

ANNUAL REPORT 2008-09









GOVERNMENT OF INDIA MINISTRY OF WATER RESOURCES NEW DELHI

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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 undertakings.

The Ministry was headed by Hon'ble Prof. Saifuddin Soz as the Union Minister of Water Resources with Hon'ble Shri J.P.N. Yadav 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 Additional Secretary.

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 15 Central Sector and 5 State Sector Schemes. During the year 2008-09, the central sector schemes implemented by the Ministry include the Development of Water Resources Information System, Hydrology II 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 state sector schemes implemented and monitored by the Ministry during 2008-09 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.

Major Achievements and Developments

- XIth Plan allocation for Irrigation, Flood Control and Command Area Development at Rs. 232311 crore shows an increase of 142.75% in relation to Xth Plan outlay of Rs. 95700 crore.
- There was quantum jump in the Central Assistance released to States during 2008-09 under "Accelerated Irrigation Benefits Programme (AIBP)". A total grant of Rs.7,598 crore was released to various States against the release of Rs.5446 crore during 2007-08. 13 major & medium projects and 1186 minor irrigation schemes have been included under AIBP during the year 2008-09. An irrigation potential of about 7.5 lakh hectares has been created under AIBP assisted projects during 2008-09.
- The guidelines for implementation of the scheme of "**National Projects**" were issued. 14 projects have been identified as National Projects for which Central assistance of 90% of cost of the project is to be provided.
- Central assistance of Rs. 324 crore was released to States during the year 2008-09 under "Command Area Development & Water Management (CAD&WM) Programme."
- The Ministry is implementing an ambitious scheme of "Artificial Recharge to Ground Water Through Dug Wells" in 1180 over-exploited / critical / semi critical blocks in the States of Andhra Pradesh, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Gujarat and Madhya Pradesh during the XI Plan. The scheme provides 100% subsidy to marginal and small farmers and 50% subsidy to other farmers for construction of recharge structures at an average unit cost of Rs.4000.
- 4054 demonstrations have been completed under the **Farmers' Participatory Action Research Programme** being implemented by Ministry of Water Resources with a view to increase water use efficiency in agriculture.
- With a view to ensure necessary convergence of the activities under various schemes / programmes of Ministry of Water Resources (e.g. AIBP, CAD&WM, Flood Management, Repair, Renovation and Restoration of Water Bodies and Ground Water Management) with the activities under NREGA, a guideline has been jointly issued by Ministry of Water Resources and Ministry of Rural Development.
- Web Enabled Ground Water Information System (WEGWIS) for dissemination of ground water related information has been developed by Central Ground Water Board (CGWB). WEGWIS provides access to various thematic layers

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

- As part of streamlining the regulatory functions of "Central Ground Water Authority (CGWA)", District Magistrates have been appointed as authorized officers for grant of permission for extraction of ground water for drinking / domestic uses in 36 out of 43 blocks/ talikas notified by CGWA in 10 states for ground water regulation. They have been advised to process the grant of permission for extraction of ground water for drinking / domestic purposes in notified areas as per guidelines issued by CGWA.
- Eastern Afflux Bund of Kosi Barrage breached near Kusaha (in Nepal) on 18th August, 2008 and inundated a vast area in Supaul, Araria, Saharsa, Madhepura and Purnia districts of north Bihar. With the help of technical assistance provided by the GFCC and CWC, the breach was closed on 26th January, 2009 and the eastern afflux bund restored to its original shape and further strengthened. Rs.69.90 crore was released to the State Government during 2008-09 for the breach closure work.
- National Projects Construction Corporation Limited (NPCC), a Public Sector Enterprise under the Ministry established in 1957 is a premier construction company engaged in the construction of canal systems, irrigation and river valley projects, dams and barrages, hydel and thermal power projects, industrial structures, road and bridges, buildings, townships and airfields. NPCC had been a sick company for the last several years. The Government approved a proposal for its financial restructuring and revival. As a step towards revival of the company, the authorized share capital of NPCC has been increased from Rs.30.00 crore to Rs.700.00 crore.
- Ministry of Water Resources established 6 Professorial Chairs, one each at Indian Institute of Technology (IIT), Guwahati, IIT, Kanpur, IIT, Kharagpur, IIT, Roorkee, National Institute of Technology (NIT), Patna and NIT, Srinagar for undertaking studies on the impact of climate change on water resources.

Reform Measures and Policy Initiatives

- National Action Plan on Climate Change (NAPCC) launched by the Government in May, 2008 envisages eight National Missions which, inter-alia, include National Water Mission. Ministry of Water Resources has been assigned the work of institutionalization of the National Water Mission. Draft Comprehensive Mission Document for National Water Mission has been submitted to Prime Minister's Office for consideration of Prime Minister's Council on Climate Change. One of the important strategies is to revisit the Nation Water Policy.
- 2. The International Commission on Irrigation and Drainage (ICID) and the Ministry of Water Resources has proposed to jointly organize the 5th Asian Regional Conference and the 60th International Executive Council Meeting of ICID at New

Delhi during December 6-11, 2009. The theme of the Asian Regional Conference is "Improvement in Efficiency of Irrigation Projects through Technology Upgradation and Better Operation and Maintenance."

- **3.** As a result of initiatives taken by Ministry of Water Resources, the party States of Maharashtra and Gujarat agreed for preparation of DPRs of Par-Tapi-Narmada and Daman Ganga-Pinjal river inter-linking projects. The work started in January, 2009 and is scheduled to be completed by December, 2011.
- 4. During the 2nd meeting of Expert Level Mechanism (ELM) on Trans Border Rivers held at New Delhi from 10th to 12th April, 2008 between India and China, a draft Memorandum of Understanding (MoU) was finalized on provision of hydrological information of the Brahmaputra/ Yaluzangbu River in flood season by China to India. The MoU was signed with China on 05.06.2008 with a validity of 5 years during the visit of Hon'ble External Affairs Minister of India to Beijing from June 4-7, 2008. In pursuance, the Chinese side has started supplying the data with effect from 08.09.2008 in respect of three stations, namely, Nugesha, Yangcun and Nuxia located on River Yaluzangbu/ Brahmaputra.
- 5. Two new schemes for repair, renovation and restoration of water bodies one with external assistance and the other with domestic budgetary support have been approved by the Cabinet. These schemes envisage comprehensive improvement of selected water bodies including their restoration, improvement of their catchment areas, community participation and self supporting system for sustainable management of water bodies.
- **6.** An initiative has been taken to restructure the Brahmaputra Board considering the extended jurisdiction of the Board.

CHAPTER 1

MAJOR PROGRAMMES

MAJOR PROGRAMME (STATE SECTOR)

ACCELERATED IRRIGATION BENEFITS PROGRAMME

The Accelerated Irrigation Benefits Programme (AIBP) conceived in 1996 extends central financial assistance to the States for creation of irrigation potential by completion of identified ongoing irrigation projects. The AIBP is also meeting a part of the target of the Bharat Nirman programme under which a major thrust on irrigation is included. The projects included in the Prime Minister's package for agrarian distress districts of Andhra Pradesh, Karnataka, Kerala and Maharashtra are also receiving central financial assistance under the programme.

Major and medium irrigation projects, Extension, Renovation and Modernization (ERM) projects and surface water minor irrigation schemes of Special Category States as well as such schemes benefiting drought prone/ tribal areas in Non-Special Category States are eligible for Central Assistance under AIBP.

265 major/medium irrigation projects and 9852 surface water minor irrigation schemes have been included under AIBP till 31st March 2009 for which total central assistance amounting to Rs.34783.78 crore has been released till 31st March 2009. The grant released during 2008-09 amounts to Rs.7598.22 crore. This includes Central Assistance of Rs.828.88 crore released to North Eastern States during 1996-97, 2000-01 and 2004-05 to 2008-09 are given in **Table -I**. Out of 265 major/medium projects, a total of 100 projects have been completed till date. In addition, out of 9852 surface minor irrigation schemes, 5805 schemes have been completed. Upto March 2008, irrigation potential of 49.32 lakh ha from major/medium projects and 2.71 lakh ha from surface Minor irrigation schemes have been created. During 2008-09, irrigation potential of the order of 7.50 lakh ha is estimated to be created from major/medium/ minor irrigation projects under AIBP.

PRIME MINISTER'S PACKAGE FOR AGRARIAN DISTRESS DISTRICTS

Assured irrigation facilities to the farmers of 31 agrarian distress districts is an important component of the Prime Minister's Rehabilitation package for four States, namely, Andhra Pradesh, Karnataka, Kerala and Maharashtra. Up to March, 2009, 38 out of 65 Projects in the above States have been provided Central Assistance under AIBP. Eight Projects have been dropped by State Governments. During 2008-09, grant of Rs. 1231.23 crore has been released. The total grant released to States during the 3 years from 2006-07 to 2008-09 is Rs. 3529.72 crore.

Table -I

State-wise details of Central Assistance/grant released under AIBP

during 1996-97, 2000-01 and 2004-05 to 2008-09 (as on 31.3.2009)

Sl.	State	1996-97	2000-01	2004-05	2005-06	2006-07	2007-08	2008-09	Grand
No.					Grant	Grant	Grant	Grant	Total*
1	Andhra Dradash	35 75	95.02	87 55	311 38	813 17	087 77	855 18	3054 63
1 2	Anunachal Dradach	0.00	7.50	10.00	18.00	27.00	707.77 19	22.06	197.64
2	Anunachai Flaucsh	0.00 5.22	24.09	16.02	24.02	27.00	47.10	405.05	695.62
3	Assain	5.25 12.50	24.08	10.95	54.95 16.24	30.27	(2.24	403.93	083.02
4		15.30	12.02	37.22	10.24	3.23 10.71	02.24	109.70	037.48 576.59
2	Chnattisgarn	0.00	13.93	2.93	/.00	10./1	96.96	193.04	5/0.58
6	Goa	0.00	61.65	0.65	220 (0	1.91	32.48	39.23	204.67
1	Gujarat	74.77	421.85	530.50	339.60	121.89	585.72	258.61	5458.74
8	Haryana	32.50	0.00	11.14	6.00	3.17	0.00	0.00	90.54
9	Himachal Pradesh	0.00	18.02	3.69	30.08	3.93	114.05	119.32	337.71
10	Jammu & Kashmir	1.30	10.46	12.74	36.69	37.77	199.23	393.07	763.55
11	Jharkhand	0.00	5.72	21.29	5.04	1.29	9.22	3.72	103.47
12	Andhra Pradesh	10.74	54.63	73.08	17.29	-126.98	-6.72	10.09	406.55
13	Arunachal Pradesh	10.07	51.46	74.13	6.74	-164.57	-41.35	-24.77	277.03
14	Assam	9.40	48.29	75.17	-3.81	-202.17	-75.99	-59.63	147.51
15	Bihar	8.73	45.12	76.22	-14.35	-239.76	-110.63	-94.49	17.98
19	Nagaland	0.00	5.00	4.00	8.00	10.60	40.51	48.60	135.10
20	Orissa	48.45	100.32	24.22	151.37	133.88	624.36	724.44	2556.53
21	Punjab	67.50	55.62		26.32		13.50	9.54	464.83
22	Rajasthan	2.68	78.47	352.90	90.30	11.60	156.53	178.62	1930.34
23	Sikkim	0.00	0.00	0.75	0.91	3.32	3.24	0.00	13.48
24	Tripura	3.77	13.88	11.00	32.00	22.51	8.10	43.18	226.00
25	Tamil Nadu	20.00	0.00				0.00	0.00	20.00
26	Uttar Pradesh	43.50	315.90	175.92	133.13	81.90	150.69	315.47	2645.48
27	Uttarakhand	0.00	0.00	38.99	80.44	84.73	265.65	371.66	892.18
28	West Bengal	5.00	26.83	13.46	0.03	6.70	8.95	22.81	208.66
	Total	500.00	1856.20	2867.34	1900.31	2301.97	5445.71	7598.22	34783.78

(Rs. Crore)

NATIONAL PROJECTS

The Central Government has declared 14 water resource projects as National Projects. These are: Nao Dehang Dam Project and Upper Siang Project (Arunachal Pradesh); Kulsi Dam Project (Assam); Renuka Dam Project and Gyspa Project (Himachal Pradesh); Kishau Project (Himachal Pradesh/ Uttarakhand); Bursar Project and Ujh Multipurpose Project (Jammu & Kashmir); Ken-Betwa Project (Madhya Pradesh); Gosikhurd Project (Maharashtra); Shahpur Kandi Project and Ravi Vyas Link (Punjab); Lakhvar Vyasi Project (Uttarakhand); and Teesta Barraga Project (West Bengal).

The irrigation benefit from these projects is estimated to be about 21 lakh ha apart from additional indirect benefits and availability of drinking water.

The Union Cabinet in its meeting held on 7th February 2008 has approved the proposal of the Ministry of Water Resources for implementation of National Projects with central assistance of 90% of the cost of the project as grant. A new project fulfilling the following criteria will be eligible for consideration for inclusion in the scheme of National Projects 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 interstate 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 have been issued on 26th February, 2009. For Gosikhurd National Project of Maharashtra, grant amounting to Rs.450 crore has been released under AIBP during 2008-09.

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 hectares (Mha) in 4 years i.e., from 2005-06 to 2008-09. Creation of total irrigation potential of 6.14 Mha has been reported by States. Full information of potential creation during 2008-09 is to be reported by States by 30th June, 2009. It is estimated that during 2005-06 to 2008-09, the total irrigation potential of about 7 Mha would be created.

NATIONAL PROJECT FOR REPAIR, RENOVATION AND RESTORATION OF WATER BODIES

The Government of India had approved a Pilot scheme, namely, 'National Project for Repair, Renovation and Restoration (RRR) of Water Bodies directly linked to Agriculture' in January, 2005 with an estimated cost of Rs. 300 crore to be shared by Centre and State in the ratio of 3:1 for 26 districts in 15 States, namely, Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu, West Bengal, Himachal Pradesh, J&K, Gujarat, Kerala and Maharashtra. Against Central share of Rs. 224.94 crore, an amount of Rs. 197.30 crore was released to the states. These projects cover 1098 water bodies with total original culturable command area of 1.72 lakh hectares. An additional irrigation potential of 0.78 lakh hectares was targeted under the scheme. Physical work for restoration of 939 water bodies have been completed in 14 States by March, 2009.

With a view to expand the scheme of repair, renovation and restoration of water bodies, Government approved two schemes for RRR of water bodies (i) with external assistance at a cost of Rs.6000 crore and (ii) with domestic budgetary support at a cost of Rs.4000 crore. The expansion of the programme envisages comprehensive improvement of selected tank systems, improvement of catchment areas of tank commands, increase in storage capacity of water bodies, ground water recharge, improvement in agriculture and increased availability of drinking water.

Under the scheme covered by external assistance, States may take up projects for funding wherein 75% loan arranged from the World Bank is passed on to them on back to back basis. The balance 25% is taken as liability of Government of India and passed on as Additional Central Assistance (100% grant) to the States for the projects. Domestic support funding is also in the ratio of 25: 75 (Centre: State) for non-special category States and in the ratio of 90:10 for special category States (NE States including Sikkim, Himachal Pradesh, Uttarakhand, J&K and undivided Koraput, Bolangir and Kalahandi (KBK) districts of Orissa), drought prone/naxal affected/tribal areas.

Under the scheme of RRR of water bodies with external assistance, the World Bank Loan Agreement has been signed with Tamil Nadu for Rs. 2182 crore to restore 5763 water bodies having a CCA of 4 lakh hectares, with Andhra Pradesh for Rs. 835 crore for restoration of 3000 water bodies with CCA of 2.5 lakh hectares, with Karanataka for Rs. 268 crore for restoration of 1225 water bodies having a CCA of 0.52 lakh hectare and with Orissa for Rs. 478 crore for restoration of 900 water bodies with CCA of 1.2 lakh hectare. The West Bengal project is at appraisal stage.

ARTIFICIAL RECHARGE TO GROUND WATER THROUGH DUG WELLS

A State Sector Scheme of "Recharge of Ground Water through Dug wells" has been launched in 1180 Over- exploited, Critical and Semi-Critical blocks of seven States viz. Andhra Pradesh, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Gujarat and Madhya Pradesh at a cost of Rs.1798.71 crore including Rs.1499.27 crore as subsidy to farmers for recharge structures to provide sustainability to the ground water during XIth Plan. The scheme is to be implemented on cluster approach basis in a time span of three years from 2007-10. Salient features of the Scheme are indicated below:-

- The scheme aims to improve the ground water situation in the affected areas, increase the sustainability of wells during lean period, improve quality of ground water and community involvement in water resource management in the affected areas.
- Total number of irrigation dug wells proposed for recharge is 4.45 million, of which 2.72 million are owned by small and marginal farmers and 1.73 million

are owned by other farmers. Average cost of recharge structure per well is Rs. 4000.

- The scheme will be executed by farmers owning dug well in their agricultural land.
- Provision has been made for 100% subsidy to small and marginal farmers and 50% subsidy to other farmers.
- An amount of Rs. 1536.75 crore has been released to National Bank for Agriculture and Rural Development (NABARD) by the Ministry of Finance.
- A National Level Programme Monitoring Committee (NPMC) has been constituted under CGWB to review and monitor the physical and financial progress of the scheme.

During 2008-09 (till 31st March, 2009), funds amounting to Rs. 142.09 crores which include Rs. 123.09 crore as Subsidy to beneficiaries and Rs.19 crore for IEC/Capacity Building activities have been sanctioned to the concerned States under the above scheme.

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 multi-disciplinary team under a Command Area Development Authority.

Coverage

Initially, 60 major and medium irrigation projects were taken up under the CAD Programme, covering a Culturable Command Area (CCA) of about 15.00 million hectare. From 1974-75 till now, 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. 1-4-2004. Now the scheme is being implemented as a State Sector Scheme during the XIth Five Year Plan (2008-09 to 2011-12).

Programme Components

The components of the CADWM Programme are as follows:

a) Survey, planning and designing of on-Farm Developments (OFD) works;

- b) On Farm Development (OFD) works comprising construction of field channels and also land levelling and shaping and realignment of field boundaries, with a minimum 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 150 Cusec (4.25 cumec) capacity;
- e) Reclamation of water logged area with a minimum 10% beneficiary contribution including use of location specific bio-drainage techniques to supplement conventional techniques for reclamation of water logged area;
- f) Trainings/adaptive trials/demonstrations through Water and Land Management Institutes (WALMI) and other Central/State institutions and monitoring & evaluation of the programme with 75% funding from Government of India;
- g) Warabandi [with requisite funds for hardware activities under item(c) and software activites under item (f)]
- h) One time functional Grants to Water Users' Associations; and
- i) Establishment cost: 20% of the expenditure on items(b),(c),(d) and (e)

The following modifications have been made in the programme during XIth Five Year Plan:

- (i) To promote water use efficiency in irrigation, installation of drip and sprinkler irrigation systems is available under the schemes of Ministry of Agriculture. Thus, under the programme, it 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.

Participatory Irrigation Management (PIM)

Under the Programme, there is thrust on Participatory Irrigation Management (PIM). It has been recognised that participation of beneficiaries will help greatly for 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.

14 States viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu and Uttar Pradesh have either enacted exclusive legislation or amended their Irrigation Acts for involvement of farmers in irrigation management. Other States are also taking steps in this direction. So far 56539 Water Users' Associations have been formed in various States covering an area of 13.156 M.ha. under various commands of irrigation projects.

Under the programme, formation of Water Users' Associations (WUAs) at minor or specified area of a canal is mandatory for implementing the CADWM programme. Apart from this, farmers will have to contribute 10% cost of the works in the form of cash/ labour in the construction of OFD works and reclamation of water logged areas.

Central assistance for correction of system deficiencies upto distributaries of 4.25 cumec (150 Cusec) capacity has been linked to formation of Distributaries Committees and handing over of the distributaries to such Committees for maintenance in future.

Financing Pattern

The funding pattern for all the Programme components is on 50:50 sharing basis between the Centre and the 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.

Outlay

The approved outlay for the Command Area Development and Water Management Programme during the XIth Five Year Plan (2008-09 to 2011-12) is Rs.1600 crore.

Financial Achievements

An amount of Rs.3528.08 crore has been released to States as Central Assistance under the CAD Programme since its inception in 1974-75 upto March, 2008. The continuation of CADWM scheme has been approved as State Sector scheme in October, 2008. During the year 2007-08, an amount of Rs.277.14 crore was released to States. An outlay of Rs.350.00 crore has been provided under CADWM during 2008-09. The details of central assistance released during IXth, Xth and XIth plan (2007-08 and 2008-09) are given in Table 2.

Table 2. Central Assistance released under CADWM Programme

(Rs. crore)

Period	Outlay approved by Planning Commission	BE Allocation	Release	% Release w.r.t. BE Allocation
IX Plan	1000	825.72	751.68	91.03
X Plan	1208	969.80	796.39	82.12
XI Plan				
2007-08	300	300.00	277.14	92.38
2008-09	350	350.00	324.39	92.68

Physical Achievements

The core components of physical works are construction of field channels, field drains and implementation of warabandi (rotational water supply). The cumulative progress of works on these components are given in Table 3.

Table 3. Physical Achievements under CADWM Programme

Item of work	Cumulative achievement since 1974-75 to 1996-97	Achievement during			
		IX Plan	X Plan	2007-08	2008-09*
Field Channel	13.95	1.80	2.31	0.394	0.220
Warabandi	8.64	1.54	1.12	0.141	0.006
Field Drains	0.77	0.35	0.64	0.069	0.004

(Million hectare)

*Provisional

Reclamation of Water Logged Areas

Although development of irrigation has increased agriculture production, it has also caused adverse effect in the form of water logging and associated problem of soil salinity/alkalinity in many irrigation commands. The Ministry of Water Resources introduced a component of Reclamation of Water logged Areas under the Centrally Sponsored Command Area Development Programme w.e.f. 1.4.1996. So far 482 schemes of 9 states, namely, Bihar, Gujarat, Madhya Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Orissa and Uttar Pradesh have been approved for reclamation of 63566.49 ha. water logged area. Out of this, an area of 50249 ha. has been reported to be reclaimed by these States up to March, 2008. During 2008-09, 4 schemes of Orissa covering 209 ha of waterlogged area for reclamation have been sanctioned at an estimated cost of Rs. 38.52 lakh.

FLOOD MANAGEMENT PROGRAMME (FMP)

A restructured scheme, namely, "Flood Management Programme" at a cost of Rs. 8,000 crore was 'in principle' approved by the Cabinet, under the State Sector for XI Plan period by amalgamating the 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).



Darbhanga Town Protection Works



Raising and Strengthening of Embankments on river Burhi Gandak

Under the restructured scheme, 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 have been covered. Central Assistance to the State Governments has also been included for the first time for restoration of damaged flood management works, based upon the recommendations of Task Force on Flood Management/Erosion Control-2004.

Detailed guidelines for providing Central Assistance to the State Governments under FMP were issued on 27.12.2007 by the Ministry of Water Resources. Further, an Empowered Committee under the Chairmanship of Secretary (Expenditure), Ministry of Finance has been constituted for examining and including the proposals submitted by the State Governments under FMP to ensure cost effective solutions.

Three meetings of the Empowered Committee have been held upto 31st March'2009 and a total of 281 flood control/ river management schemes from 16 states (with a total estimated cost of Rs.2426 crore) have been approved under FMP for providing central assistance to the states as indicated in Table 4.

SI. No.	State	Schemes Included under FMP		
		Nos.	Estimated Cost (Rs. Crore)	
1	Arunachal Pradesh	9	54.72	
2	Assam	82	708.59	
3	Bihar	30	798.13	
4	Goa	1	8.84	
5	Himachal Pradesh	1	34.67	
6	Jammu & Kashmir	16	171.91	
7	Jharkhand	1	20.12	
8	Manipur	12	39.64	
9	Nagaland	5	13.90	
10	Orissa	69	163.63	
11	Punjab	1	111.39	
12	Sikkim	24	86.21	
13	Tripura	11	26.57	
14	Uttar Pradesh	7	99.04	
15	Uttranchal	4	28.68	
16	West Bengal	8	59.46	
	Total	281	2425.50	

Table 4. Flood Management Programme during XIth Plan Period

The central assistance to the States is being provided on the following pattern:

(i) For special category states - 90% central share : 10 % state share,

(ii) For non-special category states - 75% central share: 25 % state share, and

(iii) For restoration of damage works, the central assistance would be provided as 90% central share and 10 % state share to all states.

MAJOR PROGRAMME (CENTRAL SECTOR)

RIVER MANAGEMENT ACTIVITIES AND WORKS RELATED TO BORDER AREAS

A Central Sector Scheme, namely, River management activities and works related to border areas, has been approved to cover 10 on-going works/ schemes of X plan (with 100% central assistance) along with 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.



The Chief Minister of Bihar, Shri Nitish Kumar discussing with the Prime Minister, Dr. Manmohan Singh and the Union Home Minister, Shri Shivraj V. Patil about the relief operations in flood-affected areas, in Bihar, August 28, 2008. The Chairperson, UPA, Smt. Sonia Gandhi, the Union Railways Minister, Shri Lalu Prasad Yadav, the Union Minister of Chemicals & Fertilizers and Steel, Shri Ram Vilas Paswan and the Minister of State for Water Resources, Shri Jai Parkash Narayan Yadav are also seen.

New works include river management, flood control and minor irrigation schemes/ works, on common/ border rivers especially on border with Bangladesh and Nepal under the scheme. Any new works on the western sector in Indus river system would also be funded with 100% central assistance to the concerned states. A breach occurred in the Eastern Afflux Bund of Kosi Barrage near Kusaha (Nepal) on 18.8.2008. Breach closure work was immediately undertaken by the Government of Bihar for which technical and financially assistance was provided by MoWR. The breach was closed on 26.1.2009. Further works to restore the embankment to its original shape and strengthening of the existing afflux bunds have also been completed. For Breach Closure Works of Eastern Afflux Bund of Kosi Barrage in Nepal, an estimate amounting to Rs 143.42 crore has been approved by the TAC of MoWR and an amount of Rs. 69.90 crore was released to Government of Bihar during the year 2008-09.

Ground Water Management & Regulation

A Central Sector Scheme, namely, "Ground Water Management and Regulation" at a cost of Rs. 460 crore has been approved for implementation by CGWB during the XIth Plan. Demonstrative projects on Artificial Recharge to Ground Water and Rain Water Harvesting are proposed to be taken up under central sector scheme of "Ground water Management and Regulation "by CGWB, at an estimated cost of Rs.100 Crores with 100% funding by the Central Government. It is proposed to construct structures for artificial recharge and rainwater harvesting through implementing agencies / beneficiaries and Panchayats. The scheme will demonstrate the efficacy of artificial recharge and rain water harvesting techniques in identified areas selected on scientific basis in different hydrogeological situations and encourage implementing agencies to replicate successful models in similar set ups. It will result in capacity building of the various agencies involved in construction of such recharge structures for optimum benefits.

Central Ground Water Board, in coordination with concerned State Government departments will take up recharge and rain water-harvesting projects in following areas on priority:

- i. Over-exploited / Critical Blocks
- ii. Urban areas showing steep decline in ground water levels
- iii. Drought prone & water scarcity area
- iv. Coastal areas
- v. Sub-mountainous / hilly areas
- vi. Area with geo-genic contamination of ground water.

Sites for construction of feasible artificial recharge structures would be identified by taking into consideration Watersheds / Talukas / Block / Mandal on compact area basis. Computation of surplus runoff and hydrogeological conditions need to satisfy the pre-requisites for recharge projects. The implementing agency would be responsible for preparation of Detailed Project Report for the recharge projects and may take technical guidance from regional office of CGWB. Schemes would be implemented in coordination with the State Government by implementing agency under technical supervision of Regional office of the Central Ground Water Board.

Three project proposals costing Rs.5.66 Crores (2 from Tamilnadu and one from Punjab) and only lump sum estimates for Rs.18 Crores have been received from Karnataka and Orissa states. The three DPRS were considered by the TCC (CHQ) which suggested modification of DPR and advised the concerned States to submit the modified DPR for consideration in next meeting.

The States have been requested to expedite the submission of projects proposals.

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 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/ National Disaster Management Authorities (MHA).

During the year 2008-2009, a total of 6675 forecasts were issued to the State Government/ local administration in order to take timely action and to save public properties. An expenditure of Rs. 23 crore has been incurred during the year 2008-09.

DEVELOPMENT OF WATER RESOURCES INFORMATION SYSTEM

The scheme was approved in June 2008 for implementation during the XI Plan with the total outlay of Rs. 234.30 crore.

The objective of this scheme is to collect the necessary information, ensure observation of important data and to develop information system on water resources to make available all relevant information about water resources availability and its utilization for use by the organizations, agencies and individuals associated with the planning, development, management and research in the area of water resources. Except for the sensitive and classified data, all the information will also be in public domain.

There are six components of the scheme, viz., (1) Hydrological Observations including Snow Hydrology, Water Quality and Monitoring of Glacial Lakes; (2) Rationalization of Minor Irrigation Statistics; (3) Water Quality Assessment Authority; (4) Strengthening of Monitoring Unit in CWC including on line Monitoring of AIBP assisted projects and to assess irrigation potential by Remote Sensing Technique; (5) Creation of Watershed Maps and Geographic Information System; and (6) Data bank and on line Information System. The first four components are on-going activities and the last two activities were proposed during XIth Plan. The work on new components could be taken up only after June, 2008, subsequent to the approval of the Scheme in June, 2008.

The expenditure under the scheme was Rs. 45.47 Crore against the BE of Rs. 46.00 Crore during 2008-09. The component- wise achievements have been indicated below:

1. Hydrological Observations including Snow Hydrology, Water Quality and Monitoring of Glacial Lakes.

Ongoing activities of data collection and maintenance of sites and equipment are continuing. Agencies have been identified for assigning evaluation study of this activity in the X^{th} plan.

2. Rationalisation of Minor Irrigation Statistics (RMIS) Scheme

A Central Sector Plan Scheme "Rationalization of Minor Irrigation Statistics (RMIS)" is in implementation since 7th Five Year Plan. Main objective of the scheme is to build comprehensive and reliable data base in the Minor Irrigation Sector for future planning. For regular reporting, compilation 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.

Under the RMIS scheme, there is provision for conducting Census of Minor Irrigation projects on quinquennial basis. Detail information on irrigation sources, namely, Wells, Tube Wells, Surface flow and Surface lift schemes are collected and compiled on systematic basis throughout the country. Three censuses on Minor Irrigation projects have so far been conducted in the country. The report of the second and third census with reference years 1993-94 and 2000-01 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 and validation is in progress in the States/UTs.

During the year under review, an amount of Rs.9.98 crore have been spent against the Budget provision of Rs.9.98 crore.

3. Water Quality Assessment Authority

Water Quality Assessment Authority (WQAA) was constituted under Environment Protection Act, 1986, vide Gazette Notification S.O. 583(E) dated 29th May, 2001 by the Ministry of Environment & Forests, Government of India, New Delhi, to improve the quality of national water resources. The Authority is headed by the Secretary, Ministry of Environment and Forests as the Chairman and Joint Secretary (A), Ministry of Water Resources as Member- Secretary. The Authority has 12 Members.

A scheme namely, "Creation of Coordination Cell to assist the Water Quality Assessment Authority (WQAA) was introduced in the X Plan with an approved outlay of Rs.3.50 Crore. This activity is being continued in the XIth Plan period (2007-12) with an approved outlay of Rs.2.44 Crore for continuing to assist WQAA.

4. Strengthening of Monitoring Unit in CWC including online Monitoring of AIBP assisted projects and to assess Irrigation Potential by Remote Sensing Technique

Ongoing activities of Strengthening of Monitoring Unit in CWC including online Monitoring of AIBP assisted projects are continuing. Work is underway for award of evaluation study to external agency for evaluating the performance of this activity in the X Plan. An amount of Rs. 4.91 crore was spent during 2008-09.

5. Creation of Watershed Maps and Geographic Information System

The joint proposal of CWC & ISRO of the work "Generation of Data base & implementation of Web enabled Water Resources Information System (India – WRIS) in the country" has been approved at an estimated cost of Rs. 78.32 Crore. The MoU has been signed and advance payment of an amount of Rs. 16.59 Crore has been made to ISRO as sanctioned in BE 2008-09. A workshop with the concerned technical officers was held to finalise the data base structure and arrangements for data inputs for display on the identified digital maps.

6. Data Bank and online Information System

Nodal Officers have been designated in 29 States/UTs so that CWC can correspond with them for the purpose of setting up of data bank on water resources and related aspects. For creation of a new website for the system, the website name, <u>www.waris.gov.in</u> has been registered with NIC. Presently, the publications of the Information System Organisation of CWC have been put up on a separate page within the website <u>www.cwc.nic.in</u>. Other historical data on water resources and water related information are being arranged to be put up on the above page. The contents of the above web page will be transferred to the new website, <u>www.waris.gov.in</u> and made available under a new web design as soon as the new website is activated by NIC.

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 19.1.2006. The project has become effective from 5th April, 2006. The duration of the project is 6 years and is estimated to cost Rs.631.83 Crore supported with a loan of US\$104.98 Million from IBRD. Ministry of Water Resources is the Nodal Ministry for implementation of the project.

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, Goa, Punjab, Pondicherry and Himachal Pradesh and 8 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 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. At the State level also Steering Committees have been formed and Project Coordinators have been put in place. A meeting of National Level Steering Committee was held in January, 2009.

The project is to be implemented with the help of consultants. During the year 2008, three key consultants have been appointed for Technical Assistance and Management Consultancy (TAMC), Decision Support System for Planning and Management of Water Resources (DSS-Planning) and Decision Support System Consultancy for Real Time operation of the Bhakhra and Beas System of Reservoirs (DSS-RT).

In new participating states, data collection network and data centres are being created. In old HP-I States, the existing facilities of data collection, storage and communication are being strengthened and updated. The basis for DSS (P) studies have been identified in each state and necessary data is being collected and provided to DSS(P) consultants. 18 proposals of surface water and 13 of ground water domain for Purpose Driven Studies (PDS) have also been finalised to be carried out by the participating agencies.

The total expenditure on the project has been Rs. 29.91 crore during 2008-09.

INFRASTRUCTURE DEVELOPMENT SCHEME

A proposal for continuation of Infrastructure Development Scheme with an outlay of Rs. 115.00 crores by merging of four continuing schemes, viz. (i) Land & Buildings & Information Technology Plan of Central Ground Water Board; (ii) Land and 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 during Xlth Plan period was approved on 30.7.2008 by the Expenditure Finance Committee (EFC). Out of the total outlay

of Rs. 115 crores for the scheme, Rs. 99 crore is meant for Land & Building of the scheme and Rs. 16 crores is for IT component.

The scheme aims at providing a better environment in the offices and to achieve this, besides construction of offices, provision of hutments for field workers, separate funds have been kept for modernization of existing offices of CWC/MoWR etc. Efforts are also on to integrate and streamline existing scattered information systems into unidirectional dynamic E-governance mode.

With merger of four above mentioned continuing schemes, the implementation of these schemes has been streamlined. Ministry has already incurred expenditure of Rs. 9.38 crores in Land & Building and Rs. 96.98 Lakhs in Information Technology components of Central Water Commission/ Central Ground Water Board/ Ministry (Proper) under the Scheme.

FARAKKA BARRAGE PROJECT

The Farakka Barrage Project, with headquarters at Farakka in West Bengal, was commissioned in 1975 to serve the need of preservation and maintenance of Calcutta 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 Calcutta and surrounding areas. In January 2005, the jurisdiction of Farakka Barrage Project was extended to 40 km upstream and 80 km downstream of the Barrage to take up anti-erosion measures.

A Central Sector Plan Scheme under 'Transport Sector' was approved at estimated cost of Rs.350 crore during the current Five Year Plan. Besides the special repairs of the barrage gates, project colony etc, anti-erosion and bank protection works are included in the Plan scheme.

During the year 2008-09, Farakka Barrage Project Authority (FBPA) have completed the anti-erosion works in a length of 2570 meter at a cost of Rs. 22.82 crore in villages Birnagar-Simultala and Manikchak Ghat of Malda district on upstream of barrage; and in a length of 700 meter at a total cost of Rs. 6.07 crore in district Murshidabad at Ramrampur / Arjunpur and Dhuliyan villages on downstream of barrage.

Besides the regular anti-erosion works, interim measures were also taken in a length of 1033 meter at Manikchak Ghat amounting to Rs. 1.43 crore. Strengthening of partially damaged works at Birnagar/ Simultala were also completed in a length of 760 meter at a cost of Rs. 1.18 crore, by which land and public property was largely saved from heavy erosion by river Ganga.

INFORMATION, EDUCATION AND COMMUNICATION (IEC)

The Information, Education and Communication scheme aims to create awareness among various target groups about the importance of development and management of water resources in a holistic manner with due emphasis on a coordinated effort for addressing various water related issues. The objectives of the scheme are:-

- (i) To create awareness for optimal sustainable development, maintenance of quality and efficient use of country's water resources to match the growing demands on this precious natural resource with active involvement of all stakeholders in order to achieve accelerated, equitable, economic development of the country.
- (ii) To create awareness for the urgent need for mutual cooperation and adopting integrated planning and participatory approach in management.
- (iii) To create awareness among the people about necessity of water conservation.
- (iv) To promote advocacy on the tenets of National Water Policy with focus on learning, documenting and dissemination of knowledge of water science and technology and issues concerning sustained development of water resources.
- (v) To create awareness about necessity of adopting measures for rainwater harvesting and artificial recharge of ground water to meet present and future needs of water.
- (vi) To strengthen awareness infrastructure specially campaign mechanism and support structure.

The total outlay of the scheme is Rs. 83.00 crore for the XI Five Year Plan. An outlay of Rs. 13.00 crore had been allocated for the FY 2008-09 against which an expenditure of Rs. 9.05 crore was incurred on various mass awareness activities.

During the year 2008-09, the following major activities were undertaken under the IEC Scheme for generating mass awareness amongst various stakeholders.

96th Indian Science Congress

The Ministry participated in the 96th Indian Science Congress held in Shillong from 3rd to 7th January, 2009 by raising a pavilion on the theme of water. The educative theme of various exhibitory models, translites, posters, banners etc. were of special interest to university students who visited the pavilion.

Observation of World Water Day-2009

In consonance with the United Nations General Assembly's Resolution adopted on 22.12.1992 declaring 22nd March as World Water Day, Ministry observed World Water Day on 22.3.2009. This year, the theme of World Water Day, as declared by United Nations was "Trans-boundary Waters - Shared Waters, Shared Opportunities". On this occasion, a quarter page coloured advertisement containing messages of water conservation and advisory to the public in the shape of Do's and Do not's was released throughout the country on 22.03.09. Some workshops on various issues relating to water viz. Corporate Social Responsibility, Trans-boundary Aquifer Systems, IEC and Capacity Building in Water

Resources, Civil Society Participation and IWRDM, Water Quality, Health, Urban Water Security and IWRM, Conjunctive Use of Surface and Ground Water, Technology Transfer and Water Use Efficiency, R&D in Water Sector, Investment in Water Sector, Eco System Security etc. were organized from 23rd to 30th March, 2009. The recommendations finalized in different workshops organized by the Ministry of Water Resources at New Delhi were presented under the chairmanship of Secretary, Ministry of Water Resources in the concluding session organized at Vigyan Bhawan, New Delhi on 30.03.09. The recommendations made in different workshops emphasized the need of further consolidating the efforts for synergy of investments in the water sector being made by different agencies, participatory approach to management and development of water resources, measures aimed at promoting effective regulation, capacity building of the stakeholders and sustainable development of this scarce resource.

Thrissurpuram Festival

The Ministry participated through CWC in the Thrissurpuram festival held in April and May, 2008 in Kerala by raising a grand pavilion and depicting models to educate the public about various means of conservation of water and creating water literacy on other aspects of water through banners, posters, translates, etc. The pavilion was awarded the first prize for its beautiful and educative presentation.

Electronic Media Campaign

An electronic media campaign was carried out through Doordarshan and its regional channels and All India Radio including FM channels by airing video/audio spots on the theme of water to spread awareness about necessity and desirability of conservation and judicious use of water.

India International Trade Fair – 2008

The Ministry of Water Resources participated in the 28th India International Trade Fair (IITF) at Pragati Maidan, New Delhi during the period 14th to 27th November, 2008. Live models of rain water harvesting in the rural and hilly areas, water cycle on smaller scale through diorama, models on the activities of CWC, CWPRS, NIH, CSMRS, CGWB and other organisations of the Ministry were exhibited to depict wide variety of subjects concerning their activities. The interactive touch screens and pantomime shows were also arranged for the visitors, specially students to generate water literacy among them.

Mass Awareness Campaign

In the year 2008-09, Ministry printed and distributed 6 lakh Meghdoot Postcards with the design of Rainwater Harvesting structures and message on conservation of Groundwater.

Mass Awareness Programmes and Water Management Training Programmes

The Ministry organized Mass Awareness Programmes through CGWB throughout the country to create awareness on various water related regional problems and their feasible solutions. The Ministry also organized Water Management Training Programmes for various target groups including farmers, housewives, children, industrialists etc. During such programmes, the relevant literature was provided to the participants and their individual queries were attended on one to one basis.

Participation in Fairs and other Events

The Ministry participated through CWC and CGWB in the Asom International Trade Fair held from 4th February, 2009 at Guwahati by raising a grand pavilion and depicting models to educate the public about various means of conservation of water and creating water literacy on other aspects of water through banners, posters, translites etc. The pavilion was awarded the first prize for its beautiful and educative presentation.

The Ministry also participated in the Harihar Kshetra Sonepur Mela, 2008 held in Bihar in November, 2008 through distributing pamphlets and displayed Banners on water conservation.

Preparation of films/documentaries

A film has been prepared to compile the success stories from Farmers Participatory Action Research Programme for generating a multiplier effect.

Display of Backlit Translites and Hoardings at prominent places

Several backlit translites and hoardings on conservation of water were displayed at Metro Stations, Metro Pillars and Railway Stations of Indian Railways at Delhi.

IMPORTANT ACTIVITIES ORGANIZED DURING 2008-09

13th National Symposium on Hydrology

National Institute of Hydrology, Roorkee organized the 13th National Symposium on Hydrology with focal theme on **"Inflow Forecasting during Extremes"** during 28-29 August 2008 at IIT, Delhi. Besides the focal theme, other related aspects of hydrology including water resources management, environmental and social aspects of water, etc. were also covered during the Symposium. About 120 participants who included researchers/scientists, academicians/scholars, engineers, bureaucrats/ policy makers, planners, managers and non-governmental organizations (NGOs) interacted and shared their knowledge and experiences on various water related issues with special emphasis on inflow forecasting during extremes.

National Seminar on Conservation and Restoration of Lakes (CAROL-2008)

National Institute of Hydrology, Roorkee and National Environmental Engineering Research Institute, Nagpur jointly organized a two days National Seminar on Conservation and Restoration of Lakes (CAROL-2008) during 16 – 17 October, 2008 at NEERI, Nagpur. The main theme of the seminar was lake conservation and their restoration. About 105 participants, who included researchers /scientists, academicians / scholars, engineers, bureaucrats/policy makers and non-governmental organizations (NGOs) interacted and shared their knowledge for the management of lakes. About 76 research papers were presented during the seminar.

International Conference on Water, Environment, Energy and Society (WEES) – 2009

National Institute of Hydrology, Roorkee organized International Conference on Water, Environment, Energy and Society (WEES) – 2009 during January 12-16, 2009 in New Delhi. The Conference was inaugurated by Shri Saifuddin Soz, Honorable Union Minister of Water Resources on 12.01.2009. The main themes of the Conference were water and environment, water hazards, water for energy, water for other uses, water for society, etc.

Brain Storming Session on Impact of Climate Change on Water Resources and Adaptation Strategies



The Union Minister for Water Resources, Prof. Saifuddin Soz delivering his address on the occasion of inauguration of a Seminar on "Impact of Climate Change on Water Resources and Adaptation Strategies", in New Delhi on April 24, 2008.

Prof. Saifuddian Soz, Hon'ble Union Minister for Water Resources, Govt. of India inaugurated one day Brain Storming Session on "Impact of Climate Change on Water Resources and Adaptation Strategies" organized by the National Institute of Hydrology, Ministry of Water Resources at Central Soil and Material Research Station (CSMRS), New Delhi. During the session, it was mentioned that at the country level, Prime Minister's Climate Council will provide overall policy and mechanism to cope up with the impact of climate change on natural resources, social, economic and human

well being. The Ministry of Water Resources is to play a proactive role in devising adaptation, mitigation and coping strategies for tackling the impact of climate change on water resources.

INVESTIGATION OF WATER RESOURCES DEVELOPMENT SCHEMES INCLUDING INTER-LINKING OF RIVERS

A Central Plan Scheme "Investigation of Water Resources Development Scheme" was approved at a cost of Rs. 222.80 crore for implementation during XIth Plan. The Scheme has following two components:-

- 1. Investigation of Water Resources/multi-purpose Projects by CWC Rs. 40.00 crore
- 2. Inter-linking of Rivers Rs. 182.80 crore

Investigation of water resources/ multi-purpose projects by CWC

The work includes investigation of 10 Hydro-electric projects in Arunachal Pradesh, DPRs of Ujh Project in J&K and Kirthai Stage-II, Seli & Raoli in Himachal Pradesh, Investigation of Manas-Sankosh-Teesta Link Canal and Running & Maintenance of the existing Hydro-meteorological & Seismological stations in Sankosh Basin. An expenditure of Rs. 5.14 crore has been incurred during 2008-09.

Inter-linking of Rivers

National Perspective Plan (NPP) for Water Resources Development (1980) for interlinking of rivers comprises two components:

- i) Peninsular Rivers Development
- ii) Himalayan Rivers Development

30 links has been identified by NWDA (16 under Peninsular Component and 14 under Himalayan Component) for preparation of Feasibility Reports (FRs). Out of these, FRs of 14 links under Peninsular Component and 2 links (Indian Portion) under Himalayan Component have already been completed. Further, Detailed Project Reports of Ken – Betwa link has been completed and that of two more links, namely, Par – Tapi – Narmada and Damanganga – Pinjal were initiated during 2008-09.

An expenditure of Rs. 30.04 crore has been incurred during 2008-09 under physical progress.

Chapter 2

INITIATIVES IN NORTH-EAST

North East India 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.

North- East Water Resources Authority

Hon'ble Prime Minister announced in November, 2004 to consider the establishment of North-East Water Resources Authority (NEWRA) or Brahmaputra Valley Authority to provide effective flood control, generate electricity, provide irrigation facilities and develop infrastructure for the region. Accordingly, Inter-Ministerial consultations and discussions with the State Governments were held for setting up of NEWRA. All the States, except Arunachal Pradesh agreed to the proposal.

A High Level Group (HLG) to hold discussions and develop a consensus on utilizing the hydro power potential of Arunachal Pradesh and integrated development of the region through setting up of NEWRA was constituted in December, 2006. The composition of HLG is as given below:

Minister of Water Resources	-	Chairman
Deputy Chairman, Planning Commission	-	Member
Chief Minister of Arunachal Pradesh	-	Member
Chief Minister of Assam	-	Member
Member(WR & Energy),Planning Commission	-	Member

The first meeting of HLG was held on 27.12.2006. It was subsequently decided to prepare Feasibility Reports to bring out the comparative benefits and costs of storage and run-off of the river projects and to arrive at a policy decision considering available options. Accordingly, feasibility studies bringing out best options out of a number of options in respect of ten projects are being coordinated by Central Electricity Authority (CEA). The comparative study reports in respect of 7 projects were made available by CEA.

In order to discuss the issues concerning optimum utilization of Hydro Power potential of Arunachal Pradesh and to clarify on the concerns of the state, Member (WR & Energy), Planning Commission alongwith Member (Hydro), CEA and Commissioner (B&B), MoWR visited Itanagar on April 16-17, 2008. Discussions were held at a meeting chaired by Chief Minister of Arunachal Pradesh where important dignitaries

including 4 Ministers, Speaker, 22 MLAs and 4 senior officers were also present. During the meeting, there was a general political support for storage projects.

Brahmaputra Board

The important activities of Brahmaputra Board in North-Eastern Region are as below:

A) Pagladiya Dam Project: The preliminary works of Pagladiya Dam Project were initiated after approval of Government of India.

The project envisages assured irrigation to a gross command area of 54,160 ha, Flood benefit to 40,000 ha & incidental Hydro Power generation of 3 MW (I.C). 956 ha of land has been acquired against 3238 ha for rehabilitation & resettlement purposes.

The construction activities are, however, held up due to non completion of Zirat (property) survey by the Government of Assam. Attempts are being made to resolve the deadlock.

B) 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.

C) 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) and also diversion of Lohit (combined with Noa-Dehing) 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.

D) Protection of Majuli Island, Assam: Majuli 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 Government 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 have been completed in the year 2008.

Another scheme to provide flood protection and anti-erosion has been initiated. The scheme consists of three phases. Phase-I works at a cost of Rs. 56 crore are presently under progress. The physical and financial progress of phase-I works up to March 2009 are 92.50% and Rs.45.69 crore respectively.

Physical model studies for firming up the long-term measures and its design parameters have been carried out at NEHARI, North Guwahati. Based on the findings of the model studies, the DPR for phase-II & III have been prepared and approved for Rs. 115 crore.

(E) Anti-erosion works of Nagrijuli, Rangia town and Mukamua/Borbhag area from flood and erosion of Puthimari River, Assam – The estimate for Nagrijuli protection works for Rs. 4.89 crore have been technically cleared by CEC in the year 2005-06 and expenditure sanction was accorded during March 2007. The work is almost completed.

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 hydrological observation sites for 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 modernisation of Flood Forecasting activities, 19 telemetry stations have been installed in the region to improve lead time accuracy and presentation. Telemetry stations involve installing sensor based instrumentation and acquisition of data i.e. water level, rainfall and other meteorological data through satellite based communication system.

(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. Pahumara Irrigation Project (medium)
- 5. Modernisation of Jamuna Irrigation Scheme (Major/ ERM)
- 6. Borolia Medium Irrigation Project (Medium)

MANIPUR

- 1. Thoubal Multipurpose Project (Major)
- 2. Khuga 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)

An amount of Rs. 288.03 crore has been released for these schemes to NE States during 2008-09.

(b) Minor Irrigation Schemes

The Central Loan Assistance (CLA)/Central Assistance (CA) is also being provided to North Eastern States including Sikkim for Minor Irrigation (MI) Schemes under Accelerated Irrigation Benefits Programme (AIBP) of Central Government. Monitoring of these schemes on random sample basis is carried out by CWC.

A total of 6284 minor irrigation schemes have so far been included under AIBP for which Rs.1256.57 crore has been released. During 2008-09, 757 minor irrigation schemes were taken up. The amount released on these schemes and the on-going schemes of previous years stood at Rs. 540.85 crore

(c) 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, Loktak Lift Irrigation
- 3, Thoubal Multipurpose
- 4. Singda Multipurpose

5. Cluster of 8 MI Projects namely Saikot. Masemlok, Wangoo, Ethei Maru, Haipi, Lamlang, Satalok and Setou.

MEGHALAYA

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

MIZORAM

1. Cluster of 40 M.I. projects consisting of 36 (29 Flow 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, Lunglet and Chhimtuipui district)

NAGALAND

 Cluster of 11 M.I. projects in Medziphema Bowl TRIPURA
Cluster of 4 M.I. projects

(d) Farmers Participatory Action Research Programme (FPARP)

The monitoring of this scheme is being carried out by CWC.

The following two technologies which have been developed by the Water Management Division of ICAR are being demonstrated to the farmers:

(i) low cost micro rain water harvesting structure- Jalkund.

(ii) in-situ Residue Management for Moisture Conservation in Terraced Land.

Central Ground Water Board (CGWB)

The CGWB is conducting scientific and technical studies for ground water assessment, development and management in the North Eastern Region. Major achievements during the financial year 2008-09 are given below:

SI.No	Activities	Achievements
1.	Ground Water Management	14500 Sq. km (Pre-monsoon)
	studies	10374 Sq.Km. (Post-monsoon)
2	Ground Water Exploration	30 wells drilled in North Eastern Region
3.	Monitoring of Ground Water Wells	Monitored during April, August, November 2008 and January, 2009 through a network of 620 Ground Water Monitoring Wells. The water samples were collected during the pre-monsoon monitoring.
4.	Water Quality Analysis	463 samples analyzed for basic constituents and 428 samples have been analyzed for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc. and 18 samples analyzed for specific purpose.
5.	Short Term Water Supply Investigations	31 investigations
6.	Geophysical Studies	VES (Vertical Electrical Sounding) – 29
7.	Reports	20 District Ground Water brochures, 1 Ground Water Year Book of N E States were issued. 1 Ground Water Exploration Report submitted whereas 1 District Report under issuance & 1 State Report is under compilation.
8.	Estimation of Ground Water Resource of the entire Region based on GEC - 1997 Methodology	Completed
9.	Organized Mass Awareness Programme	1 Mass Awareness Programme completed
10.	Organized Training Programme on Rain Water Harvesting	1 Water Management Training Programme completed

Central Soil and Material Research Station (CSMRS)

CSMRS is involved with the following activities :-

Mass awareness programme on Conservation of Water and Environment

A one day mass awareness programme on "Conservation of Water and Environment" was jointly organized by Central Soil and Materials Research Station, New Delhi and

Meghalaya State Electricity Board, Meghalaya at Jowai, Jaintia Hills, Meghalaya on 24th March, 2009 as a part of World Water Day Celebration.

Training programme

A training programme on the topic "Quality Control for Hydroelectric Projects" was organized at Shillong, Meghalaya. 40 officers from different organizations in the North Eastern region participated in the training programme.

Development of infrastructure facilities in North Eastern Region

For the development of infrastructure facilities in research, educational institutions and projects located in the north-eastern region, equipments such as precision balance and portable drilling machine were purchased from the fund allotted by Government of India and issued to the Department of Geological Sciences, Guwahati University and Assam Engineering College, Guwahati respectively.

Central Water and Power Research Station (CWPRS)

CWPRS is carrying out Hydraulic model studies for:

- Power house tailrace joining works with river & Spillway aerator, Subansiri Lower HE Project, Arunachal Pradesh
- Diversion channel; Teesta low dam project Stage IV, Sikkim

National Institute of Hydrology (NIH)

The earlier existing North Eastern Regional Centre of the Institute at Guwahati has been 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 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, Ground water 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, structural and non-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, water quality assessment and iron and fluoride level determination in Karbi-Anglong district of Assam.

National Projects Construction Corporation Limited (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 Rs.90-100 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 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.

CHAPTER 3

INTER-STATE RIVER ISSUES

INTER-STATE WATER DISPUTES ACT, 1956

Inter-State Water Disputes Act, 1956 was originally enacted by the Parliament in 1956 for adjudication of disputes relating to waters of inter-state rivers and river valleys. In view of the Sarkaria Commission recommendations, Inter-State Water Disputes Act, 1956 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. 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 02.11.09 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 2.11.2009 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. Preliminary hearing of SLPs was held before the Hon'ble Supreme Court on 28th July 2008 and the Hon'ble Court passed the order that these appeals may be put up before a three member Judge Bench in the month of November, 2008. However, the matter did not come for hearing again and SLPs are yet to be disposed by the Hon'ble Supreme Court.

Expenditure incurred by the Tribunal

(F	Rs. lakh)
i) Expenditure incurred by the Tribunal during 2008-09ii) Cumulative Expenditure up to 3/09	136.71 1331.27
III) Budget Allocation for 2009-10	160.00

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, Chief Engineers of the basin States and Chairman, Central Water Commission as Members. The Authority is required to give effect to the implementation of the Interim Order dated 25th June 1991 of the Tribunal and its related subsequent orders. The CRA has held 6 meetings so far. Last meeting of CRA was held on 10.2.03. The CMC has held 23 meetings so far and its last meeting was held on 16.10.08. During the Water Year 2008-09, starting from June, 2008, as per the Interim Order, an inflow of 202.99 TMC was required at Mettur up to 30th April 2009. Against this, an inflow of 198.69 TMC has been received at Mettur up to 30th April 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 Krishna and river valleys thereof. The term of KWDT has been extended upto 01.04.09 as per the provisions of ISRWD Act, 1956. Meanwhile, in the Writ Petition filed by the Govt. of A.P., Hon'ble S.C. has ordered that the effective date of constitution of the tribunal will be 01.02.06. Consequently, the term of the tribunal has been extended up to 31.1.2010.

Progress in adjudication of the dispute

The KWDT passed orders on June 9, 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 90 Interlocutory Applications (IAs). All the 90 IAs filed so far have been disposed of by passing necessary orders.

Oral evidence of the Witnesses started during the previous year 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 continuing. 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. lakh)
(i)	Expenditure during 2008- 09	144.11
ii)	Cumulative Expenditure up to 3/09	483.47
(iii)	Budget Allocation for 2009-10	140.00

Vansadhara 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 Vansadhara 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 adverse effect of the executive action of Government of Andhra Pradesh in undertaking the construction of the aforesaid flood flow canal at Katragada and failure of Government 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 Vansadhara and its valley. It has also raised the issue of scientific assessment of available water in Vansadhara at Katragada and Gotta Barrage and the basis for sharing the available water.

Secretary (WR) convened an inter- State meeting on 24.4.2006 at New Delhi to explore the possibility of finding out negotiated settlement of the dispute. In the meeting, both the States agreed that yield of the river is to be shared between Orissa and Andhra Pradesh on 50:50 basis. Both States also agreed that CWC will 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 2.3.2007 by the Additional Secretary, MoWR with the Principal Secretaries of two States. Divergent views emerged to the meeting and it was felt appropriate to request Secretary, MoWR to hold another meeting with the Chief Secretaries of the States. The said meeting could

not take place due to inability shown by Chief Secretary of the Govt. of Orissa Meanwhile, a writ petition was filed by Orissa in this regard.

In the hearing dated 6.2.2009, the Hon'ble Supreme Court directed Central Government to constitute a water dispute tribunal within a period of six months from the date and refer to it the dispute relating to Vansadhara River. Further action in this regard is being taken by the Ministry.

Mahadayi/Mandovi River Water Dispute

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

Meanwhile, Government of Goa filed a Suit in the Supreme Court for setting up of Water Disputes Tribunal for adjudication of the above river water dispute and an Interlocutory Application (IA) for stay in construction activities in September 2006. The Suit with the Application has been listed on number of occasions before the Court. In its hearing on 30.4.2008, 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 27.9.2006, the State Government of Karnataka will not actually utilize the waters under Kalsa Banduri Project till next date of hearing. Further, in the hearing dated 14.10.08, 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.

RAVI & BEAS WATER TRIBUNAL

The Ravi & Beas Tribunal which was constituted on 2nd April, 1986 had 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 up to 5th August, 2009. The Tribunal's hearings have become dependent on the outcome of a Presidential Reference related to Punjab Termination of Agreement Act, 2004.

CHAPTER 4

CO-OPERATION WITH NEIGHBOURING COUNTRIES

Introduction

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

CO-OPERATION WITH BANGLADESH

Indo-Bangladesh Joint River Commission

An Indo-Bangladesh Joint Rivers Commission (JRC) is functioning since 1972 with a view to maintain liaison in order to ensure the most effective joint effort in maximizing the benefits from common river systems. The JRC is headed by Water Resources Ministers of both the countries. So far, 36 meetings have been held. The last meeting was held in September, 2005.

Treaty on Sharing of Ganga/ Ganges Waters at Farakka

A Treaty was signed by the Prime Ministers of India and Bangladesh on 12th December, 1996 for the sharing of Ganga/Ganges waters at Farakka during the lean season. As per the Treaty, the Ganges water is being shared at Farakka (which is the last control point on river Ganga in India) during the 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 the year. The Treaty is being implemented to the satisfaction of both the countries since 1997.

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 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. Flood data during the monsoon, 2008 was communicated to Bangladesh as per the above understanding.



Exchanging Records of discussions of 38th Meeting of Joint Committee by the Members, JRC



Visit to Joint Observation Site at Hardinge Bridge (Bangladesh) on river Ganga on 21st May, 2008

CO-OPERATION WITH BHUTAN

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 was accordingly 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 so far. The first meeting of JGE was held in Bhutan from 1st to 5th November, 2004 and the second meeting of JGE was held on February 26-27, 2008 at New Delhi.

CO-OPERATION WITH CHINA

In the year 2002, the Government of India entered an MOU with China for provision of hydrological information on Yaluzangbu/Brahmaputra river in flood season by China to India. In accordance with the provisions contained in the MOU, the Chinese side provided hydrological information (Water level, discharge and rainfall) in respect of three stations, namely, Nugesha, Yangcun and Nuxia located on river Yaluzangbu/Brahmaputra from 1st June to 15th October every year (upto 2007), which was utilized in the formulation of flood forecasts by the Central Water Commission. The above 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 05.06.08 during the visit of Hon'ble External Affairs Minister of India to Beijing from June 4-7, 2008. In pursuance, the Chinese side has started supplying the data w.e.f. 08.09.08.

Another Memorandum of Understanding was signed during the visit of the Chinese Premier to India in April, 2005 for supply of hydrological information in respect of 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 2007. 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 20 to 23 November, 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 Groups from both sides are led by the Joint Secretary level officers.

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

CO-OPERATION WITH NEPAL

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.

3rd Meeting of India-Nepal Joint Committee on Water Resources (JCWR)

3rd Meeting of India- Nepal Joint Committee on Water Resources (JCWR) headed by Secretaries (WR) of India and Nepal was held from 29th September, 2008 to 1st October, 2008 at Kathmandu (Nepal) to oversee the works of all existing bilateral technical bodies and expert groups in the field of water resources. JCWR recommended a three tier bilateral mechanism comprising of (i) Joint Ministerial Level Committee on Water Resources (JMCWR) to be headed by Ministers of Water Resources of India and Nepal, (ii) existing Joint Committee on Water Resources (JCWR) headed by Secretaries (Water Resources) of India and Nepal and (iii) Joint Standing Technical Committee (JSTC) headed by Chairman, GFCC from Indian side. JCWR also decided to set up Pancheshwar Development Authority (PDA) at the earliest for the development, execution and operation of Pancheshwar Multipurpose Project.

1st meeting of JSTC was held on 8-9 December, 2008 at New Delhi. JSTC recommended formation of a Committee on Flood Management to look into all matters related to floods and the works entrusted to other Committees viz., SCIP, SCEC, SCFF, JCFM and HLTC to JCWR. JSTC also formed 4 Task Groups to resolve issues related to inundation, flood forecasting, etc. It was agreed that SCEC would continue its work until a final decision is taken by JCWR.

4th Meeting of India- Nepal Joint Committee on Water Resources (JCWR)

4th Meeting of India- Nepal Joint Committee on Water Resources (JCWR) headed by Secretaries (WR) of India and Nepal was held on 12-13 March, 2009 at New Delhi. During the meeting, draft Terms of Reference (TOR) of Pancheshwar Development Authority (PDA) were discussed and it was agreed to discuss it further and finalize at the next meeting of JCWR.

Indian side reiterated its request to Nepalese side to provide security at all the sites of Sapta Kosi High Dam Multipurpose Project including Sun Kosi Storage cum Diversion Scheme so that the investigations may be resumed immediately to complete the works by June, 2010. Nepalese side conveyed that Government of Nepal was making all possible efforts to ensure that the work would resume at the earliest at the Sapta Kosi Project area. The Indian side stated that if this does not succeed within three months, downsizing of the Joint Project Office (JPO) should be considered.

JCWR finalized the Terms of Reference (TOR) of Joint Ministerial Level Commission on Water Resources (JMCWR).

JCWR also 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.

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.

During the 8th meeting of India- Nepal Joint Team of Experts (JTE) on Sapta Kosi High Dam Multipurpose Project and Sun Kosi Storage-cum-Diversion Scheme held from 15th to 17th December, 2008 at New Delhi, Nepalese side assured that Government of Nepal had taken necessary security measures for the resumption of field investigation works and instructed JPO-SKSKI to resume the field activities.

The tenure of JPO-SKSKI has been extended to June, 2010 to complete field investigation and preparation of DPR at a revised cost of Rs. 74.86 crore.

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.

Indo-Nepal Sub Committee on Embankment Construction (SCEC)

In order to prevent spilling of flood waters from Lalbakeya, Bagmati, Khando and Kamla rivers from Nepal side into Bihar, India and Nepal have agreed to extend the embankments along these rivers in Indian Territory to Nepal and tie to high ground in Nepal with corresponding strengthening of embankments on Indian side. In this connection, a Sub Committee on Embankment Construction (SCEC) was constituted which is responsible for planning, design and construction of these embankments.

During 2008-09, 11th meeting from 4 – 9 May, 2008 and 12th meeting from 2 -7 February, 2009 of SCEC were held at Birgunj and Kathmandu (Nepal) respectively. During the meetings, SCEC endorsed the tenders approved by the competent authority of Government of Nepal for works of embankment. Cost estimate for works on river Lakbakeya was also approved. Field visits were undertaken to see the physical progress of works and necessary instructions were issued to the concerned officers, wherever necessary.

CO-OPERATION WITH PAKISTAN

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

During 01.01.2008 to 31.03.2009, the Commission held three meetings, namely, the 100th Annual meeting in May-June, 08, 101st meeting in July, 08 regarding Kishenganga HEP & 102nd meeting in October, 08 regarding Baglihar HEP. The Commission also held four Tours of Inspection, namely, the 107th tour to Baglihar HEP in July, 08, 108th tour to Neelum Valley in August, 08, 109th tour to Baglihar HEP in October, 08 & 110th tour to Merala Head works in Pakistan in November, 08.

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 was sent to Pakistan every month.

Irrigated Cropped Area statistics for Indus, Jhelum & Chenab basins was also sent to Pakistan for the crop year 2007-08.

Flood flow data communications were sent by India to Pakistan for their benefit through Telephones and Radio Broadcasts during the period from 1st July to 10th October, 2008, for Indus system of rivers.

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-theart 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). The brief details are in Table 5.

Table 5.	EXTERNALLY	ASSISTED	ON-GOING	PROJECTS

World Bank

S No	State	Name of Project	Date of Agreement/ Completion	Amount of Assistance Donor Currency (in Million)	Cumulative Disbursement upto 31.03.09 Million Donor Currency
1	Karnataka	Karnataka Community Based Tank Management Project CR.3635-IN	06.06.2002 31.1.2009	SDR 80 Revised SDR 63.420	US\$ 46.826
2	Madhya Pradesh	Madhya Pradesh Water Sector Restructuring Project LN 4750-IN	<u>30.11.2004</u> 31.3.2011	US\$ 394.020	US\$ 79.375
3	Mahara- shtra	Maharashtra Water Sector Improvement Project-LN4796-IN	<u>19.8.2005</u> 31.03.2012	US\$325	US\$72.579
4	Rajasthan	Rajasthan Water Sector Restructuring Project Cr.3603-IN	<u>15.3.2002</u> 31.3.2010	SDR 93.452 (Loan)	US\$ 96.291

5	Uttar Pradesh	UP Water Sector Restructuring Project Cr.3602-IN	08.3.2002 31.10.2009	SDR 90.471 (Loan)	US\$ 57.610
6	Tamil Nadu	TamilNaduIrrigatedAgricultureModernization andWaterBodiesRestorationandManagementProjects(Cr.No.4846(IBRD)&Cr. <no.< td="">(IDA)</no.<>	<u>12.2.2007</u> 31.7.2013	US\$ 485	US\$ 58.363
7	Andhra Pradesh	Andhra Pradesh Community Based Tank Management Project Cr.4291-IN & 4857-IN	8.6.2007 31.12.2012	US\$ 189	US\$ 11.671
8	Karnataka	Karnataka Community Based Tank Management Project C.4872-IN & 3635-I-IN	<u>17.1.2008</u> 31.1.2012	US\$64	US\$ 0.852
9	Orissa	Orissa Community Tanks Management Project (7576-IN)	<u>27.01.09</u> 31.08.2014	US\$ 112.000	US\$ 4.000
10	Multi-State	Hydrology Project (Phase-II) Cr 4749-IN	<u>19.1.2006</u> 30.6.2012	US\$ 104.980 (Loan)	US\$ 17.649
Asia	an Developn	nent Bank (ADB)			
1	Chhattis- garh	Chhattisgarh Irrigation Development Project 2159-IND	20.3.2006 31.3.2013	US\$ 46.108 (Loan)	US\$ 5.839
Jap	an Bank for	International Coc	operation (JBI	C)	
1	Andhra Pradesh	Modernization of Kurnool-Cuddapah Canal (II)	<u>31.3.2004</u> 18.06.2012	JY 4773	JY 2811.784

2	Andhra	Andhra	Pradesh	20.3.2007	JY 23974	JY 415.642
	Pradesh	Irrigation	and	11.07.2016	(Loan)	
		Livelihood	Project			
3	Orissa	Rengali	Irrigation	<u>31.3.2004</u>	JY 6342	JY5531.834
		Project (II)	31.05.2011		
4	Rajasthan	Rajasthan	Minor	31.3.2005	JY 11555	JY 41.164
	-	Irrigation		28.07.2015		
		Improvem	ent			
		Project				
Kre	Kreditanstalt fur Wiederaufbau (Kfw), Germany					
1	Maharashtra	Minor	Irrigation	<u>31.12.1998</u>	EURO 23.008	EURO 9.998
		Project	(Kfw-	30.06.2011		
		financial				

There are 7 Externally aided Projects under pipeline, 3 with World Bank assistance and 4 with ADB assistance as indicated in Table 6.

Table 6. EXTERNALLY AIDED PROJECTS UNDER PIPELINE

A. WORLD BANK ASSISTANCE

cooperation)

S.No.	Name of Project	Estimated Cost (US\$ in Million)	Present Status
1	Dam Rehabilitation and Improvement Project (DRIP) - (Multi-state)	369.75	The World Bank Mission has identified 249 dams in 5 states. The views of State Govts. have been sought on issues of World Bank Pre- appraisal Mission relating to procurement and financial management, environment and social management, legal agreement, etc.
2.	Andhra Pradesh Water Sector Improvement Project, Modernization and Rehabilitation of Nagarjuna Sagar Project.	600.00	The State Govt. of Andhra Pradesh has sent a revised proposal for enhancement of the project cost. The DPRs for the project are still awaited from them.
3.	Orissa Water Sector Improvement Project	698.3	The major Project Components are: Basin Planning & Environment Action Plan; RBO; Mega Lift Schemes; R&R and IPDP; Dam Safety-II; Drainage

	(Mahanadi Delta); Minor Irrigation (91 schemes in 10 districts) and Flood Control measures.
	The comments of CWC on various components of the Project have been referred to the State for necessary compliance.

B. ASIAN DEVELOPMENT BANK

S.No.	Name of Project	Estimated Cost (US\$ in Million)	Present Status
1.	Orissa Integrated Irrigated Agriculture & Water Management Project	250	Detailed Project Report in respect of the Schemes for tranche-1 of the project has been evaluated by CWC.
2.	Sustainable Coastal Protection and Management Project	418	The ADB Project Preparation Technical Assistance Project Report is complete. The Project is now in transition phase. Initially, only 3 States viz. Goa, Karnataka and Maharashtra are covered.
3.	North Eastern Integrated Flood and River Bank Erosion Management Project (Assam)	149	Draft final Report (DFR) of the project prepared by the TA Consultant of the ADB is under examination.
4.	North Eastern Integrated Flood and River Bank Erosion Management Project (Arunachal Pradesh)		Aide Memoire received from ADB in March, 2009 is under examination.

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 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 geo physical 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 2008-09, 20 research schemes were under implementation, out of which 2 have been completed.

Indian National Committee on Hydrology (INCOH)

The Indian National Committee on Hydrology (INCOH) constituted in 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 2008-09, 32 research schemes were under implementation, out of which 7 research schemes have been completed. The Research & Development Session of INCOH was held in December, 2008 at Thiruvananthapuram.

Indian National Committee on Irrigation and Drainage (INCID)

The Indian National Committee on Irrigation & Drainage (INCID) was constituted in 1990, the apex body in Irrigation and Drainage with the responsibility of coordinating various research activities in the field of irrigation, drainage, agronomy, water management, environmental impact and socio-economic aspect of water resources projects, plasticulture development, geo-textiles. This is working as National Committee for India for the International Commission on Irrigation & Drainage (ICID). INCID contributes to various ICID meetings/ workshops/ conferences and to other international conferences. INCID is also involved in bringing out technical publications in the form of manuals, reports, bulletins and seminar proceedings, etc. During the year 2008-09, 33 research schemes were under implementation, out of which 2 schemes have been completed.

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

Two National Committees on Geotechnical Engineering (INCGE) and Construction Materials and Structures (INCCMS) constituted in 1991 & 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 2008-09, 26 research schemes were under implementation under the supervision of INCGECM. Out of this, 6 schemes have been completed. In pursuance of its objectives, the Committee has published 3 state-of-art reports in Geotechnical Engineering in the country.

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.

Status of R&D Schemes

Since 1992, 275 research schemes have been sanctioned to various academic and research institutions by the Ministry of Water Resources. Out of this, 175 schemes have been successfully completed, six schemes foreclosed and 94 schemes are under progress in various academic and research institutions. About 28 new research proposals are under consideration of the Ministry for funding under the research and development programme.

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 March 2009 to deliberate upon 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 MoWR and its organisations like CWC, CGWB; Non-governmental Organisations (NGOs) and academic experts in the field of water resources attended the workshop. The recommendations of the Reports are being examined for acceptance in view of the observations/ suggestions made by the State Governments and other stakeholders.

15th meeting of the Standing Advisory Committee (SAC)

The 15th meeting of the Standing Advisory Committee (SAC) of MoWR for Research & Development was held in February, 2009. A total of 18 new research proposals were considered by the Committee. Eight research proposals were approved for funding under the R&D Programme. Eight 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.

New Activities Proposed during XIth Plan

With a view to address the research problems in proper perspective, the State Government Institutions such as Engineering / Irrigation Research Institutes, Water & Land Management Institutes are being actively involved in (a) efficiency studies on completed major and medium irrigation projects; (b) effect of climate change on water resources and studies in respect of vulnerability assessment and adaptation; (c) reservoir sedimentation studies; (d) post-facto evaluation and management plan for optimal benefit from the resources; and (e) initiative of bench-marking of irrigation projects for performance improvement. Professorial chairs have been established at reputed academic institutions, namely, IIT, Roorkee, IIT, Kanpur, IIT, Kharagpur and IIT, Guwahati and NIT, Srinagar and NIT, Patna for carrying out studies on water resources with special emphasis on assessment and effect of climate change on it and adaptation strategies in respect of planning, design and management of water resources system of India.

NATIONAL ACTION PLAN ON CLIMATE CHANGE

With a view to address the possible threats posed by climate changes, the National Action Plan on Climate Change (NAPCC) was announced by the Hon'ble Prime Minister on 30th June, 2008. The NAPCC has laid down the principles and has identified the approach to be adopted to meet the challenges of impact of climate change through eight National Missions, namely, (a) National Solar Mission, (b) National Mission for Enhanced Energy Efficiency, (c) National Mission on Sustainable Habitat, (d) National Water Mission, (e) National Mission for Sustaining the Himalayan Eco-system, (f) National Mission for a Green India, (g) National Mission for Sustainable Agriculture, and (h) National Mission on Strategic Knowledge for Climate Change.

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 data base 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

In view of large number of stakeholders and numerous cross-cutting issues, consultative process was adopted for preparation of the Comprehensive Mission Document. The Document for National Water Mission was drafted and suggestions were invited from State Governments and various other stakeholders including experts, academic institutions, NGOs etc. on the draft Mission Document. The draft Mission Document was also uploaded on the website of the Ministry of Water Resources. A National Workshop was also held on 17th March, 2009. Based on the suggestions received from various States and stakeholders and the views that emerged during the deliberations at the Workshop, the draft Mission Document for "National Water Mission" has been revised.

CHAPTER 7

ORGANIZATIONS AND INSTITUTIONS

ATTACHED OFFICES

CENTRAL WATER COMMISSION

Introduction

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.

Organizational Set-up

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

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

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

Activities

The activities of CWC may be summarized as follows:

- Flood Forecasting and Assistance to State Governments. in Flood Management
- Collection and Analysis of Hydrological Data
- Techno-Economic Appraisal of Projects
- Monitoring of Projects and Projects receiving Central Assistance
- Design of Projects
- Surveys, Investigations and Preparation of DPR

- Studies on Environmental and Socio-Economic Issues
- Studies Related to Irrigation Planning and Water Management
- Basin Planning and Management
- National Water Resources Assessment
- Assistance in Resolution of Inter-State Water Disputes
- Construction and 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 and 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 and dissemination to bonafide users.

Hydrology Project-II

The role of Central Water Commission in Hydrology Project Phase-II consists of Institutional Strengthening and Vertical Extension. Under Institutional Strengthening, it is proposed to increase awareness for data dissemination and knowledge sharing, providing logistical support, etc. Under Vertical Extension, the major activities envisaged by the Central Water Commission are Development of Hydrological Design Aids including standardization of methodology/ protocols.

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

Status of major activities of CWC under H.P -II is as given below:

- Purpose Driven Studies (PDS) 18 proposals received from the States of Andhra Pradesh, Maharashtra, Orissa, Madhya Pradesh, Gujarat, Kerala, Tamil Nadu, Himachal Pradash as well as from NIH and Bhakra Beas Management Board (BBMB) were examined and cleared by HISMG (Tech.) and concurrence of World Bank on these proposals was received in June, 2008. Subsequently, two proposals were received from the State of Chhatisgarh, which are under examination.
- Development of Hydrological Design Aids The Technical Proposals for consultancy services for Development of Hydrological Design Aids were received

from the firms and were evaluated by the "Committee for Evaluation of Technical Proposals". Financial Proposals were opened on 19th March, 2009 after receiving necessary clearance from the World Bank. Financial as well as combined evaluation has been completed.

 Construction of NWA Building at Pune – The administrative approval for the works at NWA has been conveyed by MoWR on 22-8-2008. Matter has been taken with organisations like NPCC, MES etc. to take up the construction work as per World Bank procedures.

Water Quality Monitoring

Central Water Commission is monitoring water quality at 371 key locations covering all the major river basins of India. It has a three-tier laboratory system for analysis of the parameters. The level-I Laboratories are located at 258 field water quality monitoring stations on major rivers of India where physical parameters such as temperature, colour, odour, specific conductivity, total dissolved solids, pH and dissolved Oxygen of river water are observed. There are 24 level-II Laboratories located at selected Divisional Headquarters to analyse 25 physico-chemical characteristics and bacteriological parameters of river water. 4 Level-III/II+ Laboratories are functioning at Varanasi, Delhi, Hyderabad and Coimbatore where 41 parameters including heavy elements/toxic parameters and pesticides are analysed periodically. The data generated are computerized in the data base system and disseminated in the form of hydrological year book, status reports and bulletins. Water Quality year books are published and WQ Bulletins are issued regularly.

Flood Forecasting and Inflow Forecasting

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 2008 (May to October), 6675 flood forecasts (5656 level forecasts and 1019 inflow forecasts) were issued out of which 6529 (97.81%) 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.

Survey and Investigation

More than 200 Irrigation and Hydro-electric Projects have been investigated by CWC and the Detailed Project Reports (DPR) have been prepared and submitted to the concerned authorities. 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.

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; and
- (iii) Estimate the life of reservoir.

CWC has carried out hydrological studies in respect of almost all the projects in the country.

Hydrological studies are made in connection with Detailed Project Reports prepared by CWC. 110 projects were dealt by CWC during the year 2008-09 from hydrological point of view, out of which 8 projects were dealt as consultancy work and 102 projects were dealt for hydrological studies/review work.

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 132 projects out of which 85 projects (including 27 from North Eastern region) are at construction stage while the remaining 47 projects (including 21 from North Eastern region) are either at investigation or at DPR stage. Technical examination for 66 projects were also carried out. In addition to above, special studies have been carried out and special problems handled in respect of 9 projects.

Dam Safety

During the year 2008-09, two meetings (19th and 20th Meetings) of "" were held on 11.04.2008 and 23.09.2008 respectively at New Delhi. In the 19th meeting, seismic design parameters for 19 projects were discussed and the Committee approved the coefficients and response spectra for 8 projects and accorded conditional approval to 6 projects. In the 20th meeting, 14 projects were discussed and committee approved coefficients and response spectra for 4 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 hypothetical failure of the dam. The Dam Break Analysis is being carried out in CWC on consultancy basis using one dimensional mathematical model MIKE-11 developed by Danish Hydraulic Institute(DHI), Denmark. During the year, integrated dam break analysis of Omkareshwar Project and Indira Sagar Project have been carried out.

Environmental Management and Rehabilitation-Resettlement Issues

CWC has 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 projects located in the States of Uttar Pradesh, Rajasthan, Orissa and Andhra Pradesh are also being taken up.

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 on going major & medium reservoir projects, data on rehabilitation measures have been collected and data base has been generated / updated.

Project Appraisal

Since 1961 till March, 2009, CWC has appraised more than 1546 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.

During the year 2008-09, technical examinations of 37 Water Resources projects (14 Major irrigation, 9 Medium irrigation and 14 Flood protections) were completed and accepted by Advisory Committee. At present 169 irrigation schemes (111 Major & 58 Medium) are under different stages of appraisal.

Project Monitoring

Central Water Commission monitors the progress of selected on going 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 2008-09, CWC has carried out general monitoring of 95 on going major, medium and Extension, Renovation and Modernization (ERM) projects. This includes 16 major pre-fifth / fifth Plan projects which have been put under vigorous monitoring.

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 126 major and medium projects under AIBP.

Monitoring of Centrally Sponsored Command Area Development Programme

The coordination and other related works of monitoring of CAD Programme in respect of 135 projects in 28 states was carried out by CWC. During the year 2007-08, 73 and during the year 2008-09, 18 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:

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

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

The progress of work done during 2008-09 is as under:

- (1) Satellite Remote Sensing based reservoir sedimentation study (in house) of 2 reservoirs has been completed. Study of 4 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 is under progress.
- (2) CWC & ISRO has jointly undertaken the work of Development of Water Resources Information System (WRIS) during 11th plan. The estimated cost of the project is Rs. 78.32 crore for which the approval from MoWR has been received & MoU has been signed between the two parties. The work is under progress.

In order to update the Status of the data of Working Group Report, 1991, by Ministry of Water Resources, on water logging, salinity & alkalinity, a study on "Assessment of Waterlogged and Salinity and / or Alkalinity affected areas in irrigated commands of all major and medium projects throughout India using Remote Sensing Technique" was taken up by Central Water Commission in collaboration with "Regional Remote Sensing Service Centre" (RRSSC), Jodhpur during the period Oct 2003-June 2008. In the third and fourth phases of the study, eleven reports in respect of Uttar Pradesh, Uttarakhand, Jammu & Kashmir, Kerala, Andhra Pradesh, Tamil Nadu, Orissa, West Bengal, Himachal Pradesh, North Eastern States and Union Territories were prepared. These reports were approved in the 6th and 7th TAC Meeting held on 06/10/2008 & 07/10/2008 respectively. All the 23 reports in this regard are expected to be completed by June, 2009.

Benchmarking of Irrigation Projects

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, 7 regional workshops and 4 project level workshops have been organized in various parts of the country.

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. These guidelines have been placed on the website of CWC (www.cwc.nic.in).

Study of Water Use Efficiency in Irrigation System

A Technical Advisory Committee headed by Member (WP&P), CWC has been constituted to oversee and guide in conducting studies relating to water use efficiency in irrigation system. So far, 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 in its 7th meeting. So far 14 final reports have been received from WALMI's / Research institutes. Out of 14 Final Reports, 10 have been examined by core group and 6 reports have been accepted.

Reservoir Operation and Water Resources Systems Engineering

During the year 2008-09, 21st meeting of Joint Operation Committee (JOC) for Rihand reservoir was held on 07-10-08 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 and Basin Panning & Management Organisation of CWC (as one of the central agencies) is providing necessary technical inputs in this regard.

The CWC publication entitled 'Evaporation Control in Reservoirs" (1990) has been revised and is under printing.

National Water Academy and Other Training Activities

National Water Academy at Pune is functioning as a Centre of Excellence for in-service training of Water Resources Engineering Personnel of State Government, Central Water Commission and other Central organizations. During the year 2008-09, 28 courses were conducted at NWA. So far, the Academy has conducted 280 courses, in which 6582 officers have been trained since its inception in 1988.

In addition, the Training Directorate at Headquarters has organised 19 courses during 2008-09. About 400 officials of various State Government and Central Government Organizations/ Departments have undergone training through these courses. So far, Training Directorate has conducted 435 courses on various topics related to Water Resources Development. About 11,900 officials have undergone training through these courses.

Snow melt runoff forecasting in Himalayan River Basins

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.

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

- Soil mechanics and foundation engineering including soil dynamics, geotextiles, soil chemistry and rockfill technology
- Concrete technology, drilling technology for sub-surface characterization and construction materials
- 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 75 river valley projects and other civil engineering structures has been handled successfully. The work comprised field and laboratory investigations for soil, rock, geosynthetics, water and other construction materials. Further, quality control aspects of on going projects and instrumentation etc. formed a part of the works undertaken. Some of the important projects handled include:-

- Salma Dam Project, Afghanistan
- Saptakosi H.E. Project, Nepal
- Sun Kosi Storage-cum-Diversion Scheme, Nepal
- Myntdu Leshka Project, Meghalaya
- Subansiri Lower Project, Arunachal Pradesh
- > Arakot-Tiuni ,Koteshwar ,Kotlibhel ,Tehri Dam Projects, Uttarakhand

- ➢ Kol Dam Project, H.P.
- Ken-Betwa Link Canal Project, M.P.
- Sardar Sarovar Multipurpose Project, Gujarat
- Punatsangchu H.E. Project, Bhutan
- Kopili H.E. Project, Assam
- Dagmara H.E. Project, Bihar
- Mapang-Sirkari, Rupsiabagar-Khasiabara, Natwar-Mori H.E. Projects, Uttarakhand

Training Programmes

Seven training programmes were conducted on the following subjects:

- > Water Quality and its Management (NIH in collaboration with CSMRS)
- Soil Laboratory Testing exclusively for officers from Indian Metereological Department
- Material Testing and Quality Assurance of Earth and Rockfill Dam A tailor-made programme for NTPC Engineers
- Concrete Technology for Hydro Power Projects
- Geo-technical Instrumentation of Hydro Power Projects
- Induction Training Course for newly recruited Assistant Directors of CWC
- > Quality Control for Hydro Electric Projects for Engineers of North-Eastern Region

Institutional Co-operation Programme

An institutional co-operation programme on "Safety Evaluation and Risk Assessment for Ageing Dams in India" was signed between Norwegian Geotechnical Institute, Norway and CSMRS on 27th December, 2006 for a period of three years. The areas of co-operation in this project are:

- Implementation of Failure Modes and Effect Analysis (FMEA) and Event Tree Analysis (ETA) for assigning priority on remedial measures.
- Development of a methodology for probabilistic risk assessment of dams in India, including the impact of dam failure on downstream elements at risk, and perform hazard and risk assessment.
- ➢ Back analysis of an existing dam that has suffered deterioration.
- Stability analysis of main dam structures and reservoir rim.
- Instrumentation and performance based monitoring for evaluating and reducing the risks associated with ageing dams.
- A comparison and review of numerical techniques for static and dynamic analysis of dams

Under the present institutional cooperation programme, two officers have visited the Norwegian Geotechnical Institute, Oslo, Norway. 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).

SUB-ORDINATE OFFICES

CENTRAL GROUND WATER BOARD (CGWB)

The Central Ground Water Board is entrusted with the responsibilities of scientific management studies, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country. The data generated from various studies provide a scientific base for user agencies for water resource planning. Besides advising states and other user agencies on planning and management of ground water schemes, the Board is also taking up special studies on R&D, artificial recharge, conjunctive use of surface & ground water, water balance and geogenic contamination, etc. It also organizes various training courses for personnel of its own as well as Central/State Government organizations engaged in ground water related activities.

The Central Ground Water Board is headed by the Chairman and has four main 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 Board are being 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 unit offices for undertaking various field activities.

Central Ground Water Authority (CGWA) constituted under the Environment (Protection) Act, 1986, has been entrusted with regulation and control of ground water development and management in the country.

The achievements of CGWB in respect of their main activities during 2008-09 are as follows:

Ground Water Management Studies: An area of 1.62 Lakh sq. km was covered during pre-monsoon period and Post-monsoon studies have been completed in 1.55 Lakh sq. km.

Ground Water Exploration: The CGWB has explored high yielding aquifers in various States/UTs under its scientific exploratory drilling programmes by utilizing latest studies and technologies which includes remote sensing and geophysical techniques. The CGWB provided support to Indian Army in ground water exploration in Siachin valley to meet the drinking water requirement.

During financial year 2008-09, the CGWB under their Ground Water Exploration Programme, constructed 761 wells (EW-404, OW 159, PZ-197, SH-01) including 60 high yielding wells to assess the ground water potential in different hydrogeological set ups. Priority was accorded to drought affected and tribal areas, hard rock areas, pollution affected areas, etc. The study will help in identifying ground water sources and in guiding the states to adopt follow up action with regard to ground water development for drinking water supply and other demands.

Monitoring of Water Level and Water Quality: 15600 Ground Water Observation Wells monitored and water samples collected.

Geophysical Studies: Carried out 1932 Vertical Electrical Soundings, 10.88 line kilometer resistivity profiling and conducted geophysical logging of 88 bore holes in various parts of the country.

Water Quality Analysis: 17937 samples have been analyzed during the year up to 31 March, 2009, out of which 15620 samples were analysed for basic constituents, 2228 samples for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc. and 89 samples for organic and specific constituents.

Short- term Water Supply Investigations (Need based): 116 investigations were carried out all over the country till 31 March,2009 for augmentation of water supply in respect of various organizations in the country including Defence Establishments, Railways, etc.

Artificial Recharge to Ground Water: A scheme on "Rain Water Harvesting and Artificial Recharge to Ground Water" for 2006-09 is being implemented in 8 identified areas in Andhra Pradesh, Tamil Nadu, Karnataka and Madhya Pradesh. Under the scheme, recharge structures in over-exploited areas were approved for implementation by the respective state departments under the overall technical guidance of CGWB with 100% funding by the Central Government under Central Sector Scheme. The approved cost of construction of recharge structures in cluster mode is Rs. 5.95 Crores. Out of 200 project proposals approved under the scheme, 191 have been completed.

Estimation of Ground Water Resource based on GEC-1997 Methodology: The Dynamic Ground Water Resource of the country has been jointly estimated by respective state ground water departments and Central Ground Water Board, based on the methodology recommended by Ground Water Resource Estimation Committee-1997 (GEC-97). The ground water resource is estimated as on March, 2004.

The Report on "Dynamic Ground Water Resources of India" has been printed and circulated. Brief details are given in Table 7.

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

Table 7. Dynamic Ground Water Resources of India

Rajiv Gandhi National Ground Water Training and Research Institute (**RGNTRI**):-Fifteen training programmes have been conducted by the Institute during the year 2008-09. 308 trainees from various disciplines were trained in these training courses conducted at various places.

Research & Development Schemes: An Indian National Committee on Ground Water (INCGW) under the Chairmanship of Chairman, CGWB was constituted by the Ministry of Water Resources in September 2008. A sub committee of Indian National Committee on Hydrology (INCOH) has also been constituted on R&D in Ground Water with a view to accelerate the development programmes in ground water sector and to give due consideration for taking up research in the field of ground water. This Subcommittee examines the project proposals received on ground water issues to assess their suitability for funding.

Exhibitions/Trade Fairs/Workshops: In order to educate the stake holders about the importance of ground water conservation and sustainable use of ground water, the CGWB organized 19 Workshops at 18 Regional offices and State Unit Office, Delhi and also participated in various Exhibitions/Trade Fairs including India International Trade Fair-2008. Various techniques of rain water harvestings and artificial recharge to ground water and ground water development were demonstrated through live models in these workshops/trade fair. The awareness material relating to ground water related issues were also distributed.

Web Enabled Ground Water Information System (WEGWIS): A Web Enabled Ground Water Information System for dissemination of ground water related information has been developed by CGWB. The Ground Water Information System provides access to various thematic layers as well as the nation wide data base on ground water level and water quality generated by CGWB. This initiative will help more effective sharing of information relating to ground water resource availability and water 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 on ground water. 11 States/UTs, namely, Andhra Pradesh, Goa, Tamil Nadu, Lakshadweep, Kerala, Puducherry, West Bengal, Himachal Pradesh, Bihar, Chandigarh and Dadra and Nagar Haveli have already enacted and implemented the legislation while remaining 18 other States/UTs are in the process of taking necessary action in this regard.

Central Ground Water Authority: Central Ground Water Authority (CGWA) has been constituted under the Environment (Protection) Act of 1986 for regulation and control of ground water development and management in the country.

Decentralization of Powers and Functions of CGWA

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

Ground Water Recharge Programme

During the XI Plan, artificial recharge studies are being taken up under the on going Central Sector Scheme of Ground Water Management & Regulation in priority areas viz. over-exploited and critical assessment units, urban areas showing steep decline in ground water levels, drought prone and water scarcity areas, coastal areas, sub-mountainous/ hilly areas etc. The fund earmarked for demonstrative recharge projects is Rs. 100 Crores. The civil works is to be carried out by State Govt. Departments as implementing agencies on cost deposit basis. In order to examine and approve the projects, Technical Coordination Committee and State Level Technical Coordination Committees have been constituted.

CENTRAL WATER AND POWER RESEARCH STATION

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

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 water samples and civil engineering materials. Another area of activity is calibration of different types of flow/ current meters. CWPRS has made significant strides in the application of remote sensing techniques for providing solutions to river and coastal engineering problems. The requirement of accurate and reliable instrumentation for data acquisition and control systems for physical model studies/ prototype measurements is met by in-house developments.

Organisation

CWPRS provides specialised services through physical and mathematical model studies in river training and flood control, hydraulic structures, harbours, coastal protection, foundation engineering, construction materials, pumps and turbines, ship hydrodynamics, hydraulic design of bridges, environmental studies, earth sciences and cooling water intakes. The major 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 Khadakwasla, Pune, to provide safe, economic and rational technical solutions. During the current year, more than 100 technical reports based on applied research studies were submitted to various project authorities.

CWPRS undertakes assignments on a *no-profit no-loss* basis. During the period under reporting, more than 209 new research studies, pertaining to the three major sectors - namely, water resources, energy and water borne transport - were awarded by various project authorities to the institution.

Some of the important projects investigated and the studies carried out using Physical/Mathematical model and field investigations by CWPRS during the current year are listed below:

- > Diversion channel Teesta low dam project Stage IV, Sikkim
- Schedule of gate operation of Sardar Sarovar dam Spillway, Gujarat
- Pump sump of proposed 4 x 250 MW Maithon Thermal Power Station
- > Development of fishing harbour at Karanja in Raigad District, Maharashtra
- Proposed embankment for protection of left bank of river Yamuna from Nizamuddin road bridge (NH-24) to Chilla regulator, New Delhi
- Bridge on river Vamsadhara at Gumuda Village, Orissa
- > Spillway of Dhanikari dam, Andaman & Nicobar
- > Spillway aerator and tail race for Subansiri Lower HE Project, Arunachal Pradesh
- Proposed river front development on right bank of river Yamuna downstream of Okhla barrage, New Delhi
- Tidal hydrodynamics for the proposed groynes at the mouth of Nandgaon Creek, Murud, Maharashtra
- Augmentation of existing storm water drainage system of Rihand Super Thermal Power Project Stage III, UP
- Tidal hydrodynamics, siltation and hot water recirculation for the proposed 4 x 330 MW capacity Thermal Power Plant of M/s Adani Power Ltd., at Mundra
- > Flood embankment in Mahananda basin, Bihar
- Identification of dumping ground for disposal of dredged material at Aerial bay, Diglipur and Junglighat, Port Blair
- Identification of dumping ground for disposal of dredged material at Neil island, Port Blair
- Effect of proposed Rewas Ports Ltd., channel (-14.5) on the prevailing flow and siltation pattern in the extended MbPT/ JNPT channel and JNPT port facilities
- > Locating intake/ outfall of the proposed desalination plant in Kharo creek, Gujarat

- Area drainage studies and determination of safe grade elevation for proposed Krishnapatnam Ultra Mega power project of M/s CAPL, AP
- Wave propagation, tidal hydrodynamics and shore line changes for proposed ship building yard near Cuddalore, Tamil Nadu
- Tidal hydrodynamics and siltation aspects for development of fisheries harbour at Vellayil, Parappanangadi, Thanur, Kerala
- Examining wave tranquility and predicting shoreline changes for development of outer harbour and Cochin port and fisheries harbour at Manjeshwar, Kerala
- Extension of Essar jetty at Hazira for M/s Essar Bulk Terminal Ltd., Gujarat
- Assessing the effect of proposed Gomati river development front near Lucknow
- Wave propagation for the proposed development of Rajapur Shipyard at Rajapur, Maharashtra
- Morphological studies for assessing stability of Kosi river in the vicinity of proposed barrage at Dagmara
- Design of shore protection works for more than 20 sites along the coast of Maharashtra, Karnataka, Kerala, Andhra Pradesh, Gujarat and Tamil Nadu.
- Restoration of damaged breakwater at Mus, Car Nicobar
- Area drainage studies for proposed Sasan Ultra Mega Power Project, MP, Meja Thermal Power Project, UP
- Location and hydraulic design of intake for proposed Sasan Ultra Mega Power Project , MP
- Estimation of water availability and location and type of intake structure for proposed Meja JV Thermal Power Project, UP
- Evaluation of site-specific design seismic parameters for the proposed Hongadhalla and Bettakumbri earthern dams for Gundia HE Project, Karnataka
- Storm wave hind-casting and storm surge analysis for the proposed ship building yard near Cuddalore, Tamil Nadu
- Estimation of water availability and location and type of intake structure for proposed New Nabinagar Thermal Power Plant, NTPC for Bihar
- Evolving measures for prevention of floating debris and hot water recirculation in the intake canal of Rihand STPS, UP
- > Existing intake well of Kahalgaon STPS of NTPC in river Ganges, Kahalgaon
- Location and type of intake structure for proposed Vaishali Power Generation Company Ltd., Bihar
- Design of re-aligned south breakwater at old Mangalore Port for M/s ANZDEC Ltd., New Zealand, ADB consultant
- Bank protection works for river Gomati near Lucknow, UP
- Design of breakwater for the proposed development of Rajapur Shipyard, Maharashtra
- Seismological studies at Tala HE Project and Sankosh Project, Bhutan.
- ➢ Water flow measurement of Tillari Hydro Power Station, Maharashtra
- Rating of Tungabhadra Left Bank Canal, Karnataka
- Non-destructive testing for the masonry dams of Vihar, Tulsi and Powai lakes
- Underwater seismic survey at Nangal Hydel Channel, Punjab

- Ultrasonic testing of TG foundation of unit No. 2 New Parli Thermal Power Station, Maharashtra
- Tracer studies for assessing interconnection of well-water with the Andhali Tunnel water at Jihe-Kathapur Lift Irrigation Scheme, Maharashtra
- Monitoring of blast vibration during excavation at Koyna Dam Foot Power House (LB) Koynanagar, Maharashtra
- Studies for identification of suitable epoxy compound for strengthening of generator barrel and draft tube of unit No. 3 at Koyna
- Controlled blast studies for widening and deepening of Mithi river from Mahim Causeway to CST bridge, Mumbai
- Monitoring of blast vibrations during excavation of shaft and tunnel for sea water intake system for 500 MW PFBR project, BHAVINI, Kalapakkam, Tamil Nadu
- Hydraulic model studies for spillway & power Intake structure and Mathematical model studies for surge shaft of Pare H.E. Project, Arunachal Pradesh for NEEPCO
- Estimation of site specific design seismic parameters for Tawang Stage-I & II projects, Arunachal Pradesh for M/s NHPC Ltd.
- Hydraulic model studies for tailrace tunnel of Chukha H.E. Project, Bhutan for M/s WAPCOS
- Physical hydraulic model studies for proposed barrage across river Falgu at Uderasthan, Jehanabad, Bihar
- Hydraulic model studies for sluice spillway (2D Sectional Model) and Hydraulic model studies for spillway & power intake (3D Comprehensive Model) of Punatsangchhu-I H.E. project, Bhutan for M/s WAPCOS
- Hydraulic model studies for power intake, desilting chamber for flushing of sediment from reservoir, silt flushing tunnel, beyond desilting chamber and Mathematical model studies for reservoir sedimentation, Punatsangchhu-I H.E. project, Bhutan for M/s WAPCOS
- Seismological studies at Punatsangchhu-I H.E. project, Bhutan (January 2009 to December 2013) for M/s WAPCOS

Dissemination of Technical Information

- A total of 90 staff members participated and 36 papers presented in various conferences/ workshops/ seminars/ courses/ training; Moreover three technical memoranda were published during the period.
- CWPRS officers delivered 25 technical lectures in different training courses organised by the National Water Academy, Pune and other institutions.

GANGA FLOOD CONTROL COMMISSION

Introduction

Ganga Flood Control Commission, a subordinate office of the Ministry of Water Resources was established in 1972 with its headquarters at Patna.

The Commission has been assigned the task of preparing comprehensive plans for flood management of the river systems in the Ganga basin, phasing/sequencing of programme

of implementation, monitoring, performance evaluation of various flood management schemes, assessment of adequacy of waterways under road and rail bridges and providing technical guidance on flood management to the basin states, namely, West Bengal, Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, Chhattisgarh, Madhya Pradesh, Delhi, Haryana, Himachal Pradesh and Rajasthan. The Commission also accords technical clearance of flood management schemes of the Ganga basin states.

Achievements

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 is being done based on site inspection after every flood season. The GFCC was pioneer in the Kosi breach closure work that occurred in the Eastern Afflux bund of Kosi Barrage in August, 2008 in Nepal. The breach has been closed and its further strengthening work is under progress. So far Rs. 69.90 crore have been released to WRD, Bihar for this purpose by MoWR, Govt. of India.

Updating of Comprehensive Plan for Flood Management

Comprehensive Plans for flood management for all the 23 river systems of the Ganga basin have already been prepared between 1975 and 1990. The updating of the comprehensive Plans is underway. So far Comprehensive Plans for 22 river systems have been updated. During the year 2008-09, updation of the Comprehensive plan of Burhi Gandak was completed.

Monitoring of Important Flood Management Schemes

GFCC is monitoring the following flood management schemes:

- ➢ Ghea-Kunti Drainage Scheme, West Bengal.
- > Tamluk Basin Drainage Scheme, West Bengal.
- Urgent Development Work in the Sunderbans in West Bengal.

In addition, the following centrally sponsored schemes are also being monitored.

- Maintenance of flood protection works of Kosi and Gandak Projects.
- > Extension of embankments along Lalbakeya, Kamla, Bagmati and Khando rivers.
- Critical anti-erosion schemes being executed by the states of West Bengal, Bihar, Jharkhand, Uttar Pradesh, Uttarakhand & Himachal Pradesh.
- Schemes approved under Flood Management Programme during XIth Plan.

Technical Examination of Flood Management Scheme

Technical examination of flood management scheme of Ganga basin States is a continuing activity of GFCC. 49 schemes pertaining to eleven states of Ganga basin have been appraised in GFCC.

Expenditure on GFCC

The actual expenditure stood at Rs. 383.58 lakh during the period 2008-09.

FARAKKA BARRAGE PROJECT

Background

The Farakka Barrage Project, with headquarters at Farakka in West Bengal, was commissioned in 1975 to serve the need of preservation and maintenance of Calcutta 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 Calcutta and surrounding areas. The rail-cum-road bridge built across the river Ganga at Farakka establishes direct road and rail communication link to the North-Eastern States. The Bhagirathi, the Feeder Canal and the Navigation Lock at Farakka form part of the Haldia-Allahabad Inland Waterway (National Waterway No.1).

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 six Divisions each headed by an Executive Engineer. Except Jangipur Barrage Division and its field units, 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 upland supplies from Ganga at Farakka into Bhagirathi
 - o Preservation and maintenance of the Calcutta 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 county, 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 Project – for undertaking anti-erosion and bank protection works. Subsequently there has been, since the year 2005, 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 Project. 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 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 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. Physical and financial achievements during the year 2008-09 are presented in Table 8.

Table 8. Anti – Erosion Works completed during 2008-09

(Rs. crore)

SI No.	Name of Work	Length (M)	Expenditure upto March, 2009
1	Anti Erosion Works :		
	 Anti erosion work upstream of Barrage on the left bank of river Ganga at Manikchak. 	1650	13.54
	 Anti-erosion work downstream of Barrage on the right bank of river Ganga at Ramrampur, Arjunpur & Dhulian. 	700	5.71
	(iii) Anti-erosion work upstream of Barrage on the left bank of river Ganga at Simul Tola / Bir Nagar.	870	9.42
	 (iv) Anti-erosion measures in partially damaged reaches on left bank of river Ganga near Bir Nagar upstream of Barrage. 	760	1.21
	 (v) Interim measures for protection of left bank of river Ganga (a) near Manikchak Ghat. (b) At Right Bank of river Ganga at Dipchandpur 	800 50	1.32
2	Anti-Erosion Works – Liability of previous works carried out at Mova on		0.76
	Right bank of Ganga in 2006-07		

During the current financial year, anti-erosion and bank protection works at Manikchak Ghat and Pachanandapur, both in the upstream of Farakka Barrage Project, are in execution in accordance with the design and drawings furnished by the Central Water Commission. Such works at Sagardighi and Dhuliyan in West Bengal, downstream of Farakka Barrage Project, are under processing.

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.

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 28th April, 1961. It has been decided that the Technical Advisory Committee will be a Standing Committee to render technical advice on matters specifically referred to it. The Committee is chaired by the Member, Design & Research, CWC.

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.

SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE

Composition and Functions

The Sardar Sarovar Construction Advisory Committee (SSCAC) was constituted in 1980 by the Government of India in accordance with the directives of the Narmada Water Disputes Tribunal (NWDT) with a view to ensure efficient, economical and early execution of Unit-I (Dam and Appurtenant works) and Unit-III (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 Irrigation, Power, Finance and Revenue etc. concerned with the construction of the project, of the four party States viz. Gujarat, Maharashtra, Rajasthan and Madhya Pradesh along with their counterparts from Government of India and the Narmada Control Authority, are Members of the Committee. The Committee has a full time Secretary of the rank of the Chief Engineer belonging to the Central Water Engineering Service.

Meetings of the Permanent Standing Committee (PSC) of SSCAC

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

Two meetings of PSC of SSCAC were held during the year 2008-09. The 95th meeting of PSC was held on 16th May 2008 at New Delhi and 96th meeting was held on 21st January 2009 at New Delhi. The following important issues were discussed in the above two meetings:

- Time extension and revision of rates for the civil works of underground River Bed Power House of Sardar Sarovar Project (SSP).
- > Revision of rates for the Main Dam works of SSP.
- Revised Implementation Schedule (RIS-September 2003) for construction of Garudeshwar Weir.
- Revised Estimate of Unit-I and Unit-III of SSP at 2005-06 price level.
- Review of the progress of Unit-I and Unit-III works of SSP.
- Draft proposal for Annual Development Plan 2008-09 of Unit-I and Unit-III works of SSP.
- > Installation of Regulatory mechanism for Godbole Gate.
- > Upgradation/replacement of SSP data transmission system.
- Review of the progress of Real Time Data Acquisition System (RTDAS) in Narmada River Basin.
- Closure of contract with M/s BHEL for work package-I & II of EMC Project.

Progress of Main Dam Works

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 12th/13th March 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) achieved up to March 2009 is given at Table 9.

Items	Est. Qty.	Cumulative Progress upto 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

Table 9. Progress of Sardar Sarovar Dam (Unit-I)

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 (1x50 MW) have 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 powerhouse 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 six Units of RBPH have been commissioned. Total 2312.62 million units energy was generated from both the power houses during 2008-09.

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 18th August 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. Excavation, rock covering concreting, installation of steel liner, concreting around steel liner and service gate hoist chamber, etc. have been completed.

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 as 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 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 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 crores. The revised estimated cost of the project now stands at Rs 1453.77 crores.

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 m, 161 m and 185 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 Nos. 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.

The dam at its full height has submerged 336 villages. Approximately 1.5 lakh Project affected Persons (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.

Budget & State Shares

The budget provision made for the project, sub-head wise expenditure during the financial year 2008-09 and cumulative expenditure up to March 2009 is as given in Table 10.

				(Rs. crore)
SI.No.	Sub-head	Budget	Expenditure	Cumulative
		Provision	during 2008-09	expenditure up to
				March,2009
1	2	3	4	5
1.	Establishment	18.330	10.032	167.111
2.	Tools & Plants	0.010	0.000	2.078
3.	Suspense (debit)	0.100	0.013	148.575
4.	Works	18.500	61.697	1284.392
	Gross Total	36.940	71.742	1602.156
5.	Suspense (Credit)	0.100	0.266	142.384
	Net total	36.840	71.476	1459.772

Table 10. Budget Expenditure of Bansagar Project

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 31.03.2009 of Rs 1459.776 crore is given in Table 11.

Table 11. Details of share due/ received in relation to the expenditure onBansagar Project

(Rs.crore)				re)		
Total Expenditure		Share Due		Ba	lance Sha	ire
	S	nare Receive	ed			
	M.P.	U.P.	BIHAR	M.P.	U.P.	BIHAR
Up to 31.03.2008:	<u>694.15</u>	<u>347.075</u>	<u>347.075</u>	(+)	(-)	(-)
1388.30	811.24	237.498	339.562	117.09	109.577	7.513
During	<u>35.738</u>	<u>17.869</u>	<u>17.869</u>	(+)	(+)	(-)
2008-09 up to 03/2009:	43.676	27.80	0.000	7.938	9.931	17.869
71.476						
Total as on	<u>729.888</u>	<u>364.944</u>	<u>364.944</u>	(+)	(-)	(-)
31.03.2009:	854.916	265.298	339.562	125.028	99.646	25.382
1459.776						

UPPER YAMUNA RIVER BOARD

Introduction

"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), comprising the Chief Ministers (Governor in case of President's Rule) of the co-basin States as members and Union Minister/Minister of State for Water Resources as Chairman, to supervise the working of the Upper Yamuna River Board and to ensure implementation of MoU dated 12.5.94.

Functions of UYRB

The functions of the 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 of UYRB

The Board has been making tentative seasonal distribution of water to Basin States at various distribution points. The Board has also been engaged in resolving the Inter-State issues amongst the basin States related to water distribution and benefits and cost sharing of the proposed storage projects in Yamuna Basin. The Board has held 34 meetings so far. The last meeting was held on 30.12.2008.

Activities of UYRC

Pursuant to decisions taken in the 3rd UYRC meeting held on 12.04.2006, a steering Committee had been constituted to expedite construction of Kishau, Renuka & Lakhwar Vyasi storage projects in Upper Yamuna basin. This Committee held its 2nd meeting on 05.09.2007, during which the States were urged to agree for implementation of projects, pending resolution of issues on sharing of cost & benefits.

Pursuant to the 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. This committee has submitted its report to MoWR in December, 2007 which shall be put up to UYRC 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 Grantsin-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-basin links as proposed by States. Accordingly, MOWR vide resolution dated 30.11.2006 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 reports 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.

Organizational Set-up

The NWDA is headed by the Director General of the rank of Additional Secretary to Govt. of India. The Headquarters of the Agency is at New Delhi. Chief Engineer (Hq), Director (Tech) and 7 Superintending Engineer alongwith other staff assist Director General, NWDA at Headquarter. NWDA has 2 field organizations each headed

by a Chief Engineer, 5 Circles each headed by a Superintending Engineer, 16 Divisions each headed by an Executive Engineer and 4 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

Based on studies, NWDA has identified 16 water transfer links under Peninsular Component for Surveys and Investigations and preparation of Feasibility Reports. So far FRs of 14 links under Peninsular Component have been completed and FR of another one link is in progress. DPR of one link, namely, Ken-Betwa has been completed. The work of preparation of DPR of Par-Tapi-Narmada & Damanganga – Pinjal Link is in progress.

Himalayan Rivers Development Component

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

Based on studies, NWDA has identified 14 water transfer links under Himalayan Component for Surveys and Investigations and preparation of Feasibility Reports. So far FRs of 2 links (Indian Portion) in the Himalayan Component have been completed and balance are in progress.

Benefits from Inter Basin Water Transfer Link

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.



Hon'ble Minister of Water Resources and President of NWDA Society, Prof. Saifuddin Soz presiding over the 24th Annual General Meeting of NWDA Society held on 09.07.2008 at New Delhi. Sitting to his right is Shri Jai Prakash Narayan Yadav, Hon'ble Union Minister of State for Water Resources and Vice President of the NWDA Society and sitting to the left of Hon'ble Minister (WR) are i) Shri Ponnala Lakshmaiah, Hon'ble Minister (Major & Medium Irrigation), Govt. of Andhra Pradesh; ii) Shri Nurjamal Sarkar, Hon'ble Minister (Irrigation), Govt. of Assam and iii) Capt. Ajay Singh Yadav, Hon'ble Minister (Public Works and Irrigation), Govt. of Haryana.



Shri U.N. Panjiar, Secretary (WR) Chairing the 52nd Meeting of the Governing Body held on 19.12.2008. On his right is Shri A.K. Bajaj, Chairman, CWC and on his left is Shri A.D. Bhardwaj, DG, NWDA.

National Common Minimum Programme

The National Common Minimum Programme (NCMP) of the Government envisages that the UPA Govt. will make a comprehensive assessment of the feasibility of linking the rivers of the country starting with the South bound rivers. This assessment will be done in a fully consultative manner. It will also explore the feasibility of linking sub-basins of rivers in States like Bihar. The follow up action in this regard has already

been taken. The functions of NWDA have been modified to include preparation of Pre-feasibility/feasibility reports of intra-state links as may be proposed by the States.

Other Initiatives

(a) 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 interbasin water transfer of NWDA and helping the States. The consensus Group has held 9 meetings so far. With the efforts, the concerned states of Madhya Pradesh and Uttar Pradesh signed a tripartite MoU for taking up to DPR of Ken-Betwa link. NWDA has completed the DPR of Ken-Betwa on 31.12.2008. Further, States of Maharashtra and Gujarat have also conveyed their concurrence in taking up DPRs of Par-Tapi-Narmada and Damanganga-Pinjal links. NWDA has started this work which is planned to be completed in December, 2011.

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

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 Interlinking of Rivers fully consultative. 6 meetings of this Committee have been held so far. Last meeting was held on 13th Jan, 2009.

(c) Intra-state links

NWDA has received 30 proposals from 6 States. The proposals received from states viz. Jharkhand, Maharashtra, Bihar, Gujarat, Orissa and Rajasthan 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. Four PFRs of the Intra-State links have been completed during the year 2008-09.

NATIONAL INSTITUTE OF HYDROLOGY

Introduction

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: (1) 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. The titles of the completed and ongoing sponsored projects are given below:

Completed Projects

- 1. Hydrologic Studies for Ken-Betwa Link Project [Phase-I].
- 2. Estimation of Probable Maximum Flood for Pulichintala Dam.
- 3. Hydrogeological study of Mata Shukh and Kasnau Lignite Mine Area in District Nagaur, Rajasthan.
- 4. Surface water groundwater interaction at selected locations along the Yamuna River in NCT Delhi.
- 5. Remote Sensing work in respect of "Irrigation efficiency studies of Saran Main Canal System, Bihar".
- 6. Remote Sensing work in respect of "Irrigation efficiency studies of Upper Morhar Canal System, Bihar".
- 7. Performance Evaluation of Anti-erosion Work at Village Arjunpur in Buxor District of Bihar.
- 8. Performance Evaluation of Flood Protection Work of Raunahi Embankment from 0.6 km to 1.7 km on the right bank of river Ghaghra in Faizabad District of Uttar Pradesh.
- 9. Streamflow Modelling of Bhagirathi River, Hydrograph Separation using Isotopic and Geochemical Techniques.
- 10. Seasonal characterization of ablation, storage and drainage of melt runoff and simulation of streamflow for the Gangotri Glacier".
- 11. Study of glacier contribution in the streamflow of Bhagirathi river at Loharinag Pala Power Project (4 x 150 MW) site and its influence on long term sustainability.

- 12. Study of glacier contribution in the streamflow of Dhauliganga river at Tapovan Vishnugad Power Project (4 x 130 MW) site and its influence on long term sustainability.
- 13. Hydrologic Studies for Ken-Betwa Link Project (Phase-II).
- 14. Real time flood inundation mapping for Sabarmati basin.
- 15. Hydrological and Hydrogeological Investigations to Assess Causes of Seepage from the Reservoir of Jaswant Sagar Dam in Jodhpur, Rajasthan.
- 16. Development of non-linear data driven models for flood forecasting for Indian rivers.
- 17. National Programme on Isotope Fingerprinting of Waters of India (IWIN).
- 18. Integrated Hydrological Study for Sustainable Development of two Hilly Watersheds in Uttaranchal.
- 19. Development of drought vulnerability indices for preparedness and mitigation.
- 20. Water Balance Studies of the Forested Watersheds, Western Ghats, India.

Consultancy Capabilities

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

- Flood routing
- Real time flood forecasting
- Dam break flood wave simulation
- Flood plain zoning
- Flash floods studies
- Flood estimation
- Integrated drought vulnerability assessment
- Drought characterization in different climatic regions
- Regional drought studies
- Impact of urbanization on hydrologic regime
- Land use changes vis-à-vis hydrological components
- Sedimentation and soil erosion in lake catchments
- Forest hydrology
- Analysis and modeling of groundwater flow
- Aquifer dynamics and recharge
- Inverse modeling for source identification
- Stream-aquifer interaction
- Fresh water-saline water interactions
- Contaminant transport modeling
- Aquifer remediation, well head protection and management
- Impact of climate change on groundwater
- Groundwater-Environment-Energy interaction
- Impact of inter-basin transfer of water on groundwater regime
- Risk based management of water systems
- Cumulative impact of dams and diversions
- Adaptation of hydro-systems to climate change

- Assessment of water demand and availability using spatially distributed modeling
- Inter-basin water transfer
- Conjunctive use of surface water and aquifers
- Hydro-informatics for water systems management
- Water, energy and food security nexus
- Spatial estimate of AET using RS data
- Data driven models for analysis of water systems
- Prediction of extreme hydrologic events in ungauged catchments
- Design flood estimation for gauged as well as ungauged catchments
- Water availability
- Hydrological modeling
- Isotopic characterization of water resources on regional scale
- Water quality and human health
- Natural and organic contaminants
- Non-point source pollution
- Assessment of environmental flows
- River bank filtration for water supply
- Sediment dynamics
- Integrated hydrological studies of lakes
- Low cost treatment/remediation technologies

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

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. During the year 2008-09, the trainings arranged by NIH are indicated in Table 12.

Table 12. Details of Trainings arranged by NIH during 2008-09

S.No.	Topic of Training / Workshop	Venue
1.	Training Course on Applications of Remote Sensing	Roorkee
	and GIS in Water Resources Management	
2.	Training Course on SWDES	HIPA, Shimla
3.	Training Course on SWDES and HYMOS	Chennai
4.	Training Course on Applications of RS and GIS in	NIH, Roorkee
	Water Resources Management	
5.	Workshop on Emerging Trends in Groundwater	DRC, NIH, Kakinada
	(with special reference to coastal aquifers)	
6.	Training Course on Mathematical Modelling of River	CFMS, Patna
	flows	
7.	Training Course on Water Quality Assessment and	HRRC, NIH, Belgaum
	Management	
8.	Inception Workshop on DSS (Planning) for	New Delhi
	Integrated Water Resources Development &	
	Management	
9.	Training Course on Project Hydrology	Gandhinagar

Technical Publications

The research output of the Institute is published in the form of reports and peer reviewed scientific papers. During the year 2008-09, the Institute has published 100 papers in reputed international and national journals and proceedings of international and national conferences and symposia. About 30 reports based on studies and research in hydrology has been prepared during the year. Besides these publications, the Institute Scientists have published 7 chapters in books.

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) under Ministry of Water Resources. The Board functions from Guwahati. The jurisdiction of the Board covers the entire area of the seven States in the North Eastern Region falling under Brahmaputra and Barak Valley. The limits of Brahmaputra Board were extended to cover the entire area of Sikkim and Northern part of West Bengal falling within Brahmaputra and Barak Basin.

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 of 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

The Master Plan preparation has been taken up in 3 parts.

- Part-I: Main Stem of Brahmaputra
- Part-II: Barak and its tributaries
- and
- Part-III: Tributaries of the river Brahmaputra & Barak and the rivers in Tripura (55 Nos)

So far, Government of India has already approved 41 Master Plans out of 57.

Brahmaputra Board has identified 41 drainage congested areas in Brahmaputra and Barak basin, out of which the detailed project reports of 20 have been completed. The North Eastern Hydraulic & Allied Research Institute (NEHARI) was established near Guwahati with facilities of Hydraulic Modeling, Soil Testing, Concrete and Rock Mechanics Laboratory in association with CSMRS, CWPRS. The Board has successfully carried out sample testing as requested by various organizations like NEPCO, CWC, NEC, NHPC, and State Government of Assam, Manipur, Meghalaya and Mizoram for their on-going projects.

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

Schemes under execution of Board

- (A) Pagladiya Dam Project
- (B) Protection of Majuli Island
- (C) Protection of Nagrijuli Rangia Town and Mukalmuwa/Barbhag area from flood and erosion of Barnadi river
- (D) Avulsion of Brahmaputra at Dhola-Hatighuli
- (E) 7 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

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, which, inter-alia, constituted the Narmada Control Authority and Review Committee, in 1980 for proper implementation of the decisions and directions of the Tribunal.

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

Organisation

The Authority is headed by the Secretary, Ministry of Water Resources, Govt. of India, as its Chairman, with Secretaries of the Union Ministries of Power, Environment & Forests, Social Justice & Empowerment and Tribal Welfare, Chief Secretaries of the four party States, 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.

Meeting of Narmada Control Authority

Two meetings of Narmada Control Authority were held on 12th August, 2008 and 16th March 2009 during 2008-09. The construction of piers and installation of gates of SSP, Resettlement and Rehabilitation, Environment, Administrative and other Project related matters were discussed.

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 its 72nd meeting held on 8.9.2004. 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. The Table 13 given below indicates overall cumulative progress of R&R of Project Affected Families (PAF) up to Feb, 2009.

 Table 13. Progress of Resettlement & Rehabilitation(upto February-2009)

STATE		Total Project Affected Families (PAFs)	Total PAFs resettled	Balance Families to be resettled
GUJARA	T (i)	4744	4744	0
MAHARA	ASHTRA			
(a) I	n Gujarat	773*	773	0
(b) I	n Maharashtra	3454*	3094	360
(ii)	Sub Total	4227a	3867	360
MADHYA	A PRADESH			
(a) I	n Gujarat	5395**	5395	0
(b) I	n Madhya	32242**	32177 b	65
Р	radesh			
	Total (iii)	37637 a	37572	65
	Total (i+ii+iii)	46608	46183	425

* These figures were reported by GoM during 71st R&R Sub-group meeting held on 05.01.2009.

** These figures were finalized in 12th meeting of Task Force Committee on R&R for SSP held on 29.5.2008.

a. This number may change after inclusion of PAFs to be declared by GRA/State Government including impact of backwater level.

b. The figures are based on the ATRs/Progress report submitted by GoMP to NCA.

(B) Indira Sagar Project (ISP)

As per the R&R Sub-Group of NCA decisions in its 67th, 68th and 70th meetings, the NCA Secretariat requested Narmada Hydro-electric Development Corporation (NHDC) to furnish information related to 250 villages involving 40026 declared PAFs upto FRL and also details about the additional PAFs due to Tapu Land, error in survey at FRL and backwater q at FRL. A total of 3253 additional PAFs were identified of which 1139 have been rehabilitated. The NHDC has furnished information related to submergence villages and one Town and the information related to 42 R&R sites developed so far which includes 34 R&R sites developed by NHDC/Govt. of Madhya Pradesh and 8 R&R sites developed by PAFs themselves.

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. So far, 19 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 2007-08 has been 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 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 costs as well as benefits of the project are to be shared equally by both the States. Construction work of Dam and Power House is almost complete.

Land Acquisition

The dam submerges 38 villages in U.P. and 31 villages in M.P. Compensation in M.P. area is completed. In U.P., the District Administration, Lalitpur had paid the land

compensation of 25 villages and for balance 13 villages, the land property are being acquired through mutual negotiation by the Betwa River Board.

The filling of reservoir upto FRL of R.L. 371.00 M. may not be possible till the acquisition of land and property of balance 13 submergence villages is completed.

Planning and Present status of Rajghat Power House works

The estimate of Rajghat Hydro Electric Project at 1997 price level was Rs. 131.26 crores which included Rs. 58.41 crores for civil works. The revised cost of the civil works of Power House at December, 1999 price level is Rs. 66.89 crores and same has been furnished by BRB to 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 generation are 280, 572, 1047, 676, 1431, 931, 1328, 1335, 518 & 1320 lakhs unit during the year 1999-2000, 2000-2001. 2001-2002, 2002-2003, 2003-2004, 2004-2005, 2005-2006, 2006-2007, 2007-08 and 2008-09 respectively.

O & M Estimate of Rajghat Dam Project during Transition Period

An amount of Rs. 9.00 Crore per annum towards O&M has been prepared and submitted to both the party states by Chief Engineer, BRB for transition period until the project is taken over by one of the party states. The matter was discussed at Secretary, MoWR level on 02.02.2006. It was agreed to operate O&M account of the project from October, 2005. Both the states agreed to contribute their due share towards O&M in addition to pending liabilities under capital cost. The States of U.P. and M.P. have paid only Rs. 12.65 crores and Rs. 15.90 crores respectively against their due share of Rs. 18.25 crores each upto 11/2008.

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 started since 1992-2000.

FRL of the reservoir is 371.00 m. Reservoir has been filling up gradually upto 370.20 m. during the last 8 years. The details of which are given in Table 14.

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

Table 14. Detail of FRL of Rajghat Dam Reservoir

Financial Position of B.R.B.

The financial position of Rajghat Dam and Rajghat Power House Project are given in Tables 15 and 16 respectively.

Table 15. Financial Position of Rajghat Dam

(Rs. crore)

S.No.	Item	U.P.	M.P.	Total
1.	Apportioned cost as per revised cost estimate	150.30	150.30	300.60
2.	Contribution received	150.30	150.30	300.60
3.	Balance to be contributed	Nil	Nil	Nil
4.	Revenue/other receipts	-	-	16.23
5.	Contribution due against O&M head upto July,	18.25	18.25	36.50
	2008			
6.	Contribution received against O&M head upto	12.65	15.90	28.55
	July, 2008			
7.	Balance to be contributed against O&M head	5.60	2.35	7.95
	upto July, 2008.			
8.	Gross expenditure upto 09/2008	-	-	322.62
9.	Balance available with BRB in 09/2008	-	_	19.81

Table 16. Financial Position of Rajghat Power House

(Rs. crore)

rr		
	Civil works by B.R.B.	E & M works by MPEB
Revised cost estimate of works	66.89	72.85
components		
Contribution received upto June,2008	59.51	Expenditure has been
		made by MPEB directly
Balance to be contributed	7.38	-
Net expenditure incurred upto	63.75	-
09/2008		
Balance available with BRB	(-) 4.24	-

TUNGABHADRA BOARD

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

Organization

The Board consists of a Chairman, appointed by the Government of India, and three Members, one each representing the States of Andhra Pradesh, Karnataka and the 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 Government 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 is filled up to the full reservoir level this year. The inflow into the reservoir from June 2008 to March 2009 was 7704.86 million cumec (mcum) (272.095 thousand million cubic feet (TMCft.).

The utilization of water by the States of Karnataka and Andhra Pradesh till the end of March 2009 was 4319.500 mcum (152.558 TMCft) and 67.111 mcum (2.370 TMCft) respectively as against the likely abstraction of 4,148.41 mcum (146.500 TMCft) for the water year 2008-2009. Evaporation losses from June, 2008 to March, 2009 were 222.485 mcum (7.857 TMCft) to be shared by Karnataka and Andhra Pradesh in the ratio of 12.5:5.5. A total quantity of 3356.305 mcum (118.527 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 2008-2009. Against this, the power generated till the end of March, 2009 was 204 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 of 3 units of 2.75 MW each. The power generated is purchased by the Transmission Corporations of Karnataka and Andhra Pradesh in the agreed ratio of 20:80.

Fisheries Development

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 have been auctioned for the year 2008-09 to a local Fishermen's Co-operative Society for Rs.47.25 lakhs In order to facilitate preservation of fish catch, the Board is running an ice-cum-cold storage plant. Quality fishnets are also manufactured in the fish net making plant run by the Board.

Board Meeting

During the year, the Tungabhadra Board held four meetings till the end of March, 2009.

CHAPTER 8

UNDERTAKINGS OF THE MINISTRY

WATER AND POWER CONSULTANCY SERVICES (INDIA) LTD (WAPCOS)

WAPCOS Limited is a "MINI RATNA" Public Sector Enterprise under the aegis of the Union Ministry of Water Resources. Incorporated on June 26th, 1969 under the Companies Act. 1956, WAPCOS has been providing consultancy services in all facets of Water Resources, Power and Infrastructure Sectors in India and Abroad.

The quality management systems of WAPCOS comply with the Quality Assurance requirements of ISO 9001:2000 for Consultancy Services in Water Resources, Power and Infrastructure Development Projects, as certified by Indian Register Quality Systems.

Fields of Specialisation

Main fields of specialisation 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 & Investigations, Human Resource Management, System Studies and Information Technology. WAPCOS has also been venturing into newer fields such as Software Development, City Development Plans, Financial Management System, Technical Education, Quality Control and Construction Supervision, Roads & Bridges. The Company has 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 e.g. pre-feasibility studies, feasibility studies, simulation studies, diagnostic studies, socio-economic studies, master plans and regional development plans, field investigations, detailed engineering including designs, detailed specifications, tendering process, contract and construction management, commissioning and testing, operation & maintenance, quality assurance & 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 & international consultancy organisations. In order to provide state of the art Technology for Consultancy Services in India, WAPCOS associated with DHI (Danish Hydraulics Institute, 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.

Recognition with International Organizations and Operations Abroad

WAPCOS have successfully completed/on-going consultancy assignments abroad in 40 countries and is registered with various international funding agencies for participating in the funded projects like World Bank/International Bank for Reconstruction and Development, African Development Bank, Asian Development Bank, Food and Agriculture Organisation, International Fund for Agricultural Development, United Nations Development Program, World Health Organisation, 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

Since its inception, the performance of the company has been steadily growing and promising. The company has been able to manage its business operations so far from its own resources and has not taken recourse to any borrowings, loan or any other form of financial assistance from the Government or any other financial institution. WAPCOS has been able to pay consistently high percentage of dividends on its paid up capital and has been able to effect skillful utilisation of available human resources to match up with the job requirements.

WAPCOS provides the best professional consultancy services at competitive rates to the entire satisfaction of clients.



The Union Minister for Water Resources, Prof. Saifuddin Soz receiving a dividend cheque for the year 2007-08 from the CMD, WAPCOS, Shri D. Dutta, in the presence of the Secretary, Water Resources, Shri U.N. Panjiar in New Delhi on 2nd September, 2008.

Provisional, Unaudited Financial Performance for the year 2008-09

The Provisional, Unaudited Financial Performance of the Company for the year 2008-09 along with the comparative figures for 2007-08 is indicated in Table 17.

Table 17. Provisional, Unaudited Financial Performance of WAPCOS-2008-09

(Rs. lakh)

Particulars	2008-2009 (Provisional)	2007-2008
INCOME		
(i) Consultancy and Contract Income	20500.00	16005.10
(ii) Other Misc. Income	577.47	401.26
Total Income (A)	21077.47	16406.36
EXPENDITURE		
(i) Consultancy and Contract Expenses	16126.00	12623.15
(ii) Administrative & General Expenses	1431.47	1223.69
(iii) Depreciation	80.00	70.15
(iv) Provisions	250.00	207.83
(v) Donation	-	0.40
Total Expenditure (B)	17887.47	14152.22
Profit for the year (A) – (B)	3190.00	2281.14
Add : Prior Period Adjustments	-	87.97
Profit before Tax	3190.00	2369.11
The turnover of the Company for the year 2008-09 shows an increase of 28.08% over last year's. The profit before tax has been Rs. 3190 lakh, which is an increase of 34.6% over last year's. The Company has become eligible for "Excellent" rating for the 6th year in succession under the MoU System of Company's performance evaluation by the Department of Public Enterprises.

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED (NPCC)

National Projects Construction Corporation Limited was established on 9th Jan 1957, presently under the aegis of Ministry of Water Resources, to undertake Irrigation and Hydel Projects. It also acted as a deterrent on price to free run private construction companies. Subsequently, NPCC diversified in other construction fields. Over the past 51 years, NPCC has created land marks by completing innumerable projects even in remote areas where private sector companies did not venture. Completion of Wazirabad barrage across river Yamuna in one working season at Delhi, Asia's longest Sir Aurther Cotton barrage across river Godavari in A.P., Singda earth Dam and Khuga Dam in Manipur, Maharani, Khowai & Mannu barrage in Tripura, Loktak hydroelectric project in Manipur ,Grain Silo project in Iraq, Chukha hydel project, Bhutan and Nahar-Saad Canal Project, Iraq are few challenging projects of importance to demonstrate NPCC's ability to contribute in the National & International development. NPCC believes in implementing the projects with highest customer satisfaction with global standards and take optimal care of all concerned stakeholders.

With a galaxy of professionals, NPCC is fully geared up to implement all types of civil/structural engineering projects from concept to commissioning in India and abroad. An ISO 9001-2000 accredited PSU, NPCC has been contributing to Nation's development by way of executing projects timely, qualitatively, economically and also uplifting the socio-economic level of masses. NPCC works on EQTEP: Execute Projects Qualitatively, Timely and Earn Profit.

It has mission with aim to become a world class Project Implementing Organization with due regards to social responsibilities - Make India Proud.

The authorized capital of the company is Rs. 30 Crores and its Paid- up Capital is Rs. 29.84 Crores.

NPCC has contributed for development of infrastructural sector in the field of Water by completing some of the major projects as indicated below:

- > Maneri Bhali Hydro Electric Project in Uttarakhand
- Jobat Dam in MP
- Khuga Dam in Manipur
- Marginal Bund and Afflux Bund for Ganga Barrage at Kanpur in UP
- Protection Work of Gagon River at Moradabad in UP
- Meja Link Channel at Mirzapur in UP
- R.C.C. Barrage Work at Ujjain in MP

Construction of Madku Anicut, Khamhardih Anicut, Dagon Anicut and Podi Anicut in Chhattisgarh



The Union Minister for Water Resources, Prof. Saifuddin Soz lighting the lamp at the '52nd Annual Day' function of the National Projects Construction Corporation (NPCC), in New Delhi on 15th January, 2009 seen in the picture is the Minister of State for Water Resources, Shri Jai Prakash Narayan Yadav

Business Development

NPCC has secured business in recent past as under:-

- A. Year 2006-07: Rs.1278 Crore against target of Rs. 1260 Crore.
- B. Year 2007-08: Rs. 1618 Crore against target of Rs. 1600 Crore.
- C. Year 2008-09: Rs. 1709 Crore against the total financial year target of Rs. 1500 Crore.
- D. The present order book position of NPCC ending March, 09 is Rs. 4517 Crore.

Major Works Secured during the Year 2008-09

- Construction of Flood Lighting in the State of Tripura along Indo Bangladesh Border for Rs. 375 Crore.
- > ESIC buildings at Bhubaneswar and Chudwar Orrisa for Rs. 250.00 Crore.
- > Civil works of 2x250 MW Parichha Thermal Power Project for Rs.17.48 Crore.
- Construction of B Type quarters including Internal & External infrastructure at NALCO – ANGUL for Rs. 15.29 Crore.
- > PMGSY Road work in Uttar Pradesh, Bundelkhand for Rs. 325.00 Crore.
- > Enhancement of ITBP Road work in J&K for Rs. 122.00 Crore.

> Enhancement of IBB Fencing and Road works in NER for Rs. 190.00 Crore.

Turnover

The turnover (Gross) of the Corporation during the last five years and the achievement for the current year 2008-09 is given in Table 18.

Table 18. Detail of Gross Annual Turnover during last six years

(Rs. crore)

Year	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Turnover	302.88	305.64	577.66	721.80	712.35	820.47 unaudited

The growth of NPCC in items of turnover, work bagged and order book is also depicted below:



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, Mozoram, 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 are:

Irrigation and River Valley Projects

Dolaithabi Barrage in Manipur, Kalsi Barrage Project (Tripura)

Thermal Projects

- Construction of New Ash Pond area of NTPC at Talcher Super Thermal Power Project in Orissa
- > Off site civil works at Sipat STPP in Chhatisgarh
- > Off site civil works for Kahalgoan STPP in Bihar
- > Ash Dyke lagoon I, site leveling work for stage III of NTPC in Farakka
- Civil works of 2x250 MW Parichha Thermal Power Project for Rs.17.48 Crore

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, Vasant kunj in New Delhi.
- Construction of DMRC main Lab cum Administrative Building at Jodhpur in Rajasthan.
- Administrative Building at College Tilla of IGNOU, Fisheries College at Agartala, Hospital Building work at headquarter complex of TTADC in Tripura.
- College of Horticulture & Fisheries at Pasighat in Arunachal Pradesh, CRPF Transit camp at Ambari in Assam. Assam Rifles Quarters at different locations in the state of Nagaland, Arunanchal Pradesh, Manipur, Mizoram, Meghalaya, Tripura, Sikkim & Assam.
- Various Hostel Buildings at different locations, Ashram / Ekalava Vidydlaya at Sisai, Kumala & Chalibasa Distt., Engineering College at Ramgarh, Polytechnic College at Pakur, Baharagora, Bhaga and Gola in Jharkhand.
- > Construction of D Type Quarters, Get Hostel at NALCO, Angul.
- > Construction of Building in the state of Tripura.
- Construction of residential accommodation & barrack for Assam Riffles Works in Tripura, Manipur, Meghalaya, Nagaland at different location of Rs. 212.00 Crore.
- Renovation work of National Institute of Homeopathy, Kolkata of Rs. 1.20 crore.
- Enhancement of Construction of Regional Centre Building for IGNOU at Agartala of Rs. 7.62 crores.
- > Construction of NIFM phase-II extension building works of Rs.10.00 crore.

Road Works & other Projects

- ➢ High altitude roads at Leh in J&K.
- PMGSY Roads works in the districts of Patna, Nalanda, Bhojpur, Buxer, and Rohtas & Kaimur in Bihar.
- > PMGSY works in Jharkhand, Ranchi.
- > PMGSY Road works at different locations in Chattisgarh.

- Storm water drains (III & IV), Gali Anjaneya Temple Flyover in Bangalore, Quarters and Allied Services, LCA production facility, HAWK production facility, finished goods Hanger in Aerospace Division at HAL (BC).
- Parking, Boundary wall, OH Reservoir, Roads, water lines, etc. under Falta Economic Zones in West Bengal.
- Raising of Ash Pond Western compartment and allied works for Vizag Steel Plant in Andhra Pradesh.
- Indo Bangla Border Fencing & Roads works in Tripura, Mizorum, Meghalaya & Assam.
- > Construction of Road & Bridge in the State of Tripura.

TRAININGS

NATIONAL WATER ACADEMY

National Water Academy at Pune is functioning as a Centre of Excellence for in-service training of Water Resources Engineering Personnel of State Government, Central Water Commission and other Central organizations. During the year 2008-09, 28 courses were conducted at NWA. So far, the Academy has conducted 280 courses, in which 6582 officers have been trained since its inception in 1988.

In addition, the Training Directorate at Headquarters has organised 19 courses during 2008-09. About 400 officials of various State Government and Central Government Organizations/ Departments have undergone training through these courses. So far, Training Directorate has conducted 435 courses on various topics related to Water Resources Development. About 11,900 officials have undergone training through these courses.

RAJIV GANDHI NATIONAL GROUND WATER TRAINING AND RESEARCH INSTITUTE

Fifteen training courses were conducted during 2008 – 09 up to 31st March 2009 under Rajiv Gandhi National Ground Water Training and Research Institute. The details of training courses are given below -

A one week refresher course for Chemist on Analysis of Basic Water Quality Parameter was successfully organized during 16th June 2008 to 20th June 2008 at Central Ground Water Board, Southern Region, Hyderabad. 20 participants were attended the course.

Four weeks training course on "Hydrogeological Investigation, Development and Management of Ground Water in Hard Rock Terrain – Technique, Equipment and Practices" was successfully conducted at Southern Region, Hyderabad during 18.08.2008 to 12.09.2008. 18 participants attended the course from CGWB and other State Govt. Department & Institutes etc.

Two weeks training course on "Application of Geophysical Techniques for Ground Water Exploration and Management" was successfully conducted during 15-27th September 2008 at Northern Region, Lucknow. The training course was inaugurated by Chairman, CGWB . Dr. P.N. Rajdan, Senior Dy. Director General of GSI, Lucknow was the Chief Guest on the occasion. 23 trainees attended the training course.

A one week Refresher course on "Material Management" was successfully conducted during 8-12th September 2008 at Central Ground Water Board, Division XII office, Bhopal. 18 participants attended the training course.

A one week Administrative training course for staff of Central Ground Water Board was successfully conducted during 8 - 12th September 2008 at ISTM, New Delhi. 25 participants have attended the training course.

A one week Refresher course on "Ground Water Resource Estimation" was successfully conducted during 13 - 17th October 2008 at RGI, Central Ground Water Board, Bhujal Bhawan, Faridabad. 22 participants attended the training course out of which 9 officers were from State Ground Water Departments.

A one week training course on "Artificial Recharge in different hydrogeological conditions" was successfully completed on 21st November 2008 at RGI, Central Ground Water Board, Bhujal Bhawan, Faridabad. 23 participants attended the training course out of which 22 officers were from State Departments and NGO's.

A training course on "Hydrogeological Investigation, Development, Management of Ground Water in Alluvial Terrain-Techniques, Equipments and Practices" was successfully conducted during November 11th t0 5th December 2008 at North Western Region, Chandigarh. 17 trainees from CGWB, States Government and other Central Government departments were attended the course.

Training course on "Administrative matters for Senior officers of CGWB" was successfully conducted at Indian Institute of Public Administration (IIPA), New Delhi during $3^{rd} - 7^{th}$ November 2008. 20 officers of CGWB attended the course.

Training Programme on Geographical Information System (GIS) and Mapping Tools was conducted at NITTT&R, Chennai during November 24th – December 5th, 2008. 20 trainees attended the course.

A one week Refresher course on "Analysis of Pumping Test Data" was successfully completed on 20th December 2008 (December 15-20 2008), at Central Ground Water Board, Central Region, Nagpur. 7 officers from CGWB and 14 officers from State Ground Water Organization/Institutes attended the training course.

A two weeks training course on "Application of Remote Sensing & GIS in Ground Water System" was successfully completed on 30th January 2009 (19th January – 30th January 2009) at IIRS, Dehradun. 18 participants from CGWB and State Ground Water Organizations attended the training course.

An Eight weeks training course on "Water Well Construction – Techniques, Equipment and Management" was successfully completed on 27th February 2009 (January 05 to February 27, 2009) at Central Ground Water Board, Division XII, Bhopal. 18 officers from CGWB and State Ground Water Organization/Institutes attended the training course.

A two weeks training course on Mathematical Modelling of Ground Water System" was successfully completed on 28th March 2009 (March, 16-28, 2009) at IIT, Roorkee. 15 officers from CGWB and State Ground Water Organisations attended the training course.

A three days training course on "Appreciation Course on Ground Water Estimation and Management Software (GEMS) for Senior Officers" was successfully completed on 1st April 2009 (30th, 31.03.09 to 1.03.2009) at State Ground Water Department, Shimla. 30 officers from State Ground Water Organisation attended the training course.

Total 308 trainees from various disciplines have been trained in the above training courses conducted at various places during the year up to 31st March 2009.

MoWR

As part of developing the human resources, 50 officials of the Ministry were sent on training in various institutes to enhance their capabilities and skills.

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 were prepared and 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 of forwarding the applications to the concerned CPIOs and depositing of the fee received with the DDO, MoWR, after 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 2008-09, 10 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 technique of e-governance 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: -- (<u>http://www.mowr.gov.in</u>).
- (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.

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 consequence, many States have amended their Irrigation Acts or come out with Specific Acts on Participatory Irrigation Management. Some of the State Governments have taken initiatives and have made specific provisions for women's participation.

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 greater strength. 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.

PROGRESSIVE USE OF HINDI

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

During the year, Hindi Advisory Committee was reconstituted. Its first meeting under the chairmanship of Hon'ble Minister of State for Water Resources was organized on 9.2.2009. In this meeting, Hon'ble Minister of State highlighted the importance of Hindi and gave Awards to three organizations for doing appreciable work in Hindi.

Department of Official Language, Ministry of Home Affairs awarded Indira Gandhi Rajbhasha second prize for excellent performance in the field of Official Language to the Ministry of Water Resources. The prize in the form of shield was received by the Secretary, Ministry of Water Resources from Her Excellency, President of India, Smt. Pratibha Devi Singh Patil in the ceremony organized on the occasion of Hindi Day on September 14, 2008 at Vigyan Bhawan.

The second Sub-Committee of the Parliamentary Committee on Official Language inspected Ministry of Water Resources on 02.02.09 and its organizations viz. Brahmaputra Board, Guwahati; Central Water Commission, Bangalore; National Water Development Agency, Bhubaneswar; National Water Development Agency, Pune; Narmada Control Authority, Indore; Wapcos, Hyderabad; Central Water Commission, Madurai; Wapcos, Bangalore and Central Ground Water Board, Hyderabad and suggested measures for progressive use of Hindi in these offices.

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

To encourage healthy competition among the Organizations under the Ministry for doing maximum work in Hindi, the Rajbhasha Vaijayanti Shield for the year 2007-08 was awarded to Central Ground Water Board, Faridabad; National Water Development Agency and Central Water and Power Research Centre, Pune for First, Second & Third prizes respectively.

Hindi Fortnight was organized in the Ministry during September, 2008. The activities and competitions like Rajbhasha Quiz, Hindi Noting & Drafting, Hindi Essay, Hindi Typing, Sulekh, Hindi Debate and Hindi Poetry recitation were organised. First, Second and third prizes of Rs. 3000/-, Rs.2000/- and Rs.1500/- respectively were given for these competitions. Two compensatory prizes of Rs. 500/- each were also given for competitions. Officers and employees of the Ministry enthusiastically participated in these competitions.

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 with a view to promote Hindi in official work. Information regarding Official Language Act/Regulations was provided and participants were trained to do official work in Hindi during these workshops.

CHAPTER – 13

STAFF WELFARE

Introduction

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.

Minority Welfare

In accordance with the guidelines issued by the Ministry of Welfare (now the Ministry of Social Justice and Empowerment) in March, 1990, 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 for OBC in discharging their functions on various matters relating to reservation for SC/ST/OBC in Government services and carrying out inspections of reservation rosters. It also advises on allied matters in respect of various organizations of the Ministry.

Committee for Complaints on Sexual Harassment of Women Employees

In accordance with the guidelines laid down by the Hon'ble Supreme Court of India, a Committee has been constituted to look into the complaints of the female employees working in the main secretariat of the Ministry. The Committee has been reconstituted on 30th October, 2007 with the following composition: -

1.	Ms. Meeta Singh, Director (C & PPP)	-	Chairperson
2.	Shri N.K. Gupta, U.S. (Admn.)	-	Member
3.	Ms. Prisca Poly Mathew, S.O (PP)	-	Member

The Committee submits it's findings to the Joint Secretary (Admn.) for necessary action. The Committee holds its meetings from time to time and meets the women employees in the Ministry and its organizations in Delhi to find out if they have any

complaints regarding sexual harassment. During the year 2008-09, the Committee received no complaint from the women employees working in the Ministry proper. Similar Committees have also been constituted in the organizations under this Ministry.

Staff and Public Grievances

A Grievances Redressal Cell is in existence in the Ministry of Water Resources, which looks into the grievances of staff of all the organizations under the Ministry. 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 January to December 2008, this Ministry received 36 grievances, out of which 19 grievances have been disposed off. In addition 52 cases were received through CPGRAMS 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**

VIGILANCE

The Vigilance Wing of the Ministry looks after the vigilance/disciplinary matters pertaining to the Ministry and the organizations under its administrative control. This Wing 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 and a Section. The Vigilance Wing deals with various aspects pertaining to vigilance and disciplinary matters of all the employees of the Ministry and all Group A and B Officers of the attached/subordinate offices as well as Group-A Officers of other organizations including Public Sector Undertakings under the administrative control of the Ministry.

The Vigilance Wing also functions as a link between the Ministry and the Central Vigilance Commission and other Authorities in disciplinary/vigilance matters. It also tenders advice on vigilance matters to the Attached and Subordinate Offices, PSUs, Statutory Bodies, Registered Societies etc. under the Ministry, in consultation with CVC and CBI and other agencies/ Departments, wherever required. This Wing also monitors the disciplinary cases and related matters of the organizations under the Ministry.

This Wing takes measures for preventive vigilance activities such as capacity building for system improvement, streamlining and simplification of procedures for bringing in greater transparency in disposal of the works, etc.

The Vigilance Wing also collects and monitor Annual Property Returns of all Group A and B Officers.

APPOINTMENT OF DISABLED PERSONS

Monitoring of Reservation for Physically Handicapped

Monitoring of the recruitment of physically handicapped is being done to ensure fulfillment of 3% quota for the category by the Ministry as well as various organisations under it. Periodic reports on the progress made are being sent regularly to the Ministry of Social Justice & Empowerment. Accordingly, 3% of posts/vacancies (1% 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 plotting the reservation of disabled persons.

Organisation C



Vacant

hart of Ministry of Water Resources

Annexure I



Annexure -II

SI.	Name of Office		G	roup	A			-			Group	B						Gr	oup (C			Gr	oup I)			Gra	nd To	tal	
No.								(Gaze	etted)		(Non	Gaze	tted))															
		Total	SC	ST	PH	OBC	Total	SC	ST	РН	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	82	7	2	-	1	52	08	1	1	1	85	14	2	-	8	117	22	4	4*	15	87	51	5	1* **	3	423	102	14	6	28
2.	Controller of Accounts, Ministry of Water Resources	2	1	-	-	-	87	7	-		1	-	-	-	-	-	114	30	8	-	15	27	11	2	-	4	230	50	10	-	19
3.	Central Water Commission	555	68	20	3	9	405	56	7	4	6	412	72	11	2	5	1737	300	58	9	79	784	232	82	6	11	3893	728	178	24	110
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	141	21	4	2	9	73	14	4	1	4	126	21	8	2	15	407	59	25	12	17	290	68	25	12	14	1036	183	66	29	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	1	1		1	24	7	2	1		37	5	1	1		303	52	12	5	9	156	32	4	4	1	536	97	20	11	11
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	-	-	-	-	-	-	-	-	-	-	6	1	-	-	-	4	1	-	-	2	15	2		-	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	32	4	1	-	2	4	1		-	2	5	-	-	-	-	79	17	4	3	12	39	9	3	1	1	160	30	8	4	15
14.	National Water Development Agency	63	4				63	9				15	2				329	52	19	6	12	120	34	10	2	1	590	102	29	8	14
15.	National Institute of Hydrology	75	9	2	1	7	-	-	-	-	-	48	5	-	-	1	73	16	-	1	4	42	18	-	-	5	238	48	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																										13329				

Staff Strength of Ministry of Water Resource and its Organisations

*In group C post, two physically handicapped employees is also SC, OBC **In group D post, one physically handicapped employee is Visually Handicapped

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 A.K.Bajaj, Chairman Tel. No. 0612-2222294
5.	Central Water and Power Research Station, P.O. Khadakwasla, Pune-411024	Smt. V. M. Bendre, 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 Nirmal Jot Singh, 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

List of Addresses of Heads of Organisations under the Ministry of Water Resources

	Public Sector Undertakings	
10.	Water and Power Consultancy Services (India) Limited, 5 th Floor, 'Kailash', 26, Kasturba Gandhi Marg, New Delhi-110001	Shri D. Datta , 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 Engg. & Secretary Tel. No. 0517-2480183
17.	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt: Bellary, Karnataka State, PIN: 583225	Shri O.P.Khanda, Chairman Tel. No. 08394-439113 Fax: 08394-439112

40.

BUDGET AT A GLANCE (SECTOR-WISE)

No.	Organisation	Autuals	2007-08	DE 20	08-09	RE 200	08-09	BE 20	BE 2009-10		
1.	/Scheme 2	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan		
			4.	0.	0.	1.	8.	9.	10.	11.	
	Secretariat-Economic Services										
1.	Ministry of Water Resources (prop.)	0.00	14.41	0.00	19.13	0.00	19.58	0.00	21.00	21.0	
2.	Ravi-Beas Waters Tribunal	0.00	0.63	0.00	0.75	0.00	0.75	0.00	0.80	0.8	
3.	Cauvery Water Disputes Tribunal	0.00	1.19	0.00	1.37	0.00	1.45	0.00	1.60	1.6	
۱.	Krishna Water Disputes Tribunal	0.00	1.09	0.00	1.28	0.00	1.17	0.00	1.40	1.4	
	Total : Secretariat- Economic Services	0.00	17.32	0.00	22.53	0.00	22.95	0.00	24.80	24.8	
1	Major & Medium Irrigation										
	Central Water Commission										
	Direction & Administration	0.00	13.81	0.00	14.25	0.00	15.97	0.00	23.00	23.0	
	Data Collection	0.00	46.35	0.00	44.65	0.00	47.35	0.00	69.22	69.2	
	Training	0.00	0.42	0.00	0.57	0.00	0.60	0.00	0.65	0.6	
	Research	0.00	0.87	0.00	1.11	0.00	1.50	0.00	1.60	1.6	
i.	Survey & Investigation	0.00	5.16	0.00	3.25	0.00	4.50	0.00	4.50	4.5	
	Consultancy	0.00	13.88	0.00	13.56	0.00	18.00	0.00	20.00	20.0	
•	Contribution to international bodies	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.0	
	Exhibition and Trade Fair	0.00	0.13	0.00	0.30	0.00	0.30	0.00	0.30	0.30	
	Modernization of equipment CWC Offset Press	0.00	0.19	0.00	0.25	0.00	0.25	0.00	0.35	0.3	
0.	Seminars and conferences on water resources on water	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1.	Cell for monitoring externally aided projects	0.00	0.44	0.00	0.45	0.00	0.50	0.00	0.60	0.60	
2.	Water Planning Wing	0.00	0.92	0.00	0.93	0.00	1.25	0.00	1.40	1.40	
3.	Hydrological observations in Chenab basin	0.00	1.20	0.00	1.35	0.00	1.50	0.00	1.60	1.60	
4.	National Water Academy	1.86	0.00	2.30	0.00	2.64	0.00	2.60	0.00	2.60	
	Total : CWC	1.86	83.37	2.30	80.68	2.64	91.73	2.60	123.23	125.83	
5.	Central Soil and Materials Research Station	0.00	4.31	0.00	4.85	0.00	4.82	0.00	5.00	5.00	
8.	Central Water & Power Research Station	0.00	18.24	0.00	17.00	0.00	22.10	0.00	25.00	25.00	
7.	National Institute of Hydrology	0.00	5.18	0.00	5.20	0.00	5.20	0.00	5.30	5.30	
8.	Sardar Sarovar Construction Advisory Committee	0.00	0.43	0.00	0.51	0.00	0.58	0.00	0.90	0.90	
			5								

No.	Organisation	Actuals	2007-08	BE 20	08-09	RE 20	08-09	BE 20	009-10	Total
140.	/Scheme	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	1
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
19.	Bansagar Control Board	0.00	0.11	0.00	0.16	0.00	0.16	0.00	0.23	0.23
20.	Sutlej Yamuna Link Canal Project	0.00	0.00	0.00	25.00	.0.00	15.00	0.00	22.00	22.00
21.	Upper Yamuna River Board	0.00	0.37	0.00	1.58	0.00	1.08	0.00	1.84	1.84
22.	Research and Development Programme	33.28	0.00	60.00	0.00	60.00	0.00	52.00	0.00	52.0
23.	Development of Water Resources Information System	18.65	0.00	46.00	0.00	45.10	0.00	70.00	0.00	70.0
24.	Hydrology Project	6.98	0.00	44.00	0.00	25.51	0.00	38.10	0.00	38.10
25.	Investigation of Water Resources Development Schemes	25.09	0.00	37.00	0.00	37.59	0.00	42.00	0.00	42.00
26.	Information, Education and Communication	1.32	0.00	13.00	0.00	13.00	0.00	12.00	0.00	12.00
27.	River Basin Organization/ Authority	0.00	0.00	1.00	0.00	0.01	0.00	0.50	0.00	0.50
28.	Dam Safety Studies and Planning	0.48	0.00	1.60	0.00	0.58	0.00	1.00	0.00	1.00
29.	Infrastructure Development	1.33	0.00	5.00	0.00	2.35	0.00	1.00	0.00	1.0
	Total: Major & Medium Irrigation	88.99	112.01	209.90	134.98	186.78	140.67	219.20	183.50	402.70
"	Minor Irrigation									
	Central Ground Water Board	0.00	59.51	0.00	57.70	0.00	82.80	0.00	95.00	95.00
	Rajiv Gandhi NGWTRI	0.60	0.00	2.10	0.00	0.81	0.00	2.00	0.00	2.00
	Ground Water Management and Regulation	48.11	0.00	95.00	0.00	84.29	0.00	70.00	0.00	70.00
	Infrastructure Development	1.27	0.00	7.00	0.00	4.60	0.00	4.00	0.00	4.00
	Total : Minor Irrigation	49.98	59.51	104.10	57.70	89.70	82.80	76.00	95.00	171.00
v.	Command Area Development Command Area Development Programme #	277.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total: Command Area Development	277.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
	Flood Control Central Water Commission									
	Flood Data Collection	0.00	36.48	0.00	35.00	0.00	50.00	0.00	55.00	55.00
	Payment to Government of Bhutan for maintenance of flood forecasting and warning centres	0.00	0.71	0.00	0.80	0.00	1.00	0.00	1.20	1.20
	Strengthening and moderni- zation of flood forecasting and hydrological network in Brahmaputra and Barak Basin	0.00	1.58	0.00	1.60	0.00	2.00	0.00	2.25	2.25
	Total : CWC	0.00	38.77	0.00	37.40	0.00	53.00	0.00	58.45	58.45
	Emergent Flood Protection	0.00	1.32	0.00	3.00	0.00	3.00	0.00	3.00	2.00

SI	Sector/	Actuals	2007-08	BE 200	8-09	RE 200	8-09	BE 200	9-10	Total
No.	Organisation /Scheme	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	Plan	Non- Plan	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
	Measures in Eastern and Western Sectors									
5.	Schemes for the benefit of North Eastern States & Sikkim									
	-Pagladia Dam Project	1.35	0.00	2.00	0.00	1.00	0.00	0.50	0.00	0.50
6.	Flood Forecasting	13.91	0.00	23.00	0.00	22.22	0.00	25.00	0.00	25.00
7.	River Management Activities and Works related to Border Areas	51.44	0.00	160.00	0.00	160.50	0.00	199.30	0.00	199.30
8.	Infrastructure Development	1.54	0.00	26.00	0.00	14.12	0.00	10.00	0.00	10.00
	Total : Flood Control	68.24	40.09	211.00	40.40	197.84	56.00	234.80	61.45	296.25
VI. 1.	Other Transport Services Farakka Barrage Project	30.99	18.31	75.00	19.24	75.68	28.25	70.00	32.00	102.00
2.	Jangipur Barrage	0.00	1.52	0.00	1.75	0.00	2.00	0.00	2.25	2.25
3.	Feeder Canal	0.00	3.09	0.00	3.40	0.00	3.54	0.00	4.00	4.00
	Total : Transport Services	30.99	22.92	75.00	24.39	75.68	33.79	70.00	38.25	108.25
	TOTAL (I to VI) *	516.04	251.85	600.00	280.00	550.00	336.22	600.00	403.00	1003.00
VII.	AIBP and other Water Resources Programme **	5445.71	0.00	5550.00	0.00	7850.00	0.00	8700.00	0.00	8700.00
	GRAND TOTAL	5961.75	251.85	6150.00	280.00	8400.00	336.22	9300.00	403.00	9703.00

Source of financing : *Demand No. 103 – Ministry of Water Resources for 2009-2010 (excluding AIBP) ** Details shown in Demand No. 35- Ministry of Finance (Transfers to State and Union Territory Governments). # Scheme has been transferred to State Sector w.e.f. 2008-09

Wing -wise Appellate Authorities/CPIOs in 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
2.	N.K. Gupta, Under Secretary (Administration)	Administration Section & SC/ST/OBC Cell	& PSU)
3.	K. Rajappa, Under Secretary (E-I)	Establishment I Section	S.V. Singh, DS (E &
4.	G.S. Audhkhasi, Under Secretary (Vigilance)	Vigilance Section	Vigilance)
5.	R.K. Kundi, Under Secretary (GW)	Ground Water Desk	Rajeev Kumar, Director (GW)
6.	P.S. Chakraborty, Under Secretary (WB & ID)	Water Bodies	Yogendra Singh, Director
7.	P.C. Rajagopalan, Under Secretary (General Administration)	General Administration Section	(Water Bodies)
8.	M.N. Sukumaran, Under Secretary (CGWB)	Central Ground Water Board Desk	
9.	S.K. Gaur, Section Officer (Information Technology Cell)	Information Technology Cell	Dr. P.K. Mehrotra, Director (GW Estt) & IT Cell
10.	Shasi Pal, Under Secretary (Information, Education and Communication)	Information, Education and Communication Cell	
11.	Dr. Arijit Dey, Scientist 'D'	Water Quality Issues	
12.	Dalbir Kaur, Junior Analyst (WS)	Internal Work Study Unit	
13.	T.K. Gupta, Under Secretary (FT)	Foreign Training	Preeti Pant, Deputy
(A)	N.K. Gupta, Under Secretary	Establishment matters of Farakka Barrage Project	Secretary (WS)
14.	A.C. Trivedi, Section Officer (E-III)	Establishment matters of Brahmaputra Board	
15.	Ashok Kumar, Deputy Director (OL)	Official Language	
16.	S.P. Gahlaut, Section Officer (ID)	Infrastructure Development	Rajeev Kumar Arora, Director (ID)

(B)	T.K. Gupta, Under	Coordination	
	Secretary (Coord)		S.S.K. Rao, Deputy
17.	S.P. Gahlaut, Section Officer	Parliament	Secretary (Coord)
18.	S.P.S. Chauhan, Sr. Joint	Hydrology Project matters of	
	Commissioner (B&B)	Brahmaputra & Barak Wing	Narender Kumar, Commissioner (B&B)
19.	R.K. Sund,	Matters of Brahmaputra &	
	Under Secretary (B&B)	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,	Projects Wing - Basin	
	Sr. Joint Commissioner	Management Section except	
	(BIVI)	Inose of Inter-Linking Rivers/	
		Agency	
25.	A.K. Suri,	Projects Wing – works	
	Deputy Secretary (BM)	relating to Ganga Basin	Indra Raj, Commissioner
		Section and Narmada Control	(PR)
26.	Bhupinder Singh	Projects Wing – works	
	Deputy Commissioner (BM)	relating to Inter-Linking of	
		Rivers/ National Water	
07		Development Agency	
27.	Shallesh Rana, Section Officer (Projects)	Project Section excluding	V.K. Nagpure, Sr. Joint
	Section Officer (Projects)	Advisory Committee and	Commissioner (PR)
		Narmada Control Authority	
28.	Anil Kumar, Assistant	Minor Irrigation	S.L. Jain, Deputy
	Engineer (MI)		Commissioner (MI)
29.	VIJAY KUMAR, Director (1)	Indus Wing	G. Aranganathan,
30	A K Srivastava	Minor Irrigation Statistics	V K Arora Additional
	Director (MI)		Director General
31.	S.K. Thakur,	Finance Wing – Finance	Ananya Ray, JS & FA
	Director (Finance)	Desks and Budget Section	
32.	Raj Singh, Director (EA)	External Assistance Desks	Vijay Kumar, Advisor (Eco)
33.	Satya Narain, Asstt	Matters related to Principal	
	Controller of Accounts	Accounts Office and Pay &	
		Accounts Uffice (Sectt.) and	

		Cash Section	Dr. Kavitha Gotru,
34.	Kanta Arora, Asstt	Matters related to Pay &	Controller of Accounts
	Controller of Accounts	Accounts Office (CWC) and	
	(CWC)	Pay & Accounts Office	
		(CSMRS)	
35.	G.D. Prashad, Sr. Accounts	Matters related to Pay &	
	Officer (FBP)	Accounts Office (FBP)	
36.	J. Thothadhri, Sr. Accounts	Matters related to Pay &	
	Officer (CWPRS)	Accounts Office (CWPRS)	
37.	D.P. Sharma, Sr. Accounts	Matters related to Pay &	
	Officer (CGWB)	Accounts Office (CGWB)	

Note : In case work of any CPIO/ Appellate Authority is changed or a new official joins in place of the existing CPIO/ Appellate Authority, he/ she would automatically be the CPIO/ Appellate Authority of the allotted work.

List of Postal Addresses of Directors of Public Grievances/ Staff Grievances in the Ministry of Water Resources and its Organisations

S. No.	Name of the Organization	Address	Name & Designation of P.G./ S.G. Officer
1.	Ministry of Water Resources	Room No.425, 4 th Floor, Shram Shakti Bhavan, New Delhi-110001 (Tele No. 23766135) (Fax No. 23710253) e-mail: dirwb-mowr@nic.in	Shri Yogendra Singh, Director (Coord.) & Director (PG/SG)
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)
		CGWB, CHQ, Faridabad (Tele No. 95129- 2419084) Fax No.95129- 2419059	Shri U.V. Singh, L.IO & Staff Grievances Officer
5.	Central Ground Water Board	CGWB, CHQ, Faridabad –121 001. (Tele No.95129-2413321 & (Fax No. 95129- 2412524) e-mail: <u>cgwb@nic.in</u> &hp_cgwb@nic.in	Shri Sunil Kumar, Sr. Hg. 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),3 rd Floor Sewa Bhawan,R.K. Puram, New Delhi- 110066(Tele No. 26187232) (Fax No. 26195516) e-mail: secymail@nic.in	Shri V.K. Chawla, 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.N. Sharma, Superintending Engineer (Coord.) & Director (Staff Grievances) Shri P.K. Alagh, Superintending
		03403-233000)	Engineer & Director (PG)
10.	Ganga Flood Control Commission	Ganga Flood Control Commission, Sinchai Bhawan, IIIrd Floor, Patna- 800015 (Tele No. 0612-2233591) e-mail: <u>dir-adm-gfcc@nic.in</u> & 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. 01332-276416 (O), 272909 & 272718,276416 (Fax No. 01332-272123) e-mail: svnrao@nih.ernet.in	Dr. S.K. Jain, Scientist F & Chairman, Grievance Cell
12.	National Projects Construction Corporation Limited	NPCC Ltd., Plot No. 67-68, Sector 25, Faridabad (HNA) (Tele No. 95129 - 2442546) (Fax No. 95129-2552546) e-mail: anupkumar.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. 26852735) (Fax No. 26960841) e-mail: cehqnwda@rediffmail.com	Shri N.K. Bhandari, Chief Engineer (HQ) & Staff Grievance officer
14.	Sardar Sarovar Construction Advisory Committee	Sardar Sarovar Construction Advisory Committee, Narmada Bhavan, "A" Block 4 th Floor, Vadodara – 390001 (Tele No. 0265-2421272) Fax No. 0265- 2437262 (Telefax) e-mail: jbabu50@rediffmail.comS	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	Shri M.S. Aggarwal, Member Secretary & Director of Grievances
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	FRL	Full Reservoir Level
AIBP	Accelerated Irrigation Benefit Programme	GFCC	Ganga Flood Control Committee
BB	Brahmaputra Board	GRA	Grievances Redressal Authorities
BCB	Bansagar Control Board	HP	Hydrology Project
BRB	Betwa River Board	IBRD	International Bank of Reconstruction
CADWM	Command Area Development & Water Management	INCGECM	Indian National Committee on Geotechnical Engineering and Construction Materials
CCA	Culturable Command Area	INCID	Indian National Committee on Irrigation and Drainage
CEA	Central Electricity Authority	IEC	Information, Education and Communication
CGWB	Central Ground Water Board	INCH	Indian National Committee on Hydraulic Research
CSMRS	Central Soil & Material Research Station	INCOH	Indian National Committee on Hydrology
CSS	Central Sector Scheme	ISRO	Indian Space Research Organisation
cumec	cubic metre per sec	INCGW	Indian National Committee on Ground Water
cusec	cubic foot per sec	ISRWD	Inter-State River Water Disputes
CWC	Central Water Commission	JBIC	Japan Bank for International Cooperation
CWPRS	Central Water & Power Research Station	JCWR	Joint Committee on Water Resources
CLA	Central Loan Assistance	JET	Joint Expert Team
CRA	Cauvery River Authority	JGE	Joint Group of Experts
CWDT	Cauvery Water Disputes Tribunal	JRC	Joint Rivers Commission
DPR	Detail Project report	Kfw	Kreditanstalt fur Wiederaufbau
DSS	Decision Support System	KWDT	Krishna Water Disputes Tribunal
DRIP	Dam Rehabilitation and Improvement Project	MI	Minor Irrigation
EFC	Expenditure Finance Committee	MoU	Memorandum of Understanding
ERM	Extension, Renovation and Modernization	M & M	Major and Medium
FPARP	Farmers Participatory Action Research Programme	Mha	million hectares
FBP	Farakka Barrage Project	MoWR	Ministry of Water Resources
FMP	Flood Management Programme	NAPCC	National Action Plan on Climate Change
FR	Feasibility Report	NCA	Narmada Control Authority
NIH	National Institute of Hydrology	RRSSC	Regional Remote Sensing Service Centre

NCSDP	National Committee on Seismic Design Parameters	R&R	Rehabilitation and Resettlement
NHDC	Narmada Hydro-electric Development Corporation	SS	State Sector
NLSC	National Level Steering Committee	SSCAC	Sardar Sorovar Construction advisory Committee
NPMC	National Level Programme Monitoring Committee	SAC	Standing Advisory Committee
NPP	National Perspective Plan	SCEC	Sub Committee on Embankment Construction
NWDT	Narmada Water Disputes Tribunal	SSP	Sardar Sarovar Project
NWM	National Water Mission	TAC	Technical Advisory Committee
NPCC	National Projects Construction Corporation Ltd	TAMC	Technical Assistance and Management Consultancy
NWDA	National Water Development Authority	TOR	Terms of Reference
NCMP	National Common Minimum Programme	ТВ	Tungbhadra Board
OFD	On Farm Development	UYRB	Upper Yamuna River Board
PIM	Participatory Irrigation Management	WAPCOS	Water And Power Consultancy Services (India) Ltd
PAC	Project Advisory Committee	WB	World Bank
PAF	Project Affected Families	WEGWIS	Web Enabled Ground Water Information System
PDS	Purpose Driven Studies	WQAA	Water quality Assessment Authority
PSC	Permanent Standing Committee	WRIS	Water Resources Information System
RMIS	Rationalisation of Minor Irrigation Statistics	WUA	Water User Association
RRR	Repair, Renovation and Restoration		