JGE have been held. The first meeting of JGE was held in Bhutan from 1st to 5th November 2004 and the second meeting was held on February, 26-27, 2008 at New Delhi.

Presently design/drawings for construction of Punatsangchu Hydel Project Stage-1 (6x200MW) are being provided by CWC through WAPCOS. Design/Drawings for preparation of DPR of Punatsangchu Hydel Project Stage-2 (6x165 MW) are being provided by CWC through WAPCOS.

INDIA-CHINA COOPERATION

In the year 2002, the Government of India had 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 is providing 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.

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 years has been signed with China on 5th June 2008 during the visit of Hon'ble External Affairs Minister of India to Beijing from June 4-7, 2008.

Another Memorandum of Understanding has been signed during the visit of the Chinese Premier to India in April 2005 for supply of hydrological information in respect of Sutlej (Langquin zangbu) in flood season. Chinese side is providing hydrological information in respect of their

Tsada station on river Sutlej (Langquin zangbu) from the monsoon of 2006. Implementation Plan was signed in this regard during April 2008.

The Hon'ble President of the People's Republic of China paid a state visit to the Republic of India from November 20-23, 2006. During the visit, it was agreed to set up an Expert – Level Mechanism to discuss interaction and cooperation 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.

The first meeting of the Joint Expert Level Mechanism was held on September19-21, 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 at New Delhi from 10-12th April 2008. 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 third meeting of 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.

INDIA – NEPAL COOPERATION

5th Meeting of India- Nepal Joint Committee on Water Resources (JCWR)

5th Meeting of India- Nepal Joint Committee on Water Resources (JCWR) headed by Secretaries (WR) of India and Nepal was held on November 20-22, 2009 at Pokhara (Nepal) to oversee the works of all existing bilateral technical bodies and expert groups in the field of water resources. During the meeting, JCWR finalized the Terms of Reference (TOR) of Pancheshwar Development Authority (PDA). Composition of PDA was earlier finalized during the 3rd meeting of JCWR held from 29th September to 1st October 2008 at Kathmandu (Nepal).

Nepalese side informed during the meeting that despite best efforts put in by Government of Nepal to resume field investigation works suspended since May 2007, the work environment has not improved to recommence the drilling and drift works at Sapta Kosi Dam sites. JCWR agreed that in case the work cannot be resumed by March, 2010, JPO personnel may be redeployed to effectively utilize their services or the strength may be downsized.

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 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 November 20-22, 2009 at Pokhara (Nepal), JCWR finalized the Terms of Reference (TOR) of PDA.

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, because of political instability and frequent strikes / bandhs, the field investigations got delayed. Field works of Sapta Kosi High Dam Multipurpose Project continues to be suspended. The tenure of JPO-SKSKI has been extended up to June 2010 to complete field investigation and preparation of DPR at a revised cost of Rs. 74.86 crore.

Dr. Prakash Sharan Mahat, Minister of Energy, Nepal having meeting with Shri Vincent H. Pala, Hon'ble Minister of State for Water Resources in New Delhi on 20th August 2009

During the 5th meeting of JCWR, Nepalese side informed that despite the best efforts put in by Government of Nepal to resume field investigation works suspended since May 2007, the work environment has not improved to recommence the drilling and drift works at Sapta Kosi Dam sites. JCWR agreed that in case the work cannot be resumed by March 2010, JPO personnel may be redeployed to effectively utilize their services or the strength may be downsized. The works at Saptakosi dam site have not still been resumed.

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.

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

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

JCWR during its 4th meeting held on March 12-13, 2009 at New Delhi, finalized the Terms of Reference (TOR) of JMCWR.

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. 1st meeting of JCIFM was held from 30th June to 5th July 2009.

INDO-PAKISTAN CO-OPERATION

Under the Indus Water Treaty 1960, India and Pakistan have each 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 held the 103rd Annual meeting in May-June 2009 upto December 2009.

In fulfillment of the requirements of Indus Waters Treaty, the daily data of hydrological sites of six basins, The Indus, The Jhelum, The Chenab, The Ravi, The Beas and The Sutlej of Indus system is being sent to Pakistan every month.

Irrigated Cropped Area statistics for Indus, Jhelum & Chenab basins was also sent to Pakistan for the crop year 2008-09. India also communicated flood flow data of rivers Chenab, Sutlej and Ravi through telephone during the period from 1st July to 10th October 2009, for taking advance measures to meet flood situation.

CHAPTER 5

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, particularly, for irrigation schemes.

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 16 on-going externally aided projects under implementation in various States with assistance from the World Bank (10), Asian Development Bank (1) and other bilateral agencies, namely, Japan Bank for International Cooperation (JBIC) (4) and Kreditanstalt fur Wiederaufbau (Kfw), Germany (1).

Out of 10 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; 1 relates to water sector improvement in the state of Maharashtra; 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 exernal aided projects are given in **Table-10**

Table-10

World Bank Assisted On-Going Projects

(Rs. in crore)

S No	State	Name of Projects	Date of Agreement/ Completion	Amount of Assistance Donor Currency (in Million)	Cumulative Disburse-ment upto 31.12.2009 Million Donor Currency	% of disbursement/ disbursement yet to be made
1	2	3	4	5	6	7
1	Madhya Pradesh	Madhya Pradesh Water Sector Restructuring Project LN 4750-IN	30.11.2004 31.3.2011	US$ 394.020 (Rs.1943.012)	US$ 109.02 (Rs.495.89)	27: 5yrs 1 months 73: 1yr 3 months
2	Rajasthan	Rajasthan Water Sector Restructuring Project Cr.3603-IN	15.3.2002 31.3.2010	SDR 100.052 (Rs. 643.116) (Loan)	US$ 105.35 (Rs.471.49)	88: 7 yrs 9 months 12: 3 months

1	2	3	4	5	6	7
3	Uttar Pradesh	UP Water Sector Restructuring Project Cr.3602-IN	08.3.2002 31.10.2010	SDR 90.471 (Rs.652.523) (Loan)	US$ 85.93 (Rs.390.87)	77: 7yrs 9months 23: 10 months
4	Andhra Pradesh	Andhra Pradesh Community Based Tank Management Project Cr.4291-IN & 4857-IN	8.6.2007 31.12.2012	US$ 189 (Rs. 944.350)	US$ 21.50 (Rs. 94.92)	11: 2 yr 06 months 89: 3 yrs 0 months
5	Karnataka	Karnataka Community Based Tank Management Project CR.3635-IN	08.07.2002 31.1.2012	SDR 80 Revised SDR 63.420 (Rs. 451.003)	US$ 48.41 (Rs.216.46)	65: 7yrs 5 months 35: 2yrs 1 months
6	Karnataka	Karnataka Community Based Tank Management Project C.4872-IN & 3635-I-IN	17.1.2008 31.1.2012	US$64 (Rs. 321.553)	US$ 1.18 (Rs. 5.52)	2: 1 yr 11 months 98: 2 yrs 1 months
7	Orissa	Orissa Community Tanks Management Project (7576-IN)	27.01.09 31.08.2014	US$ 112.000 (Rs. 545.544)	US$ 4.42 (Rs. 22.20)	4: 11 months 96: 4yrs 8 months
8	Mahara-shtra	Maharashtra Water Sector Improvement Project-LN4796-IN	19.8.2005 31.03.2012	US$325 (Rs. 1604.419)	US$120.39 (Rs.557.87)	37: 4yrs 4 months 63: 2yrs 3 months
9	Tamil Nadu	Tamil Nadu Irrigated Agriculture Modernization and Water Bodies Restoration and Management Projects (Cr.No. 4846 (IBRD) & Cr. No. 4255-IN (IDA)	12.2.2007 31.7.2013	US$ 485 (Rs.2425.761)	US$ 109.47 (Rs.499.73)	22: 2yrs 10 months 78: 3yrs 07 months
10	Multi-State*	Hydrology Project (Phase-II) Cr 4749-IN	19.1.2006 30.6.2012	US$ 104.980 (Rs.519.024) (Loan)	US$ 21.82 (Rs. 98.11)	21: 3yrs 11 months 79: 2yrs 6 months
		TOTAL		US$ 1920.34 (Rs.10050.31)	US$ 627.49 (Rs.2853.06)	

*Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu Goa, Punjab, Pondicherry and Himachal Pradesh and eight Central Agencies viz. Central Water Commission (CWC), Central Ground Water Board (CGWB), India Meteorological Department (IMD), National Institute of Hydrology (NIH), Central Water and Power Research Station (CWPRS), Ministry of Water Resources (MoWR), Central Pollution Control Board (CPCB) and Bhakara Beas Management Board (BBMB).

Issues

The position disbursement of funds in each Project by the World Bank has been indicated in the last column 6 & 7 of Table-9**.** Slow progress in utilization of funds under the projects has generally been attributed to : (i) delay in appointment of Consultants; (ii) frequent transfer of project staff; (iii) lack of adequate skilled technical hands; (iv) failure on the parts of contractors to carry out the civil works involved and (v) non availability of the inland suppliers and/or inadequate response to the global tenders.

A brief status of ADB assisted ongoing exernal aided project is given in **Table-11**.

Table-11

Asian Development Bank

S No	State	Name of Projects	Date of Agreement/ Completion	Amount of Assistance Donor Currency (in Million)	Cumulative Disburse-ment upto 31.12.2009 Million	% of disbursement/ disbursement yet to be made
1	Chhattisgarh	Chhattisgarh Irrigation Development Project 2159-IND	20.3.2006 31.3.2013	US$ 46.108 (Rs.230.212) (Loan)	US$ 5.839 (Rs.26.058)	3 yrs 9 months 2yrs 3 months

A brief status of JBIC assisted ongoing exernal aided projects are given in **Table-12**.

Table-12

Japan Bank for International Cooperation (JBIC)

S No	State	Name of Projects	Date of Agreement/ Completion	Amount of Assistance Donor Currency (in Million)	Cumulative Disburse-ment upto 31.12.2009 Million	% of disbursement/ disbursement yet to be made
1	Andhra Pradesh	Modernization of Kurnool-Cuddapah Canal (II)	31.3.2004 18.06.2012	JY 4773 (Rs. 184 crore)	JY 2921.55 (Rs. 117.21)	5 yrs 9 months 2yrs 6 months

2	Andhra Pradesh	Andhra Pradesh Irrigation and Livelihood Project	20.3.2007 11.07.2016	JY 23974 (Rs.1236.696) (Loan)	JY 633.10 (Rs. 31.43)	2 yrs 9 months 6yrs 7 months
3	Orissa	Rengali Irrigation Project (II)	31.3.2004 31.05.2011	JY 6342 (Rs.243 crore)	JY 6084.34 (Rs.248.88)	5 yrs 9 months 1yrs 5 months
4	Rajasthan	Rajasthan Minor Irrigation Improvement Project	31.3.2005 28.07.2015	JY 11555 (Rs.440.708)	JY 54.77 (Rs.2.68)	4 yrs 9 months 5yrs 6 months
5	Maharashtra	Minor Irrigation Project (Kfw-financial cooperation)	01.06.2000 30.06.2011	EURO 23.008 (Rs.130.50 Cr.)	EURO 10.64 (Rs. 59.07)	9 yrs 6 months 1yr 6 months

Projects under Pipeline- World Bank

Out of 4 Externally aided Projects under pipeline assisted by World Bank, 2 relates to water sector improvement in the states of Orissa and Andhra Pradesh, 1 relates to Accelerated Development of Minor Irrigation Project (ADMI) in West Bengal and 1 relates to Dam Rehabilitation and Improvement in 5 States. The brief details are given in **Table-13.**

Table-13

Sl. No.	Project Name	Date of proposing	Estimated Cost (Rs. Crore)	Status
1.	Dam Rehabilitation and Improvement Project	7th May, 2003	718.99	World Bank has now proposed to initially start the project in five states, namely, Chhattisgarh, Orissa, Kerala, Madhya Pradesh and Tamil Nadu.
2.	Andhra Pradesh Water Sector Improvement Project	18th April, 2006	2250.00	World Bank preparation mission visited the project during May, 18-30, 2009
3.	West Bengal Accelerated Development of Minor Irrigation Project (ADMI)	17th January, 2007	1143.00	The project is tentatively scheduled for delivery in FY09 of the Bank. World Bank has sanctioned Project Preparation Advance of US $ 2.94 million on April, 29, 2008.
4.	Orissa Water Sector Improvement Project (OWSIP)	16th May, 2007	3493.10	The proposed project is included in their lending pipeline with targeted delivery during FY10.

A brief status of projects under pipeline with Asian Development Bank assistance are given in **Table-14**.

Table-14

S.No.	Name of Project	Estimated Cost (US$ in Million)	Status
1.	Orissa Integrated Irrigated Agriculture & Water Management Project	250	Detailed Project Report in respect of the Schemes for tranche-1 of the project have been evaluated by CWC and approved by the TAC in its meeting held on 22nd May 2008.
2.	Sustainable Coastal Protection and Management Project	418	Technical Assistance (TA) consultant of ADB has furnished Draft Final Report for project preparation in respect of three States, namely, Goa, Karnataka and Maharashtra. MoWR has given "In principle" approval to the Aide Memoire of the Fact Finding Mission (29th September- 14 October 2009) subject to observations of CWC and clearance of 4 sub-projects by TAC to DEA.
3.	North Eastern Integrated Flood and River Bank Erosion Management Project (Assam)	149	Draft final Report (DFR) of the project has been prepared by the TA Consultant of the ADB. An ADB Consultation Mission fielded from 7-11 December 2009 in Assam and 14th December 2009 in New Delhi.
4.	North Eastern Integrated Flood and River Bank Erosion Management Project (Arunachal Pradesh)	Rs. 420 cr.	The comments of CWC on the Aide Memoire of TA Review Mission fielded by ADB from 12-15 & 19 June 2009 have been forwarded on 20.01.2010 to DEA and the State Govt.

The Secretary, Ministry of Water Resources, Shri U. N. Panjiar and the Australian High Commission to India, Mr. Peter N. Varghese signing a Memorandum of Understand (MoU) on Cooperation in the field of Water Resources Management, in the presence of Union Minister for Parliamentary Affairs and Water Resources, Shri Pawan Kumar Bansal, in New Delhi on November 10, 2009.

Bilateral Cooperation / Signing of MOUs - Memorandum of understanding (MOUs) was signed by India with the Kingdom of Cambodia in the field of Water Resources Management during 2007. The Memorandum of Understanding between the Government of India and Government of Australia on Cooperation in the field of Water Resources Management has been signed on 10th November 2009, which will be effective for a period of 5 years.

Draft MOUs between the Government of Republic of India and Royal Government of Bhutan and the Government of the Kingdom of Morocco in the Water Resources Sector are under consideration.

Bilateral Cooperation with African Countries – The Action Plan in the areas of training and capacity building has been prepared for bilateral cooperation with the African countries in the Water Resources Sector and is presently under finalization in consultation with various organizations of Ministry of Water Resources.

CHAPTER 6

RESEARCH AND DEVELOPMENT

The Ministry of Water Resources has three organizations viz., Central Water and Power Research Station (CWPRS), Central Soil and Material 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, hydro power, navigation, coastal works and related instrumentation. CSMRS is involved in the research related to construction materials, concrete technology, geo physics, 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 have been reconstituted. The INCGE and INCCMS have been 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 the year 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. During the year 2009-10, 18 research schemes were under implementation and are under progress.

Indian National Committee on Hydrology (INCOH)

The Indian National Committee on Hydrology (INCOH) was constituted in the year 1982, 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 has brought out 26 state-of-art Reports in hydrology in the country. The Committee has also provided financial support for organising seminars, conferences etc. for dissemination of knowledge and promoting education and training in hydrology.

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.

During the year 2009-10, 18 research schemes were under implementation and are under progress.

Indian National Committee on Irrigation and Drainage (INCID)

The Indian National Committee on Irrigation & Drainage (INCID) was constituted in the year 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. During the year 2009-10, 35 research schemes were under implementation out of which 2 schemes have been completed.

INCID organized 60th International Executive Council (IEC) Meeting of ICID and 5th Asian Regional Conference (ARC) at New Delhi during December 2009.

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. During the year 2009-10, 20 research schemes are being implemented under the supervision of INCGECM.

The Prime Minister Dr. Manmohan Singh being received by the Union Minister for Parliamentary Affairs and Water Resources, Shri Pawan Kumar Bansal, to the inaugurate the "5th Asian Regional Conference on Improvement in Efficiency of Irrigation Projects" organized by M/o of Water Resources, in New Delhi on December 10, 2009. The Minister of State of Water Resources, Shri Vincent Pala is also seen.

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 scheme pertaining to ground water which so far were being dealt by INCOH, have been brought under INCGW. At the beginning of the year 2009-10, 17 research schemes were ongoing, out of which one has been closed and one has been completed.

Status of R&D Schemes

Since 1992, 283 research schemes have been sanctioned to various academic and research institutions by the Ministry of Water Resources. Out of which 175 schemes have been successfully completed, six schemes foreclosed and 102 schemes are under progress in various academic and research institutions.

Study Related to Gap in Irrigation Potential Created and Irrigation Potential Utilised

The Ministry of Water Resources has awarded a study to examine the various issues related to gap between irrigation potential created and utilised and for suggesting measures for reducing the gap in the country to four Indian Institutes of Management (IIMs), namely, IIM Ahmedabad, IIM Bangalore, IIM Lucknow and IIM Calcutta. The Final Reports of the study have been received from them. A one day workshop was organized in the month of March 2009 to deliberate the Final reports of IIMs on study related to gap between the irrigation potential

created and utilised. The representatives from the Planning Commission, Ministry of Agriculture, various State Governments/Union Territories (Water Resources Deptt.) including Ministry of Water Resources and its organisations like Central Water Commission, Central Ground Water Board, Non-Governmental Organisations (NGOs), and academic experts in the field of water resources attended the workshop. The recommendations of the Reports and final outcome have been sent to all concerned State Governments/Departments as well as Planning Commission, Ministry of Agriculture, all apex organizations working under the Ministry in May 2009.

16th Meeting of the Standing Advisory Committee (SAC)

The 16th meeting of the Standing Advisory Committee (SAC) of MoWR for Research & Development was held in December 2009. A total of 22 research proposals including 8 deferred proposals were considered by the Committee. 9 research proposals were approved for funding under the R&D Programme. 11 research proposals were deferred for consideration in the next meeting of SAC with the direction that the views / observations of concerned State Governments/ Organizations should be obtained. Two research proposals were not accepted for funding.

CHAPTER 7

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.

Organisational Setup

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 four regions, data from other regions are also recived and stored at NSWDC, New Delhi.

Hydrology Project

CWC is acting as one of the main central agency to undertake the works of Hydrology Project – II as mentioned in Chapter 1 under Central Sector Major Programmes.

Water Quality Monitoring

About 4095 samples collected from 371 observation sites on major rivers of India were analysed for water quality assessment upto December 2009 during the year 2009-10 by CWC.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 nos. 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

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 as also 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 when the erstwhile Central Water and Power Commission (CW &PC) set up a Flood Forecasting Unit (FFU) for issuing flood warnings of floods in the Yamuna at the National Capital, Delhi. 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. They pertain to 15 States viz., Andhra Pradesh, Assam, Bihar, Chattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Tripura, Uttaranchal, Uttar Pradesh & West Bengal and one Union territory Dadra & Nagar Haveli and National Capital Territory of Delhi.

On an average, over 6000 forecasts are being issued 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.

During the flood season 2009, (May to October) 3991 flood forecasts (3324 level forecasts and 667 inflow forecasts) were issued out of which 3906 (97.87%) forecasts were within accuracy limits. During the flood season, the real time hourly data of over 250 stations (most of Flood forecasting stations and few base stations) were collected through web and compiled, analysed and was used to generate flood report of the regions.

To make the flood forecasts more accurate, effective and timely, CWC is continuously updating and modernizing its flood forecasting system with a view to improve the quality and accuracy of the forecasts through (i) Automated data collection and transmission, (ii) Use of Satellite based communication system through VSAT and (iii) Improvement of forecast formulation techniques using computer based catchment models. This scheme is of immense help to the project authorities to know well in advance on the quantum of water likely to be received at various dam sites and flood prone populated areas so that they can take advance action for suitable reservoir regulation for ensuring safety of the dam as well as property and livestock. During the 10th Plan, the scheme for updating and modernizing flood forecasting system has been extended to Brahmaputra, Barak, Damodar, Krishna, Godavari, Yamuna, Ghaghra, Rapti and Sutlej river basins.

During XI plan, telemetry system is proposed to be installed in 222 stations in different river basins in the country.

Technical Expert Group

During September, 2007, a Technical Expert Group (TEG) headed by Member (RM), CWC, with representatives from the States and concerned Central Organizations has been constituted by the Ministry of Water Resources for preparation of National Perspective Plan for controlling floods and mitigating their impacts. TEG has met three times ; the last meeting of TEG was held on 29-01- 2008. Based on the information provided by various State Governments, a report is under finalization in CWC.

Techno Economic Appraisal of Flood Management Schemes

During 2009-10, a total of 153 Flood Management Schemes from States of Andhra Pradesh, Assam, J&K, Karnataka, Delhi, Orissa, Punjab, Tamilnadu, Tripura, Uttar Pradesh and the U.T. of Puducherry were received in Central Water Commission. Out of which, 58 schemes have been cleared by CWC , 31 schemes are under correspondence ,Project Reports for 32 schemes were not technically sound and 32 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) 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. Pancheshwar Multi Purpose Project has been investigated by the Joint Project Office – Pancheshwar Investigation (JPO-PI). The Joint DPR could not be completed due to some outstanding issues still to be resolved by the Joint Group of Experts (JGE) of Nepal and India.

Joint Project Office for survey and investigation of Sapta Kosi High Dam Multipurpose Project and Sun Kosi Storage-cum-Diversion Dam, has been opened in Nepal in August 2004 and the work is under progress.

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

Morphological Study of six rivers was proposed in 10th Plan, out of which morphological studies of four rivers, namely, Kosi, Ghaghra, Sutluj and Gandak rivers were taken up during 10th Plan period. The draft reports for Kosi and final report of Ghaghra and Sutluj have been submitted by NIH, Roorkee during December 2009 and is being examined. For river Gandak, the interim report has been submitted by CWPRS, Pune. The preparation of final report for these four rivers has spilled over to 11th Plan.

With a view to have a multi disciplinary approach, a 'Standing Committee for Morphological Studies of Himalayan Rivers of India' has been constituted under the chairmanship of Member(RM) in June 2006. The Committee is having members from MoWR, CWC, Brahmaputra Board, CWPRS, Pune, NIH, Roorkee, NRSC, Hyderabad, Space Application Centre, Ahmedabad, GSI, IWAI, Water Resources/Irrigation Departments and Space Application Centres of State Government of the concerned basins. The first meeting of the Standing Committee was held on 11th December 2006. During the meeting, it was decided to include eleven more rivers for Morphological Studies in 11th Five Year Plan and to modifiey the existing General guide Lines (1991) for preparing River Morphological reports. The General guide Lines have been modified and new guide Lines have been issued in March,2009. During 11th Plan, morphological studies of seventeen rivers are proposed to be taken up under the Plan Scheme, 'R&D Programme in Water Sector'. The rivers are Ganga (Allahabad to Buxer), Sharda, Rapti, Yamuna, Brahmaputra, Subnsiri, Pagladia, Mahanadi, Kosi, Bagmati, Mahananda, Tapi, Krishna and Tungbhadra. 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' has been approved during February 2008 for 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 7500 km, out of which about 2017 km is affected by sea erosion. Almost all the maritime States/UTs are facing coastal erosion problem in various magnitudes.

Considering the need of overall planning and cost effective solution to the coastal problems, the Govt. of India constituted Beach Erosion Board in the year 1966 under the Chairmanship of Chairman, CWC (erstwhile CW&PC). With the objective of development in the protected coastal zone, the Beach Erosion Board was reconstituted and renamed as Coastal Protection and Development Advisory Committee (CPDAC) by the Ministry of Water Resources, Govt. of India, in April 1995, under the Chairmanship of Member (RM) and representatives of all coastal States and related Central Departments. The Beach Erosion Board held 24 meetings in all. "So far, CPDAC has held 10 meeting upto December.2009.

Realizing the severity of sea-erosion problems in certain reaches of the coastline, Ministry of Water Resources initiated the process of collecting details of severely affected reaches with a view to exploring the possibility of preparing a National Coastal Protection Project (NCPP) for taking up the same for external assistance. As an out come of discussions between the Government of India and the Asian Development Bank (ADB), a Technical Assistance (TA) programme with ADB grant of $1.0 Million for preparing a Sustainable Coastal Protection and Management Project for the states of Maharashtra, Karnataka & Goa was implemented in 2009. The Technical Assistance broadly supports NCPP. ADB loan of about $ 250 Million is in the

pipeline for implementing sustainable Coastal Protection works which would be phased out in three tranche for a period of 8 years.

Hydrological Studies

Detailed Hydrological studies are carried out by the Central Water Commission at various stages of projects for assessment of quantities of available water and its time distribution, estimation of design flood, sediment rate 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;
(iii) Estimate the life of reservoir.

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

Hydrological studies are made in connection with technical examination of Detailed Project Reports and other special studies/consultancy work. 110 projects were dealt by CWC during the year 2009-10 from hydrological point of view, out of which 7 projects were dealt as consultancy work and 103 projects were dealt for hydrological studies/review work.

CWC has come up with Indian version of regional models for rational estimation of design flood. The country has been divided into 7 zones and further 26 hydro meteorologically homogeneous sub- zones. So far flood estimation reports covering 24 sub-zones have been published.

For estimation of design storm, the Generalised PMP Atlases for i) Cauvery and other East flowing rivers, ii) Godavary and other East flowing rivers, iii) Mahanadi and adjoining rivers, iv) Chambal, Betwa, Sone & Mahi basins, v) Narmada, Tapi, Sabarmati, Banas & Luni systems and rivers of Saurashtra and Kutch region and vi) West flowing rivers of Western Ghats have been prepared under DSARP – I. Work for preparation of PMP Atlases for Indus and Krishna Basins has been completed through IITM in X Plan. The work for preparation of PMP Atlases for Ganga and Brahmaputra Basins has been initiated in the current plan.

Design

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

At present, CWC is carrying out design consultancy in respect of 106 projects out of which 77 projects (including 16 from North Eastern region) are at construction stage while the remaining 29 projects (including 6 from North Eastern region) are either at investigation or at DPR stage. Technical examinations for 49 projects were also carried out in year 2009-10. In addition to above, special studies have been carried out and special problems handled in respect of 11 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 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.

Dam Safety Organization of CWC acted as a Nodal agency in the implementation of the World Bank assisted "Dam Safety Assurance and Rehabilitation Project (DSARP)" in which 4 states i.e. Madhya Pradesh, Rajasthan, Orissa and Tamil Nadu participated. Basic dam safety measures were provided for 182 dams, while 55 dams were taken up for rehabilitation and rectification works.

After seeing the performance and benefits accrued from the Dam Safety Assurance and Rehabilitation project, an imperative need was felt that another project covering some more dams in States having significant number of large dams be implemented through the World Bank assistance on similar terms and conditions. Two committees namely National Level Steering Committee (NLSC) under the Chairmanship of Secretary (Water Resources), Govt. of India and a Technical Committee under the Chairmanship of Member (D&R), CWC were constituted to give Policy Directive in the formation and implementation of the Project and review the technical details and project progress. A new Project, named 'Dam Rehabilitation and Improvement Project (DRIP)' was subsequently conceived in consultation with the World Bank

The World Bank DRIP Preparation Mission visited India from 12 to 22 November 2008 and held discussions with officials of CWC & participating States. Out of 13 participating States, only 11 States participated in the discussions. The Aide Memoire circulated by the World Bank indicated to include 5(five) States viz. Chhattisgarh, Kerala, Madhya Pradesh, Orissa and Tamil Nadu as confirmed States on the basis of institutional readiness, Government interest and commitment.

The proposed Dam Rehabilitation and Improvement Project (DRIP) would be a six-year project starting around April 2010. Apart from structural and non-structural measures for rehabilitation and improvement of 243 dams, the scope of project includes the development of appropriate institutional mechanisms for the safe operation and maintenance of all large dams in five participating states. In addition, strengthening of the institutional setup for national level dam safety surveillance and guidance would be taken up in Central Water Commission (CWC) under the Ministry of Water Resources (MoWR). The total project cost is estimated at Rs. 2100 crore (US$437.5 million). Out of the total estimated cost, 80% cost will be financed by World Bank while balance 20% will be financed by respective State Governments.

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. Guidelines for Preparation of Emergency Action Plan, approved in the 27th meeting of NCDS, which was held on 27th September 2005, were circulated to dam owning States/Agencies. The 29th meeting of NCDS was held on 12th December, 2008 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. Next meeting is proposed during the year 2010.

During the year 2009-10, 21st meeting of "National Committee on Seismic Design Parameters (NCSDP)" was held on 8th September 2009 at New Delhi. In this meeting, seismic design parameters for 21 projects were discussed and the Committee approved the coefficients and response spectra for 10 projects.

Dam Break Analysis is carried out to prepare the inundation map and disaster management plan in the unlikely event of dam failure. It estimates the maximum water level at the down stream locations of the dam in the event of failure of the dam. The Dam Break Analysis is being carried out in CWC on consultancy basis. During the year, integrated dam break analysis of Omkareshwar Project and Indira Sagar Project, Madhya Pradesh have been carried out. The back water Studies of Demwe Lower H.E. Project and Glacier Lake Outburst Flood (GLOF) studies of Demwe Lower & Upper H.E. Project, Arunachal Pradesh as submitted by the Project Authorities were examined by FE&SA Directorate, CWC.

Dam Safety Legislation

Government of India constituted a Standing Committee in 1982, under the Chairmanship of Chairman, Central Water Commission to review the existing practices and to evolve unified procedures of dam safety for all dams in India. The Standing Committee submitted its report titled "Report on Dam Safety Procedures" in July 1986. One of the recommendations of Committee was the 'enactment of Dam Safety Legislation '. As a follow up, a draft "Dam Safety Act (1987)" was prepared by CWC and circulated to National Committee on Dam Safety (NCDS) members in 1988. Comments/ suggestions were received from 12 states. Accordingly, modified Bill (2000) was prepared by CWC, approved by Ministry of Water Resources (MOWR) & vetted by Ministry of Law. It was circulated to four Dam Safety Assurance and Rehabilitation Project (DSARP) participating states (Madhya Pradesh, Orissa, Rajasthan & Tamil Nadu) for adoption as Bill. This modified Draft Bill- as per suggestions of Tamil Nadu & Madhya Pradesh - discussed in 23rd NCDS (March 2002) meeting. Subsequently, a Draft Bill-2002, approved by MOWR, circulated to all states. The States have responded well to the Draft Bill. The Government of Bihar has passed the Dam Safety Act 2006 on line with the Draft Bill circulated by MOWR / CWC, and the same was published in the Bihar Gazette on 4.5.2006. The Government of Andhra Pradesh has adopted a Resolution on 24th March 2007 that the Dam Safety Resolution should be regulated in the State of Andhra Pradesh by Parliament by Law. The Government of West Bengal has also passed a similar Resolution on 24th July 2007 empowering the Parliament of India to pass the necessary Dam Safety Act. Government of Madhya Pradesh, Maharashtra, Orissa and Uttar Pradesh are in the process of adopting similar resolution.

Draft Dam Safety Bill 2002, was renamed as Dam Safety Bill-2007(without any other modification). The same was circulated by MOWR for fresh comments. In February 2008, copies of Draft Bill were circulated to Prime Minister's Office, Planning Commission, Ministry of Power, Ministry of Finance (Deptt. of Expenditure), Ministry of Law & Justice, Ministry of Home Affairs, National Disaster Management Authority and Central Water Commission (CWC) for their comments. In response, CWC in June 2008 furnished a modified version of the Draft Bill. The Draft Bill modified by CWC was then sent by MOWR to the Ministry of Law and Justice for their concurrence. Subsequently, and after detailed discussion with CWC officials, Ministry of Law and Justice finalized the Dam Safety Bill 2009. The comments of Ministry of

Finance (Deptt. of Expenditure), National Disaster Management Authority and Ministry of Home Affairs were also received. The Ministry of Law and Justice, Govt. of India has given their concurrence on the Dam Safety Bill 2009 on 22nd August 2009 and presently the Bill is under the purview of MOWR for getting the approval of the Cabinet before its placement to the Parliament.

Environmental Management and Rehabilitation-Resettlement Issues

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 safeguards as per environmental clearance. Member (Water Planning & Projects) is the Chairman of this Inter-ministerial multidisciplinary NEMCRVP having representatives of Ministries of Environment & Forests, Agriculture & Co-operation, Tribal Affairs and Water Resources, besides Planning Commission.

NEMCRVP held its 61st meeting on 29th April 2009 at New Delhi. The draft revised Guidelines for Environmental Monitoring of River Valley Projects have been circulated among members of NEMCRVP and is in the process of being finalisation. New Hydel and Irrigation projects, cleared recently by MoEF will also be soon taken up under the purview of Environmental monitoring of CWC and reports on compliance of environmental safeguards shall be prepared.

CWC has also taken up Environmental Evaluation/Impact Assessment study of selected river valley projects in the country. Three such studies taken up during 2005-06 in respect of Jayakwadi (Stage-I) Project (Maharashtra), Barna project (M.P.) and Salandi Project (Orissa), are nearing completion. Four more studies of a similar nature in respect of Mahanadi delta projects Orissa, Mahi bajaj sagar project Rajasthan, Singur irrigation project, A.P., Ramganga dam Uttar Pradesh were taken up during 2008-09. Inception/Interim report of all four projects has been submitted by the consultant for examination.

The Rehabilitation and Resettlement (R&R) aspects of displaced/ affected persons of Water Resources Projects are monitored by Central Water Commission. In respect of 245 existing ongoing major & medium reservoir projects, data on rehabilitation measures have been collected and data base has been generated / updated.

Project Appraisal

Since 1961 till December 2009, CWC has appraised about 1561 projects. 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. After confirmation of the techno economic feasibility of the project, the Advisory Committee on irrigation, flood control and multipurpose projects headed by the Secretary, Water Resources considers the project for acceptance and thereafter, it is recommended for investment clearance by the Planning Commission.

So far, during the year 2009-10, technical examinations of 66 Water Resources projects (36 major irrigation, 21 medium irrigation and 9 flood protection schemes) were completed and

accepted by Advisory Committee. At present 193 new irrigation schemes (103 Major & 90 Medium) are under different stages of appraisal.

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 2009-10, CWC is carrying out monitoring of 199 major, medium and Extension Renovation and Modernization (ERM) projects which inter alia involves monitoring of 165 AIBP assisted Projects. This includes 15 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 Loan Assistance under Accelerated Irrigation Benefits Programme (AIBP) are also monitored by CWC. As a 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 165 major and medium projects under AIBP.

So far, as AIBP projects are concerned, at the request of Planning Commission, two pilot studies covering Upper Krishna Project in Karnataka and Teesta barrage project in West Bengal were carried out successfully by NRSA, Hyderabad, using IKONOS and Quickbird satellite data during 2005. The results of both the assessments were satisfactory and compared well with ground realities, which were verified and reported by CWC field officers and State Governments.

Subsequently, Ministry of Water Resources, entrusted to NRSA, Hyderabad, the work of assessment of irrigation potential under AIBP funded irrigation projects using cartosat-1 data covering about 5.45 Mha spread across 53 projects in 18 States in India. Reports have been submitted by NRSA to CWC. Action for entrusting similar study in respect of additional 50 AIBP projects has been initiated.

Monitoring of Centrally Sponsored Command Area Development Programme

The coordination and other related works of monitoring of CAD Programme in respect of 136 projects in 28 states was carried out by CWC. During the year 2008-09, 35 Nos & during the year 2009-10(December 2009),19 nos of half yearly status reports were received from the field units and these reports were examined and comments/ observations were made wherever necessary.

Application of Remote Sensing Technique in Water Resources Sector

The following components in two different plan schemes are to be carried out using Remote Sensing techniques during 11th Five Year Plan Period during 2009-10:

(i) "Estimation of sedimentation in Reservoirs using Remote Sensing Technique" under the sanctioned plan scheme "Research & Development Programme in Water Sector".

Satellite Remote Sensing based reservoir sedimentation study (in house) of 3 reservoirs has been completed. Study of 3 new reservoirs (in-house) is under progress. Work of another 25 new reservoirs out of a total of 100 reservoirs proposed during 11th plan has been awarded to Regional Remote Sensing Service Centre (RRSSC), Jodhpur under Indian Space Research Organisation (ISRO), Department of Space (DOS). The study of 12 out of 25 reservoirs has been completed and balance are found non-feasible. The progress to award of the work of another 30 new reservoirs to outsource agencies is under progress.

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

Details are available in Chapter 1 under Major Programmes "Development of Water Resources Information System".

Benchmarking of Irrigation Projects

Benchmarking in Water Resources Sector is in use in developed countries for quite some time. This concept is now being acknowledged as a management tool in irrigation sector in India as well. Accordingly, a Core Group under the Chairmanship of Member (WP&P), CWC for Benchmarking of Irrigation Systems in India set up by MOWR, is playing an active role as a co-coordinator as well as a facilitator by way of providing technical support to the State Governments. National/ regional/ project level workshops are being organized by CWC/State Governments in various states to facilitate concerned State Governments to take up Benchmarking of Irrigation Projects in their respective States. First National Workshop on Benchmarking of Irrigation Projects was organized in February 2002 at Hyderabad and since then, 9 regional workshops and 5 project level workshops have been organized in various parts of the country. During 2009-10, a proposal for organising workshop on Benchmarking by CWRDM, Kerala at Calicut has been received and the same is under.

Guidelines for Water Audit and Water Conservation

Water Audit is an important aspect of water management. In view of this "General Guidelines for Water Audit and Water Conservation" have been formulated by CWC, taking into consideration the views of various Central Government Organizations dealing with Water Resources Development and Management, State Governments, NGOs etc to generate awareness among the people towards the importance of water saving. These Guidelines have been placed on the website of CWC (www.cwc.nic.in).

Study of Water Use Efficiency in Irrigation System

Irrigation Sector is the biggest consumer of fresh water (about 83%) and any improvement in irrigation project efficiency will be like creating a new source of water supply which can be gainfully utilised to various competing demands of water. Water use efficiencies are generally low and it is felt that there is a need to improve the same. It is, therefore, proposed to construct a data bank relating to water use efficiency of all major and medium projects. The objective of the study is to cover:

1) Reservoir Filling Efficiencies (Inflow and release pattern)
2) Delivery System/ Conveyance Efficiency.
3) On Farm Application Efficiency
4) Drainage Efficiency
5) Irrigation Potential Created and Utilised.

It is proposed to carry out the aforesaid studies of some selected irrigation projects initially and to gradually cover all the major & medium projects in the country through consultants and mainly through Water and Land Management Institutes / Irrigation Management & Training Institutes/ NERIWALM. In this matter, a Technical Advisory Committee headed by Member (WP&P), CWC was constituted to oversee and guide in conducting the aforesaid studies. Till December 2009, 57 Major and Medium Irrigation Projects across the country have been taken up for these studies. Out of 57 study, 43 study were found acceptable and approved by MoWR. 35 Draft Final Reports received from WALMI's / Research institutes have been considered by TAC.

Performance Evaluation of Completed Irrigation Projects

CWC has entrusted with Post Project Performance Evaluation Studies covering System Performance, Agro-economic, Socio-Economic and Environmental Impact Assessment Studies of completed Major & Medium irrigation Projects through consultants. Performance Evaluation Studies in respect of nine projects viz. Samrat Ashok Sagar (Madhya Pradesh), Kanchi Weir (Jharkhand), Salki (Orissa), Sukla (Assam), Chandan Reservoir (Bihar), Itiadoh (Maharashtra), Kodayar (Tamil Nadu), Loktak (Manipur), and Nanak Sagar (Uttar Pradesh) were taken up. Studies of all these projects were continued during 2009-10. Final Reports of Samrat Ashok Sagar , Kanchi Weir, itiadoh, Kodayar and Nanaksagar have been received. Seven other Irrigation projects are proposed to be evaluated during XI plan.

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 were completed in all respects and report finalization of 3 reservoirs carried over to the first year of XI Plan.

During XI Plan, a SFC Memo for covering 20 more reservoirs under Capacity Survey at an estimated cost of Rs. 410.00 lakhs has been sanctioned by the Ministry on 20th February 2008.

Out of these 20 reservoirs, a proposal for 5 reservoirs for taking up survey during the year 2009-10 is under process.

Policy and Planning

The National Water Resources Council (NWRC), under the Chairmanship of the Prime Minister and with Chief Ministers of States, Administrators of Union Territories and Union Ministers of concerned departments as Members, is the apex policy making body for the water resources development in India. Issues connected with the development of the water resources of the country as well as progress achieved in the implementation of the National Water Policy are required to be considered, reviewed and reported to the council from time to time, The Government of India has, therefore constituted a National Water Board (NWB) of the National Water Resources Council, under the Chairmanship of the Secretary (Water Resources) and Member (WP&P), CWC as Member-Secretary. Basin Planning & Management Organization under Water Planning & Projects Wing of CWC is acting as the Nodal agency in providing technical inputs related to water policy and planning aspects to the Ministry and functions as technical Secretariat for National Water Board. Five meetings of NWRC and 13 meetings of the NWB have been held so far.Last meeting of National Water Board was held on 18th September 2009.

Integrated River Basin Planning

National Water Policy states that for planning, development and management of water resources a river basin / sub-basin should be taken as hydrological unit and multi-disciplinary units should be set up to prepare comprehensive plans taking into account various uses of water so that available water can be put to optimum use. The guidelines for preparation of river basin master plan (1990) prepared earlier have been revised and are under print.

Reservoir Operation and Water Resources Systems Engineering

During the year 2009-10, 22nd meeting of Joint Operation Committee (JOC) for Rihand reservoir was held on 5th October 2009 to finalise the Operation plan for the year 2008-09 for Rihand reservoir to meet the irrigation requirement at Indrapuri Barrage (Bihar) and Hydro power generation plan of Uttar Pradesh Power Corporation Limited (UPPCL) and Uttar Pradesh Jal Vidyut Nigam Limited (UPJVNL).

Under HP-II, Decision Support System (Planning) is being developed for which NIH, Roorkee is the Nodal Agency. Director (Reservoir operation) is a member of the “Review Committee for DSS (P).

The CWC publication entitled ‘Evaporation Control in Reservoirs” (1990) has been updated and sent to CWC H/Q and Field offices for technical reference”.

Reassessment of Average Annual Water Resources Potential Based on the Strategy Identified in the Comprehensive Mission Document of National Water Mission

One of the strategies (Strategy No. 1.6) identified for implementation under the Mission Document is “Reassessment of basin wise water situation” under present scenario including water quality by using latest techniques, which inter-alia may include:

(i) Development or adoption of comprehensive water balance based model,

(ii) Fitting models to basin using current data, and

(iii) Assessment of likely future situation with changes in demands, land use, precipitation and evaporation.

In pursuance to the above, discussions were held with National Remote Sensing Centre, ISRO, Hyderabad for formulating the methodology for assessment of water resources using satellite remote sensing data based geo-spatial approach. So far, it was decided that the study would first be taken up on a pilot basis for two river basins namely Godavari and Brahmani-Baitarani and then depending upon the outcome of the study for these two basins, further course of action would be decided.

Review of Hydrological Data Collection Network

CWC has already started working on review of Hydrological Data Collection Networks of different hydrological parameters under the guidance of a Committee under Member (RM), CWC. The proposal for outsourcing the activity has been prepared and under process of approval.

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 Sutlej 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.

Others

An Engineering Museum fully devoted to water resources development in the country is maintained in Delhi. Various aspects of the development in the field of water resources in India are illustrated through self-explanatory working models. Central Water Commission Library has an extensive collection of more than 1,04,000 books and journals which are widely referred by water resources engineers/organisations. A new Library-cum-Auditorium Building has been constructed.

CENTRAL SOIL AND MATERIALS RESEARCH STATION

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

The Hon'ble Union Minister of Water Resources visited the Norwegian Geotechnical Institute, Oslo, Norway

Institutional Co-operation Programme

CSMRS - NGI Institutional Co-operation Programme on "Safety Evaluation and Risk Assessment for Ageing Dams in India" was signed between NGI and CSMRS on the 27th December 2006. A total of six officers visited the Norwegian Geotechnical Institute, Oslo, Norway for a total of 4 man months and carried out stability analysis and numerical analysis. The officers were exposed to the practices being adopted at NGI for carrying out Failure Modes and Effect Analysis (FMEA) and Event Tree Analysis (ETA). The following reports have been prepared under this programme.

- Stability analysis of earth and rockfill dam using Limit Equilibrium Method and Finite Element Method.
- Effect of joint stiffness on dam-foundation interaction.
- Modelling of Rockfill materials and analysis of a 260 m high earth and rockfill dam using Plaxis.

SUB-ORDINATE OFFICES

CENTRAL GROUND WATER BOARD (CGWB)

Central Ground Water Board (CGWB), under the Ministry of Water Resources, is a multidisciplinary Scientific Organisation 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 & financial matters of the CGWB are dealt with 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 broachers, Ground Water Information System (GWIS) and RTI etc.

Achievements of CGWB during 2009-10

Ground Water Management Studies: An area of 1.52 Lakh sq. km was covered during pre-monsoon period and Post-monsoon studies have been completed in 84538 sq. km up to 31st December 2009. 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 the financial year 2009-10, the CGWB under their Ground Water Exploration Programme, constructed 495 wells (EW-224, OW-96, PZ-175) including 23 high yielding wells constructed up to 31st December 2009 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 495 bore wells constructed, 47 wells and 140 wells have been 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.

Geophysical Studies: Carried out 725 Vertical Electrical Soundings, 1.04 line kilometer resistively profiling and geophysical logging of 64 bore holes have been conducted in various parts of the country during 2009-10 up to 31st December 2009.

Water Quality Analysis: 11997 samples have been analyzed during the year up to 31st December 2009, out of which 10419 samples were analysed for basic constituents, 1079 samples for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc, 499 samples for organic and specific constituents.

Demonstrative Projects on "Artificial Recharge to Groundwater & Rainwater Harvesting": The details of demonstrative projects on artificial recharge to Groundwater and Rain Water Harvesting have been approved and are being implemented in the states of Kerala, West Bengal, Punjab, Arunachal Pradesh, Andhra Pradesh, Karnataka and Tamil Nadu during XI Plan.

In the year 2008-09, 8 demonstrative recharge studies were approved for implementation in over-exploited and hilly areas in the states of Arunachal Pradesh, Kerala, Punjab, Tamil Nadu and West Bengal at an estimated cost of Rs. 7.0 crores. An amount of Rs. 2.10 crore has been released during the year as first installment (30% of approved cost) for construction of 412 artificial recharge structures in cluster mode.

During 2009-10, 5 project proposals for construction of 382 recharge structures have been received from the States of Tamil Nadu, Andhra Pradesh and Karnataka amounting to Rs. 6.55 crore has been approved by MOWR. 1st installment (70% of approved cost as per revised guidelines) amounting to Rs. 4.58 crore has been released in till December 2009.

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 database 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 level trend with user groups, planners and administrators.

Enactment of Legislation on Ground Water by States/UTs: Ministry of Water Resources has been persuading the States/UTs for enactment of law for managemenmt of ground water. 11 States/UTs namely Andhra Pradesh, Goa, Tamil Nadu, Lakshadweep, Kerala, Pondicherry, West Bengal, Himachal Pradesh, Bihar, Chandigarh and Dadra and Nagar Haveli have already enacted and implemented the legislation. The remaining 18 other States/UTs are in the process of taking necessary action in this regard.

CENTRAL GROUND WATER AUTHORITY

In pursuance of the order passed by the Hon'ble Supreme Court of India, Central Ground Water Authority (CGWA) has been constituted under sub-section (3) of Section 3 of the Environment (Protection) Act, 1986 vide notification No. S.O. 38 (E) dated 14th January 1997 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/ Departments/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 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.

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

CENTRAL WATER AND POWER RESEARCH STATION, PUNE

The Central Water and Power Research Station (CWPRS), Pune 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 the Economic and Social Committee for Asia and Pacific (ESCAP) since 1971.

For providing solutions to complex problems referred to CWPRS, the methodology adopted includes use of physical/ mathematical models, field-investigations, desk-studies or a combination of these. CWPRS also undertakes allied works such as collection of field data, site investigation using seismic reflection and refraction surveys, evaluation of site-specific seismic parameters and testing of civil engineering materials as also water and allied samples. Another area of activity is calibration of different types of flow and current meters. CWPRS has made significant strides in the application of remote sensing techniques for providing solutions to river and coastal engineering problems. Requirement of accurate and reliable instrumentation for data acquisition and control systems for physical model studies/ prototype measurements is met by in-house developments. The institution, with an interdisciplinary approach to its activities, provides unique R&D services to its national and international clientele.

Organisation

CWPRS provides specialised services through physical and mathematical model studies for river training & flood control, hydraulic structures, harbours, coastal protection, foundation engineering, construction materials, pumps & turbines, ship hydrodynamics, hydraulic design of bridges, environmental studies, earth sciences and cooling water intakes. The major laboratories of CWPRS are as given below.

- Hydrology and Water Resources Analysis
- River Engineering
- Reservoir and Appurtenant Structures
- Coastal and Offshore Engineering
- Ship Hydrodynamics
- Hydraulic Machinery
- Earth Sciences
- Mathematical Modelling
- Instrumentation and Control Engineering
- Foundations and Structures

Research Activities

CWPRS carries out basic, applied and field-oriented research through its major laboratories at Pune, to provide safe, economic and rational technical solutions. During the current year, more than 43 technical reports based on applied research studies were submitted to various project authorities.

CWPRS undertakes assignments on a no-profit no-loss basis. During 2009-10, more than 77 new research studies, pertaining to three major sectors of water resources, energy and water borne transport were awarded to the institution by various project authorities.

Dissemination of Technical Information

- During 2009-10 (upto December 2009) a total of 45 CWPRS staff members participated and 5 papers presented in various conferences/ workshops/ seminars/ courses.
- CWPRS officers delivered 18 technical lectures in different training courses organised by the National Water Academy, Pune and other institutions during 2009-10 (upto December 2009).

Participation in Technical Committees

CWPRS officers participated in various International / National technical committee meetings and made valuable contributions. The important committees included: High Level Expert Team for Kosi barrage and appurtenant structures, High Level Expert Group for examining minimum environmental flow in Bhagirathi river, National Mirror Committee for ISO/ TC 113, Expert Committee for river valley projects, BIS Geological Investigations – Sectional Committee WRD-5, Committee regarding Protection Works for Erosion Mitigation of Coastal Region, Technical Advisory Committee Meeting of Kolkata Port Trust, Technical Advisory Committee Meeting of Farrakka Barrage Project, Committee of Experts on 'Global Standards for Geotextile Products, Committee regarding dredging in navigational channel at Kandla Port, CESC Meeting of Atomic Energy Regulatory Board and B-3 Committee by Indian Road Congress.

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 etc. of various flood management schemes, assessment of adequacy of waterways under road and rail bridges and providing technical guidance to the basin states, namely, West Bengal, Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, Chhattisgarh, Madhya Pradesh, Delhi, Haryana and Rajasthan on flood management. 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 2009-10 are as under:

Achievements during the Period

Maintenance of Flood Protection Works of Kosi and Gandak Projects Including the Breach Closure of Eastern Afflux Bund (EAB)

The Flood Protection Works on river Kosi and Gandak are being done based on site inspection after every flood season and on the recommendations of Kosi High Level and Gandak High Level Standing Committees respectively. The reimbursement of expenditure incurred for maintaining the flood protection works executed in Nepal portion is done by Govt. of India after utilization certificate of the same based on the recommendations of KHLC/GHLSC on receipt from the respective State Govt. of Bihar for Kosi and Uttar Pradesh for Gandak. This year also, the KHLC/GHLSC inspected the flood protection works taken up on river Kosi and right bank of river Gandak respectively, held meetings and finalized the recommendations for taking up flood protection works on these rivers before the floods of 2010.

A breach in the Eastern Afflux Bund at 12.00 km. at Kusaha in Nepal occurred on 18th August 2008. GFCC was actively involved in the closure of the breach. The breach closure work including it strengthening was completed in all respect before the floods of 2009.

Updating of Comprehensive Plan for Flood Management

Comprehensive Plans for flood management for all the 23 river systems of the Ganga basin were prepared between 1975 and 1990. The updating of the comprehensive Plans is underway. This is a continuing activity of GFCC. So far Comprehensive Plans for 22 river systems have been updated. The updation of the Comprehensive Plan of Kosi is under progress and is likely to be completed during the year.

Monitoring of Important Flood Management Schemes

GFCC is monitoring about 63 flood management scheme which inter-alia include (a) 60 flood management scheme supported under “Flood Management Programme” of Ministry of Water Resources; and (b) 3 schemes namely (i) Maintenance of flood protection works of Kosi and Gandak Projects in Nepal, (ii) Extension of embarkments along Lalbakeya, Kamla, Bagmati and Khando rivers in Nepal, (iii) Schemes on common border rivers in West Bengal and Tripura along India Bangladesh under the – Central Sector Scheme “River Management activities and Works related to Border Areas”

Technical Examination of Flood Management Scheme

24 schemes pertaining to eleven states of Ganga basin were technically appraised and cleared by GFCC.

FARAKKA BARRAGE PROJECT

The Farakka Barrage Project, with headquarters at Farakka in West Bengal, was commissioned in the year 1975 to serve the need of preservation and maintenance of Kolkata Port by improving the regime and navigability of the Bhagirathi-Hoogly river system. The increased upland supply from Ganga at Farakka into Bhagirathi reduces salinity in the system and ensures sweet water supply to Kolkata and surrounding areas. The rail-cum-road bridge built across the river Ganga on Farakka Barrage establishes sole direct road-and-rail communication link to the North-Eastern States with rest of the country. The Bhagirathi, the Feeder Canal and the Navigation Lock at Farakka form part of the Haldia-Allahabad Inland Waterway (National Waterway No:1). A 'Jurisdiction Map of Farakka Barrage Project' showing Ganga / Padma River System, in West Bengal, including tributaries and distributaries and locations of Farakka Barrage, Feeder Canal and Jangipur Barrage is provided below:

Set-up of Farakka Barrage Project

Farakka Barrage Project is headed by General Manager. It has three Circles and one Co-ordination Unit, each headed by a Superintending Engineer and ten Divisions each headed by an Executive Engineer. Except Jangipur Barrage Division and its field units and Purchase Office at Kolkata, all remaining field formations of Farakka Barrage Project are situated at Farakka.

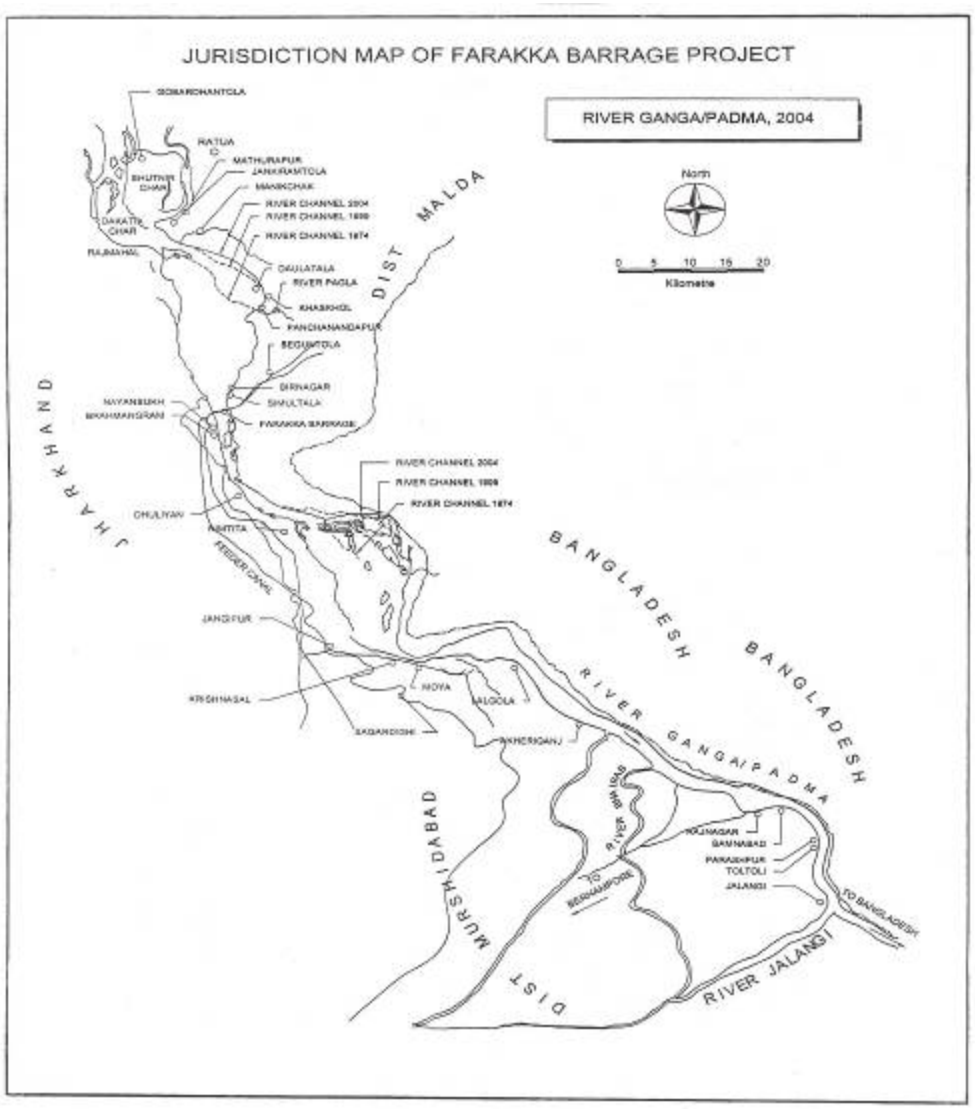
Project Components

The principal components of the Farakka Barrage Project are:-

- A 2245 metre long Barrage across river Ganga, with 109 bays and a Head Regulator with 11 bays
- A 213 metre long Barrage across river Bhagirathi at Jangipur with 15 bays
- 38.38 km long Feeder Canal with carrying capacity of 1133 cumec (40,000 cusec)
- Navigation locks at Farakka, Jangipur and Kalindri, Lock Channels, Shelter Basins, Navigation Lights and other infrastructures
- Left Afflux Bundh of Farakka Barrage of 33.79 km, Right Afflux Bundh of 7 km and 16.31 km of Afflux Bundh of Jangipur Barrage
- Two road-cum-rail bridges and two road bridges across the Feeder Canal
- A number of Regulators at different locations in both Murshidabad and Malda Districts of West Bengal
- Bhagmari Syphon at RD 48.00 of Feeder Canal and Jetties shelter basin at RD 62.532 of Feeder Canal

Benefits from Farakka Barrage Project

- Increased inland supplies from Ganga at Farakka into Bhagirathi
  - Preservation and maintenance of the Kolkata port
  - Improvement in Navigation System in National Highway No: 1, operating between Haldia and Allahabad
  - Reduction in salinity in water and thus improvement in availability of potable water to Kolkata and surrounding areas
- Sole surface communication link to North-Eastern Region of India with rest of the country, including Bhutan and Nepal through Road-cum-Rail Bridge of the Project
- Catering water need of 2000 MW thermal power station at Farakka of National Thermal Power Corporation



Anti-Erosion and Bank Protection Works

Initially, Farakka Barrage Project had a jurisdiction of 20 km – 12 km upstream and 8 km downstream of Farakka Barrage – for undertaking anti-erosion and bank protection works. Subsequently, since the year 2005, there has been substantial increase in jurisdiction of Farakka Barrage Project for taking up anti-erosion and bank protection works. Farakka Barrage Project presently undertakes anti-erosion and bank protection works in the extended jurisdiction of 120 km – 40 km upstream and 80 km downstream of Farakka Barrage. With successful accomplishment of time specific anti-erosion and bank protection works in last many years in succession, on river banks of Ganga / Padma / Bhagirathi and tributaries in North Bengal, Farakka Barrage Project has been able to protect lives of vulnerable inhabitants and livestock and also their valuable movable as well as immovable properties.

Plan Scheme

A Central Sector Plan Scheme under 'Transport Sector' at an estimated cost of Rs.350 crore is under implementation during the current Five Year Plan in Farakka Barrage Project. Anti-erosion and bank protection works under Farakka Barrage Project are also taken up under this Plan scheme.

During the current financial year, anti-erosion and bank protection works at Manikchak Ghat and Pachanandapur, both in the upstream of Farakka Barrage Project, have been executed in accordance with the design and drawings furnished by the Central Water Commission.

For the current financial year 2009-10, a total budget of Rs.70 crore has been provided against which an expenditure of Rs.57.81 crore has been incurred up to December 2009. During the year 2009-10, Farakka Barrage Project Authority completed the anti-erosion works in a length of 2655 m at a cost of Rs. 42.00 crore at Manikchak Ghat and in a length of 228 m at a cost of Rs. 3.00 crore at Panchanandpur of Malda district on upstream of barrage to save land and public property from heavy erosion by river Ganga.

Committees / Study Groups

The following committees have been constituted for smooth functioning of Farakka Barrage Project for (a) Operation and Maintenance of Project Components and (b) Anti-erosion and bank protection works -

Farakka Barrage Project Advisory Committee (PAC)

The Ministry of Water Resources has constituted the Farakka Barrage Project Advisory Committee (PAC) to advise, monitor and supervise the activities of Farakka Barrage Project for its smooth and effective functioning. The PAC is co-chaired by Additional Secretary, Ministry of Water Resources and the Member (Design & Research) of Central Water Commission. Members of Parliament, Members of Legislative Assembly of the Project area and public

representatives / dignitaries make participation in the meetings of Farakka Barrage Project Advisory Committee.

Pictorial view of Project Components and Anti-erosion and Bank Protection Works

MANIKCHAK dt. 22.08.2009

Technical Advisory Committee (TAC)

Technical Advisory Committee is the highest technical body formed with the objective of obtaining expert advice on technical matters and has been set up in terms of the Government of India Resolution No. F7/7/61-GB dated the 28th April 1961. It has been decided that the Technical Advisory Committee will be a Standing Committee to (i) render technical advice on matters specifically referred to it. The Committee is chaired by the Member, Design & Research, CWC - Ex-Officio Additional Secretary to Government of India.

Gate Regulation Committee

Gate Regulation Committee undertakes studies on behaviour and flow pattern of River Ganga, both upstream and downstream of Farakka Barrage and reviews gate operation schedule. Based upon its findings, the Committee recommends modifications, if any, in the gate operation schedule. Its recommendations are placed before the Technical Advisory Committee for a final decision.

Canal Study Group

The Canal Study Group undertakes studies related to the feeder canal and its appurtenant structures, flow conditions within the canal, conditions of the bed and banks and other structures along and across the canal. Based on the studies, it recommends the measures to be adopted for proper operation and maintenance of the canal. These recommendations are placed before the Technical Advisory Committee for decisions.

Tender Committee

The Ministry of Water Resources has constituted a Tender Committee under the Chairmanship of Member (Design & Research) CWC and Chairman of Technical Advisory Committee for processing and evaluation of tenders for (a) awarding anti erosion works in the extended jurisdiction of the project,(b) undertaking/repairs/replacement of gates and hoisting arrangements and (c) repairs of Feeder Canal, cross drainage works and construction of bridges etc. Meetings of the Tender Committee are held as required at various stages of tendering of anti-erosion works.

Other Committees

Internal Committees are formed by the Farakka Barrage Project to deliberate upon the issues arising from time to time.

SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE, VADODARA

The Sardar Sarovar Construction Advisory Committee (SSCAC) was constituted in 1980 by the Government of India in accordance with the directives of the Narmada Water Disputes Tribunal (NWDT) with a view to ensure efficient, economical and early execution of Unit-I (Dam and Appurtenant works) and Unit-III (Hydro Power works) of the Sardar Sarovar Project. The Secretary, Ministry of Water Resources, 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 alongwith 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 the Chief Engineer belonging to the Central Water Engineering (Group-A) Service, who is also Member Secretary of SSCAC.

Sardar Sarovar Construction Advisory Committee (SSCAC) – 76th Meeting

The 76th meeting of the SSCAC was held on 15th June 2009 at Kevadia (Gujarat), wherein following important decisions were taken on matters related to Sardar Sarovar Project (SSP):

- Continuation of Insurance Coverage for Sardar Sarovar Power Project every year
- Payments of Share Cost of Sardar Sarovar Project by the party States
- Proceedings of the 94th, 95th and 96th PSC meeting
- Draft Annual Development Plan 2008-09 of Unit-I (Dam and Appurtenant) & Unit-III (Hydro Power) works of Sardar Sarovar Project (SSP)
- Revised Implementation Schedule (RIS-September 2003) for construction of Garudeshwar Weir of Sardar Sarovar Project
- Claim put forth by M/S Jaiprakash Associates
- Review of the progress of Unit-I (Dam and Appurtenant) & Unit-III (Hydro Power) works of Sardar Sarovar Project (SSP)
- Real Time Data Acquisition System (RTDAS) in Narmada Basin
- Payment to M/s BHEL for supply of hydro equipments for RBPH & CHPH

Permanent Standing Committee (PSC) Meetings

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

97th meeting of PSC of SSCAC was held on 18th December 2009 at New Delhi wherein following important issues related to Sardar Sarovar Project (SSP) were deliberated:

- Time extension and revision of rates for the civil works of underground river bed powerhouse (UGRBPH) of SSP
- Revision of rates for the main dam works of SSP
- RIS (RIS-September 2003) for construction of Garudeshwar weir
- Revised Estimate of Unit-I and Unit-III (Hydro power) of SSP at price level 2008-09
- Review of the progress of Unit-I and Unit-III works of SSP
- Installation of regulatory mechanism for Godbole gate
- Draft proposal for Annual Development Plan 2009- 2010 of Unit- I and Unit-III works of SSP
- Review of the progress of RTDS in Narmada River Basin
- Closure of contract with M/s BHEL for work package- I & II of EMC Project
- Claim put forth by M/s Jaipraksh Associates for handling excess sand content in the river shol at Tilakwada for constructing Main Dam of SSP
- Draft proposal for ADP 2010-11 of Unit-I and Unit-III works of SSP

Progress of Main Dam Works

The construction of the main spillway portion of the dam had been held up for over five years due to the writ petition filed by Narmada Bachao Andolan in the Supreme Court of India. The final judgment on the case was delivered by the Supreme Court on 18th October 2000, in which the Court gave directions for the immediate raising of the dam up to EL 90.0 m with direction to the Narmada Control Authority (NCA) to give permission for further raising of the dam on pari-pasu completion of the R&R and environmental measures. The work of raising the block nos. 30 to 46 to EL 90.0 m was completed on 30th December, 2000.

The NCA's stipulated target, however, was not achieved due to the slow progress of R &R works. Permission for raising of the effective dam height to EL 95.0 m was given by NCA in its 64th meeting held on 17th May 2002 and the work was completed by middle of July 2002. The NCA in its 66th (Emergency) meeting held on 14th May 2003, gave permission to raise the main spillway blocks (Nos. 30 to 46) up to EL 100 m, along with permission to construct 3.0 m high hump over blocks 31 to 45, leaving the blocks 30 and 46 as such for the safety of downstream stilling basin. The said work was completed by the end of June 2003. Subsequently, the NCA in its 70th meeting held on March 12-13,2004 granted permission for raising the blocks no.30 to 46 to EL 110.64 m level. Besides these, the blocks numbering 29,47,48,49 and 50 which were at EL 105.0 m level, were also required to be raised to the EL 110.64 m level for achieving the effective dam height of 110.64 m. This work concreting commenced on 17th March 2004 and was completed on 30th June 2004. After deliberation on the R&R works in the States of Madhya Pradesh, Gujarat and Maharashtra and with the recommendations of Environmental and R&R Sub-groups, in the 76th emergency meeting of NCA held on 8th March 2006, permission was granted for raising the block nos. 30 to 46 to EL 121.92 m level. The work of raising these blocks to 121.92 m commenced on 9th March 2006 and was completed on 31st December 2006. The balance works remaining to be carried out are raising of piers and installation of Radial Gates in the spillway portion of the dam. As per Court's directions, the permission for further raising of dam is now to be given by the NCA, after obtaining clearances from the Resettlement and Rehabilitation Sub-Group, the Environmental Sub-Group and in consultation with the Grievances Redressal Authorities (GRA's) of Gujarat, Maharashtra and Madhya Pradesh.

The overall progress of Main Dam (Unit-I) is given in **Table-15**.

Table-15

Items	Est. Qty.	Cumulative Progress up to March 2009	Percentage Progress up to March 2009
Excavation (Lakh Cu.m)	64.00	63.59	99.36
Concreting (Lakh Cu.m)	68.20	65.76	96.43
Drilling& Grouting (Lakh RM)	2.82	2.50	88.65

Progress of Canal Head Power House (CHPH)

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

Progress of River Bed Power House (RBPH)

The work of the River Bed Power House was held up due to development of stress zone in the Power house Cavern and non-receipt of embedded parts for the Turbine Generator (TG) Sets owing to some contractual problems. The issue of supply of T.G. Sets was resolved with the signing up of a fresh agreement with M/s Sumitomo Corporation of Japan.

All the civil and electrical works of RBPH are complete and all the 6 Units of RBPH have been commissioned.

Total 14137.16 million units (M.U.) energy was generated from both the power houses till December 2009, out of which 1718.08 M.U generated in the Financial Year 2009-10(upto December 2009).

Progress of Irrigation Bye-Pass Tunnel (IBPT)

The decision about necessity of IBPT was taken in the 60th meeting of the NCA held on 18th July 2000, which was endorsed by the RCNCA in its 9th meeting held on 18thAugust 2001. The irrigation Bye-Pass Tunnels (IBPT) arrangement comprises of two circular tunnels of 5.5 m finished diameter across the right bank hill connecting the main reservoir with the first irrigation pond. The twin IBPTs, with invert level of EL 88.39 m at the inlet, will have a discharge capacity of about 283.12 cumecs (10,000 cusecs) at reservoir level of 97.53 m and 424.81 cumecs (15,000 Cusecs) at reservoir level of 110.64 m.

IBPT works completed in May 2008.

The dam has overflowed this year from 12th September to 20th September and maximum water level attained was 126.49 m.

BANSAGAR CONTROL BOARD

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 River Sone and the cost of the Bansagar Dam. After amendment, the main features of the resolution are given below:

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

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

The Union Minister of Water Resources is the Chairman of the Board and the Minister of State for Water Resources, Union Minister of Power, Chief Ministers, Minister-in-Charge 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. The project was originally estimated to cost Rs 91.30 crore. The revised cost of the project at 1991 price level is Rs 936 crore [Civil Works: Rs 300 crore and Land Acquisition & Rehabilitation (LA&R) Works: Rs. 636 crores]. Project authorities have further revised the cost estimate based on Madhya Pradesh Unified Civil Schedule of Rates (UCSR) 1998 to Rs 1054.96 crores (Civil Works: Rs 391.30 crore and LA&R Works: Rs 636.66 crores). The estimated cost of the project has been revised further to Rs 1525.00 crores at 2009 Price Level based on the final cost.

Components of Bansagar Dam

The Bansagar dam envisages construction of –

i) 67.5 m high masonry dam including rock fill flanks across the Sone river just downstream of the gorge at Kusumah (Deolond). Length of masonry dam, left rock fill dam and right rock fill dam are 670.00 m, 161.00 m and 185.00 m respectively.
ii) Six low earth dykes, four on the left bank of Sone River and two on its right bank with a total length of 6.95 km.
iii) Kuteshwar Lime Stone Deposits Protection works.

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. Development of residential plots in required numbers in model villages have already been done and handed over to the PAP's. R&R Programme has been implemented based on norms approved by the Executive Committee and orders issued by Government of Madhya Pradesh. Comprehensive R&R Policy for the project has been finalized and implemented.

Budget & State Shares

The Budget provision made for the project; sub-head wise expenditure during the financial year 2009-10 and cumulative expenditure up to December 2009 is in **Table –16**.

Table -16

(Rupees in Crores)

Sl.No.	Sub-head	Budget Provision	Expenditure during 2009-10 up to 12/2009	Cumulative expenditure up to 12/2009
1.	Establishment	15.100	8.930	176.046
2.	Tools & Plants	0.010	0.000	2.078
3.	Suspense (debit)	0.150	0.000	148.575
4.	Works	17.590	10.720	1295.107
Gross Total		**32.940**	**19.650**	**1621.806**
5.	Suspense (Credit)	0.150	0.088	142.473
Net total		**32.790**	**19.562**	**1479.332**

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 as on 31st December 2009 of Rs. 1479.336 crore in **Table –17**.

Table -17

(Rs in crores)

Total Expenditure	*Share Due* Share Received			Balance Share		
	M.P.	U.P.	BIHAR	M.P.	U.P.	BIHAR
Up to 31.03.2009: **1459.776**	**729.888** ***854.915***	**364.944** ***265.299***	**364.944** ***339.562***	**(+)** **125.027**	**(-)** **99.645**	**(-)** **25.382**
During 2009-10 up to 12/2009: 17.05	9.78 *(-) 4.39*	4.89 *0.000*	4.89 *23.950*	(-) 14.17	(-) 4.89	(+) 19.06
Total as on 31.12.2009: **1476.826**	**739.668** ***850.525***	**369.834** ***265.299***	**369.834** ***363.512***	**(+)** **110.857**	**(-)** **104.535**	**(-)** **6.322**

UPPER YAMUNA RIVER BOARD

"Upper Yamuna" refers to the reach of river Yamuna from its origin at Yamunotri to Okhla barrage at Delhi. A Memorandum of Understanding (MoU) was signed on 12th May, 1994 amongst the basin States of Himachal Pradesh, Uttar Pradesh, Haryana, Rajasthan and Delhi, for sharing the utilisable surface flows of river Yamuna up to Okhla.

The MoU also provided for creation of "Upper Yamuna River Board" to implement the said MoU. Accordingly, the Central Government constituted the Upper Yamuna River Board (UYRB) in 1995 as a subordinate office under the Ministry of Water Resources (MoWR) by a Resolution. (The State of Uttaranchal, now Uttarakhand, has been included in the Board after its creation in 2000).

The Resolution also provided for constitution of a Review Committee, to be known as the Upper Yamuna Review Committee (UYRC), with the Union Minister/Minister of State for Water Resources as Chairman and the Chief Ministers (Governor in case of President's Rule) of the co-basin States as members, to supervise the working of the Upper Yamuna River Board and to ensure implementation of MoU dated 12th May 1994.

Functions - The functions of the Upper Yamuna River Board include all aspects of water management in the Upper Yamuna basin, viz. implementation of the MoU on water sharing; water allocation; water accounting and data warehousing; monitoring and upgrading the quality of surface and ground water; controlling the ground water extraction; coordination of the construction of all projects in the basin, integrated operation of all the projects, watershed development and catchment area treatment plans.

Activities - 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 benefits and cost sharing of the proposed storage projects in Yamuna Basin. The Board has held 36 meetings.

Upper Yamuna Review Committee

The Upper Yamuna Review Committee has held three meetings up to December 2009. Pursuant to decisions taken in the 3rd UYRC meeting held on 12th April 2006, a Steering Committee was constituted to expedite construction of Kishau, Renuka & Lakhwar Vyasi storage projects in Upper Yamuna basin. Pursuant to another decision taken in the 3rd UYRC meeting, an Empowered Committee with the Principal Secretary (Irrigation), Govt. of Rajasthan as its Convener, had also been set up to sort out the issue of supply of water to Rajasthan from Tajewala.

Steering Committee - The Steering Committee has held three meetings up to December 2009. In its 3rd Meeting held on 20th July 2009, during the discussions on Renuka Project, the States agreed to deposit funds tentatively with the project authority for the construction of the projects, subject to adjustments of their shares of cost in the project as per agreement, to be arrived at, on the sharing of costs and benefits. However, the States shall not claim any right on the benefits to be accrued from the project on the basis of such tentative funding made by them. Upper Yamuna River Board in consultation with Central Water Commission and co-basin states has been assigned to prepare draft agreements for the project.

Empowered Committee - This committee has submitted its report to MoWR in December 2007 which will be put up to UYRC for its consideration in its next meeting.

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 to study the feasibility of the Peninsular Component of National Perspective Plan. The NWDA is fully funded by Government of India through grants-in-aid. Subsequently in 1990-91, NWDA Society resolved to take up the studies of Himalayan Component also. Further, on 28th June 2006, NWDA Society approved modifications in the functions of NWDA to include preparation of DPR of link projects and pre-feasibility/ feasibility reports of Intra-State links as proposed by States. Accordingly, MOWR vide resolution dated 30th November 2006 has modified the functions of NWDA Society.

The Agency functions with the following main objectives:

(a) To carry out detailed surveys and investigations of possible reservoir sites and inter-connecting links in order to establish feasibility of the proposal of Peninsular Rivers Development and Himalayan Rivers Development Components forming part of the National Perspective for Water Resources Development prepared by the then Ministry of Irrigation (now Ministry of Water Resources) and Central Water Commission.

(b) To carry out detailed surveys about the quantum of water in various Peninsular River systems and Himalayan River systems which can be transferred to other basins/states after meeting the reasonable needs of the basin/states in the foreseeable future.
(c) To prepare feasibility report of the various components of the scheme relating to Peninsular Rivers development and Himalayan Rivers development.
(d) To prepare detailed project report of river link proposals under National Perspective Plan for Water Resources Development after concurrence of the concerned States.
(e) To prepare pre-feasibility/feasibility report of the Intra-State links as may be proposed by the States.
(f) To do all such other things the Society may consider necessary, incidental, supplementary or conducive to the attainment of above objectives.

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

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

The NWDA is headed by the Director General of the rank of Additional Secretary to Govt. of India. He is the Principal Executive Officer of the Society, responsible for the proper administration of the affairs and funds of the Society assisted by Chief Engineer (HQ) and Directors and is also responsible for coordination and general supervision of the activities of the Society. The Headquarters of the Agency is at New Delhi. NWDA has 2 field organisations 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 Proposals

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

Peninsular Rivers Development Component

Under Peninsular Component, National Water Development Agency has completed collection of data and water balance studies of all 137 basins/sub-basins and 52 identified diversion points (including 3 additional studies), 58 reservoir studies, toposheet studies of 18 links including 1 additional study and all 18 pre-feasibility reports. Based on these studies, NWDA has identified 16 water transfer links under Peninsular Component for Surveys and Investigations and preparation of Feasibility Reports. FRs of 14 links under Peninsular Component have been completed. DPR of one link, namely, Ken-Betwa has been completed. A copy of DPR was submitted to concerned states of UP and MP, who gave their comments on the DPR which are

under examination in NWDA.The work of preparation of DPR of Par-Tapi-Narmada & Damanganga –Pinjal Link is in progress.

Himalayan Rivers Development Component

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

Under the Himalayan Rivers Development Component, NWDA has completed water balance studies at all the 19 diversion points, toposheet studies of 16 storage reservoirs & 19 water transfer links and pre-feasibility report of 14 links. Based on these studies, NWDA has identified 14 water transfer links under Himalayan Component for Surveys and Investigations and preparation of Feasibility Reports (FRs). FRs of 2 links (Indian Portion) in the Himalayan Component have been completed. The surveys and investigations and other works of five more links entirely in India have also been completed and one targeted to be completed by March 2010.

Benefits from Inter Basin Water Transfer Link Schemes

The National Perspective Plan would give additional benefits of 25 million ha of irrigation from surface waters, 10 million ha by increased use of ground waters, 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 etc. in various States.

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

Other Initiatives

(a) Preparation of Detailed Project Report (DPR)

(i) Ken-Betwa Link Project

The DPR of the link project has been completed by December 2008 as scheduled and the report was sent to Govt. of MP and UP for their examination and comments in February, 2009. Comments have been received from Government of Madhya Pradesh in August, 2009. Govt. of MP intimated that conceptually the DPR is acceptable to them but NWDA may explore the possibility of alternative of proposed Makodia dam on Betwa river and also suggested 35 schemes in place of Makodia dam which is being examined. Comments of Govt. of Uttar Pradesh have also been received in November 2009. Further action in this regard is being taken.

The link project has been included in the list of National Projects.

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

The consensus amongst the Govt. of Gujarat and Maharashtra has been arrived during the year 2008-09. However, the work for preparation of DPRs of these two links have been started by NWDA in January 2009 and the DPRs are scheduled for completion by 31st December 2011.

(b) Consensus Group Headed by Chairman, CWC

The objective of the Consensus Group headed by Chairman, CWC is to discuss and expedite the process of arriving at consensus amongst the States regarding sharing of surplus water in river basins/sub-basins and quantum of surplus water to be transferred from surplus basins to deficit basins/areas as per the proposals of inter-basin water transfer of NWDA and helping the States. The consensus Group has held 9 meetings till December 2009.

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

As a follow up action on comprehensive assessment of Inter-linking of Rivers, the Ministry of Water Resources had constituted a Committee of Environmentalists, Social Scientists and other Experts in December 2004 under the Chairmanship of Secretary, MOWR to make the process of proceeding on inter-linking of rivers fully consultative. Seven meetings of this Committee have been held till December 2009. Last meeting was held on 31st July, 2009. In this meeting, the present status of Terms of Reference (TOR) for Environmental Impact Assessment (EIA) studies for preparation of DPRs of Par-Tapi-Narmada & Damanganga-Pinjal Links and final report of EIA study of Ken-Betwa link were discussed. Members of the committee gave their suggestions on EIA and R&R, Public hearing for environmental concerns etc. for Ken-Betwa link project and decided to incorporate suggestions of members in final EIA report after public hearing.

(d) Intra-State links

NWDA has received 31 proposals from Seven States for intra-state river links. The proposals received from states viz. Jharkhand, Maharashtra, Bihar, Gujarat, Orissa, Rajasthan and Tamil Nadu have been examined / discussed by NWDA officers with the officers of these States in various meetings and based on discussion / outcome, NWDA has initiated action for preparation of PFRs of these Intra – state link proposals. PFRs of the 8 Intra-State links (3 Jharkhand, 3 Bihar, 1 Orissa and 1 Maharashtra) have been completed and sent to concerned states.

(e) Other Important Meetings held during the year 2009-10 & Public Awareness Programme

Governing Body (GB) Meeting of NWDA

53rd & 54th Meetings of the GB of NWDA were held on 16th July 2009 & 23rd November 2009 respectively at New Delhi. Shri Umesh Narayan Panjiar, Secretary (Water Resources) and Chairman, Governing Body presided over these meetings. The meetings were attended by the senior officers of NWDA, CWC, MOWR and other Central and State Government Departments.

Shri U.N. Panjiar, Secretary (WR) chairing 54th meeting of the Governing Body of NWDA held on 23.11.2009 at New Delhi. Sitting to the left is Shri A.K.Bajaj, Chairman Central Water Commission and sitting to the right is Shri A.D. Bhardwaj, Director General, NWDA & Member-Secretary of the Governing Body.

Hon'ble Minister of Water Resources Shri Pawan Kumar Bansal chairing 4th Special General meeting of the Governing Body of NWDA held on 23.11.2009 at New Delhi. with Minister of State Shri Vincent H Pala Shri U.N. Panjiar, Secretary (WR), Shri A.K.Bajaj, Chairman Central Water Commission and Shri A.D. Bhardwaj, Director General, NWDA & Member-Secretary of the Governing Body.

Participation in India International Trade Fair

NWDA participated in India International Trade Fair held from November 14-27, 2009 by putting up a stall on the activities of NWDA for creating public awareness in the pavilion of Ministry of Water Resources.

NATIONAL INSTITUTE OF HYDROLOGY

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

Objectives

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

Organization

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

The Institute has set up six regional centers 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; Centre for Flood Management Studies for Brahmaputra, Guwahati; Western Himalayan Regional Centre, Jammu; Centre for Flood Management Studies for Ganga, Patna; Deltaic and East Coast Regional Centre, Kakinada; and Ganga Plains (South) Regional Centre, Sagar. The studies and research in the Institute are carried out under five scientific themes at the Headquarters, two centers for flood management studies at Guwahati and Patna and four regional centers at Belgaum, Jammu, Kakinada and Sagar. The scientific themes are: i) Surface Water Hydrology ii) Ground Water Hydrology iii) Environmental Hydrology iv) Water Resources Systems and v) Hydrological Investigations.

Major Research Areas (XI Plan)

- Hydrology of extremes
- Impact of climate change on water resources
- Groundwater modelling and management
- Sustainable water systems management
- Surface water modelling and regional hydrology
- Environmental hydrology

Studies and Research

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

- Basic studies and research
- Applied studies and research
- Software development
- Field and Laboratory oriented and strategic research
- Sponsored research

Sponsored Research Activities

The Institute has gained expertise and advanced technical knowledge in different areas of hydrology and water resources development. The Institute has been undertaking research studies for providing solutions to the real life hydrological problems in the field using advanced techniques.

Consultancy Capabilities

The Institute has excellent capabilities in the areas of hydrology and water resources to take up national and international consultancy.

Laboratories

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

- Nuclear Hydrology
- Remote Sensing & GIS
- Soil Water
- Snow & Glacier
- Water Quality

Technical Publication

The research output of the Institute is published in the form of reports and peer reviewed scientific papers. During the year 2009-10, the Institute has published 37 papers and 42 papers have been accepted for publication in reputed international and national journals and proceedings of international and national conferences and symposia. About 20 reports based on studies and

research in hydrology has been prepared during the year. Besides these publications, the Institute Scientists have published 3 chapters in books.

Technology Transfer

One of the main objectives of the Institute is to transfer the developed technology to the target users. Besides, wide circulation of the published 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.

All India Workshop on "Flood Risk Management", November 26-27, 2009, Roorkee.

The Institution of Engineers (India) Roorkee Local Centre and National Institute of Hydrology, Roorkee have organized a All India Workshop on "Flood Risk Management" at Roorkee during November 26-27, 2009. The course was primarily aimed to train the personnel engaged in water resources development and management in the country, by providing the knowledge of Indian experience in managing floods, latest tools and techniques in flood risk management such as flood inundation modelling, flood risk mapping, flood hazard mapping and decision. The workshop will provide indepth knowledge in the areas of (1) Principles of flood risk management (2) Indian experience in managing flood (3) Hydroinformatics tools available for flood risk management (4) Flood forecasting and uncertainty associated (5) Dam break flood modeling (6) Modern tools and techniques in flood management (7) Flood inundation modeling (8) Flood risk and flood hazard mapping (9) Decision Support System in flood forecasting. The experts from various disciplines and organizations from National Institute of Hydrology and Indian Institute of Technology, Roorkee have delivered the lectures with the case studies. This workshop was an appropriate technical activity for synergizing the principles with practices. The purpose of the workshop was to educate engineering and scientific fraternity regarding flood risk management.

STATUTORY BODIES

BRAHMAPUTRA BOARD

The Brahmaputra Board is a statutory body set up by an Act of Parliament called Brahmaputra Board Act (Act 46 of 1980) with its headquarter at Guwahati. The jurisdiction of the Board covers the entire area of the seven States in the North Eastern Region, Sikkim and northern part of West Bengal falling under Brahmaputra and Barak Valley.

The main functions assigned to the Board are to carry out survey and investigation and to prepare Master Plan for the control of floods, bank erosion and improvement of drainage congestion, giving due importance to the development and utilization of water resources of the Brahmaputra and Barak Valleys for irrigation, hydro power, navigation and other beneficial purposes. Its assignment also includes preparation of Detailed Project Report of the dams and other Projects identified in the Master Plan as approved by Central Government and to take up Construction & Maintenance of the projects approved by the Central Government.

Since inception, the Brahmaputra Board has been performing its statutory functions like preparation of Master Plans for flood moderation, improvement of Master Plans for flood

moderation, improvement of drainage congestion along with integrated development of the basin to ensure proper utilization of vast water resources of the North Eastern Region. These Master Plans are of immense utility for water user agencies of the region.

Organization

The Board consists of 4 full time members comprising the Chairman, Vice-Chairman, General Manager and the Financial Adviser and 17 part time members representing 7 States of the North Eastern Region, North Eastern Council, concerned Ministries, namely, Water Resources, Finance, Agriculture, Power, Surface Transport and Organizations of Government of India, namely, Central Water Commission, Central Electricity Authority, Indian Meteorological Department and Geological Survey of India.

Activities of Brahmaputra Board

- **Master plans:** Brahmaputra Board carried out detailed planning and documentation of the water resources of North Eastern Region and prepared the Master Plans. It has completed the preparation of 43 numbers of Master Plan out of 57 Nos. These Master Plans have been approved by Central Government and thereafter Brahmaputra Board has sent them to State Government for implementation.
- **Survey, investigation & preparation of DPR for Multipurpose Project:** DPRs of five projects (Siang Single Stage, Subansiri Single Stage in Arunachal Pradesh, Tipaimukh in Manipur and Mizoram, Pagladiya in Assam and Bairabi in Mizoram) have been completed and DPRs of 7 projects, viz. Lohit, Noa-Dehing, Jiadhal (In Arunachal Pradesh), Kulsi, Kilin (in Assam & Meghalaya) and Simsang, Kynshi Stage-I, Kynshi Stage-II (in Meghalaya) are in various stages of investigation / DPR are under preparation.
- **Drainage Development Schemes (DDS):** The Board has completed the DPRs of 20 numbers of drainage development schemes out of 39 nos of identified drainage development schemes (DDS).
- **The North Eastern Hydraulic & Allied Research Institute (NEHARI):-** The institute was established near Guwahati with facilities of Hydraulic Modeling, Soil Testing, Concrete and Rock Mechanics Laboratory in association with CSMRS and CWPRS. The Board has successfully carried out sample testing as requested by various organizations like NEPCO, CWC, NEC, NHPC, and State Government of Assam, Manipur, Meghalaya and Mizoram for their on-going projects.

  NEHARI has completed physical model studies of (i) Jiadhal river (ii) river Brahmaputra from Porvita to South Salmara (iii) Majuli Island and (iv) Kameng river.

Schemes under execution by the Board

Brahmaputra Board is executing following schemes: -

(A) Protection of Majuli Island Phase-I, II and III
(B) Avulsion of Brahmaputra at Dhola-Hatighuli Phase-IV
(C) Drainage Development Schemes, namely,:
  1) Harang Drainage Development Scheme
  2) Barbhag Drainage Development Scheme
  3) Amjur Drainage Development Scheme

4) East of Barpeta Drainage Development Scheme
5) Singla Drainage Development Scheme
6) Jengrai Drainage Development Scheme
7) Jakaichuk Drainage Development Scheme

(D) Pagladiya Dam Project

NARMADA CONTROL AUTHORITY

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

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

The Review Committee for Narmada Control Authority (RCNCA), headed by the Union Minister of Water Resources comprises Union Minister for Environment & Forest and Chief Ministers of four party States viz. Madhya Pradesh, Rajasthan, Maharashtra & Gujarat as members which can suo-moto or on the application of any party State or Secretary to the Government of India, Ministry of Environment & Forests, review any decision of the Authority. The expenditure of NCA is borne by the party States.

The Narmada Control Authority has its headquarters at Indore. Narmada Control Authority is monitoring the Narmada Main Canal and R & R activities of SSP and enviromental activities of SSP and ISP.

Environmental Monitoring Activities

Environment Sub-group of Narmada Control Authority chaired by Secretary, Ministry of Environment and Forests monitors various surveys, studies and implementation of Environmental Safeguard Measures in respect of Sardar Sarovar Project and Indira Sagar Project as per terms of Narmada Water Scheme and various clearances issued to the projects by the Central Government including clearance from environmental angle issued by Ministry of

Environment & Forest, Govt. of India. Accordingly, the progress on following activities is being monitored by NCA:

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

Resettlement and Rehabilitation Activities

(A) Sardar Sarovar Project (SSP)

The progress of Resettlement and Rehabilitation activities is being monitored by the Resettlement and Rehabilitation (R&R) Sub-group of the Narmada Control Authority chaired by the Secretary, Ministry of Social Justice and Empowerment and also by a Task Force constituted by the NCA. In addition, Chairman/Chairperson of R&R Sub-group and NCA's R&R officials make field visits, as and when required, to the submergence villages and R&R sites.

(B) Indira Sagar Project (ISP)

In pursuance of the direction of Hon'ble High Court of M.P, Jabalpur Bench and decisions of R&R Sub-group of NCA, the NCA R&R officials are undertaking field studies and more than 1000 PAFs representing 29 villages submitted applications pertaining to various grievances which was forwarded to GRA-ISP for necessary action. The GRA-ISP has examined all the applications & forwarded the same to the NVDA for clarifications & necessary action on their grievances.

Energy Management Centre (EMC) of NCA

Energy Management Centre (EMC) is coordinating activities of power generation of Sardar Sarovar Power (SSP) Complex (1450 MW installed capacity) comprising River Bed Power House (6x200 MW) and Canal Head Power House (5x50 MW) in consultation with Western Regional Power Committee (WRPC), Western Regional Load Despatch Centre (WRPLDC), Central Electricity Authority (CEA) and beneficiary States & concerned State Electricity Boards for generation, planning, daily scheduling, monitoring of generation, transmission and energy accounting etc. During 2008-09, the total energy generation of SSP complex was 2317.67 MU (RBPH 1980.63 MU and CHPH 337.07 MU) which was shared among the party States in the ratio prescribed by NWDT Award. RBPH units are also being operated in synchronous condenser mode as per system requirements to regulate the voltage of 400 KV line emanating from SSP complex to provide stability to the Grid.

Hydro Meteorological Network and Water Accounting

In the light of the stipulation made in the NWDT's final orders and decisions for the flood warning system, the NCA Secretariat with the concurrence of the State Governments concerned, took up the work of Real Time Data Acquisition System (RTDAS) in Narmada basin for flood

forecasting & River Flow Accounting. Under Phase-I, 26 Remote Stations were selected for hydro-meteorological data observations on real time basis. 22 Data Acquisition Stations and the Master Control Centre have become functional.

As per the provision of NWDT Award, NCA is required to furnish Annual Water Account for the river Narmada and its tributaries for each water year (1st July to 30th June) and apportionment of the same among the party States. Annual water account for the year 2008-09 has been finalized and published.

BETWA RIVER BOARD

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

The Union Minister of Water Resources is the Chairman of the Board. Union Minister of Power, Union Minister of Water Resources, 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 cost 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 submerges 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 is being acquired through mutual negotiation by the Betwa River Board.

The filling of reservoir upto FRL of R.L. 371.00 M. will be possible after the acquisition of land and property of balance 13 submergence villages is completed.

Planning and Present Status of Rajghat Power House Works

The cost estimate of Rajghat Hydro Electric Project at 1997 price level was Rs. 131.26 crores which included Rs. 58.41 crores for the civil works. The revised cost of the civil works of Power House at December 1999 price level is Rs. 66.89 crores and the same has been furnished by BRB

to Madhya Pradesh Power Generating Company Ltd.(MPPGCL). MPPGCL have contributed Rs. 59.51 crores. The total expenditure incurred on civil works of Rajghat Power House till June, 2008 is Rs. 63.15 crores.

The three units of Power House have been tested and commissioned during 1999-2000. Since commissioning, the power generated is 9822 lakhs unit upto 30th November 2009.

O & M Estimate of Rajghat Dam Project during Transition Period

A amount of Rs. 9.00 Crore per annum towards O&M for transition period until the project is taken over by one of the party states is to be borne by the two states.

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 Bhander 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 9 years, details of which are given in **Table-18**.

Table-18

Sl.No.	Year	Filling level
1.	2001-2002	368.35 m.
2.	2002-2003	367.00 m
3.	2003-2004	370.00 m.
4.	2004-2005	370.00 m.
5.	2005-2006	369.85 m.
6.	2006-2007	370.20 m.
7.	2007-2008	366.75 m.
8.	2008-2009	370.15 m
9	2009-2010	370.35m

TUNGABHADRA BOARD

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.

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 2009 to November 2009 was 10516.038 Million Cubic Meters (Mcum) (371.371 Thousand Million Cubic feet (TMCft.).

The utilization of water by the States of Karnataka and Andhra Pradesh till end of November 2009 was 1503.276 Mcum (53.086 TMCft) and 868.759 Mcum (30.680 TMCft) respectively as against the likely abstraction of 4162.570 Mcum (147.000 TMCft) for the water year 2009-2010. Evaporation losses from June 2009 to November 2009 were 159.792 Mcum (5.643 TMCft) to be shared by Karnataka and Andhra Pradesh in the ratio of 12.5 :5.5. A total quantity of 5601.120 Mcum (197.802 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 136 million units of power generation is envisaged during the water year 2009-2010. Against this, the power generated till end of November 2009 was 120 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 27th October 2004. The mini Hydel plant comprises 3 units of 2.75 MW each and generated 21.950 million units upto November 2009. 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 biomass. The fishing rights of the Reservoir was auctioned for the year 2009-10 to a local Fishermen's Co-operative Society for Rs.71,06,060/-. In order to facilitate preservation of fish catch, the Board is running an Ice-cum-Cold Storage Plant. Quality fish nets are also manufactured in the Fish Net Making Plant run by Board.

During the year, the Tungabhadra Board held 2 meetings till the end of December 2009.

CHAPTER 8

PUBLIC SECTOR ENTERPRISES

WAPCOS LIMITED

WAPCOS Limited is a "MINI RATNA" Public Sector Enterprise under the aegis of the Union Ministry of Water Resources. Incorporated on 26th June 1969 under the Companies Act, 1956, the Company has been providing consultancy services in all facets of Water Resources, Power and Infrastructure Sectors in India and abroad. The quality management systems of WAPCOS comply with the Quality Assurance requirements of ISO 9001:2000 for Consultancy Services in Water Resources, Power and Infrastructure Development Projects.

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, Hydro Power 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 and Investigations, Human Resources 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 and Bridges. The Company has recently amended its Articles of Association to provide concept to commissioning services for developmental projects in India and abroad.

Spectrum of Services

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

Business Development

For initial introductions and to get foothold in new areas, Company entered into joint ventures with national and international consultancy organizations. In order to provide state of the art technology for Consultancy Services in India, WAPCOS associated with Danish Hydraulics Institute(DHI), Denmark and Hydro Tasmania, Australia for Submission of proposals under International Competitive Bidding. Similarly for projects abroad, WAPCOS entered into Strategic Alliances with Consultants already having base in other countries.

Hon'ble Prime Minister of India, Dr. Manmohan Singh presenting "MoU Excellence Award" to Sh. R.K. Gupta, CMD, WAPCOS Limited

Recognition with International Organisations and Operations Abroad

WAPCOS is empanelled 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 Program, 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. Apart from India, WAPCOS is currently engaged in providing consultancy services in Afghanistan, Bhutan, Cambodia, Ethiopia, Eritrea, Laos, Lesotho, Mozambique, Rwanda, Sudan, Swaziland, Uganda, Zambia and Zimbabwe.

Performance

Against the target of turnover of 255 crore during the year 2009-10, the turnover of Rs.205 crore has been achieved upto December, 2009. The turnover during the corresponding period (April 2008 to December 2008) was 114.35 crore.

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED (NPCC)

National Projects Construction Corporation Limited (NPCC) was established on 9th January 1957 under the aegis of the Ministry of Water Resources, to undertake Irrigation and Hydel Projects.

Subsequently, the Company diversified in other construction fields and is now an ISO 9001-2000 accredited PSU.

Some of the important projects implemented by the Company in the Water Sector are :-

- Maneri Bhali Hydro Electric Project in Uttrakhand
- Jobat Dam in Madhya Pradesh
- Khuga Dam in Manipur
- Marginal Bund and Afflux Bund for Ganga Barrage at Kanpur in Utter Pradesh
- Protection Work of Gagon River at Moradabad in Utter Pradesh
- Meja Link Channel at Mirzapur in Utter Pradesh
- R.C.C. Barrage Work at Ujjain in Madhya Pradesh
- Construction of Madku Anicut, Khamhardih Anicut, Dagon Anicut and Podi Anicut in Chhattisgarh

Performance

During the year 2009-10, the turnover of Rs.521.75 crore has been achieved upto December, 2009. The turnover during the corresponding period (April 2008 to December 2008) was 458.26 crore.

Works under Execution

At present, the corporation is working at more than 500 project sites spread all over the country. These includes IBB Fencing works in Tripura, Mizoram, Assam & Meghalaya, Assam Rifle works in different States of North East, Irrigation & River Valley Projects, Hydroelectric Projects, Thermal Projects, Industrial Structures & other miscellaneous projects. Some of the major projects under execution are:-

Irrigation and River Valley Projects

Dolaithabi Barrage in Manipur, Kalsi Barrage Project (Tripura).

Thermal Projects

- Off site civil works at Sipat STPP in Chhatisgarh
- Off site civil works for Kahalgoan STPP in Bihar
- Civil works of 2x250 MW Parichha Thermal Power Project for Rs.17.48 Crore
- Execution of first raising of existing Ash Dyke compartment 'B' PTPP, Paricha

Building Works

The Corporation has undertaken several construction assignments relating to Buildings, Roads, Hospitals, Bridges, Flyovers etc. Some of them have been indicated below:-

- Administrative Block and other works of Patel Chest Institute, Institutional building for CRPF & C/O House Block under Phase - II of CRPF at Vasant Kunj in New Delhi.
- Construction of DMRC main Lab cum Administrative Building at Jodhpur in Rajasthan.

- Fisheries College at Agartala & Hospital Building work at headquarter complex of TTADC in Tripura.
- College of Horticulture & Forestry at Pasighat in Arunachal Pradesh, Assam Rifles Quarters at different locations in the state of Nagaland, Arunanchal Pradesh, Manipur, Mizoram, Meghalaya, Tripura, Sikkim & Assam.
- Engineering College at Ramgarh & Polytechnic College at Pakur, Baharagora, Bhaga and Gola in Jharkhand.
- Construction of D Type Quarters, GET Hostel & B type quarters including Internal & External Infrastructure at NALCO, Angul.
- Construction of Building in the state of Tripura.
- Construction of Residential Quarter & Auditorium of North Eastern Regional Institute of Water and Land Management (NERIWALM) at Tejpur, Assam.
- Renovation work of National Institute of Homeopathy, Kolkata of Rs. 36.94 Crore.
- Construction of NIFM phase-II extension building works of Rs.10.00 crore.
- Construction of New Office Building for Central Institute for Tribal Medicine (CITM), Guwahati.
- Construction of Krishi Vigyan Kendra Building at Aizawl, Mizoram.
- Construction of 100 Beded Central Research Institute at district Mandya, Karnataka.
- Construction of 2nd & 3rd Floor of the building for CRIH Homeopathy building at Sector 24 Noida.

Road Works & Other Projects

- High altitude roads at Leh in J&K.
- PMGSY roads works in the district of Patna, Nalanda, Bhojpur, Buxer, Rohtas & Kaimur in Bihar.
- PMGSY works in Jharkhand and Ranchi.
- PMGSY road works at different locations in Chattisgarh.
- Gali Anjaneya Temple Flyover in Bangalore, Quarters and Allied Services, LCA & HAWK production facility, finished goods Hanger in Aerospace Division at HAL (BC).
- Indo Bangla Border Fencing & Roads works in Tripura, Mizorum, Meghalaya and Assam.
- Construction of road & bridge in the state of Tripura.
- Construction of road works from Judo to Barwala, Viasi Project (17 KM).
- PMGSY road works in different districts of Uttar Pradesh, viz. Lalitpur, Mahoba, Chitrakoot, Jhansi, Sitapur, Hardoi, Fatehpur.

Revival Package for NPCC

In pursuance of the approval of revival package of NPCC by the Cabinet Committee on Economic Affairs (CCEA) during its meeting held on 26th December 2008 by way of coversion of Govt. of India loan of Rs. 219.43 crore and cumulative interest due and accrued on it on the date of conversion to equity capital and further written down to 10% of value, the capital base of NPCC has been increased from Rs. 30.00 crore to Rs. 700.00 crore to accommodate further allotment of shares to the President of India, during the Extra ordinary Meeting of the General Body of the shareholders of NPCC. The reduction of the share capital has also been approved by the shareholders of the company in the Annual General Meeting held on 30th December 2009. The NPCC has filed a petition with the Central Government (i.e. Ministry of Corporate Affairs) for confirmation of reduction of Capital.

CHAPTER 9

TRAININGS

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 2009-10, NWA took following initiatives.

(i) Short term training programmes for media personnel,

(ii) Customized off-campus training programmes for state Governments

(iii) Regular training programmes – off campus - at Guwahati for engineers from North-Eastern states in association with Brahmaputra Board and IIT, Guwahati. This was also the first programme in association with an IIT.

(iv) Conducting a web based survey to assess hydraulic information needs.

(v) Guiding/ Assisting Govt. of Maharashtra in "Purpose Driven Study" (PDS) under Hydrology Project-II on "Perspective Planning of Water utilization of "Nath Sagar Reservoir" using RIBASIM software.

(vi) Integrated simiulated studies of integrated simulated studies of Mahanadi-Gundar Link System for National Water Development Agency.

Since its inception in the year 1988, NWA has conducted a total of 311 courses consisting of 986 weeks of training and trained 7100 officers. During the year 2009-10, NWA, Pune has conducted 35 courses consisting of total 46 weeks of training.

During the year 2009-10, Training Directorate at CWC Headquarters has organized 10 courses on various topics related to Water Resources

Rajiv Gandhi National Ground Water Training and Research Institute (RGNTRI): following ten training programmes have been completed by the institute during the year 2009-10 up to 31st December 2009 and 199 trainees have been trained.

Hydrogeological Investigations, Development & Management of ground water in Hard Rock Terrain - Techniques, Equipments and Practices during August 18- September 12,2009, Refresher Course on Surface Resistivity Surveys Dee 07 -18, 2009 at Hyderabad, Application of Geophysical Techniques for Ground Water Exploration and Management September 2-15, 2009, Refresher Course on Material management September 8-12,2009 at Bhopal, Refresher course for Chemist on 'Analysis of Basic Water Quality Parameters in ground water and Data Validation'

August 17-21, 2009 at Lucknow Refresher Course on Ground Water Resource Estimation October 26-30, 2009, Faridabad, Training course on Artificial Recharge Techniques in different Hydrogeological conditions November 9-13,2009 at Raipur, Hydrogeological Investigations, Development & Managomen1 of ground water in Alluvial Terrain- Techniques. Equipments and Practices Nov.l7 -Dee; 11.2009 at Chandigarh, Analysis of Pumping Test Data, December 14-19,2009 at Nagpur and Training on Administrative & Financial matters for Senior Officers of CGWB, December 14-18,2009 at IIPA, New Delhi

CSMRS

Three training programmes were conducted on the following subjects:

- Concrete Technology and Geotechnical Engineering for engineers from PWD, Tamil Nadu
- Seismic Aspects of Geotechnical Characterization
- Water Quality and its Management *(NIH in collaboration with CSMRS)*

National Institue of Hydrology (NIH)

During the year 2009-10, NIH has organized Workshop to Discuss the Findings of Climate Change Studies Carried Out under MoWR Action Plan on Climate Change, July 31, 2009, DSS Needs Assessment Workshop August 05 - 06, 2009 at New Delhi , Project Hydrology Sept. 21-23, 2009 at Kakinada, Training Course on SWDES/HYMOS Software Sept. 24,25, 28,29,30 and October 1, 2009at Goa, Artificial Ground Water Recharge & Aquifer Management Oct. 05-10, 2009 at Kolkata, Rainfall Runoff and River Basin Modelling for States & Central Agencies Oct., 19-23, 2009 & Oct. 26, Nov. 6, 2009 and Nov. 9-20, 2009 National Workshop on Climate Change and Water Reources in India Nov. 18-19, 2009 All India Workshop on "Flood Risk Management" Jointly organized by Institution of Engineers (India) Roorkee Local Centre and NIH, Roorkee on November 26-27, 2009 at NIH, Roorkee, Water Quality & its Assessment Nov. 9-13, 2009 CSMRS, New Delhi, Ground Water Assessment, Modelling and Management Nov. 16-20, 2009 HRRC, NIH, Belgaum and Training Course on Data Processing and Validation using SWDES & HYMOS Software Nov. 30-Dec. 4, 2009 at Nasik

Human Resources Development

As part of developing the human resources, 27 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 10

TRANSPARENCY

The Right to Information Act, 2005

The Right to Information Act, 2005 came into effect from 12.10.2005. As provided under Section 4(1) (b) of the Act, all the 17 manuals in respect of Ministry (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**.

E-governance Applications

The e-governance tool is also being utilized for providing information to public. In this regard, the video spots relating to electronic media campaign have been uploaded on the Ministry's website. Photographs relating to Celebration of World Water Day, Participation in India International Trade Fair, Republic Day Parade and messages on Rainwater Harvesting have also been placed on the website in public domain. In addition, all the notices issued for inviting tenders/expression of interest are regularly hosted on the website of the Ministry for larger public information and greater transparency.

With a view to strengthen the E-governance applications, the Ministry implemented the Information Technology Strategic Plan under which the following activities were taken up:

(i) A new web-enabled software **"Hydrological Observation Information System for Indus Basin"** has been developed in ASP.NET and SQL Server to provide more flexibility in compilation and trend analysis of data & generation of report etc.

(ii) RTI-MIS is being operated for redressal of grievances. List of Nodal Officers have been fed in the RTI-MIS software.

(iii) The bilingual website of the Ministry is available at the link: -- (http://www.mowr.gov.in).

(iv) LAN in MOWR has been upgraded and expanded using latest switching methodology, latest types of cabling, wireless connectivity in MoWR, Krishi Bhavan, Lok Nayak Bhavan, CGO Complex, Mohan Singh Place Building. A total of 337 nodes including 130 new nodes have been installed.

Under Section 4 (1) (a) & (b) of the Right to Information Act, 2005, the requisite manuals were prepared and put in the website.

CHAPTER 11

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 12

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.

The second Sub-committee of the Parliamentary Committee on Official Language inspected the office of Executive Engineer, Central Ground Water Board, Ambala on 27-10-2009 and suggested measures for progressive use of Hindi.

The Official Language Implementation Committee of the Ministry under the Chairmanship of Joint Secretary (co-ordination) has been meeting regularly. Timely action has been taken on the decisions taken in these meetings.

To encourage healthy competition among the Organizations under the Ministry for doing maximum work in Hindi, the Rajbhasha Vaijayanti Shield is awarded every year to the meritorious organizations.

Hindi Fortnight was organized in the Ministry during September 2009. 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.

To encourage the staff to work in Hindi, a noting and drafting incentive scheme was also implemented during the year. Four Hindi workshops were organized for officers and staff of the Ministry with a view to promote the use of Hindi in official work. Lectures on Official Language Act/Regulations and noting-drafting were delivered by experts and participants were trained to do official work in Hindi during these workshops.

Official Language inspections of eight offices of the Ministry were made by various officers of the Ministry during the year and these organizations were motivated to work for achieving the targets laid down in the Annual Programme issued by the Department of Official Language. In addition, sections of the Ministry were inspected by the Deputy Director (OL)/Asstt. Director (OL) and problems of these sections were sorted out on the spot.

CHAPTER – 13

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 cases, leave of all kinds, forwarding of applications etc., are also dealt with.

Minority Welfare

In accordance with the relevant guidelines the Ministry is monitoring the recruitment of minority communities and representation of minorities in Selection Commission/ Boards in the Ministry and the organisations under it.

Monitoring of Reservation for SC/ST/OBC

The Scheduled Caste/ Scheduled Tribe and Other Backward Classes (SC/ST/OBC) Cell also form part of the Administration Section. It renders secretariat assistance to Liaison Officers for SC/ST and 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. It also advises on allied matters in respect of various organizations of the Ministry.

Complaints Committee on Sexual Harassment of Women Employees

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)	Ms. Charul Baranwal, Director (Gen. Admn.)	-	Chairperson
(ii)	Shri N.K. Gupta, Under Secretary (Admn.)	-	Member
(iii)	Ms. Prisca Poly Mathew, Section Officer (Bil)	-	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.

Staff and Public Grievances

A Grievances Redressal Cell is functioning in the Ministry of Water Resources, which entertains the grievances of staff of all the organizations under the Ministry. Shri Ram Swarup, Deputy Secretary (Coordination), has been designated as Director (Public & staff Grievances). Due attention is paid for disposal of grievances within a reasonable period. Most of the grievances received are related to service matters, payment of pensionary benefits, etc.

During the period 1st January, 2009 to 31st December, 2009, this Ministry received 38 grievances out of which 13 grievances have been disposed off. In addition 94 cases were received through CPGRAM which were all disposed off. As the Ministry has no interaction with the public, no public grievance has been received during the period.

List of Postal addresses of Directors of Public Grievances/ Staff Grievances in the Ministry of Water Resources and its various organisations is given at **Annexure-VI**

CHAPTER 14

VIGILANCE

The vigilance matters relating to this Ministry and its organizations 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 part time Deputy Secretary, Dy. CVO (CWC), Under Secretary and a 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 Organizations 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 Subordinate Offices, PSUs, Statutory Bodies, Registered Societies etc. under the administrative control of the Ministry, in consultation with CVC and other agencies/departments.

This Division monitors the disciplinary cases and related matters of the organizations under the Ministry through periodical returns prescribed by CVC/CBI, DoPT, etc. and also update 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 3rd to 7th November 2009. Preventive vigilance inspection under CVC instructions has been organized in respect of the Farakka Barrage Project during December 2009. The Vigilance Division is also responsible for calling of the Annual Property Returns of all Group A and B Officers and monitoring them. Annual Property Returns for the year ending 2009 have been called for and after receiving them, the same are being computerized.

CHAPTER 15

APPOINTMENT OF DISABLED PERSONS

Monitoring of Reservation for Physically Handicapped

Monitoring of the recruitment of physically handicapped is being done to ensure fulfillment of 3% quota for the category by the Ministry as well as various organisations under it. Periodic reports on the progress made are being sent regularly to the Ministry of Social Justice & Empowerment. Accordingly, 3% of posts/vacancies (1% for each Orthopaedic, Blind & Hearing Handicapped) are reserved to be filled up from physically handicapped persons. The physically handicapped persons are given facilities, concessions and relaxations at the time of test/interview as per the rules on the subject matter. The posts identified to be filled up by the disabled persons in Groups A,B, C & D categories as per the revised list of posts notified by the Ministry of Social Justice and Empowerment, are filled up as per the requirement of the different offices under this Ministry. The relevant reservation rosters as prescribed by the Government are also maintained for planning the reservation of disabled persons.

ANNEXURES

Annexure – I

Organisation Chart

----Separate Excel file---

Annexure -II

Staff Strength of Ministry of Water Resource and its Organisations

----Separate file---

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 U.N.Panjiar, 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 R.C. Jha, 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	Shri B. M Jha, 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 A.K.Ganju, Chairman Tel. No. 26108590 Fax: 26195289

	Public Sector Undertakings	
10.	Water and Power Consultancy Services (India) Limited, 5th 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 Arbind Kumar, Chairman & Managing Director, Tel. No. 95129-2231269
	Autonomous Bodies	
12.	National Institute of Hydrology, Jal Vigyan Bhawan, Roorkee-247667 (Uttaranchal)	Dr. R.D.Singh, Director Tel. No. 01332-272106 Fax: 01332-272123/ 273976
13.	National Water Development Agency, 18-20, Community Centre, Saket, New Delhi-110017	Shri A.D. Bhardwaj, Director General Tel. No. 26519164
	Statutory Bodies	
14.	Narmada Control Authority, BG-113, Scheme No. 74-C, Vijay Nagar, Indore-452010	Shri V.K. Jyothi, Executive Member Tel. No. 0731-557276
15.	Brahmaputra Board, Basistha, Guwahati	Shri Rajan Nair, Chairman Tel. No. 0361-2301099/ 2302527 Fax: 0361-2301099/ 2307454/ 2308588
16.	Betwa River Board, Nandanpura, Jhansi-284003	Shri S.C.Gupta, Chief Engineer & Secretary Tel. No. 0517-2480183
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 2008-09		BE 2009-10		RE 2009-10		BE 2010-11		Total B.E . 2010-11
		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 (prop.)	0.00	21.74	0.00	21.00	0.00	29.16	0.00	24.52	24.52
2.	Ravi-Beas Waters Tribunal	0.00	0.82	0.00	0.80	0.00	1.09	0.00	1.04	1.04
3.	Cauvery Water Disputes Tribunal	0.00	1.41	0.00	1.60	0.00	2.31	0.00	1.93	1.93
4.	Krishna Water Disputes Tribunal	0.00	1.45	0.00	1.40	0.00	1.80	0.00	1.76	1.76
5.	Vansadhara Water Dispute Tribunal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
	Total : Secretariat-Economic Services	**0.00**	**25.42**	**0.00**	**24.80**	**0.00**	**34.36**	**0.00**	**31.25**	**31.25**
II	**Major & Medium Irrigation**									
	Central Water Commission									
1.	Direction & Administration	0.00	20.05	0.00	23.00	0.00	25.24	0.00	20.90	20.90
2.	Data Collection	0.00	65.42	0.00	69.22	0.00	74.21	0.00	65.13	65.13
3.	Training	0.00	0.49	0.00	0.65	0.00	0.39	0.00	0.32	0.32
4.	Research	0.00	1.33	0.00	1.60	0.00	2.78	0.00	1.84	1.84
5.	Survey & Investigation	0.00	7.74	0.00	4.50	0.00	6.21	0.00	5.03	5.03
6.	Consultancy	0.00	20.75	0.00	20.00	0.00	23.70	0.00	18.84	18.84
7.	Contribution to international bodies									
8.	Seminars and conferences on water resources on water.	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.01	0.01
9.	Exhibition and Trade Fair	0.00	0.18	0.00	0.30	0.00	0.15	0.00	0.01	0.01
10.	Modernization of equipment CWC Offset Press	0.00	0.23	0.00	0.35	0.00	0.33	0.00	0.24	0.24
11.	Cell for monitoring externally aided projects	0.00	0.50	0.00	0.60	0.00	0.60	0.00	0.65	0.65
12.	Water Planning Wing	0.00	1.13	0.00	1.40	0.00	1.28	0.00	1.06	1.06
13.	Hydrological observations in Chenab basin	0.00	1.61	0.00	1.60	0.00	2.05	0.00	1.69	1.69
14.	National Water Academy	2.37	0.00	2.60	0.00	2.60	0.00	4.00	0.00	4.00
	Total : CWC	**2.37**	**119.44**	**2.60**	**123.23**	**2.60**	**136.96**	**4.00**	**115.72**	**119.72**
15.	Central Soil and Materials Research Station	0.00	5.99	0.00	5.00	0.00	7.72	0.00	5.92	5.92

Sl No.	Sector/ Organisation /Scheme	Actuals 2008-09		BE 2009-10		RE 2009-10		BE 2010-11		Total B.E . 2010-11
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
16.	Central Water & Power Research Station	0.00	28.26	0.00	25.00	0.00	36.26	0.00	25.47	25.47
17.	National Institute of Hydrology	0.00	6.86	0.00	5.30	0.00	10.29	0.00	6.50	6.50
18.	Sardar Sarovar Construction Advisory Committee	0.00	0.58	0.00	0.90	0.00	0.89	0.00	0.63	0.63
19.	Bansagar Control Board	0.00	0.15	0.00	0.23	0.00	0.22	0.00	0.20	0.20
20.	Sutlej Yamuna Link Canal Project	0.00	0.00	0.00	22.00	0.00	6.18	0.00	20.00	20.00
21.	Upper Yamuna River Board	0.00	0.90	0.00	1.84	0.00	0.85	0.00	1.82	1.82
22.	Research and Development Programme	39.81	0.00	52.00	0.00	35.00	0.00	54.00	0.00	54.00
23.	Development of Water Resources Information System	45.58	0.00	70.00	0.00	70.00	0.00	66.00	0.00	66.00
24.	Hydrology Project	9.92	0.00	38.10	0.00	25.10	0.00	53.00	0.00	53.00
25.	Investigation of Water Resources Development Schemes	36.17	0.00	42.00	0.00	42.00	0.00	54.00	0.00	54.00
26.	Information, Education and Communication	9.08	0.00	12.00	0.00	12.00	0.00	15.00	0.00	15.00
27.	River Basin Organization/ Authority	0.00	0.00	0.50	0.00	0.50	0.00	0.50	0.00	0.50
28.	Dam Safety Studies and Planning	0.80	0.00	1.00	0.00	1.00	0.00	1.50	0.00	1.50
29.	Infrastructure Development	2.06	0.00	1.00	0.00	1.00	0.00	3.00	0.00	3.00
30.	National Projects Construction Corporation Limited	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
	Total: Major & Medium Irrigation	**145.79**	**162.18**	**219.20**	**183.51**	**189.20**	**199.38**	**251.00**	**176.26**	**427.26**
III	**Minor Irrigation**									
1.	Central Ground Water Board	0.00	85.53	0.00	94.99	0.00	111.27	0.00	98.31	98.31
2.	Rajiv Gandhi NGWTRI	0.64	0.00	2.00	0.00	2.00	0.00	6.00	0.00	6.00
3.	Ground Water Manag - ement and Regulation	54.37	0.00	70.00	0.00	70.00	0.00	100.00	0.00	100.00
6.	Infrastructure Development	2.07	0.00	4.50	0.00	4.50	0.00	10.50	0.00	10.50
	Total : Minor Irrigation	**57.08**	**85.53**	**76.50**	**94.99**	**76.50**	**111.27**	**116.50**	**98.31**	**214.81**
IV.	**Flood Control Central Water Commission**									
1.	Flood Data Collection	0.00	51.70	0.00	55.00	0.00	59.98	0.00	53.77	53.77
2.	Payment to Government of Bhutan for maintenance of flood	0.00	1.02	0.00	1.20	0.00	1.06	0.00	1.02	1.02

Sl No.	Sector/ Organisation /Scheme	Actuals 2008-09		BE 2009-10		RE 2009-10		BE 2010-11		Total B.E . 2010-11
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	forecasting and warning centres									
3.	Strengthening and moderni-zation of flood forecasting and hydrological network in Brahmaputra and Barak Basin	0.00	1.96	0.00	2.25	0.00	1.95	0.00	1.95	1.95
	Total : CWC	**0.00**	**54.68**	**0.00**	**58.45**	**0.00**	**62.99**	**0.00**	**56.74**	**56.74**
4.	Emergent Flood Protection Measures in Eastern and Western Sectors	0.00	0.00	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	0.50	0.00	0.50	0.00	0.50
6.	Flood Forecasting	13.68	0.00	25.00	0.00	20.00	0.00	36.00	0.00	36.00
7.	River Management Activities and Works related to Border Areas	176.09	0.00	199.30	0.00	174.30	0.00	199.00	0.00	199.00
8.	Infrastructure Development	6.56	0.00	9.50	0.00	9.50	0.00	15.00	0.00	14.00
	Total : Flood Control	**196.33**	**54.68**	**234.30**	**61.45**	**204.30**	**65.99**	**250.50**	**59.74**	**310.24**
V.	**Other Transport Services**									
1.	Farakka Barrage Project	54.03	25.89	70.00	32.00	70.00	28.30	82.00	33.10	115.10
2.	Jangipur Barrage	0.00	1.90	0.00	2.25	0.00	1.89	0.00	2.27	2.27
3.	Feeder Canal	0.00	3.78	0.00	4.00	0.00	3.81	0.00	4.07	4.07
	Total : Transport Services	**54.03**	**31.57**	**70.00**	**38.25**	**70.00**	**34.00**	**82.00**	**39.44**	**121.44**
	TOTAL (I to V) *	**453.23**	**359.38**	**600.00**	**403.00**	**540.00**	**445.00**	**700.00**	**405.00**	**1105.00**
VI.	**AIBP and other Water Resources Programme ****	**8553.70**	**0.00**	**9700.00**	**0.00**	**9700.00**	**0.00**	**11500.00**	**0.00**	**11500.00**
	GRAND TOTAL	9006.93	359.38	10300.00	403.00	10240.00	445.00	12200.00	405.00	12605.00

*Source of financing : *Demand No.103 – Ministry of Water Resources for 2010-2011 (excluding AIBP)*
*** Details shown in Demand No. 35- Ministry of Finance (Transfers to State and Union Territory Governments).*

Annexure- V

Central Public Information Officers/ Appellate Authorities in the various Sections/ Wings of the Ministry of Water Resources

S.No.	Name & Designation of CPIO appointed (S/Shri/Smt)	Name of the Section/ Desk/ work	Name & Designation of the Appellate Authority appointed (S/Shri/Smt/Kum)
1.	D.K. Paliwal, Under Secretary (Public Sector Undertaking & Public Private Partnership)	Public Sector Undertakings Section & Public Private Partnership Cell	Ram Sharan, Deputy Secretary (Administration & PSU)
2.	N.K. Gupta, Under Secretary (Administration)	Administration Section & SC/ST/OBC Cell	
3.	K. Rajappa, Under Secretary (E-I)	Establishment I Section	S.V. Singh, DS (E & Vigilance)
4.	K.K. Sharma, Section Officer (Vigilance)	Vigilance Section	
5.	P.K. Chakrabarti, Under Secretary (GW)	Ground Water Desk	Rajeev Kumar, Director (GW)
6.	P.S. Chakraborty, Under Secretary (WB)	Water Bodies	Shri Rajeev Kumar, Director (Water Bodies)
7.	P.C. Rajagopalan, Under Secretary (General Administration)	General Administration Section	Charul Baranwal, Director (General Administration)
8.	M.N. Sukumaran, Under Secretary (CGWB)	Central Ground Water Board Desk	Dr. P.K. Mehrotra, Director (GW Estt) & Water Quality Issues
9.	Shashi Pal, Under Secretary (Information, Education and Communication)	Information, Education and Communication Cell	
10.	Dr. Arijit Dey, Scientist 'D'	Water Quality Issues	
11.	Sanjeet Kumar Bhagat, Section Officer (Information Technology Cell)	Information Technology Cell	Srikanta Panda, Director (Information Technology)
12.	Dalbir Kaur, Junior Analyst (WS)	Internal Work Study Unit	Ram Swarup, Deputy Secretary (WS)
(A)	N.K. Gupta, Under Secretary	Establishment matters of Farakka Barrage Project	
13.	S.K. Jha, Section Officer (ID)	Establishment matters of Brahmaputra Board	
14.	Ashok Kumar, Deputy Director (OL)	Official Language	Ashok Kumar Sachdev, Director (OL)
15.	S.K. Jha, Section Officer (ID)	Infrastructure Development	Rajeev Kumar Arora,

16.	Jeetendar Chadha, Under Secretary (GFCC)	Administrative matters of GFCC	Director (ID)
(B)	T.K. Gupta, Under Secretary (Coord)	Coordination	Shri Ram Swarup, DS (WS)
17.	S.P. Gahlaut, Section Officer	Parliament	
18.	S.P.S. Chauhan, 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.	K.G. Thang, Under Secretary (E-II)	Establishment-II Section	Anoop Seth, DS (E-II)
23.	W.M. Tembhurney, Sr. Joint Commissioner (CADWM)	Command Area Development and Water Management Wing	G.S. Jha, Commissioner (CADWM)
24.	K. Vohra, Sr. Joint Commissioner (BM)	Projects Wing - Basin Management Section except those of Inter-Linking Rivers/ National Water Development Agency	A.B. Pandya, Commissioner (PR)
25.	Bhupinder Singh, Deputy Commissioner (BM)	Projects Wing – works relating to Ganga Basin Section and Narmada Control Authority and works relating to Inter-Linking of Rivers/ National Water Development Agency	
26.	Shailesh Rana, Section Officer (Projects)	Project Section excluding Sardar Sarovar Construction Advisory Committee and Narmada Control Authority	V.K. Nagpure, Sr. Joint Commissioner (PR)
27.	Anil Kumar, Assistant Engineer (MI)	Minor Irrigation	S.L. Jain, Deputy Commissioner (MI)
28.	V.P. Singh, SO (Indus)	Indus Wing	G. Aranganathan, Commissioner (Indus)
29.	Mamta Saxena, Director (MI Stats)	Minor Irrigation Statistics	Vijay Kumar, Additional Director General
30.	S.K. Thakur, Director (Finance)	Finance Wing – Finance Desks and Budget Section	Ananya Ray, JS & FA
31.	Prisca Poly, Section Officer (Bil)	External Assistance Desks including Foreign Training	Vijay Kumar, Advisor (Eco)
32.	R.K. Saxena, Asstt Controller of Accounts	Matters related to Principal Accounts Office and Pay & Accounts Office (Sectt.) and Cash Section	
33.	Kanta Arora, Asstt Controller of Accounts	Matters related to Pay & Accounts Office (CWC) and Pay & Accounts	

	(CWC)	Office (CSMRS)	Suman Bala, Controller of Accounts
34.	G.D. Prashad, Sr. Accounts Officer (FBP)	Matters related to Pay & Accounts Office (FBP)	
35.	J. Thothadhri, Sr. Accounts Officer (CWPRS)	Matters related to Pay & Accounts Office (CWPRS)	
36.	D.P. Sharma, Sr. Accounts Officer (CGWB)	Matters related to Pay & Accounts Office (CGWB)	

Annexure-VI

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, 6th Floor, Shram Shakti Bhavan, New Delhi-110001 (Tele No. 23714734) (Fax No. 23710253) e-mail: dscoord-mowr@nic.in	Shri Ram Swarup, Director (Public/staff grievances)
2.	Narmada Control Authority	Narmada Sadan, Sector-B, Scheme No. 74-C, Vijay Nagar, Indore – 452010(MP) (Tele No. 0731-2551144) (Fax No. 2551144) e-mail: mem.power.nca@nic.in	Shri Major Singh, Member (Power) & (Staff/Public) Grievance Redressal Officer
3.	Bansagar Control Board	Bansagar Control Board, Samab Colony, Rewa (MP) (Tele No. 07662-226318), 0755-2762059 (Tele Fax No. 07662-242433 e-mail: bansagar@sancharnet.in	Shri Soumitre Haldar, Secretary & Director (Staff / Public Grievances)
4.	Betwa River Board	Betwa River Board, Nandanpura, Jhansi-284003 (Tele No. 0517-2480183) (Fax No. 0517-2480237)	Shri A.C. Vohra, Secretary & Director (Staff/Public Grievances)
5.	Central Ground Water Board	CGWB, CHQ, Faridabad (Tele No. 0129-2419084) Fax No.029- 2419059	Shri U.V. Singh, L.IO & Staff Grievances Officer
		CGWB, CHQ, Faridabad –121 001. (Tele No.0129-2413321 & (Fax No. 0129-2412524) e-mail: cgwb@nic.in & hp_cgwb@nic.in	Shri Sunil Kumar, Scientist 'D', Public Grievances officer
6.	Central Soil and Materials Research Station	Room No. 508 (New Building, CSMRS, Hauz Khas, New Delhi – 110 016 (Tel No. 26563140/Ext. 603) (Fax No. 26853108)e-mail: skbabbar@nic.in	Shri S.K. Babbar, Joint Director & Director (Staff & Public Grievances)
7.	Central Water Commission	Room No. 311 (S),3rd Floor Sewa Bhawan,R.K. Puram, New Delhi-110066 (Tele No. 26187232) (Fax No. 26195516) e-mail: secymail@nic.in	Shri Atul Jain, Secretary & Grievances officer

8.	Central Water & Power Research Station	Central Water & Power Research Station, P.O. Khadakwasla Research Station, Pune – 411024 (Tele No. 020-24103200, 24381801) (Fax No. 020-24381004) e-mail: wapis.mah@nic.in	Shri P.K. Khare, Joint Director & Chairman (Grievance Cell) Staff Grievance & Public Grievance
9.	Farakka Barrage Project	P.O. Farakka Barrage, Distt. Murshidabad, West Bengal-742212 (Tele No. 03485 – 253286) (Fax No. 03485-253608)	Shri B.K.Karjee, Superintending Engineer (Coord.) & Director (Staff Grievances) Shri P.K. Alagh, Superintending Engineer & Director (PG)
10.	Ganga Flood Control Commission	Ganga Flood Control Commission, Sinchai Bhawan, IIIrd Floor, Patna-800015 (Tele No. 0612-2233591) e-mail: dir-adm-gfcc@nic.in & dir-mp2-gfcc@nic.in	Shri R. K. Sinha, Director (Adm) & Director (Staff Grievances & Public Grievances)
11.	National Institute of Hydrology	Jal Vigyan Bhawan, Roorkee-247667 (Uttaranchal) (Tele No. 01332-276414 (O), 272909 & 272718,276416 (Fax No. 01332-272123) e-mail: bk@nih.ernet.in	Dr. Bishm 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 - 2442546) (Fax No. 0129-2552546) e-mail: kkgupta.npcc@nic.in	Shri K.K. Gupta, Director (Grievance Committee) (Staff Grievances) _____ Shri Anup Kumar AGM (C), Director (Public Grievances)
13.	National Water Development Agency	18-20, Community Centre, Saket, New Delhi-110017 (Tele No. 26568873) (Fax No. 26960841) e-mail: cehqnwda@rediffmail.com	Ms Anita Lal Chandani Asst Director & Staff Grievance officer
14.	Sardar Sarovar Construction Advisory Committee	Sardar Sarovar Construction Advisory Committee, Narmada Bhavan, "A" Block 4th Floor, Vadodara – 390001 (Tele No. 0265-2421272) Fax No. 0265-2437262 (Telefax) e-mail: jbabu50@rediffmail.com	Shri Janardhana Babu, Deputy Secretary & Director (Grievances) & Director (Public Grievances)
15.	Water & Power Consultancy Services (India) Ltd.	76-C, Institutional Area, Sector-18, Gurgaon-122015 (Haryana) (Tele No. 95124-2397394) (Fax No. 95124 –2397392, 2348022) e-mail: wapcos@vsnl.com	Shri S.K. Ahuja, CVO & Director (PG & Staff Grievances)

16.	Brahmaputra Board	Basistha, Guwahati – 781029 (Tele No.0361-2307453 & 2307453, 2301099/2307454) (Fax No. 0361-2308588) e-mail: bbrd_ghy@sify.com	Shri G.P. Singh, Secretary & Director (Staff/Public Grievances)
17.	Upper Yamuna River Board	Upper Yamuna River Board, Wing No. 4, Ground Floor, West Block No. 1, R.K. Puram, New Delhi-66 (Phone No. 26174147) e-mail: uyrb-mowr@nic.in	Member Secretary & Director of Grievances(Shri H.K. Sahu is holding charge of Member Secretary of the Board)
18.	Tungabhadra Board	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt: Bellary, Karnataka State, PIN: 583225	Shri L.A.V. Nathan, Secretary & Director of Grievances

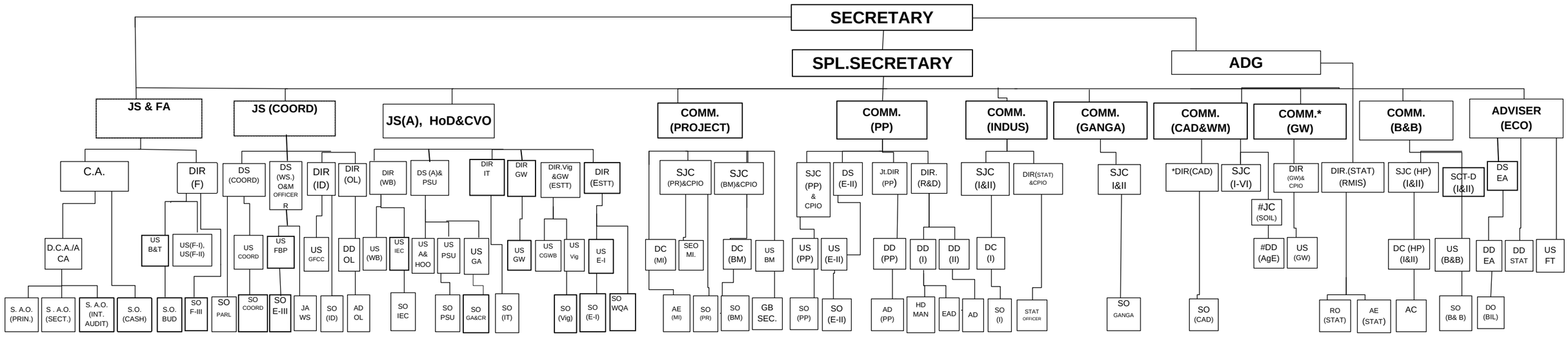
Abbreviations

ADB	Asian Development Bank
AIBP	Accelerated Irrigation Benefit Programme
BB	Brahmaputra Board
BCB	Bansagar Control Board
BRB	Betwa River Board
CADWM	Command Area Development & Water Management
CCA	Culturable Command Area
CEA	Central Electricity Authority
CGWB	Central Ground Water Board
CSMRS	Central Soil & Material Research Station
cumec	cubic metre per sec
cusec	cubic foot per sec
CWC	Central Water Commission
CWPRS	Central Water & Power Research Station
CLA	Central Loan Assistance
CRA	Cauvery River Authority
CWDT	Cauvery Water Disputes Tribunal
DPR	Detail Project report
DSS	Decision Support System
DRIP	Dam Rehabilitation and Improvement Project
EFC	Expenditure Finance Committee
ERM	Extension, Renovation and Modernization
FPARP	Farmers' Participatory Action Research Programme
FBP	Farakka Barrage Project
FMP	Flood Management Programme
FR	Feasibility Report
FRL	Full Reservoir Level
GFCC	Ganga Flood Control Committee
GRA	Grievances Redressal Authorities
HP	Hydrology Project
IBRD	International Bank of Reconstruction and Development
IEC	Information, Education and Communication
INCGECM	Indian National Committee on Geotechnical Engineering and Construction Materials
INCGW	Indian National Committee on Ground Water
INCH	Indian National Committee on Hydraulic Research
INCID	Indian National Committee on Irrigation and Drainage
INCOH	Indian National Committee on Hydrology
ISRO	Indian Space Research Organisation
ISRWD	Inter-State River Water Disputes
JBIC	Japan Bank for International Cooperation
JCWR	Joint Committee on Water Resources
JET	Joint Expert Team
JGE	Joint Group of Experts
JRC	Joint Rivers Commission
Kfw	Kreditanstalt fur Wiederaufbau
KWDT	Krishna Water Disputes Tribunal
MI	Minor Irrigation
MoU	Memorandum of Understanding
M & M	Major and Medium
Mha	million hectares
MoWR	Ministry of Water Resources
NAPCC	National Action Plan on Climate Change
NCA	Narmada Control Authority
NCSDP	National Committee on Seismic Design Parameters
NHDC	Narmada Hydro-electric Development Corporation
NLSC	National Level Steering Committee
NPMC	National Level Programme Monitoring Committee
NPP	National Perspective Plan
NWDT	Narmada Water Disputes Tribunal
NWM	National Water Mission
NPCC	National Projects Construction Corporation Ltd
NWDA	National Water Development Authority
NCMP	National Common Minimum Programme
OFD	On Farm Development
PAC	Project Advisory Committee
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 Sorovar 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		

Organisation Chart of Ministry of Water Resources

Annexure I



Legends:

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

* Additional charge

Annexure -II

Staff Strength of Ministry of Water Resource and its Organisations

Sl. No.	Name of Office	Group A					Group B (Gazetted)					Group B (Non Gazetted)					Group C					Group D					Grand Total				
		Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	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	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	Ministry of Water Resources	84	8	2	-	1	49	08*	1		2	82	13	5	-	8	138	67*	9	6	19	9	4				362	100	17	6	30
2	Controller of Accounts, Ministry of Water Resources	2	1	-	-	-	81	7	-		1	-	-	-	-	-	97	27	8	-	15	20	11	2	-	4	200	47	10	-	19
3	Central Water Commission	571	66	33	4	37	407	54	7	1		650	99	12	3	10	1260	120	34	8	58	682	191	70	7	11	2560	530	156	23	116
4	Central Soil & Materials Research Station	60	10	2	1	3	35	4	2	-		36	4		-	6	115	27	8	2	3	84	32	5	2	3	330	77	17	4	15
5	Central Water & Power Research Station	146	21	6	2	11	68	13	4	1	6	185	28	7	5	18	595	113	48	24	24						994	175	65	32	59
6	Central Ground Water Board	382	50	16	-	26	297	42	18		20	168	27	9	2	14	1718	340	127	8	108	1123	278	63	5	97	3688	737	234	15	265
7	Farakka Barrage Project	16	2	1		1	21	5	2	1	1	37	6	1		2	280	44	15	1	19	149	27	1	0	2	503	84	20	2	25
8	Ganga Flood Control Commission	19					12	1				2		1			41	9				15	5	1	2	1	89	15	2	2	1
9	Bansagar Control Board	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	9	-	-	-	-	7	-	-	-	-	19	-	-	-	-
10	Sardar Sarovar Construction Advisory Committee	5	-		-	1	-	-	-	-	-	-	-	-	-	-	3	1	-	1	-	3		-	-	2	11	1		1	3
11	Brahmaputra Board	80	3	1	-	-	-	-	-	-	-	-	-	-	-	-	381	51	30	4	40	161	25	11	5	6	622	79	41	9	53
12	Betwa River Board	11	-	-	-	-	19	-	-	-	-	17	-	-	-	-	75	7	-	-	-	1	1	-	-	-	123	8	-	-	-
13	Narmada Control Authority	30	3	1	-	-	37	6	-	-	6		-	-	-	-	90	18	7	3	10						157	27	8	3	16
14	National Water Development Agency	64	4				62	10			1	16	3				334	50	19	5	15	118	36	10	2	1	594	102	29	7	17
15	National Institute of Hydrology	71	9	2	1	7	-	-	-	-	-	48	5	-	-	1	74	16	-	1	4	41	17	-	-	5	234	47	2	2	17
16	Water & Power Constultancy Services (I) Ltd.	318	43	6	3	28	59	9	3	2	2	25	2	1	-	1	64	14	2	1	8	41	18	4	1		507	86	16	7	39
17	National Projects Construction Corporation Ltd	330	18	1		2						216	15	-	-		197	27	3	5	2	88	10	2	-	-	830	70	6	5	4
	Total																										11823				

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

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