ANNUAL REPORT

2005-06

GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES
NEW DELHI

Contents

OVERVIEW

The Ministry of Water Resources in the Government of India is responsible for laying down policy guidelines and programmes for the development and regulation of country's water resources. The following are its main functions:-

(a) 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.

(b) General Policy, technical assistance, research and development training and all matters relating to irrigation, including multi-purpose, major, medium, minor and emergency irrigation works; hydraulic structures for navigation and hydropower; tube wells and groundwater exploration and exploitation; protection and preservation of ground water resources; conjunctive use of surface and ground water, irrigation for agricultural purposes, water management, command area development; management of reservoirs and reservoir sedimentation; flood (control) management, drainage, drought proofing, water logging and sea erosion problems; dam safety.

(c) Regulation and development of inter-State rivers and river valleys. Implementation of Awards of Tribunals through Schemes, River Boards.

(d) Water quality assessment.

(e) Water Laws, legislation including International Water Law.

(f) International organisations, commissions and conferences relating to water resources development and management, drainage and flood control.

(g) Matters relating to rivers common to India and neighbouring countries; the Joint Rivers Commission with Bangladesh, the Indus Waters Treaty 1960; the Permanent Indus Commission.

(h) Bilateral and external assistance and cooperation programmes in the field of water resources development.

The Ministry is headed by Hon'ble Prof. Saif-ud-Din Soz as the Union Minister of Water Resources since 30.1.2006. Shri J Hari Narayan is the Secretary in the Ministry of Water Resources since 31.3.2005. Smt. Sushma Singh joined the Ministry as Additional Secretary on 6.2.2004. The Ministry has ten wings namely; Administration, Finance, Policy & Planning, Projects, Ganga, Indus, Command Area Development & Water Management, and Brahamputra & Barak and Ground Water Wing, Economic Wing. Each Wing is headed by an officer of the level of Joint Secretary. To achieve its various objectives, the Ministry is assisted by the following organisations to perform the assigned tasks.

ORGANIZATIONS AND BODIES UNDER THE MINISTRY OF WATER RESOURCES

1. Central Water Commission.
2. Central Soil and Materials Research Station. 3.Central Ground Water Board. /Central Ground Water Authority.
4. Central Water & Power Research Station.
5. Farakka Barrage Project.
6. Ganga Flood Control Commission.
7.Sardar Sarovar Construction Advisory Committee. 8. Brahmaputra Board.
9. Narmada Control Authority.
10. Betwa River Board.
11. National Institute of Hydrology.
12.National Water Development Agency.
13. Bansagar Control Board.
14. Tungabhadra Board.
15. Upper Yamuna River Board.
16.Water and Power Consultancy Services (India) Ltd.
17.National Projects Construction Corporation Limited.

National Water Policy

The Ministry adopted Water Policy in 1987 and same was subsequently revised. The revised National Water Policy was adopted by the National Water Resources Council under the Chairmanship of the Prime Minister of India in its 5th meeting held on 1st April, 2002.

The salient features of the National Water Policy – 2002 are as under:-

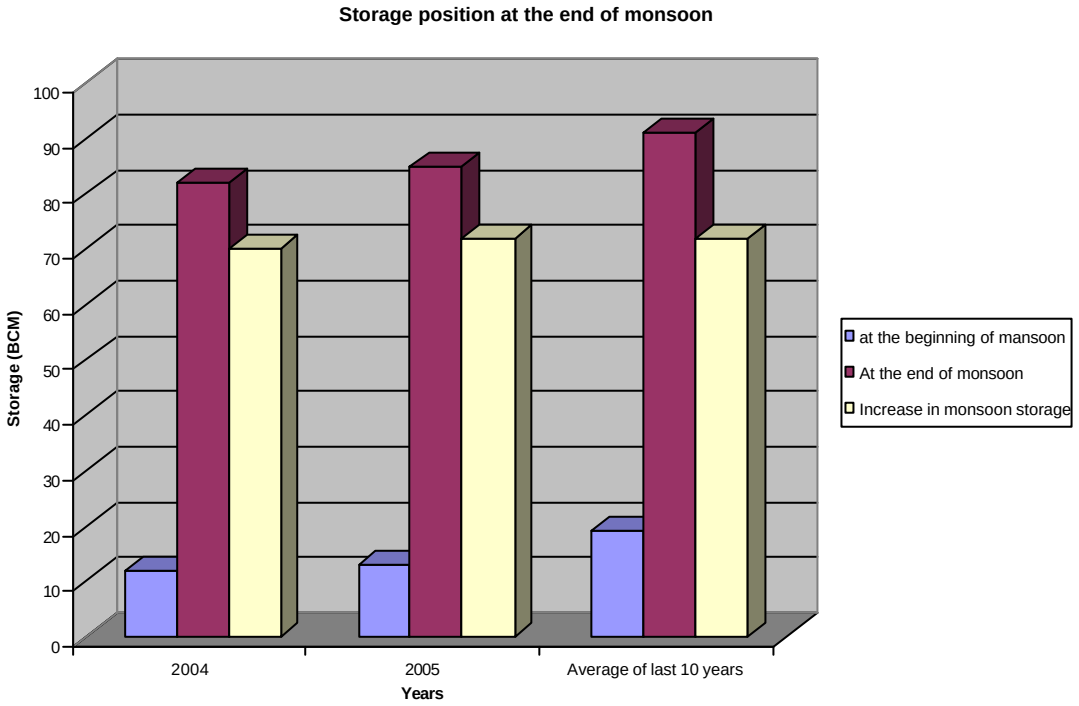
- Water is a precious national resource and its planning, development and management should be governed by national perspectives.
- A well developed information system for water related data at national/state level should be established with a net-work of data banks and data bases integrating and strengthening the existing central and state level agencies.
- Water resources development and management will have to be planned for a hydrological unit. Appropriate river basin organizations should be established for the planned development and management of the river basins.
- Water should be made available to water short areas by transfer from other areas including transfer from one river basin to another, after taking into account the requirements of the areas/basins.
- Planning of water resources development projects should, as far as possible, be for multi-purpose with an integrated and multi-disciplinary approach having regard to human and ecological aspects including those of disadvantaged sections of the society.
- In the allocation of water, first priority should be given for drinking water, followed by irrigation, hydro-power, ecology, agro-industries and non-agricultural industries, navigation and other uses, in that order.

- The exploitation of groundwater should be regulated with reference to recharge possibilities and consideration of social equity. The detrimental environmental consequences of over-exploitation of ground water need to be effectively prevented.
- Careful planning is necessary to ensure that construction and rehabilitation activities proceed simultaneously. A skeletal national policy on resettlement & rehabilitation needs to be formulated such that project affected persons share the benefits through proper rehabilitation.
- Adequate emphasis needs to be given to the physical and financial sustainability of existing water resources facilities. There is need to ensure that the water charges for various uses should be fixed such as to cover at least the operation and maintenance charges initially and a part of the capital costs subsequently.
- Management of the water resources for diverse uses should incorporate a participatory approach by involving users and other stakeholders along with various governmental agencies, in an effective and decisive manner.
- Private sector participation should be encouraged in planning, development and management of water resources projects for diverse uses, wherever feasible.
- Both surface water and ground water should be regularly monitored for quality. Effluents should be treated to acceptable levels and standards before discharging them into natural streams. Minimum flow should be ensured in the perennial streams for maintaining ecology.
- Efficiency of utilization should be improved in all the diverse uses of water and conservation consciousness promoted through education, regulation, incentives and disincentives.
- There should be a Master Plan for flood control and management for each flood prone basin. In flood control and management, the strategy should be to reduce the intensity of floods.
- Land erosion by sea or river should be minimized by suitable cost-effective measures. Indiscriminate occupation of, and economic activity in coastal areas and flood plain zones should be regulated.
- Needs of drought-prone areas should be given priority in the planning of project for development of water resources. These areas should be made less vulnerable through various measures.
- The water sharing/distribution amongst the states should be guided by a national perspective with due regard to water resources availability and needs within the river basin.
- Training and research efforts should be intensified as an integral part of water resources development.

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

1.2 Water Scenario:

The annual precipitation including snowfall, which is the main source of water in the country, is estimated to be of the order of 4000 Billion Cubic Metres(BCM). The estimated precipitation during the monsoon season (June to September) is of the order of 3000 BCM. The average availability of water in the country is assessed at 1869 BCM. Out of which, the utilizeable water resources are 1123 BCM (690 BCM of Surface water and 433 BCM of replenishable ground water) A total storage capacity of 212.78 Billion Cum (BCM) has been created in the country through major & medium projects. The projects under construction will contribute to an additional 76.26 BCM, while the contribution expected from projects under consideration is 107.54 BCM. Central Water Commission is monitoring the storage position of 76 important reservoirs spread all over the country. The Total Storage capacity (at FRL) in these reservoirs is 133.021 BCM. The total availability of water in the 76 major reservoirs was 109.77 BCM at the end of the monsoon of 2005 against 85.12 BCM at the end of the monsoon last year.



Bharat Nirman: Irrigation Sector

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

The ultimate irrigation potential for the country has been estimated as 139.88 million hectare(Mha) which include potential through major and medium irrigation projects(58.46 Mha), surface water based minor irrigation schemes(17.42 Mha) and ground water development(64.00 Mha). Irrigation potential of 99.36 Mha has been reported to be created upto March 2005. However, the created potential has not been fully utilized and the gap between created and utilized potential has been estimated to be of the order of 14 Mha,

Keeping in view the present status, the target for creation of irrigation potential under "Bharat Nirman" has been proposed to be met largely through completion of on going major and medium irrigation projects. Due emphasis has also been given to enhancing the utilization of completed projects/schemes. Further, development of new projects of minor irrigation to cater to the requirement of specific areas particularly to provide benefit to small and marginal farmers and Dalits and Tribals has also been included in Bharat Nirman.

Physical targets for various activities identified under Bharat Nirman.

Sl.No.	Component		Target
I	Completion of ongoing Major & Medium Irrigation projects.		4.2 Mha
II	Minor irrigation schemes		2.8 Mha
	* Surface water	1.0 Mha	
	* Ground Water	1.8 Mha	
III	Enhancing utilization of completed projects		2.0 Mha
	* ERM of major & medium projects	1.0 Mha	
	* Repair, renovation and restoration of water bodies/ERM of minor irrigation schemes	1.0 Mha	
IV	Ground water development in area with unutilized ground water potential (for benefit of small & marginal farmers and Tribals & Dalits)		1.0 Mha

The proposal of Bharat Nirman was discussed in detail during the conference of State Irrigation Secretaries in New Delhi on 4,5 October., 2005. Based on the discussions the State Governments, were requested to identify the project for inclusion in Bharat Nirman and draw a plan of Action and send the same to Ministry of Water Resources. Various related issues were also discussed during the State Irrigation Minister's Conference held in New Delhi on November 30, 2005. The preliminary proposal received from the State Governments have been examined and certain clarifications sought from them before firming up category – wise and State-wise targets under Bharat Nirman.

CHAPTER 1

MAJOR AND MEDIUM PROJECTS

Present Development Scenario

Irrigation development in the country has been taken up in a big way through Major, Medium and Minor irrigation schemes since independence. The irrigation potential has gone up from 22.6 Mha (9.76 Mha through Major & Medium and 12.84 Mha through Minor) prior to Plan period to 93.95 Mha by the end of IX Plan and further to 97.15 Mha (38.87 Mha through Major & Medium and 58.28 Mha through Minor) up to 31.03.2004 against the Ultimate Irrigation Potential of 139.91 Mha (58.49 Mha through Major & Medium and 81.42 Mha through Minor). This development of irrigation facilities has contributed to country's self sufficiency in food grains which has gone up from 51 Million Tons in 1950 to 210 million Tons in 2000. A total number of about 1248 Major, Medium & ERM (Extension, Renovation & Modernisation) projects have been completed up to 31.03.2004 and another 471 (169 Major, 219 Medium & 83 ERM) projects, which have spilled over from IX Plan with a balance cost of about Rupees One lakh Crore, are on-going. In addition, 300 new projects (78 Major, 136 Medium & 86 ERM) are being taken up during the X Plan period. Additional Irrigation Potential of 10.50 Mha (6.5 through Major & Medium and 4.00 Mha. through Minor) is planned to be created during the X Plan, totaling to 104.45 Mha by the end of the current Plan.

Accelerated Irrigation Benefits Programme (AIBP)

A large number of river valley projects, both multipurpose and irrigation, have spilled over from Plan to Plan mainly because of financial constraints faced by the State Governments. As a result, despite huge investment having already been made on these projects, the country is not able to derive the desired benefits. There were 171 Major, 259 Medium and 72 Extension, Renovation and Modernisation on-going Irrigation projects in the country at various stages of construction at the end of the VIIIth Plan (i.e. end of 1996-97) with spillover cost of Rs.75,690 crore. This was a matter of grave concern for the Union Government and remedial measures for expeditious completion of some of the projects which were in advanced stage of completion became necessary.

With this end in view, the Government of India launched the Accelerated Irrigation Benefits Programme (AIBP) during 1996-97 for accelerating implementation of on-going Irrigation/multi-purpose projects on which substantial progress have been made and which are beyond the resource capability of the State Governments and for other major and medium Irrigation projects which are in advanced stage of construction and could yield irrigation benefits in the next four agricultural seasons. Thus the twin objectives of AIBP are (i) to accelerate ongoing irrigation projects and (ii) to realize bulk benefits from completed irrigation projects.

Modified Guidelines Of The Existing Programme

The Cabinet in its meeting held on 16th March, 2005 considered further relaxation in criteria and the following were included

Table - I

Statewise details of CLA/grant released under AIBP

(Rs. Crore)

Sl.No.	State	Amount											Grand Total
		1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05		2005-06	
										Loan	Grant	Grant	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(14)	(15)
1	Andhra Pradesh	35.2500	74.0000	79.6700	65.0150	95.0200	281.6600	33.1860	205.5300	61.2829	26.2641	17.8890	974.7670
2	Arunachal Pradesh	0.0000	0.0000	0.0000	7.5000	7.5000	15.0000	1.5000	20.0000	1.0000	9.0000		61.5000
3	Assam	5.2300	12.4000	13.9500	14.5400	24.0770	14.5210	16.2738	19.2015	1.6930	15.2370	14.9532	152.0765
4	Bihar	13.5000	5.1500	36.1850	129.6950	151.7750	3.4200	14.4805	74.6440	26.0505	11.1645	10.7640	476.8285
5	Chhattisgarh	0.0000	4.5000	9.5000	10.5200	13.9300	48.2000	104.0000	74.6300	2.0475	0.8775		268.2050
6	Goa	0.0000	5.2500	0.0000	3.5000	61.6500	58.0000	0.0000	2.0000	0.4550	0.1950		131.0500
7	Gujarat	74.7730	196.9000	423.8200	272.7000	421.8500	581.6900	1000.3300	650.3590	484.7500	45.7500	162.0000	4314.9220
8	Haryana	32.5000	12.0000	0.0000	0.0000	0.0000	0.0000	18.0000	7.7350	7.7945	3.3405	3.3405	84.7105
9	Himachal Pradesh	0.0000	6.5000	5.0000	11.0470	18.0150	3.2440	8.1500	14.6920	0.3690	3.3210	7.0110	77.3490
10	Jammu & Kashmir	1.3000	0.0000	0.0000	4.6800	10.4600	11.0700	34.9990	21.5450	1.2744	11.4701	16.6492	113.4477
11	Jharkhand	0.0000	8.8900	11.6400	14.3450	5.7150	10.8200	9.6700	1.8330	14.8995	6.3855		84.1980
12	Karnataka	61.2500	90.5000	94.5000	157.1400	171.0000	492.5000	620.8500	266.4780	314.7921	81.5031	100.6848	2451.1980
13	Kerala	3.7500	15.0000	0.0000	0.0000	22.4000	11.2750	5.6650	31.0000	34.6080	14.8320		138.5300
14	Madhya Pradesh	63.2500	110.0000	81.2500	95.3250	151.3280	215.4100	220.0000	568.4400	361.6907	155.0103	13.4457	2035.1497
15	Maharashtra	14.0000	55.0000	50.8600	49.8750	97.0200	39.1000	133.1341	164.3950	370.5002	158.7858	23.5099	1156.1800
16	Manipur	4.3000	26.0000	10.7800	21.8100	1.5000	9.3600	19.5000	15.5000	1.3000	11.7000	18.3825	140.1325
17	Meghalaya	0.0000	0.0000	0.0000	2.6938	5.5120	4.4700	1.5000	1.0880	0.1744	1.5694		17.0076
18	Mizoram	0.0000	0.0000	0.0000	1.4330	1.4330	2.0000	0.7500	9.3000	0.5000	4.5000	9.3150	29.2310
19	Nagaland	0.0000	0.0000	0.0000	2.7300	5.0000	5.0000	2.6590	8.0000	0.4000	3.6000	2.7000	30.0890
20	Orissa	48.4500	85.0000	71.5000	90.2500	100.3200	168.4750	179.5700	154.6850	16.9561	7.2669	71.9184	994.3914
21	Punjab	67.5000	100.0000	0.0000	42.0000	55.6200	113.6900	36.6600	0.0000			4.6965	420.1665
22	Rajasthan	2.6750	42.0000	140.0500	106.6650	78.4670	96.3150	174.3850	499.8370	247.0328	105.8712	33.2475	1526.5455
23	Tripura	3.7730	5.1000	3.9750	34.6530	13.8830	21.0630	13.3947	13.3769	1.1000	9.9000	10.4984	130.7170
24	Tamil Nadu	20.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				20.0000
25	Uttar Pradesh	43.5000	78.0000	76.5000	286.0000	315.9000	354.6900	359.0000	274.7850	123.1440	52.7760	59.8665	2024.1615
26	Uttaranchal	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	25.1625	25.5525	3.8992	35.0925	37.8675	127.5742
27	West Bengal	5.0000	20.0000	10.0000	25.0000	26.8250	38.6080	28.1330	3.1440	9.4227	4.0383		170.1710
28	Sikkim	0.0000	0.0000	0.0000	1.3600	0.0000	2.4000	0.7500	0.7500	0.0750	0.6750	0.6750	6.6850
Total		**500.0010**	**952.1900**	**1119.1800**	**1450.4768**	**1856.2000**	**2601.9810**	**3061.7026**	**3128.5009**	**2087.2115**	**780.1257**	**619.4146**	**18156.9841**

**** Out of 11.238 crore CLA released during 2002-03 to Subernarekha, Rs. 10.25 crore transferred to Teesta Barrage in 2003-04***

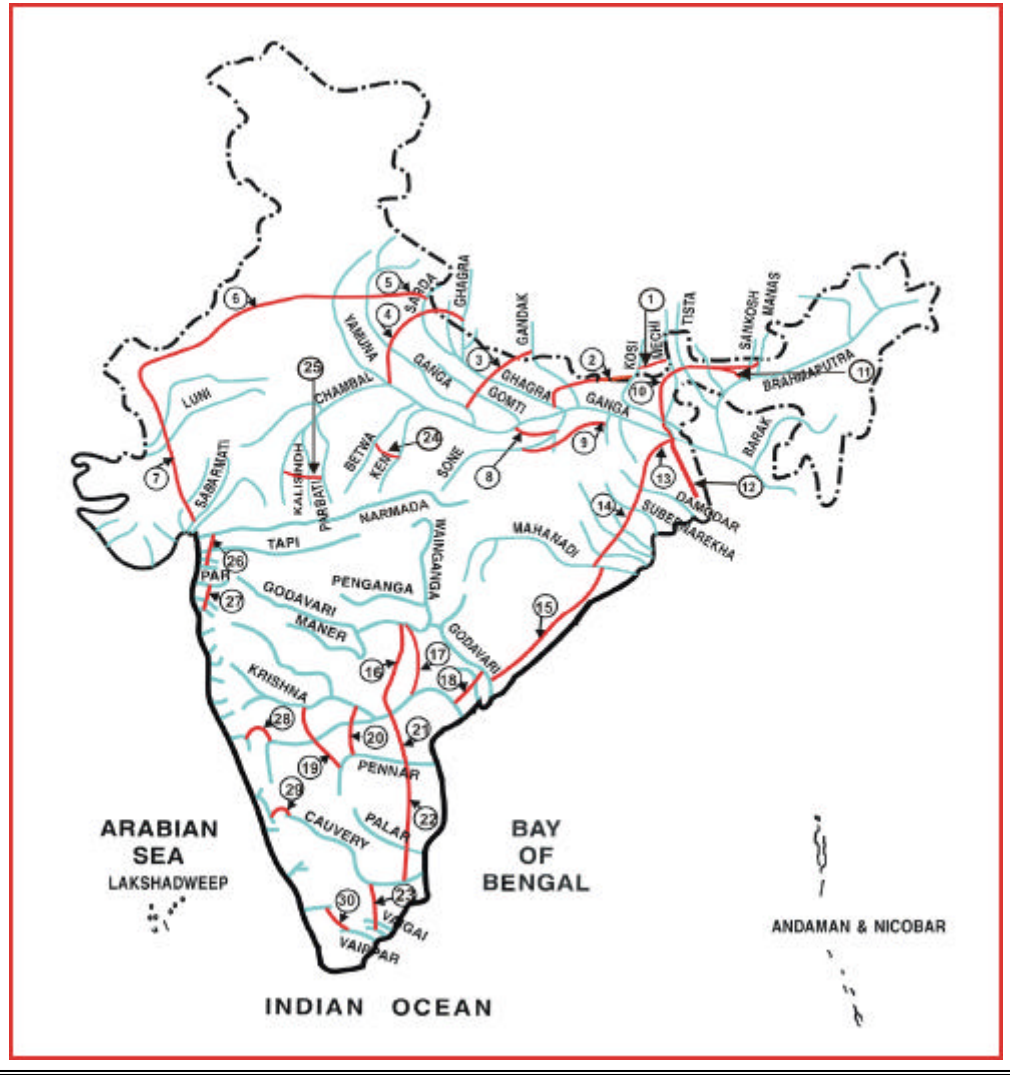
Table II

Statewise details of Major/Medium Projects completed under AIBP

S.No.		Project (Started in Plan)	Entry	Completion
1.	**Andhra Pradesh**	Cheyyeru (Annamaya) (v)	2002-03	2003-04
2.	**Assam**	Rupahi	1996-97	2001-02
3.		Bordikarai (V)	1997-98	2004-05
4.	**Bihar**	Bilasi Reservoir (v)	1997-98	2000-01
5.	**Chhattisgarh**	Shivnath Diversion (v)	1997-98	2002-03
6.	**Haryana**	Gurgaon Canal (III)	1996-97	2003-04
7.	**Jharkhand**	Latratu (VII)	1997-98	2002-03
8.		Tapkara Res. (VI)	1997-98	2002-03
9.	**Gujarat**	Umaria (V)	1996-97	1996-97
10.		Deo (V)	1997-98	1997-98
11.		Harnav-II (IV)	1996-97	1997-98
12.		Jhuj (A.P. 1978-80)	1996-97	1999-00
13.		Sipu (A.P. 1978-80)	1996-97	1999-00
14.		Damanganga (IV)	1997-98	1999-00
15.		Karjan (V)	1997-98	1999-00
16.		Sukhi (V)	1997-98	1999-00
17.		Watrak (A.P. 1978-80)	1997-98	1999-00
18.	**Karnataka**	Maskinala	2002-03	2003-04
19	**Kerala**	Kallada	1996-97	2004-05
20	**Madhya Pradesh**	Upper Weinganga (V)	1996-97	2002-03
21		Urmil (V)	2000-01	2002-03
22		Banjar (V)	2000-01	2002-03
23	**Maharashtra**	Kadvi *	2002-03	2004-05
24		Khadakwasla (II) *	2002-03	2004-05
25		Kasari	2002-03	2004-05
26		Upper Tapi	1997-98	2004-05
27		Jayakwadi St-II	2000-01	2004-05
28		Kasar sai	2002-03	2004-05
29		Jawalgaon	2002-03	2004-05
30	**Orissa**	Upper Kolab	1997-98	2004-05
31		Potteru	March, 02	2004-05
32		Sason Canal	2002-03	2004-05
33		Salki	2003-04	2004-05
34	**Rajasthan**	Jaisaand (VI)	1996-97	2000-01
35		Gambhiri (VI)	1998-99	2000-01
36		Chhapi	2002-03	2004-05
37		Panchana	2002-03	2004-05
38	**Punjab**	Ranjit Sagar Dam (VI)	1996-97	2000-01
39	**Uttar Pradesh**	Rajghat Dam (V)	1996-97	1996-97
40		Gunta Nala Dam (VI)	1996-97	1999-00
41		Sarda Sahayak (III)	1996-97	2000-01
42		Gyanpur Pump Canal (VII)	1999-00	2001-02
43		Madhya Ganga & Upper Ganga Mod. (V)	Marh,02	2003-04
44		Providing Kharif Channel in Hindon Krishni Deob	1996-97	2003-04
45	**West Bengal**	Kangsabati (II)	1997-98	2001-02

Links Identified for Preparation of Feasibility Reports

PROPOSED INTER BASIN WATER TRANSFER LINKS



HIMALAYAN COMPONENT

1. Kosi – Mechi
2. Kosi – Ghagra
3. Gandak – Ganga
4. Ghagra – Yamuna **
5. Sarda – Yamuna **
6. Yamuna – Rajasthan
7. Rajasthan – Sabarmati
8. Chunar- Sone Barrage
9. Sone Dam – Southern Tributaries of Ganga
10. Manas –Sankosh - Tista - Ganga
11. Jogighopa – Tista – Farakka (Alternate)
12. Farakka – Sunderbans
13. Ganga (Farakka) – Damodar – Subernarekha
14. Subernarekha – Mahanadi

PENINSULAR COMPONENT

15. Mahanadi (Manibhadra)–Godavari (Dowlaiswaram)*
16. Godavari (Inchampalli) – Krishna (Nagarjunasagar)*
17. Godavari (Inchampalli) – Krishna (Pulichintala) *
18. Godavari (Polavaram) – Krishna (Vijayawada) *
19. Krishna (Almatti) – Pennar *
20. Krishna (Srisailam) – Pennar *
21. Krishna (Nagarjunasagar) – Pennar (Somasila) *
22. Pennar (Somasila) – Cauvery (Grand Anicut) *
23. Cauvery (Kattalai) – Vaigai – Gundar *
24. Ken – Betwa *
25. Parbati – Kalisindh – Chambal *
26. Par – Tapi – Narmada *
27. Damanganga – Pinjal *
28. Bedti – Varda
29. Netravati – Hemavati@
30. Pamba – Achankovil – Vaippar *

* FR Completed ** FR Completed for Indian portion
@ Consent from Govt. of Karnataka awaited

i) The Central Government will release only grant component of the Central Assistance and the loan component is to be raised by the States from market borrowings. However, the Centre would raise loan financing for the loan component for fiscally weak States.
ii) The Minor Irrigation Schemes of Non-Special Category States with potential more than 100 hectare with preference of Tribal Areas and Drought Prone Areas which wholly benefit Dalits and Adivasis will be eligible under the programme. However, Drought Prone Areas, Tribals Areas and Flood Prone Areas in the country are to be identified in consultation with Planning Commission.
iii) The time limit for completion of Fast Track Projects will be taken as two financial years and for projects under normal funding, four financial years.

Releases In Various Years

The funds are released by the Ministry of Finance on the recommendations of the Ministry of Water Resources. Since inception of this programme in 1996-97 an amount of Rs.17537.57 crore has been released for various major/medium/minor irrigation projects as CLA upto 2004-05(Table-I).

During 2005-06, there is a budget provision of Rs.4500 crore in the Union Budget for Accelerated Irrigation Benefits Programme(AIBP) and an amount of Rs.619.41 crore has been released to various major/medium/minor irrigation projects as grant under this programme as on date. The State-wise details of grant under AIBP are enclosed(Table-I).

Overall Cumulative Release & Benefits

It may be seen that by injecting an amount of about Rs. 17537.57 crore since inception of the programme in 1996-97, (Table-I) the Government has been able to expedite the creation of additional irrigation potential to the tune of 3.25 million hectare upto March, 2005 through major/ medium schemes and 45 Major/ Medium Projects have since been completed with the help of this programme(Table-II).

National Perspective Plan (NPP)

Introduction

The Ministry of Water Resources (MOWR) (erstwhile Ministry of Irrigation) and Central Water Commission (CWC) formulated a National Perspective Plan (NPP) for Water Resources Development in 1980 envisaging Interbasin transfer of water from surplus basins to deficit basins/areas which comprises of two components, namely, Himalayan Rivers Development Component and Peninsular Rivers Development Component. National Water Development agency (NWDA) was set up under the MOWR in July, 1982 as a registered Society under the Societies Registration Act, 1860 for carrying out various technical studies to establish the feasibility of the proposals of NPP and to give concrete shape to it.

National Water Development Agency

Introduction

National Water Development Agency (NWDA) was established in July, 1982 as a registered Society under the Societies Registration Act, 1860 under the Ministry of Water Resources to study the feasibility of the Peninsular Component of National Perspective Plan. The NWDA is fully funded by Government of India through Grants-in-aid. Subsequently in 1990-91, NWDA Society resolved to take up the studies of Himalayan Component also.

The Agency functions with the following main objectives:

(a) To promote scientific development for optimum utilization of water resources in the country.
(b) To carry out detailed field surveys and investigations of possible storage reservoir sites and inter connecting links in order to establish feasibility of the proposals of Peninsular Rivers Development and Himalayan Rivers Development Components forming part of National Perspective for Water Resources Development prepared by the then Min. of Irrigation (now Ministry of Water Resources) and Central Water Commission.
(c) To carry out detailed studies about the quantum of water in various Peninsular and Himalayan River Systems, which can be transferred to other basins/States after meeting reasonable needs of basin States in the foreseeable future.
(d) To prepare feasibility reports of various components of the schemes relating to Peninsular Rivers Development and Himalayan Rivers Development.
(e) To take all such other actions as the Society may consider necessary, incidental, supplementary or conducive to the attainment of above objectives.

Organisational Setup

The NWDA is headed by the Director General of the rank of Additional Secretary to Govt. of India. He is the Principal Executive Officer of the Society, responsible for the proper administration of the affairs and funds of the Society assisted by Chief Engineer(HQ) and Directors and is also responsible for coordination and general supervision of the activities of the Society. The Headquarters of the Agency is at New Delhi. NWDA has 2 field organisations each headed by a Chief Engineer, 5 Circles each headed by a Superintending Engineer, 15 Divisions each headed by an Executive Engineer and 10 Sub-Divisions each headed by an Assistant Executive Engineer/Assistant Engineer.

ACTIVITIES

Inter Basin Water Transfer proposals

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

Peninsular Rivers Development Component

Under the Peninsular Component, National Water Development Agency has completed collection of data and water balance studies of all 137 basins/sub-basins and 52 identified diversion points(including 3 additional studies), 58 reservoir studies, toposheet studies of 18 links including 1 additional study and all 18 pre-feasibility reports. Based on these studies NWDA has identified 16 water transfer links under Peninsular Component for Surveys and Investigations and preparation of Feasibility Reports as furnished at Annexure-I.

Himalayan Rivers Development Component

The studies in respect of Himalayan Rivers Development Component were started by NWDA during the year 1991-92. The

Himalayan Component envisages construction of storage reservoirs on the principal tributaries of the Ganga and the Brahmaputra in India, Nepal and Bhutan, along with interlinking canal systems to transfer surplus flows of the eastern tributaries of the Ganga to the west, apart from linking of the main Brahmaputra and its tributaries with the Ganga and Ganga with Mahanadi.

Under the Himalayan Rivers Development Component, NWDA has completed water balance studies of all the 19 diversion points, toposheet studies of 16 storage reservoirs & 19 water transfer links and pre-feasibility report of 14 links.

The water transfer links being studied by The NWDA under Peninsular & Himalayan Components are shown in Plate - I.

Benefits From Inter Basin Transfer Link Schemes

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

As per National Water Development Agency studies (i) the Himalayan Component of the inter-basin water transfer proposal will benefit States of Uttar Pradesh, Uttaranchal, Haryana, Rajasthan, Gujarat, Assam, West Bengal, Bihar, Jharkhand and Orissa and also enrich the peninsular component from the surplus waters of Brahamputra. (ii) the Peninsular Component will benefit Andhra Pradesh, Orissa, Karnataka, Tamil Nadu, Kerala, Pondicherry, Madhya Pradesh, Rajasthan, Maharashtra & Gujarat.

National Common Minimum Programme:-

The National Common Minimum Programme of the United Party Alliance Government envisages comprehensive assessment of the feasibility of linking the rivers of the country starting with the southern rivers. This assessment will be done in a fully consultative manner. It will also explore the feasibility of linking the sub-basin of rivers in the States. A comprehensive assessment of the feasibility of linking rivers in the country has already been accomplished by making a presentation before the Hon'ble Prime Minister on 11th October,2004. The follow-up action on the decision taken after presentation such as creation of a Special Cell, Constitution of Committee of Environmentalists, Social Scientists and other Experts on ILR, identification of priority link etc. has already been accomplished.

MAJOR ACTIVITES

a. Survey and Investigation works of link By NWDA

The concurrence from Govt. of Karnataka for Survey & Investigations and preparation of a Feasibility Report in respect of Bedti-Varda link project has been received in August, 2005 and the field survey works of this link has been taken up during 2005-06.

Field Surveys & Investigations for preparation of Feasibility Reports of remaining 12 links of Himalayan Component (Plate-I) are under progress at various stages. Out of which, the works for Chunar – Sone Barrage and Yamuna – Rajasthan links, which do not involve international dimensions directly, are in an advanced stage of completion and it is expected that the Feasibility Reports of these two links will be completed by March 2006.

b. Putting of Feasibility Reports on website:

A Public Interest Litigation (PIL) on Interlinking of Rivers (ILR) with title "In Re: NETWORKING OF RIVERS vs ------" has been listed in the Hon'ble Supreme Court of India since October, 2002. The Hon'ble Supreme Court regularly monitors the progress of implementation of ILR projects. The Supreme Court in its Order dated 08.08.2005 directed that all such feasibility reports, which are ready and complete, shall be put on the website without reference to any person or authority and without any further delay. In compliance of the directions, NWDA has completed the task of preparation of web friendly Feasibility Reports of various completed links on war footing during 2005-06 and placed Feasibility Reports of 14 peninsular links along with the views of the concerned States on its website http://nwda.gov.in

c. 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 a consensus among the States regarding sharing of surplus water in river basin/sub-basin and quantum of surplus water to be transferred from surplus basins to deficit basins/areas as per the proposal of inter-basin water transfer of NWDA and helping the States in arriving at an agreement regarding sharing of cost and benefits by the beneficiary States.The Consensus Group headed by Chairman, CWC held 5th & 6th meeting in March, 2005 and May, 2005 respectively for Parbati-Kalisindh-Chambal link and Polavaram-Vijayawada link for which necessary secretariat assistance was provided by NWDA. As a result of further follow-up action taken on the previous meetings of the Consensus Group on Ken-Betwa link, a tripartite Memorandum of Understanding(MoU) was signed between the Union Minister of Water Resources, Chief Ministers of Government of Madhya Pradesh and Uttar Pradesh on 25th August, 2005 for preparation of Detailed Project Report(DPR) of Ken-Betwa link by Central Government.

d. The Committee of Environmentalists, Social Scientists and Other Experts

As a follow-up action on comprehensive assessment of Interlinking of Rivers, the Committee of Environmentalists, Social Scientists and Other Experts was constituted in December, 2004 under the Chairmanship of Secretary, Ministry of Water Resources to make the process of proceeding on interlinking of rivers fully consultative. The Committee of Environmentalists, Social Scientists and Other Experts held two meetings, one in June, 2005 and the other in October, 2005 for which the secretariat assistance was provided by NWDA. During the last meeting held on October 28, 2005, detailed

deliberations were made on modalities for preparation of Ken-Betwa link.

e. National Water Convention

The 11th National Water Convention was successfully organized by MOWR and NWDA at Vigyan Bhavan, New Delhi on the theme for "Water for life with the special reference to Interlinking of Rivers in India" on 11.5.2005. Dr. A.P.J Kalam, Hon'ble President of India inaugurated the Convention and addressed the gathering and delegates. A presentation on "Integrated Water Mission" was also made.

CHAPTER -2

COMMAND AREA DEVELOPMENT AND WATER MANAGEMENT SCHEME

Objective

The Centrally sponsored Command Area Development (CAD) Programme was launched in 1974-75 with the objective of bridging the gap between irrigation potential created and that utilized through efficient utilization of created irrigation potential and optimizing agricultural production from irrigated lands on a sustainable basis. The programme envisages integration of all activities relating to irrigated agriculture in a coordinated manner with multidisciplinary team under an Area Development Authority.

Coverage

Initially 60 major and medium irrigation projects were taken up under the CAD Programme, covering a Culturable Command Area (CCA) of about 15 million hectare. Since in 1974-75 till date 310 projects with a CCA of 28.45 Million ha have been included under the programme. After inclusion of new projects, deletion of completed projects and clubbing of some projects, there are 133 projects under implementation spread over 27 States**.**

Programme Components

In view of the recommendations of the Working Groups of the Planning Commission for X Plan, the CAD Programme was restructured during the year 2003-04. The **restructured** Programme, known as **Command Area Development & Water Management (CADWM) Programme**, became effective from 1.4.2004. The components of the CADWM Programme are as follows:

a) Survey, planning and designing of On-Farm Developments works;
b) Construction of field channels with a minimum 10% beneficiary contribution;
c) Full package OFD works including construction of field channels, realignment of field boundaries, land leveling and shaping also with a minimum 10% beneficiary contribution;
d) Warabandi
e) Construction of field drains, intermediate and link drains for letting out surplus water;
f) Reclamation of waterlogged areas now with a minimum 10% beneficiary contribution;
g) Trainings/ adaptive trials/ demonstrate-ions through Water and Land Management Institutes (WALMI) and other institutions and monitoring & evaluation of the programme with 75% funding from Government of India;
h) Institutional support to Water Users' Associations;
i) Establishment cost – 20 % of OFD works
j) R & D Activities.
k) Correction of system deficiencies above the outlet upto distributaries of 150 Cusec capacity;
l) Renovation and desilting of existing irrigation tanks including the irrigation system and control structures within the designated irrigation commands with a minimum 10% beneficiary contribution as maintenance fund, the interest from which has to be used for maintenance in future and

m) Use of location specific bio-drainage techniques to supplement conventional techniques for reclamation of waterlogged area as a part of item (f) above.

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

i) Central assistance to States has been linked to enactment of PIM legislation. Till this is done, alternative arrangements have to be in place for formation and empowerment of Water Users' Associations (WUAs);
ii) WUAs have to be in position before Project Components are taken up so that beneficiaries are involved in the implementing of Programme activities, since inception;
iii) A minimum 10% beneficiary contribution has been made mandatory in the construction of field channels, reclamation of waterlogged areas and renovation of Minor Irrigation Tanks to ensure increased beneficiary participation and thereby improve the quality of works;

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

Programme Implementation

The Command Area Development and Water Management Wing of the Ministry of Water Resources coordinates and monitors the implementation of the Command Area Development Programme at the National level. Proposals received from the States for inclusion of new projects under the Programme are examined and, if found techno-economically feasible, are included under the Programme. Progress of the projects is monitored through physical and financial progress reports of the programme received from the States. The quality of work is ensured through monitoring, including field visits. Moreover, technical guidelines and manuals have been circulated to the States in this regard. Functionaries are trained on specific subjects from time to time, besides holding various meetings, workshops and seminars on different technical and managerial aspects.

The programme is being implemented by the State Governments through Command Area Development Authorities (CADAs) set up by them. However, in some States, namely Arunachal Pradesh, Himachal Pradesh, Meghalaya, Nagaland, Tamil Nadu, Tripura & Uttaranchal, CAD Authorities have not been constituted and the Programme is being administered through the line Departments concerned.

Financing Pattern

The funding pattern for all the Programme components is **50:50** on sharing basis between Centre and State/farmers for all the components except for State sponsored software components such as trainings of farmers and field functionaries, adaptive trials & demonstrations, action research for Participatory Irrigation Management, seminars/ conferences/ workshops, monitoring & evaluation of the programme etc. for which the funding pattern is **75:25** basis between the Centre and States. The

funding pattern for national level training courses for Senior level officers and Monitoring & Evaluation of the Programme sponsored by Central Government is 100%.

Financial Achievements

An amount of Rs.2865.58 crores has been released to States as Central Assistance under the CAD Programme upto March, 2005 since its inception. During the year 2004-2005, an amount of Rs.141.51 crores was released. An outlay of Rs. 196.50 crores has been provided under the Central Sector for implementation of the Programme during 2005-2006 and an amount of Rs.151.897 crore has been released to the States, till 31.12.2005. Total release made under CAD/CADWM Programme is given in the Table below:

(Rs.in crore)

Plan	Year	Approved Outlay	Release	% of releases
IX Plan	1997-2002	854.77	764.27	89.41
X Plan	2002-2003	202.00	152.16	75.32
	2003-2004	202.00	144.02	71.29
	2004-2005	181.50	142.44	78.48
	2005-2006	200.00	152.99	76.50

*Released upto 31.12.2005

Seminar/Conference

Two days' Conference of Principal Secretaries / Secretaries in charge of the CADWM Programme in the States was held in New Delhi on 4^{h} October 2005 in which the progress of the programme and the guiding principles for implementation of the Programme were reviewed.

Physical Achievements

The core components of physical works are construction of field channels and field drains and implementation of warabandi (rotational water supply). The cumulative progress of works on these respective components upto the end of IX Plan is 15.75 M.ha, 1.124 M. ha. and 10.18 M. ha. The physical targets and achievements in respect of the core components of works during the IX Plan, progress up to March 2005 and targets and achievements during 2005-06 are given in the table below:

(in Million hectare)

Item of work	**Progress during IX Plan**	**Progress during 2002-03**	**Progress during 2003-2004**	**Progress during 2004-2005 (provisional)**	**Progress during 2005-06**	
					Target	**Achiev-ement***
Field Channels	1.802	0.471	0.454	0.375	0.607	0.152
Warabandi	1.538	0.340	0.342	0.172	0.117	0.012
Field Drains	0.351	0.139	0.122	0.155	0.099	0.035

*upto September 2005

Revised Targets Under The Restructured Command Area Development and Water Management Programme

The total outlay for the restructured programme for the remaining two years of Tenth Plan is Rs.622.50 crores. The details of physical targets for the period 2004-07 as per Xth Plan estimate are as under:

(Million Hectares)

Sl No.	Achievement	Target (as per X Plan estimate)
1.	Field channel/full package OFD works	0.68
2.	Field Drains/intermediate drains/link drains	0.10
3.	Warabandi	0.68*
4.	Reclamation of waterlogged areas	0.05
5.	Correction of system deficiency up to design discharge of 150 cusecs	1.00
6.	Renovation of Tanks	0.18

***No central assistance to be provided from 2004 onwards**

The above targets are tentative subject to readjustments due to availability of matching funds of the States.

Training Programmes

The central Government provides financial assistance of 75% to the State Government for training of functionaries and farmers on various aspects of the CADWM Programme. This includes various aspects of efficient water management technologies and agriculture practices, methods of survey and reclamation of waterlogged areas, participatory irrigation management etc. The training programmes are meant for officials of the State Government as well as the farmers. The national level training Programmes for senior/middle level officers are sponsored and fully financed by the Ministry and are organized through various State/central Agencies. The senior level officers are trained on aspects of policy planning and preparation of action plans, while middle and junior level officers are trained on technical, procedural and implementation aspects. Farmers, on the other hand, are educated about agricultural development and efficient management of water for irrigation. They are also motivated and made aware about the benefits of Participatory Irrigation Management (PIM). During the year 2005-06, 34 national level training courses are planned to be organized by the Ministry through various institutions.

Reclamation of Water Logged Areas

Although development of irrigation has increased agriculture production, it has also caused adverse effect in the form of water logging and associated problem of soil salinity/alkalinity in many irrigation commands. The problem of water logging can be mitigated to a large extent by efficient water management and by adopting suitable preventive measures. However, inspite of best efforts, the problem of waterlogging has surfaced in many irrigation commands and thus it is

essential to reclaim such areas so as to have optimum agricultural production from them. The Ministry of Water Resources, Govt. of India introduced a component of Reclamation of Water Logged Areas under the Centrally Sponsored Command Area Development Programme w.e.f. 1st April, 1996. So far 445 schemes of nine States namely Bihar, Gujarat, Madhya Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Orissa and Uttar Pradesh have been approved at an estimated cost of Rs. 45.18 crores for reclamation of 57,700 ha of water logged area. Out of this, an area of 46,466 ha has been reported to be reclaimed by these States upto March 2005.

Participatory Irrigation Management (PIM)

The National Water Policy 2002 stresses participatory approach in water resources management. It has been recognized that participation of beneficiaries will help greatly for the optimal upkeep of irrigation system and effective utilization of irrigation water. The participation of farmers in the management of irrigation would include transfer of responsibility for operation & maintenance and also collection of water charges to the Water Users' Association in their respective jurisdiction. One time functional grant @ Rs.600/- per ha to be shared by the Centre, State and farmers @ Rs.270 : 270 : 60 respectively is being paid to outlet level Water Users' Association as incentive, the interest from which is to be used for maintenance.

As a result of various conferences/ seminars organized by the Ministry, there has been an increased consciousness in States about the need for actively involving farmers in management of irrigation systems. Accordingly, States of Andhra Pradesh, Bihar, Goa, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu and Kerala have either enacted exclusive legislation or amended their Irrigation Acts for involvement of farmers in irrigation management. Gujarat had experimented with the idea of farmers' co-operative movement in irrigation management and is in the process of enacting act for Participatory Irrigation Management (PIM). Other States are also taking steps in this direction. So far, 55,501 Water Users' Associations have been formed in various States covering an area of 10.23 M. ha under various commands of irrigation projects.

Under the restructured 'Command Area Development & Water Management (CADWM)' Programme more emphasis is being given to participatory approach. Under this programme, payment of central assistance to States is linked with the formation of Water Users' Associations. Apart from this, farmers will have to contribute 10% cost of the works in form of cash/ labour in the construction of field channels/ full package OFD, water logging, desilting and renovation of tanks etc.

CHAPTER 3

GROUND WATER AND MINOR IRRIGATION

Co-ordination Cell of Water Quality Assessment Authority

The Water Quality Assessment Authority (WQAA) was constituted in May 2001 for the purpose of protecting the quality of National Water Resources. The 12-member Authority is headed by the Secretary, Ministry of Environment & Forests as the Chairman and the Commissioner (B&B), Ministry of Water Resources as the Member Secretary under which the Secretariat of the WQAA is functioning in MoWR.

The 3rd and 4th meeting of WQAA was held in December, 2004 and July, 2005 respectively. Based on the recommendations of the Expert Group and Task Force constituted by WQAA, Gazette Notification on the Uniform Monitoring Protocol was published by National River Conservation Directorate(NRCD), MoEF in June, 2005. A Working Group has also been constituted by WQAA to deal with issues relating to minimum flows in riverine systems. The Working Group submitted its report in July, 2005.

The State Level Water Quality Review Committees were constituted to review monitoring practices at the State level and to highlight important State level issues for consideration by the Authority. So far the State level Committees have been constituted in 35 states/union territories. The Water Quality Monitoring Committee (WQMC) of WQAA during its deliberations, WQMC considered modalities for working so as to fulfill its objectives. Relevant issues like need for R&D norms, finalizing standard monitoring protocols and effective coordination with State level WQRCs were taken up by WQMC.

A National Level Strategy Workshop on Water Quality Issues was held at New Delhi in July, 2005 in which Chairmen & Member Secretaries of all State Level Water Quality Review Committees (WQRCs) and Members of Water Quality Assessment Authority (WQAA) interacted. The recommendations of the Workshop have been circulated to all WQRCs and State and Central Agencies dealing with the subject of Water Quality for necessary action.

A plan scheme titled "Creation of Coordination cell to assist WQAA" for Rs.350 lakhs has been sanctioned for the 10th Five Year Plan. The main provision in the estimates is for salary of the staff, provision for hiring of professionals, taking up selected R&D studies, traveling, office and other administrative expenses for conducting seminars, workshops, meetings etc.

CENTRAL GROUND WATER BOARD

Organisation

The Central Ground Water Board is entrusted with the responsibility of carrying out scientific surveys, investigations, exploration, monitoring,, assessment, augmentation and regulation of ground water resources of the country. The data generated provide a scientific base for user agencies. 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.

The Central Ground Water Board is headed by a Chairman and has four main wings namely 1) Exploratory Drilling & Materials Management 2) Sustainable Management & Liaison 3) Survey, Assessment & Monitoring and 4) Training and Technology Transfer. Each wing is headed by a Member. One of the Member is designated as Commissioner (GW) at MOWR. The Board has 18 Regional Offices, each headed by a Regional Director with 17 supporting Engineering Divisions and 10 state unit offices for undertaking various field activities in the country. Central Ground Water Authority (CGWA) has been entrusted with regulation and control of ground water development and management

ACHIEVEMENTS (Upto 1st Dec,2005)

Ground Water Management Studies

Studies are carried out to evaluate the impact of various developmental activities like withdrawal of ground water, urbanization and introduction of surface irrigation schemes. The Board lays special emphasis on studies in Tribal area, drought area and problematic areas such as areas with high stage of ground water development, water logged areas and those having problems of water quality through geogenic sources. During 2005-2006 upto 1st December 2005, an area of 1.95 Lakh sq. km was covered under pre-monsoon against the target of 1.94 Lakh sq. km. Post-monsoon studies are in progress and an area of 23,651 sq. km has been covered.

The entire data generated during these studies will be analysed & accordingly the future scenario for development of Ground Water will be visualized to plan Ground Water development &management in the area.

Ground Water Exploration

Ground Water Exploration is being carried out to study the sub-surface hydrogeological setups and evaluate various aquifer parameters of the different aquifer systems. The entire exercise is aimed for quantitative & qualitative evaluation of Ground Water in the area. It is being carried out by the Board with a fleet of 84 drilling rigs have been constructed up to 1st December,2005 against a target of 812 wells. These also include Six exploratory wells constructed in acute water scarcity high altitude areas of Siachen Valley, Jammu & Kashmir. The exploratory wells have also been constructed in the Arsenic affected area in Bihar, U.P & West Bengal. Exploration has also been done in fluoride infested area of Madhya Pradesh and fluoride free zones have been delineated. The high yielding wells with discharge range 15000 lph to 180000 lph have been found in the states of West Bengal, Tamil Nadu, Orissa, Bihar, Kerala , Karnataka & Maharashtra. These studies will help in identifying Ground Water worthy areas and help in guiding the states to adopt follow up action with regard to ground water development .

Monitoring Of Ground Water Regime

The Board is monitoring the ground water levels in the country four times a year (Jan/May/Aug/Nov) through a network of 15645 Ground Water Monitoring Wells. The ground water samples collected during the pre-monsoon monitoring are analysed

for the purpose of ascertaining the changes in chemical quality of ground water. Monitoring of May, August, and November 2005 has been completed in all the offices and respective reports have been submitted indicating the fluctuation of water levels compared to the monitoring of previous year, decadal average and pre-monsoon monitoring.

Geophysical Studies

As an integral part of its activities, the Board undertakes geophysical studies to support and supplement ground water management studies, ground water exploration and short-term water supply investigations so as to demarcate bedrock configuration and thickness of overburden and saline -fresh water interface etc. During 2005-2006 up to 1st December 2005, 790 Vertical Electrical Sounding, 12.7 line kilometer resistively profiling and 71 bore hole logging have been conducted in the various parts of the Country.

Water Quality Analysis

There are 15 well equipped Regional Chemical Laboratories. All the Laboratories are equipped with Atomic Absorption Spectrophotometer to carry out the analysis of toxic elements and heavy metals. Four chemical laboratories are also equipped with Gas Chromatograph (GC) to take up the analysis of organic pollutants (Pesticides etc). Thirteen laboratories are equipped to carry out bacteriological analysis. During the year (up to 1st December 2005), 11,891 samples have been analyzed for basic constituents and 2,103 samples have been analyzed for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc. In addition 52 samples for organic constituents have also been analysed.

Short Term Water Supply Investigations

Central Ground Water Board assists various user organizations in the country to solve their immediate water supply problems by selecting sites and areas for developing ground water supplies. In this effort, it also extends the benefit of its expertise in the estimation of quantum of water supply against the projected demands. It helps defense establishments on priority basis, in the selection of sites for tubewells and solving related water problems. Besides, it is assisting Defence, Urban, Railways, Industrial Establishments and other Government Organizations in locating water supply sources and supplies. During 2005-2006 up to 1st December 2005, 193 investigations have been carried out.

Reports And Hydrogeological Maps

Results of investigations carried out by Central Water Board are suitably documented in the form of reports and maps which are categorized under four main heads viz. survey reports, district reports, state reports, basic data reports, maps and atlases. During 2005-2006 (up to 1st December 2005) 14 Ground Water Year Books have been completed. 40 District Reports , 40 Hydrogeological Maps 9 Ground Water Year Books and 5 State Reports are under different stages of completion.

Technical Examination Of Major And Medium Irrigation Schemes

As per the directives of the Planning Commission, the Board is scrutinizing the major and medium irrigation project reports/proposals sent by the State Governments / Central Water Commission / National Water Development Agency / Command Area Development & Water

Management Wing of Ministry of Agriculture from the point of view of their impact on ground water regime and specific recommendations are being made to protect quality and quantity of ground water. During the year, Nine major irrigation projects of CWC were examined. Five proposals for river linking project received from NWDA and Five irrigation projects of CADWM were also examined and area specific recommendations were made.

Basic Hydrogeological Research /Special Studies

During X^{th} plan it was proposed by CGWB to take up Special Studies/ R&D Studies covering different areas like Urban Hydrogeology, Mapping of water logged areas and feasibility study for anti-water logging measures, Conjunctive Use Studies, Sea water ingress , Remote sensing studies, Mathematical Modeling studies, Isotopic Studies, Studies in Arsenic affected areas. etc. Stress has been given for evolving new methodologies for meaningful conclusions. During 2005-06, 22 Special studies are being undertaken out of which 2 studies have been completed and 20 are under different stages of completion.

Estimation Of Ground Water Resource Based On Gec-1997 Methodology

The Dynamic Ground Water Resource of the country has been jointly estimated by 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 Resource is estimated as on March, 2004. The summary of Dynamic Ground Water Resource Estimates of India is given below –

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

Central Ground Water Authority (CGWA)

Central Ground Water Authority was constituted under Environment (Protection) Act, 1986 vide notification no. S.O. 38 (E) dated 14.01.97 with a mandate to regulate and control of ground water development and management in the country. Activity wise achievements during the period of report are summarized below:

a. Regulation of ground water development:

During the year, CGWA has notified nine severely overexploited areas in the country, namely Midjil mandal of Mehboobnagar Distt., Tirupathi (Rural) mandal of Chittoor Distt., Vempalli mandal of Cuddapah Distt. A.P.; Pushker Valley of Ajmer Distt., Chirawa and Buhana of Jhunjhunu Distt., Raniwara and Jalore of Jalore Distt. and Mundwa of Nagaur Distt. of Rajasthan. In addition to the above, regulation of ground water development is being done in 11 areas notified earlier namely South and South-west districts and Yamuna Flood Plain area of NCT, Delhi; Municipal Corporation of Faridabad and Ballabhgarh, Faridabad district, Haryana; Ludhiana City, Ludhiana, Punjab; Union Territory of Diu; Municipal Corporation of Ghaziabad, Ghaziabad Distt. U.P.; Jhotwara block, Jaipur distt., Rajasthan; Haldia Municipal area, East Medinipur Distt., W.B.; Gandhinagar Taluka, Gandhinagar Distt., Gujarat ; Gurgoan block and adjoining industrial areas, Gurgaon District, Haryana. In the notified areas of Andhra Pradesh, the regulation of ground water development is being undertaken by Andhra Pradesh Ground Water Authority. In the remaining notified areas, the regulatory measures are being enforced through the concerned District Collector / Deputy Commissioner.

b. Registration of ground water structures:

In order to put more areas under regulation, 28 new over exploited areas in the states of Gujarat, Karnataka, Maharashtra, Kerala, Haryana, Madhya Pradesh, Andhra Pradesh, Tamil Nadu, Delhi have been identified for notified for registration of ground water structures and objection have been initiated from all concerned. The registration work in these notified areas is to be undertaken by the respective States Governments.

c. Regulation of ground water withdrawal by industries:

In order to regulate the ground water development by the industries, a list of over exploited/critical areas have been circulated to Statutory organizations like State Pollution Control Boards, Ministry of Environment and Forests etc which refers new industries/ projects to CGWA for permissions prior to setting up of industries/projects . The proposals received are evaluated on case to case basis, based on site specific recommendations of Central Ground Water Board and are accorded ground water clearance. During the period eighteen industries have been accorded permissions.

d. Registration of drilling agencies:

Registration of water well drilling agencies are being undertaken by CGWA to develop micro level data base on ground water development and to control indiscriminate drilling activity in the country. During the year 55 agencies were registered.

e. Mass Awareness and Training programmes:

Rain water harvesting is an activity to facilitate ground water recharge especially in ground water stressed areas, and public participation is essential for promotion of this activity. Identifying its inevitable need, country – wide mass awareness programmes and training programmes on rain water harvesting are being organized by CGWA on regular basis to create public awareness about importance of rain water harvesting in recharging ground water.

Training on rain water harvesting are also undertaken for dissemination of cost effective techniques to users like private sector organizations, government agencies, NGO's, educational institutes, individuals etc. Response to these programmes is observed to be overwhelming, and calls for further stepping up of such activities on large scale with active involvement of various stakeholders. During the period 19 Mass Awareness Programmes and 23 Water Management Training Programmes were organized in various parts of the country.

Rajiv Gandhi National Ground Water Training And Research Institute

During 2005 - 2006 up to 1st December 2005, Five training courses out of proposed 16 training programmes have been conducted under Rajiv Gandhi National Ground Water Training And Research Institute. The details of training courses are given below -

1. Induction Level Training Course conducted at Faridabad.
2. Training course on Water Well Drilling conducted at Chennai.
3. Training course on "Artificial Recharge Techniques in different hydrogeological Conditions " conducted at New Delhi.
4. Training course on Administrative Matters for Staff of CGWB conducted at Institute of Secretarial Training & Management, New Delhi.
5. two-week training on Computer Aided Drawing and Digitization for Draftsman was organized at MTTTR, Chennai.

Research & Development Schemes

Central Ground Water Board under its R&D activities is assisting Ministry of Water Resources in the form of a sub-committee of Indian National Committee on Hydrology (INCOH), with a view to accelerate the development programme in ground water sector and giving due consideration to increased need of taking up research in he field of ground water. This Committee examines the project proposals received by INCOH in the field of ground water for their suitability for funding by MOWR and also monitors the research schemes funded by INCOH..

Exhibition / Trade Fair

CGWB/MOWR participated in Following Exhibition/Trade Fair

i) India International Trade Fair-2005:

Ministry of Water Resources participated in the 25th India International Trade Fair-2005, Pragati Maidan, New Delhi during 14th to 27th November,2005. The theme of the Pavilion was "Water Conservation". Under the theme CGWB displayed one model on Roof Top Rain Water Harvesting. Additional Secretary, Minister of Water Resources visited the pavilion and appreciated the efforts of the Scientists and Engineers towards awareness, conservation and management of water.

ii) Centenary of Banga-Bhanga Anti-movement

In the Centenary of Banga-Bhanga Anti-movement, CGWB displayed various exhibits and live models on Rainwater harvesting, arsenic infested areas, sub surface aquifer disposition etc.

MINOR IRRIGATION:

Minor Irrigation schemes are those ground water and surface water schemes which have a culturable command area

upto 2000 ha. individually. Surface water minor irrigation schemes are generally funded from the public sector outlay. The ultimate irrigation potential from minor irrigation schemes has been assessed as 81.43 mha., of which the contribution from surface water is assessed to be 17.3 mha. As per Third Minor Irrigation Census, 11.9 Mha. has been created out of surface water minor irrigation schemes. The irrigation capacity created in the minor irrigation sector(including groundwater schemes) covers about two third of the country's total irrigation capacity.

INITIATIVES

1. Repair, Restoration And Renovation Of Water Bodies.

As the follow up of the announcement made by the Union Finance Minister in his Budget Speech for 2004-05, the pilot scheme "National project for Repair, Renovation and Restoration of Water Bodies Directly Linked to Agriculture" was prepared. The scheme with the total outlay of Rs. 300 crores was approved by the Government for implementation during the remaining period of X Plan. Funding pattern for the scheme is Centre:States: 75:25. The objectives of the schemes are:

(a) to restore and augment storage capacity of the water bodies;

(b) to recover and extend their lost irrigation potential

During 2004-05, 16 districts projects in nine states namely Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Orissa, Tamilnadu & West Bengal were approved for a total cost of Rs. 168.24 crores. Central share of grants of Rs. 12 crores were also released. During the year 2005-06, four more states namely Himachal Pradesh, J&K, Kerala and Gujarat have been included under the scheme and six districts in these four states have been approved for an estimated cost of 21.09 crores. With inclusion of more water bodies for Gulgarba and Bangalore Rural district of Karnataka and one more district project, namely, Shivpuri in Madhya Pradesh, the total estimated cost of 23 districts stands at Rs. 262.91 crores as on date. Central share of Rs. 70.88 crores have been released during the current year.

Rationalisation of Minor Irrigation Statistics (RMIS) Scheme

A Centrally Sponsored Plan Scheme "Rationalisation of Minor Irrigation Statistics (RMIS)" is under implementation. The main aim of RMIS scheme is to build up a comprehensive and reliable database in the Minor Irrigation Sector for future planning. Under the RMIS scheme there is provision for conduct of Census of Minor Irrigation schemes on quinquennial basis. A sample survey on Minor Irrigation Schemes is also conducted, in between the two censuses under the scheme. For regular reporting & coordination of activities in respect of Statistical data compilation, Statistical Cells have been created in the nodal departments of States /UTs. So far Cells have been created in 30 State/UTs.

The third census of minor irrigation schemes with reference year 2000-01 is completed in all the States/UTs (except Daman & Diu and Lakhshadweep). The Report of Third Census of Minor Irrigation schemes was released by the Hon'ble Prime Minister in the State Irrigation Ministers Conference held on 30.11.2005 and the same has been placed on website http://mowr.gov.in. The 4th Census of Minor Irrigation Projects is proposed to be conducted with reference year 2005-06. Preparatory action is under process.

CHAPTER 4

EASTERN RIVERS & FLOOD CONTROL

Flood Management

Although flood management falls within the purview of State Governments, the Central Government has been initiating various measures including providing financial assistance to the States in this regard. Various Centrally Sponsored Schemes taken up by the Government of India under which financial assistance was provided to the State Governments during the year 2005-06 are detailed as under:

(i)Critical anti – erosion works in Ganga Basin States:

In order to take up critical anti-erosion works in the Ganga basin States a Centrally Sponsored Scheme has been approved at an estimated cost of Rs. 178.85 crore with a Central Share of Rs. 136.17 crore as a continuing scheme for implementation during 2004-07 to provide financial assistance to the States of Bihar, Jharkhand, Himachal Pradesh, Uttar Pradesh, Uttaranchal, West Bengal & Farakka Barrage Project Authority (FBPA). The cost of the scheme has subsequently been enhanced to Rs.242.17 crore comprising central share of Rs. 195.63 crore vide this Ministry's order dated 27.06.2005.

The funding pattern under the scheme provides for Centre and State Share in the ratio of 75 : 25 and 100% funding for FBPA. The funds are provided as advance to the State Government to take up works. Rs. 9.38 crore to Government of Bihar, Rs. 5.05 crore to Government of Uttar Pradesh and Rs. 1.00 crore to Government of Uttaranchal have been released upto 08.02.2006 during 2005-06. Further releases are contingent upon receipt of utilization certificate of the fund provided to State Governments till March 2004 under the scheme as per circular of Ministry of Finance.

(ii) Maintenance of flood protection works of Kosi & Gandak Projects:

This Centrally Sponsored Scheme, which provides protection to the banks of the river Kosi & Gandak in and around barrages from erosion, has been continuing since VIIIth Plan. The works are executed by the State Governments of Bihar and Uttar Pradesh in respect of Kosi and Gandak respectively. The full cost of the works incurred by the State Governments is reimbursed by the Central Government on the recommendations of Kosi and Gandak High Level Committees. The recommendations of Kosi and Gandak High Level Committee are awaited from GFCC following which funds will be released.

(iii) Raising, Strengthenening and extension of embankments on Lalbakeya, Bagmati, Khando and Kamla rivers:

The scheme has been continuing since IXth Plan with the purpose 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. The full cost of the works is borne by the Central Government and the funds are released on the recommendation of the Ganga Flood Control Commission on their

authentication of utilization certificates and inspection of the works. Central assistance under the scheme is released in advance to enable the State Government to take up the works. An amount of Rs. 3.50 crore has been released to Govt. of Bihar during 2005-06 for Kamala Balan river. Government of Bihar has submitted a DPR on Bagmati to Ganga Flood Control Commission for appraisal enlarging the scope of work as provided in the approved EFC memo entailing more fund. The case was subsequently referred to Central Water Commission for a holistic examination. Recently a team headed by Member (RM), Central Water Commission and comprising officers from Central Water Commission, Ganga Control Commission and Government of Bihar visited the areas in Bihar and Nepal. Central Water Commission has submitted an interim report containing recommendation which have been sent to the State Government. GFCC has examined the DPR and observations have been conveyed to the State Government.

(iv) Improvement of drainage in critical areas of the country:

Government of India sanctioned in February 2004, a Centrally Sponsored Scheme having estimated cost of Rs. 54.57 crore with a Central Share of Rs. 49.62 core to take up works relating to improvement of drainage in critical areas of the country. The scheme aims at improving drainage conditions of critical areas affected due to floods in States of Andhra Pradesh, Bihar, Orissa and Uttar Pradesh with Central Share of Rs. 5.45 crore, Rs. 27.38 crore, Rs. 13.13 crore and Rs. 3.65 crore respectively. The scheme among other benefits will also increase agricultural production in these areas. Works under the scheme shall be executed by the respective State Governments and completed by March, 2007 within the Xth Plan period. Rs. 3.25 crore to Government of Orissa, Rs. 7.00 crore to Government of Bihar and Rs. 3.00 crore to Government of Andhra Pradesh have been released during 2005-06.

(v) Committee regarding erosion problem at Panchanandpur, district Malda and Paraspur Taltoli, district Murshidabad, West Bengal

In view of seriousness of erosion problem at Panchanandpur, district Malda and Paraspur Taltoli, district Murshidabad, West Bengal, a Committee of experts under the Chairmanship of Chairman, GFCC with members from CWC, CWPRS, Government of West Bengal etc. has been constituted to critically examine the entire problem of erosion in these areas and suggest remedial measures in this regard.

(vi) Drainage development in Purba and Paschim Medinipur districts of West Bengal

In view of problems of drainage congestion in Purba and Paschim Medinipur Districts of West Bengal , an expert team headed by Commissioner (Ganga), MoWR and having other members from CWC, CWPRS, GFCC, MoWR and officers from Govt of West Bengal visited the affected area and also met the local people residing in the affected areas to understand the gravity of the situation. The expert team also held in depth discussions with Secretary and other officers of Irrigation and Waterways Department of Govt of West Bengal on various technical and financial aspects on the works proposed by State Government

for drainage development. The report of the team is under finalisation.

Task Force on flood management / flood control

Following the flood of 2004, a Task Force was constituted to look into the problem of recurring floods in Assam and neighbouring States as well as Bihar, West Bengal & Eastern U.P. under the Chairmanship of Central Water Commission with suitable items of reference. The task force submitted its report on 31.12.2004. The report of the Task Force has been sent to various State Govts. and Central Govt. Departments including Planning Commission.

Based on the recommendations of the Task Force 4 schemes of Bihar at an estimated cost of Rs. 15.42 crore were included in the ongoing CSS and an amount of Rs. 5.51 crore was released for 3 schemes during the year.For the funding of remaining schemes under the immediate and short term measures, EFC memos for taking up critical flood control and anti erosion schemes in Ganga Basin states and Brahmaputra & Barak Valley States, are under formulation for obtaining approval of competent authority.

The jurisdiction of Farakka Barrage was extended during January 2005 for speedy implementation of anti-erosion works and an amount of Rs 50 crore was kept for these works during 2005-06.

A draft proposal for setting up of North East Water Resources Authority (NEWRA), was formulated in view of the announcement of November 2004 of Hon'ble Prime Minister, which also formed a part of the recommendations of Task Force. The implementation of the proposal however, depends upon the consent of concerned State Governments.

BRAHMAPUTRA BOARD

Introduction:

The Brahmaputra Board a statutory body was 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 both the Brahmaputra and Barak Valley and extends over the seven states of North Eastern Region of the country in part or full.

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 Brahmputra and Barak Valleys for irrigation, hydropower, 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 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, the 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 Orgnisation of Government of India, namely Central Water Commission, Central Electricity Authority, Indian Meteorological Department and Geological Survey of India.

Board has also proposed extension of its jurisdiction to the left out portion of North Eastern Region and the inclusion of Sikkim and North Bengal as being part of the Brahmaputra Basin.

Activities of Brahmaputra Board:

The Master Plan preparation has been taken up in 3(three) Parts:

Part-I : Main Stem of Brahmaputra.
Part-II: Barak and its tributaries and
Part-III: Tributaries of the river Brahmaputra, Barak and rivers of Tripura (49 Nos).

So far, 36 Master plans out of 51 have already been approved by Govt. of India.

Brahmaputra Board has identified 34 drainage congested areas in Brahmaputra and Barak basin i.e. 22 in Brahmaputra Basin , 8 in Barak Basin and 4 in Tripura.

The North Eastern Hydraulic & Allied Research Institute (NEHARI) was established near Guwahati with facilities of Hydraulic Modeling, Soil Testing, Concrete and Rock Mechanic Laboratory in association with CSMRS, CWPRS, the Board has successfully carried out sample testing as requested by various organizations like NEEPCO, CWC, NEC, NHPC, state Govt. of Assam, Manipur, Meghalaya and Mizoram for their on-going projects.

So far NEHARI has completed physical model studies of (i) Jiadhal River and (ii) River Brahmaputra from Porvita to South Salmara. The Institute has received following funds from outside agencies for different works.

Up to Mar'02	- Rs. 95,69,912.00
During 2002-03	- Rs. 52,42,321.00
During 2003-04	- Rs. 9,80,641.00
During 2004-05	- Rs. 78,70,000.00

High Powered Review Board Meeting:

The 5th High Powered Review Board Meeting held on 22-09-2005 at Guwahati and 07-11-2005 at New Delhi under the Chairmanship of Hon'ble Minister of Water Resources.

Schemes under execution of Board:

(A) Pagladiya Dam Project
(B) Harang Drainage Development Scheme
(C) Protection of Majuli Island (Phase-I) Assam
(D) Barbhag Drainage Development Scheme.
(E) Protection of Kushiabil and Durgajan village at Dimapur (Nagaland).
(F) Protection of North Guwahati Township (Rangmahal) from flood and erosion, Assam.
(G) Avulsion of Brahmaputra at Dhola - Hatighuli

Critical Flood Control & Anti-Erosion:

The Govt. of India has approved a scheme of Rs. 150 Cr. with 90% grant and 10% loan in December, 2004 for taking up Critical Flood Control & Anti-Erosion Schemes in Brahmaputra and Barak Valley

including Sikkim and West Bengal. The Brahmaputra Board has been nominated as nodal and monitoring agency. There is an Empowered Committee under Chairman, Brahmaputra Board with Members from the Planning Commission, Ministry of Water Resources, Central Water Commission and State Governments for prioritising the schemes. Four meetings of this Committee have so far been held. The EFC Memo has already been revised taking into consideration the schemes recommended by the task Force under immediate and short term measures and submitted to Ministry for approval. In 2005-06, an amount of Rs.14.6295 crore has so far been released to the following States:-

Amount Released for the year 2005-06

1) Assam - Rs.11.268 crore
2) Nagaland - Rs.1.2015crore
3) Sikkim - Rs.2.16 crore

GANGA FLOOD CONTROL COMMISSION

Introduction

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

Organisation

The Commission has been assigned the task of preparing comprehensive plans for flood management of the river systems in the Ganga basin, phasing/ sequencing of programme of implementation, monitoring, performance evaluation etc. of various flood management schemes, assessment of adequacy of waterways under road and rail bridges and providing technical guidance to the basin states namely West Bengal, Bihar, Jharkhand, Uttar Pradesh, Uttaranchal, Chhattisgarh, Madhya Pradesh, Delhi, Haryana and Rajasthan on flood management. The Commission also accords technical clearance of flood management schemes of the Ganga basin.

The Commission is headed by a Chairman with two full time Members and other supporting officers and staff. The representatives of concerned central ministries and departments as well as the Engineer-in-Chief/Chief Engineers of the basin states are part time members / permanent invitees.

ACHIEVEMENTS DURING THE YEAR 2005-2006

Maintenance of Flood protection works of Kosi and Gandak Projects

The Flood Protection works on river Kosi and Gandak is being done based on site inspection after every flood season and on the recommendations of Kosi High Level (KHLC) and Gandak High Level Committees(GHLC) respectively. The reimbursement of expenditure incurred for maintaining the flood protection works executed in Nepal portion is done by Government of India after utilisation certificate of the same based on the recommendations of KHLC/GHLC is received from the respective State Government of Bihar for Kosi and U.P. (for Gandak). During the year 2004-05, an amount of Rs. 346.141 lakh was reimbursed to Govts. of U.P & Bihar. Utilisation certificates amounting to Rs. 373.5 lakh for works carried out before 2005 floods are under examination.

Flood Proofing Programme in North Bihar

Flood proofing programme in North Bihar was continued for implementation during

the first two years of the 10th plan. The scope of this scheme was enlarged to include the States of Bihar, Uttar Pradesh, West Bengal, Orissa, Assam and Andhra Pradesh for implementation during 2004-07. Continuation of works under this programme shall be based on performance evaluation of the completed schemes of Bihar entrusted to WAPCOS(I) Ltd. The evaluation is under progress.

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 under way. This is a continuing activity of GFCC. Upto March 2005, Comprehensive Plans for 22 river systems have been updated. During 2005-06 updating of plan of Kosi river system is likely to be completed. The comprehensive plans of Burhi Gandak river system is in progress and is likely to be completed in 2005-06.

Assessment of adequacy of waterways under road and rail bridges.

The study report on adequacy of waterways under road and rail bridges in respect of 21 rivers system were completed by the end of March, 2005. The adequacy report of waterways under bridges on main course of river Ganga from Buxar to Sahebganj have been completed and circulated to all concerned. Report on the reach of Main Ganga stem from Sahebganj to its outfall in the sea is under progress.

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
- Maniram Domingarh Embankment scheme, U.P

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

- Maintenance of flood protection works of Kosi and Gandak Projects.
- Flood proofing programme in North Bihar.
- 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 and Uttaranchal.

Monitoring of floods in the Ganga basin

GFCC is monitoring the flood events of Ganga basin every year. During the monsoon of 2005, 18 weekly flood bulletins were issed. The Annual flood report for the year 2004 in respect of Ganga basin has already been prepared and circulated to all concerned. The Annual flood report for the year 2005 is under progress and likely to be completed by March, 06.

Technical examination of flood management schemes

Technical examination of the schemes is a continuing activity of the commission. During the year 2005-2006, 29 nos. of

schemes were examined upto 11/2005 (U.P 7, MP-1, Assam-2, W.B-6, H.P-1, Bihar-11, Jharkhand -1). Out of 29 nos., 2 schemes of U.P, 1 scheme for Assam ,3 schemes for West Bengal, 7 nos. of Bihar and 1 of Jharkhand were cleared upto Nov. 2005..

Committees

Standing Committee on inundation problem between India and Nepal

Standing Committee on inundation problem between India and Nepal was set up in the year 1986 for dealing with the problems of inundation along Indo-Nepal border on a continuing basis. The Chairman, GFCC is the leader of the Indian side. The last meeting was held from 29.9.2004 to 1.10.2004 at Kathmandu. An internal meeting to review the follow up actions on decisions taken in the 13 h meeting of SCIP was taken by Chairman, GFCC & Team Leader of Indian side (SCIP) on 12 August, 2005.

Indo-Nepal Sub-Committee on Embankment Construction

As a follow up of the decision taken by the India Nepal Joint Committee on Water Resources(JCWR) in its first meeting held in October,2000 the Indo-Nepal sub-committee on embankment construction was constituted.

So far, seven meetings of the sub committee have been held. The last meeting was held in May 2005, in which various issues regarding construction of embankment on Lalbakeya, Bagmati, Kamla and Khando rivers were discussed. Based on the recommendation of Sub-Committee an amount of NepaleseRs 4.4 crore was released to HMG, Nepal by Ministry of External Affairs, Govt. of India.

Task Force on Flood Management/ Erosion Control

Based on recommendations of Task Force on Flood Management/ Erosion Control submitted in Dec., 2004, 4 nos. Anti-erosion schemes of Immediate category in Bihar were taken up for implementation under the continuing scheme "Critical Anti-erosion works in Ganga basin States" and work is under progress.

Indo-Nepal Joint Committee on Flood Management

In view of floods during the year 2004, both in India and Nepal, Joint Committee on Water Resources (JCWR) constituted the Indo Nepal Joint Committee on Flood Management in Oct., 04 to work out short term strategy for mitigating floods in vulnerable reaches of different rivers. The Committee submitted its report in Jan, 05 in respect of river system stretching from Gandak to Kosi.

FARAKKA BARRAGE PROJECT

Introduction ;

Owing to the problem of deterioration of Kolkata Port a Barrage across the Ganga at Farakka and a canal off taking upstream of the Barrage for diversion of 40,000 cusecs for continuous supply of water into the Bhagirathi-Hooghly river system were constructed.

Objectives Achieved:

- The increased upland supplies from the Ganga at Farakka into Bhagirathi have improved navigability, reduced salinity in the system and ensured sweet water supply to Kolkata and surrounding

areas from Farakka since its commissioning in 1975.

- The road cum rail bridges built across the river Ganga at Farakka has established direct communication link to the North-Eastern States, Sikkim, Bhutan and Nepal.
- The Hooghly-Bhagirathi, the Feeder Canal, and the navigation lock at Farakka is now a part of the Haldia – Allahabad Inland Watgerway (National Waterways No.I) which has opened a new era of inland Navigation at economical rate in Eastern India.

The principal components of the Project

- A 2245 metre long barrage across the river Ganga with 109 No. bays and Head Regulator of 11 No. bays.
- A 213 metre long barrage across the river Bhagirathi at Jangipur with 15 Nos. bays.
- 38.38 KM long Feeder Canal with 1133 cumecs (40000 cusecs) carrying capacity.
- 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 in right bank and 7 KM left bank and 16.31 KM of Afflux bundh of Jangipur Barrage.
- Bank protection works upto 40 KM upstream and 80 KM downstream of Farakka Barrage in the extended jurisdiction.
- 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 District of West Bengal.
- Baghmari Syphon at RD.48.0 of Feeder Canal and Jetties shelter basin at RD.62.532 of Feeder Canal

Important Activities :

All the principal works concerned with the two barrages and Feeder Canal have been completed. The Navigation lock at Farakka was completed and commissioned in November, 1987 and Navigation Control Tower in 1996. The Navigation lock at Jangipur is not completed fully. The anti erosion works in U/S and D/S of Farakka Barrage and maintenance of guide bundhs, afflux bundhs and numerous vital structures including operation & maintenance of two barrages, Feeder Canal as well as maintenance of three big township, the special repair of gates and operation system of Barrage is continuing work.

There are four Committees under whose guidance the works of Farakka Barrage Project were/are being carried. These committees are :

1) The Farakka Barrage Control Board.
2) The Technical Advisory Committee (TAC).
3) Committee for monitoring progress.
4) Farakka Barrage Project Advisory Committee under the Chair personship of Additional Secretary (Water Resources).

With view to control erosion upto 40 KM upstream of Farakka barrage upto Bhutni Diara and 80 KM downstream upto Jalangi has been entrusted to Farakka Barrage Project.. The F.B.Project has also taken up restoration of embankments/anti-erosion works in Cheramati/ Kullick/ Mahananda/ Fulahar rivers. The works in Mahananda Basin are likely to be completed by March, 2006.

CHAPTER 5

EXTERNAL ASSISTANCE IN WATER RESOURCES SECTOR

The Ministry of Water Resources assists the State Governments and its organizations for availing external assistance from different funding agencies to fill up the resource gap and state-of-the-art technology for water resource development of the country, particularly for the 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.

A brief account of ongoing externally aided projects (12 in number) being implemented in various States with assistance from the World Bank and other bilateral agencies namely Japan Bank for International Cooperation (JBIC) and Kreditanstalt fur Wiederaufbau (Kfw), Germany is as under:-

(A) WORLD BANK AIDED PROJECTS

S. No	Name of Projects	State	Assistance amount in Million Donor Currency
1.	A.P.Economic Restructuring Project (Irrigation component) Ln-4360-IN	Andhra Pradesh	US$ 170
2.	Karnataka Community Based Tank Management Project - CR.3635-IN	Karnataka	SDR 80
3.	Madhya Pradesh Water Sector Restructuring Project - LN.4750-IN	Madhya Pradesh	USD 394
4	Maharashtra Water Sector Improvement Project – LN 4796-IN	Maharashtra	USD 325
5	Rajasthan Water Sector Restructuring Project Cr.3603-IN	Rajasthan	SDR110
6.	UP Water Sector Restructuring Project – Cr.3602-IN	Uttar Pradesh	SDR 117

(B) BILATERAL ASSISTANCE

JAPAN			
Sl.No.	**Name of the Project**	**State**	**Amount of assistance (Million Donor Currency)**
7.	Modernisation of Kurnool-Cuddapah Canal	Andhra Pradesh	Yen 16049 – Tranche-I Yen 4773 – Tranche-II

8.	Rajghat Canal Major Irrigation Project	Madhya Pradesh	Yen 13222
9.	Rengali Irrigation Project	Orissa	Yen 7760- Tranche-I Yen 6342- Tranche-II
10	Rajasthan Minor Irrigation Improvement Project	Rajasthan	Yen 11555
GERMANY			
11.	Maharashtra Minor Irrigation Project	Maharashtra	EUR 23.008
12.	Minor Irrigation & Rural Water Supply	Himachal Pradesh	EUR 2.750

PROJECTS RECENTLY NEGOTIATED

A. WORLD BANK

S. No.	Name of Project	Amount of assistance (USD in Million)
1	Hydrology Project Phase-II	105.00

B. ASIAN DEVELOPMENT BANK

S. No.	Name of Project	Amount of assistance (USD in Million)
1	Chhattisgarh Irrigation Development Sector Project	50.00

PIPELINE PROJECTS

At present the following projects are under consideration of the funding agencies for appraisal.

A. WORLD BANK ASSISTNACE

S. No.	Name of Project	Estimated Cost (Rs. in Crore)
1	Dam safety Assurance, Rehabilitation and Disaster Management Project – Phase-II	917
2.	Tamil Nadu Water Resources Consolidation Project Phase-II	3902

B. BILATERAL ASSISTANCE

S. No.	Name of Project	Funding Agency	Estimated Cost (Rs. in crores)
3	Swan River Flood Management & Integrated Land Development and Watershed Management Project, Himachal Pradesh	Japan	432.52

For Dam Safety Project Phase-II (renamed as Dam Rehabilitation and Improvement Project), the World Bank has proposed to create Dam Rehabilitation and Improvement Fund for the long term sustainability of the dams. A National Level Steering Committee has been constituted under the Chairmanship of Secretary (WR) to look into various aspects and give policy directions in formulation and implementation of the project. A Technical Committee headed by Member (D&R), Central Water Commission has also been constituted for providing technical inputs to the Steering Committee and finalisation of the technical details of the project. The project is in the formulation stage.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

JICA is responsible for the technical cooperation aspect of Japan's Official Development Assistance (ODA) programmes. The Technical Cooperation is aimed at the transfer of technology and knowledge that can serve the socio-economic development of developing countries. JICA carries out a variety of programmes to support the nation building of developing countries through such technical cooperation. At present, a proposal namely 'Development of Ground Water in Uttar Pradesh" is under consideration of JICA under their Development Study Programme.

During the financial year 2005-06, an amount of Rs.371.54 crore has been received from the external funding agencies and utilized till November, 2005 by the Central/ State Governments for implementation of various externally aided projects in Water Resources Sector.

Workshop on "Financing Irrigation Infrastructure"

A workshop on "Financing Irrigation Infrastructure" was organized by the Ministry of Water Resources on 13th May, 2005 at New Delhi with the objective to discuss the various options for financing irrigation infrastructure and arrive at the most appropriate course of action keeping in view the present scenario. The workshop was attended by Senior officers from Central Ministries / Departments, Principal Secretaries / Secretaries from the identified State Governments, water experts and representatives from Financial institutions & eminent NGOs. Various issues related to financial management of water resource projects were discussed. The need for improvement in the financial management and capacity building was emphasized.

Hydrology Project-Phase II

Hydrology Project Phase –II is a follow-on project of Hydrology Project and to be implemented with the assistance of World Bank. The project objectives are:-

i. To extend and promote the sustained and effective use of the Hydrology Information System(HIS) by all implementing agencies concerned with water resources planning and management in the 13 States and 8 Central agencies. The coverage of existing states under the project is to help them move from development of HIS (as in HP-I) towards use of HIS in water resources planning and management.

ii. To extend HIS to the four new state agencies of H.P., Punjab, Goa and Pondicherry.

iii. Strengthening the capabilities of implementing agencies at state/central level in HIS data utilistion for efficient water resource planning and management.

iv. Awareness building and outreach services about HIS use.

During the year 2005-06, the Project preparation work in association with the World Bank was continued . Co-ordination with the 30 participating agencies was made for the purpose. The participating agencies are surface and ground water agencies in 9 states viz. A.P., Chhatisgarh, Gujarat, Karnataka, M.P., Kerala, Maharashtra, Orissa, Tamilnadu; four new state agencies of H.P., Punjab, Goa and Pondicherry and 8 Central agencies viz. CGWB, CWC, IMD, NIH, CW&PRS, MoWR, CPCB and BBMB.

The total cost of the Project including taxes, duties, physical & price contingencies is Rs. 631.83 crore. Negotiation with the World Bank was held on 24.8.2004 and a loan of Rs. 493.63 Crore (105.51 Million US$) has been approved by World Bank as IBRD Loan. The project is proposed to be implemented over a period of six years from the financial year 2006. The EFC Memo has been approved by the Expenditure Finance Committee and recommended to the Cabinet Committee on Economic Affair(CCEA). The CCEA has also cleared the legal and Project agreement for Hydrology Project II with the World Bank. It wassigned by the Department of Economic Affair (DEA) and the participating States on 19th January 2006. The Project will become effective within 90 days from the date of signing

CHAPTER 6

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.

Organisational Setup

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

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

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

ACTIVITIES

The activities of CWC may be summarized as follows:

Resources Assessment

a. Observation of hydrological and hydro-meteorological data,
b. Analysis and publishing of data related to water resources.

Macro Level Planning

a. National Perspective Plan and Basin-wise Master Plan,
b. Matters related to Inter-State Water Sharing/Disputes.

Project Planning

a. Survey & Investigation,
b. Hydrological Studies,
c. Planning for Irrigation and other Uses
d. Design,
e. Construction Equipment Planning and Plant Layout,
f. Environmental & Rehabilitation and Resettlement Issues.

Project Evaluation

Techno-economic Appraisal of Water Resources projects.

Execution of Water Resources Development Projects

a. Project Monitoring,
b. Advice on various Planning and Design problems encountered during construction,
c. Revival, restoration and rehabilitation of water bodies,
d. Advice on coastal erosion problems.

Operation of Water Resources Projects

a. Flood Forecasting,
b. Reservoir Inflow Forecast,
c. Regulation of Reservoirs,
d. Dam Safety Aspects.

Research and Development

a. Co-ordination of R&D Activities.
b. Application of Modern Techniques:
   (i) Development & Application of Software for Water Resources related Problems,
   (ii) Numerical Modelling,
   (iii) GIS & Remote Sensing Technology,
   (iv) Studies on Sedimentation.
c. Performance evaluation and Benchmarking of water resources projects,
d. Morphological studies,
e. Regional Hydrological Studies.

Standardization and Documentation

a. Preparation of BIS Codes related to Water Resources,
b. Preparation of Manuals/Guidelines.

Guidance/Advisory Role

a. Organising Trainings/Workshops/ Seminars,
b. Representation on various Committees/ Boards.

Others

Mass Awareness programmes

Technical Support to Ministry of Water Resources and other Departments of Government of India are provided on all matters related to water resources development and management.

MAJOR ACTIVITIES

Hydrological Observations

Central Water Commission operates National Network of 945 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 Circles and authenticated data in the form of Water Year Book, Sediment Year Book and Water Quality Year Book are then transmitted to CWC (HQ) for storage, updating, retrieval etc. The dissemination of data to bonafide users are processed as per the data request received in the regional offices of CWC as well as at Head Quarter by P&D Unit, as per norms and procedure laid down.

Hydrology Project

Central Water Commission has implemented Hydrology Project Phase-I spread over the 9 peninsular States of India with the World Bank Assistance which started in 1996. Under the project, a Hydrological Information System (HIS) has been established for 284 sites to provide reliable hydrological data for long term planning, design and management of water resources and water use systems and for research activities in the related aspects together with improvement in the infrastructure for data collection. States and Central agencies participated in phase-I of HP.

Central Water Commission has got a software (WISDOM) developed for all surface and ground water participating agencies for storage and dissemination of hydrological and meteorological data namely gauge and discharge, water quality and climatic data under the Hydrology Project. A combined catalogue containing Meta Data (information about availability of data) of various data storage centers have been hosted on the web (www.india-water.com).

A follow-up phase of Hydrology Project-I named as Hydrology Project-II has been cleared by the CCEA at an overall provision of about Rs.62700 Lakhs. Formal Agreement with the World Bank is expected to be signed shortly. It envisages establishment of Hydrological Information

System on the pattern of HP – I in four new States namely Punjab, Himachal Pradesh, Goa and Pondicherry and vertical extension in the nine States and central agencies which participated in phase-I for utilization of data.

Central Water Commission's proposal for Hydrology Project Phase-II consists of two major components – Institutional Strengthening and Vertical Extension. It is proposed to carry out the consolidation of HP-I, continued infrastructure development of NWA, Pune, increasing awareness for data dissemination and knowledge sharing, logistic support etc., under the Institutional Strengthening. Under the vertical component two major activities, i.e. development of Hydrological Design Aids including standardization of methodology/protocols and water resources planning decision support system are envisaged by the Central Water Commission.

The estimated cost of the CWC's component of the proposal is Rs. 2489.76 lakhs without contingencies and Rs. 2962.98 lakhs with contingencies.

Water Quality Monitoring

Central Water Commission is monitoring water quality at 371 key locations covering major river basins of India with a three-tier laboratory system for analysis of the water quality parameters. The level-I Laboratories are located at 258 field water quality monitoring stations on major rivers of India where physical parameters such as temperature, colour, odour, specific conductivity, total dissolved solids, pH and dissolved oxygen of river water are observed. There are 24 level-II Laboratories located at selected Divisional Headquarters to analyse 25 nos. physico-chemical characteristics and bacteriological parameters of river water. 4 Level-III/II+ Laboratories are functioning at Varanasi, Delhi, Hyderabad and Coimbatore where 41 parameters including heavy elements/toxic parameters and pesticides are analysed periodically. The data generated are computerized in the data base system and disseminated in the form of Hydrological Year Book, Status Reports and Bulletins.

Ministry of Environment and Forest has laid emphasis on water quality monitoring in an integrated manner by constituting the Water Quality Assessment Authority (WQAA) at national level under the provisions of Environmental Protection Act through the extraordinary notification in the Gazette of India dated 22nd June 2001 for coordinated effort in maintaining the quality of national water resources. State Level Water Quality Review Committee (WQRC) have been constituted and the Chief Engineers/Superintending Engineers of CWC are the Member Secretaries of most of the committees.

The Working Group constituted to advise the WQAA on the minimum flows in the rivers to conserve eco-system, headed by Member (RM), has submitted the recommendations to WQAA. WQAA has also constituted a Standing Group-II, headed by Member (RM), CWC to draw scheme(s) for imposition of necessary restrictions on water abstraction and discharge of treated sewage/trade effluent on land, river and other water bodies with a view to mitigate crisis of water quality. Three meetings of the Group were held during 2005-06 and the Terms of Reference (TOR) for appointment of Consultants for abatement of pollutants in selected hotspots in the river reaches was prepared and submitted to WQAA.

Flood Forecasting and Inflow Forecasting

Flood Forecasting activities in India in a scientific manner made a beginning in 1958 when the erstwhile Central Water and Power Commission (CW&PC) set up a Flood Forecasting Unit (FFU) for issuing flood forecasts and warnings of floods in the Yamuna, at the National Capital, Delhi. This service has since been expanded by CWC to cover almost all the major flood prone inter-State river basins of India. At present there are 145 level forecasting stations on the major rivers and 28 inflow forecasting stations for major dam/barrages. It covers 9 major river systems in the country, including 70 river sub-basins pertaining to 15 States viz. Andhra Pradesh, Assam, Bihar, Chhatisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra Orissa, Tripura, Uttaranchal, Uttar Pradesh, West Bengal and one Union Territory Dadra and Nagar Haveli and the National Capital Territory of Delhi. Normally forecasts are issued 12 to 48 hours in advance, depending upon the river terrain, the location of the flood forecasting sites and base stations.

During the flood season 2005 (May to October) 5619 flood forecasts (4324 level forecasts and 1295 inflow forecasts) were issued, out of which 5425 (96.55%) forecasts were within prescribed accuracy limits.

To make the flood forecasts more accurate, effective and timely, CWC is continuously updating and modernizing its flood forecasting system. During the 9th Plan, Modernization of inflow forecasting services in Mahanadi and Chambal basins was taken up 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. During the 10th Plan it is proposed to extend this system to Brahmaputra, Barak, Damodar, Krishna, Godavari, Yamuna, Ghaghra, Rapti and Sutlej river basins. During the year, orders for supply, installation, testing, commissioning and maintenance of real time data acquisition network for collection, transmission and processing of hydro-meteorological data, gauging equipment, satellite telemetry and associated systems and setting up of VSAT communication links and upgradation of MIKE 11 FF Modelling Software including additional modules have been placed.

Under USAID assisted "Disaster Management Project - Climate forecasting" of the Ministry of Home Affairs, development of decision support system for flood forecasting and management for Mahanadi basin and flash flood forecasting in Sutlej basin are under implementation. After completion, this project will help in advancing the warning time and minimizing individual's input in formulation of the forecasts.

Survey and Investigation

More than 200 Irrigation and Hydro-Electric Projects have been investigated by CWC and Detailed Project Reports (DPR) have been prepared and submitted to the concerned authorities. At present 15 projects (13 in India and 2 in Nepal) are under investigation by CWC.

CWC has 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).

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

Morphological Studies

The study of river morphology and implementation of suitable river training works as appropriate have become imperative for our nation as large areas of the country are affected by floods and erosion every year. So far eighteen morphological studies of rivers of India, eight volumes of Morphological Atlas and seventeen other monitoring status/ sedimentation/mathematical model reports of rivers of India have been completed/prepared by CWC based on data collected by field survey.

Coastal Erosion

A National Coastal Protection Project (NCPP) covering all the maritime States/UTs is under formulation in Central Water Commission for protection of severe erosion prone coastal areas through structural as well as non-structural measures. Central Government is also providing assistance to maritime States/UTs to take up coastal protection works in severely affected areas for which a centrally sponsored scheme, "Critical anti erosion works in coastal and other than Ganga Basin states" estimated to cost Rs. 20.64 crores is now under implementation. So far, Rs. 8.52 crores (Rs. 3.62 crores during 2005-06) have been released since 2003-04 under the scheme to Karnataka, Kerala, Maharashtra, Orissa, Pondicherry, Tamil Nadu and for pilot project to study beach nourishment in Maharashtra.

Hydrological Studies

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

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

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

Hydrological studies are also carried out in connection with Detailed Project Reports prepared by CWC. 100 projects were dealt by CWC during the year 2005-06 from hydrological point of view, out of which 18 projects were dealt as consultancy work and 82 projects were dealt for Technical Examination/study of hydrology.

CWC has come up with Indian version of regional models for rational estimation of design flood. Sub-zonal reports for estimating design flood for use in areas with insufficient hydrological and hydro meteorological data have been brought out by CWC which are extensively used by various state Governments and Central Government Department/Organizations.

Such models are available for 23 sub-zones out of the 26 sub-zones into which the country has been divided.

Design

The Central water Commission is actively associated with the design of majority of the mega water resources projects in the country as well as number of projects in the neighboring countries by way of design consultancy or in the technical appraisal of the projects. Four design units are functioning in CWC 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 108 projects out of which 67 projects are at construction stage while the remaining 41 projects are either at investigation or in DPR stage. In addition, specific problems in respect of 5 projects have also been referred to CWC.

The design units have prepared several memoranda on the Indo-Pakistan dispute concerning Baglihar Project in J&K and submitted to the Neutral Expert appointed for determination on points of differences referred by the Government of Pakistan under provision of the Indus Water Treaty.

Dam Safety

There are 4050 existing large dams in the country. In addition 475 large dams are under construction. About 60% of these dams are more than 20 years old. Appropriate measures for the maintenance of such structures are critical for their safety. Dam Safety Organization of CWC acted as the Nodal agency in the implementation of the World Bank assisted "Dam Safety Assurance and Rehabilitation Project (DSARP)" in which 4 states i.e. Madhya Pradesh, Rajasthan, Orissa and Tamil Nadu participated.

Basic dam safety measures were provided for 182 dams, while 55 dams were taken up for rehabilitation and rectification works. The success of this project led to the framing of a fresh proposal named as "Dam Safety Assurance, Rehabilitation and Disaster Management Project (DSARAMP)" now renamed as "Dam Rehabilitation and Improvement Project (DRIP)". This project aims at improving the safety and optimum sustainable performance of selected existing dams and associated appurtenances by setting up a Dam Safety and Improvement Fund (DRIF) with the participation of World Bank, Central/State Governments and other institutional funding agencies. The project will cover 13 States namely Andhra Pradesh, Bihar, Chattisgarh, Gujarat, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh, Uttaranchal and West Bengal.

The National Committee on Dam Safety (NCDS) was constituted by the Govt. of India in October, 1987 headed by the, Chairman, CWC, The 27th meeting of the committee was held on 27.09.2005. The importance of having a Dam Safety Act was emphasized and the State Governments were requested to bring necessary legislation in their respective States. National Committee on Seismic Design Parameters (NCSDP) has been constituted specially to decide the seismic design parameters for large dams. The 15th meeting of the committee was held on 24.02.2005 in which design seismic

parameters for five projects were recommended and design seismic parameter for Koteshwar H.E. Project, Uttranchal was approved on the basis of Seismic study carried out in CWC.

Project Appraisal

Since 1961 CWC has appraised more than 1418 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/ interstate agreements or tribunal awards for utilization of water are duly followed and the layout 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 2005-06, technical examinations of 18 irrigation projects were completed. Four irrigation and one flood protection projects were cleared by the Technical Advisory Committee. At present, 113 irrigation schemes (52 Major & 61 Medium) and 62 flood management schemes/ master plans are under different stages of appraisal.

External Financial Assistance to Water Resources Projects

The Commission assists the State Governments by providing technical support for preparation of project reports in respect of projects to be posed for external funding. Presently, 49 schemes (36 new and 13 revised) and 6 Water Sector Re-structuring Projects are under various stages of appraisal.

Project Monitoring

Central Water Commission is carrying out general monitoring of 125 selected on-going major, medium and Extension Renovation and Modernisation (ERM) irrigation projects. These 125 on-going projects include 22 Major pre-fifth/fifth plan projects which have been put under vigorous monitoring and are visited frequently or at least twice a year for achieving their completion during the X plan period i.e. by March, 2007.

The major, medium and selected minor surface water irrigation projects receiving Central Loan Assistance (CLA) 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 128 major and medium projects under AIBP. In order to evaluate the performance speedily and efficiently, and with the objective to assess the irrigation potential created up to March 2005 using high resolution satellite data by identification and mapping of the irrigation net work, satellite monitoring of two AIBP projects on pilot basis namely Upper Krishna and Teesta command have been taken up by NRSA, Hyderabad and the study is in progress.

Central Water Commission is also monitoring physical and financial progress of about 1300 minor irrigation schemes in North Eastern Region and other hilly states, implementation of CAD programme in respect of 133 irrigation projects and implementation of the scheme for "Repair, Renovation and Restoration of Water Bodies Linked to Agriculture" launched by the Hon'ble Prime Minister of India.

Monitoring of Reservoir Level and Live Storage Capacity

During the water year 2004-05, CWC monitored the storages of 71 important reservoirs in the country on weekly basis which forms an important input for the Ministry of Agriculture's Crop Weather Watch Group and, 5 more projects were included in the monitoring system, thus raising the total number of projects monitored to 76 with a total live storage capacity of 133.021 BCM. 49 more projects (each having storage capacity of 0.250 BCM or more) were also identified for inclusion in the monitoring system which will increase storage capacity of the monitored reservoirs to 156.69 BCM i.e. about 74% of the total capacity of 213 BCM created so far

Application of Remote Sensing Technique in Water Resources Sector

During the X Plan, it has been proposed to take up Satellite Remote Sensing based reservoir sedimentation studies for 124 reservoirs (out of which 79 studies will be carried out by CWC), assessment of water logging, salinity & alkalinity affected soils in the whole country and morphological studies of six rivers viz. Kosi, Gandak, Brahmaputra, Ghaghra, Satluj and Ganga from Allahabad to Buxar. Accordingly, reservoir sedimentation studies of 22 reservoirs have been completed, while work on another 19 reservoirs is in progress. Reports on assessment of water logging, salinity and alkalinity affected soils for 6 states i.e. Rajasthan, Haryana, Bihar/ Jharkhand, Delhi, Karnataka and Goa have been completed. The study in respect of five states i.e. Chattisgarh, Madhya Pradesh, Maharashtra, Gujarat and Punjab is in progress. All the 23 reports in this regard will be completed during the 10^{th} Plan period i.e. by March, 2007.

Benchmarking of Irrigation Projects

Benchmarking in Water Industry is in use in developed countries for quite some time. This concept is now being acknowledged as a potent management tool in irrigation sector in India as well. Accordingly, a Core Group under the chairmanship of Member (WP&P), CWC for Benchmarking of Irrigation Systems in India set up by the MOWR, is playing an active role as a coordinator as well as a facilitator by way of providing technical support to the State Governments. National/regional/ project level workshops are being organised by CWC in various states to facilitate concerned State Governments to take up Benchmarking of Irrigation Projects in their respective States. During 2005-06, one regional workshop was organised at Gandhinagar (Gujarat) and two project level workshops have been organized, one at Imphal (Manipur) and another at Kota (Rajasthan).

Irrigation Performance Overview of Completed Irrigation Projects:

CWC has taken up the performance evaluation studies of completed irrigation projects as a pilot project, covering various aspects such as system performance, socio-

economic, agro-economic and environmental aspects.

Performance Evaluation Studies of 14 Major and Medium irrigation projects located across the country have been accomplished by CWC till the end of the IX Plan. Ten more such studies are planned for X Plan period out of which studies in respect of 8 projects are under progress which includes four projects taken up during 2005-06.

Hydrographic Survey of Important Reservoirs

Capacity survey of reservoirs is a continuing scheme hitherto known as "Hydrographic Survey of 30 important reservoirs in the country" initiated during VIII Plan and continued through IX Plan. At the end of IX plan, 19 reservoirs were covered under the scheme at a total cost of Rs. 4.26 crores and 15 more reservoirs are planned to be covered during X Plan at an estimated cost of Rs. 3.29 crore. Capacity survey of 22 reservoirs have been completed so far. During 2005-06, proposals for 4 reservoirs are being considered.

Status Report on Watershed Management and Water Harvesting

The Status Report of watershed Management and Water Harvesting has been published and is being circulated to all Central / State Governments and other Organisations.

Policy and Planning

The Ministry of Water Resources is responsible for laying policy and planning guidelines for the development and regulation of the country's water resources. The National Water Resources Council (NWRC) under the chairmanship of the Prime Minister and with Chief Ministers of the States, Administrators of Union Territories and Union Ministers of concerned departments as Members, is the apex policy making body for the water resources development in India. Issues connected with the development of the Water Resources of the country as well as progress achieved in the implementation of the National Water Policy (NWP) are required to be considered, reviewed and reported to the council from time to time. The Government of India has therefore constituted a National Water Board (NWB) of the NWRC, under the chairmanship of the Secretary (Water Resources) and Member (WP&P), CWC as Member-Secretary.

Integrated River Basin Planning

Recognizing that the integrated Water Resources Development and Management is the key to future policies and programmes, the National Water Policy (2002) adopted by the Government of India enunciates that "Water is a scarce and precious national resource to be planned, developed, conserved and managed as such, and on an integrated and environmentally sound basis, keeping in view the socio-economic aspects and needs of the States. It is one of the most crucial elements in developmental planning. As the country has entered the 21st century, efforts to develop, conserve, utilize and manage this important resource for sustainability have to be guided by national perspective".

Keeping the above in view, a case study on "Integrated River Basin Planning Development and Management of Sabarmati River Basin" (Gujarat Portion) using RIBASIM Model was completed

and the final report of the study was circulated

Reservoir Operation

During the year, draft reservoir operation manuals for Tehri and Bansagar were prepared. 16th meeting of the Joint Operation Committee of Rihand Dam (UP) was held on 29.9.2005 to finalise the releases from Rihand reservoir to meet the irrigation requirements of Inderpuri Barrange (Bihar).

National Water Academy and Other Training Activities

National Water Academy at Pune functions as a Centre of Excellence for in-service training of Water Resources Engineering Personnel of State Government, Central Water Commission and other Central organizations. So far, the Academy has conducted 176 courses, in which 4078 officers (1076 from CWC and 3002 from State Governments and other Central Government Agencies) have been trained. In addition, the Training Directorate at Headquarters has organized about 384 courses on various topics related to Water Resources Development. About 11,000 officials have undergone training through these courses. During the year 2005-06, 28 courses at NWA, Pune and 24 short term courses at CWC Headquarters at New Delhi were organized.

Interaction with the Ministry of Agriculture

Central Water Commission is represented in the Crop Weather Watch Group meetings of the Ministry of Agriculture in which the storage status of 76 important reservoirs being monitored by CWC is appraised.

The officers of Central Water Commission actively participate in the Inter-Ministerial Central Teams Constituted by the Ministry of Agriculture from time to time for National Disasters like flood, cyclone, drought etc.

An ICAR-CWC Joint Panel was constituted in March 1979 by the ICAR for a period of three years mainly to deal with the problems relating to efficient water management and suggest measures for maximizing the return from the investments made in the Irrigation sector under major, medium, minor and other irrigation programmes. The functions of the Panel include providing adequate and efficient agricultural research, education and extension services in irrigation commands. The panel also reviews the work done by Agricultural Universities / Research Institutes, Command Area Development Authorities, Central and State Ground Water Organisations and others with a view to optimizing the yield per unit of water.

CHAPTER 7

REDRESSAL OF INTER STATE RIVER ISSUES

Inter-State Water Disputes (Amendment) Act, 2002

Inter-State Water Disputes Act 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 Sarkaria Commission recommendations, Inter-State Disputes Act 1956 has been amended and "The Inter-State Water Disputes (Amendment) Act, 2002" (No. 14 of 2002 dated 28th March, 2002) has been enacted. The Act has come into force from 6th August, 2002. The amendments include time frame for constitution of the Inter-State Water Disputes Tribunal and also prescribes time limit for the tribunals to give their awards. As per the amendment, Central Government will have to constitute a Water dispute 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 force of decree of Supreme Court

CAUVERY WATER DISPUTE

Progress in Adjudication of the Dispute before the 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. Since its constitution, the Tribunal disposed off about 138 Civil Miscellaneous petitions (CMPs) out of 149 filed by party States framed issued for adjudication, completed cross examination of expert witnesses and completed arguments on the issues covered under Group 1- (Legal issues) and Group-2 relating to availability of water – surface flows, additional /alternative resources . The Tribunal had also passed an Interim Order in June, 1991 and further Clarificatory Orders on the Interim Order in April, 1992 and December, 1995.During 2005-06, the Tribunal concluded arguments on the issues covered under Group –3 i.e. relating to equitable apportionment and related subjects on behalf of basin States. From December, 2005 the State of Tamil Nadu has started replying on the issues of Group- 3. The Tribunal in its Order of 13th May, 2005 has recorded that party States are likely to conclude all arguments by the end of March, 2005. Accordingly, Tribunal has sought extension of time by one year beyond 5.8.2005 for submission of report and decision which has been agreed to by the Central Government.

Monitoring of the Implementation of Interim Order of CWDT

The Cauvery River Authority consists of the Prime Minister as Chairperson and Chief Ministers of the basin States as members. The Monitoring Committee consists of Secretary, MOWR as Chairperson, Chief Secretaries and Chief Engineers of the basin States as Members and Chairman, Central Water Commission as Member. The Authority is required to give effect to the implementation of the Interim Order dated 25th June 1991 of the Tribunal and its related subsequent orders.

During the current year, no meeting of the Authority could be held. However, the

Monitoring Committee under the Cauvery River Authority(CRA) held its 22nd meeting on 23rd June,2005. In this meeting, Chief Secretary, Tamil Nadu requested Chief Secretary, Karnataka to ensure weekly flow and not to wait until August or so to make release. Chairman, Monitoring Committee requested the basin States to implement the Interim Order of CWDT in letter and spirit and hoped that there would be copious rain during the current water year. During the water year 2005-06, starting from June, 2005 193.59 TMC of inflow was required at Mettur upto December, 2005 as per the Interim Order. Against this, 373.844 TMC has been received at Mettur upto December, 2005.

MANDOVI RIVER WATER DISPUTE

In July, 2002, the State 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 has also to decide the machinery to implement the decision of the tribunal etc.

In the Inter-State Meeting convened by Union Minister(WR) on 20.12.2002, it was decided that the Government of Goa & Central Water Commission(CWC) would make joint efforts to reconcile the discrepancies in the data and yield figures. The Chief Minister of Goa in his letter addressed to Prime Minister in June, 2003 expressed the desire of his State to settle the long-standing issues with Karnataka through negotiations. The Government of Goa was subsequently allowed to obtain the raw data of Ganjim site of CWC. The Government of Goa has so far obtained the raw data from January, 1979 to May, 2003. The Secretary(WR) held a meeting at the level of Chief Secretaries of the basin States on 16th January, 2005 to discuss and resolve the issues. The State of Goa has requested this Ministry to immediately constitute the Tribunal and refer the matter to the tribunal for adjudication.

KRISHNA RIVER WATER DISPUTE

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 Tribunal in its sitting held on 13th April, 2005 has issued notice to the basin States under Rule 4 of the Inter State Water Disputes (ISWD) Rules 1959 for nominating thier representative on or before May 19, 2005 to present their cases in the proceedings before Tribunal. During the next meeting of the Krishna Water Disputes Tribunal (KWDT) held on 19th and 20th May, 2005 in New Delhi, all the parties requested for time to file their objections/reply to the complaint filed by each other, which was granted by Tribunal. Besides,on behalf of the State of Karnataka, one application was moved for interim orders. The States of Andhra Pradesh and Maharashtra have sought time to file reply to the application for interim relief moved by the State of Karnataka.

RAVI & BEAS WATERS 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 from the Central Government and references received from Govts. of Punjab, Haryana and Rajasthan, seeking explanation/guidance on certain points in the report.

The period for forwarding of further report by the Tribunal has been extended upto 5th February , 2006. The Tribunal has requested for extension of the period by another six months in view of the matter of a Presidential Reference On the Constitutionality of Punjab Termination of Agreements Act, 2004, pending consideration of the Hon'ble Supreme Court The request is under process. The Tribunal held hearings in February , April and September, 2005 and is scheduled to hold its next hearing on 27th January, 2006.

BOARD/AUTHORITY/COMMITTEES

NARMADA CONTROL AUTHORITY

Introduction

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

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

Meeting of Narmada Control Authority

The Narmada Control Authority held two meetings till December 2005 in which issues relating to resettlement and rehabilitation, further raising of the Sardar Sarovar Dam, other project related matters and administrative issues were discussed.

Important Decision Taken by the Authority

1. A review appeal in the judgment dated 15.03.2005 of the Hon'ble Supreme Court in Civil Writ Petition 328 of 2002 related to Sardar Sarovar Project is not advisable. However, Govt. of Madhya Pradesh, if considers necessary may submit a separate appeal in the Hon'ble Supreme Court.
2. The GOMP shall complete the additional R&R works in accordance with the judgment dated 15.03.2005 of the Hon'ble Supreme Court corresponding to EL 110.64 Sardar Sarovar in the first instance, report compliance and submit ATR to NCA as well as the GAR.
3. Based on back water details provided by GOG for various incremental increase in height of Sardar Sarovar dam, GOMP will assess the workload of R&R and shall make an assessment of number of Project Affected Famil's required to be resettled.
4. Party States to complete the work of R&R of Sardar Sarovar Project in accordance with the provisions of NWDT award and also directions given by the Hon'ble Supreme Court and submit the ATR by 31st December, 2005 positively to NCA secretariat.

Committees/ Sub-groups/Sub-committees

The Authority has constituted the following discipline based Sub-groups:

1. Environment Sub-group under the Chairmanship of Secretary, Government of India, Ministry of Environment & Forests (MOE&F).
2. Resettlement & Rehabilitation Sub-group under the Chairmanship of Secretary, Government of India, Ministry of Social Justice and Empowerment (MOSJ&E).
3. Rehabilitation Committee under the Chairmanship of Secretary, Government of India, Ministry of Social Justice and Empowerment (MOSJ&E).
4. Narmada Main Canal Sub-committee under the Chairmanship of Executive Member, Narmada Control Authority.
5. Hydromet Sub-group under the Chairmanship of Executive Member, Narmada Control Authority.
6. Power Sub-committee under the Chairmanship of Member (Power), Narmada Control Authority.
7. Environment Committee under the Chairmanship of Member (E&R), Narmada Control Authority.
8. Sardar Sarovar Reservoir Regulation Committee under the Chairmanship of Executive Member, Narmada Control Authority.

Monitoring of Projects

As per Sub-Clause-8(3)(ii) of Clause-XIV of NWDT award, the Authority shall decide the phasing and shall coordinate construction Programme of Indira Sagar Project & Unit-II (Canals) of Sardar Sarovar Project with a view to obtain expeditiously optimum benefits during and after the completion of the construction of the projects, having due regard to the availability of funds. In compliance of these directions, the NCA has been monitoring the progress of construction works of the Indira Sagar Project and Unit-II (Canals) of Sardar Sarovar Project and bringing out half yearly status reports for the period ending September and March of each year. The reports for the period ending 31st March, 2005 & 30th September, 2005 in respect of these two projects were brought out by NCA.

Resettlement and Rehabilitation Activities

(a) Sardar Sarovar Project (SSP)

The Resettlement and Rehabilitation (R&R) policy for the affected persons of Sardar Sarovar Project (SSP) is based on the decisions and final orders of the Narmada Water Disputes Tribunal

(NWDT), and directions received from Hon'ble Supreme Court from time to time in the past. Considering the socio-economic and cultural background of the population being displaced and with a view to improving the living conditions of these people, all the three participating States have formulated their own policies which contain more liberal provisions than those envisaged in the NWDT Award.

The R&R progress is being regularly monitored by the monitoring machinery i.e. Resettlement & Rehabilitation Sub-group of the Narmada Control Authority, chaired by the Secretary to the Government of India, Ministry of Social Justice & 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 to the submergence villages and R&R sites and the observations/ suggestions of the visit are being complied with by all the party States.

The Table given below indicates Overall cumulative progress of R & R of Project Affected Families (PAF) up to Sept'05.

(**No. of PAFs)**

State	Total Project Affected Families	Total PAFs Resettled	Balance to be Resettled
1. GUJARAT	4728	4726	2
2. MAHARASHTRA			
In Gujarat	1023 $	946	77
In Maharashtra	2675 $	2501	174
Total	3698	3447	251
3. MADHYA PRADESH			
In Gujarat	14124 *	5844	8280 *
In Madhya Pradesh	18890 *	13026 **	5864 *
Total	33014	18870	14144
Grand Total	41440	27043	14397

Note: $ This number may change after declaration of genuine PAFs by GRA/State Government.

* This number may change after taking option of PAFs for R&R and declaration of genuine PAFs by GRA/State Government.

** The figures are as reported by the Madhya Pradesh State in 62nd R&R Sub-group meeting held on 12.9.2005

(b) Indira Sagar Project (ISP)

In compliance with the order of the Hon'ble High Court, Jabalpur dated 17.8.2005, in the writ petition (civil) No. 3022 of 2005 that "NCA R&R Sub-group is also directed to involve itself in the monitoring of the R&R measures by Narmada Hydro-Electric Development Corporation (NHDC) to the PAF's/oustees of the 91 villages" the NCA Secretariat have requested to the Chief Executive Director, NHDC Bhopal and the General Manager (R&R) NHDC, Khandwa to furnish information. NCA has however started monitoring Resettlement & Rehabilitation (R&R) aspects of Indira Sagar Project (ISP) by undertaking field visits to the submergence villages & resettlement sites.

Energy Management Centre (EMC) of NCA

To discharge various functions on power aspects as per provision of NWDT Award, NCA has established an Energy Management Centre (EMC) at Indore in consultation with Central Electricity Authority. The Scheme of EMC comprises four packages. Packages I & II comprise Remote Terminal Units (RTUs) and Supervisory Control and Data Acquisition System (SCADA) supplied by BHEL (EDN), Bangalore for SSP data transmission to Western Regional Dispatch Centre (WRLDC), Mumbai and EMC, Indore. The original scheme for Packages I & II envisaged installation and commissioning of RTUs and SCADA system comprising 386/486 micro processor based with software. The installation and commissioning of Packages I was delayed on account of delay in commissioning of SSP units as a result of petition in the Hon'ble Supreme Court against construction of SSP Dam. With the pre-commissioning of Packages I & II, data transmission between SSP-WRLDC and EMC was undertaken by leased data circuit. With the upcoming Unified Load Dispatch Control (ULDC) scheme of Western Region, which is presently in final stages, the Packages I & II are to be made compatible to meet ULDC requirements. As the present system is technologically obsolete and is not suited to meet the long term requirements of data communication, an action plan for up-gradation/replacement of Packages I & II is under formulation as per recommendations of Group of Experts with representation from CEA, NCA, SSCAC & party States constituted by Power Sub-Committee of NCA. The preliminary action for procurement of various components of Packages I & II is presently in process.

Package III comprises various auxiliary equipment for O&M of EMC which have already been installed and commissioned. Package IV comprises Time of Day (TOD) meters to continuously monitor & record the power flow through SSP transmission lines to various party States. All the equipment under this Package have been received and installed. In line with the provisions of Electricity Act, 2003 & Indian Electricity Grid Code (IEGC), metering arrangements are to be reviewed by installing Special Energy Meters (SEMs). Accordingly, SEMs have been provided to record energy generation of SSP complex and to facilitate its sharing among the party States. All the five Units (5x50 MW) of Canal Head Power House (CHPH) are already commissioned. Four units out of total of six units of (200 MW each) River Bed Power House (RBPH) are commissioned till December,2005. The power evacuation of SSP complex is undertaken through 400 KV transmission system comprising 6 circuits (2 circuits each for the States of MP, Maharashtra and Gujarat). Four of these circuits have already been charged till December, 2005. EMC is coordinating various activities of power generation of SSP complex in consultation with WREB, WRLDC and party States for generation planning, daily scheduling, generation monitoring and energy accounting etc. During the year 2005-06 (April, 2005 to December, 2005) the total energy generation of SSP complex was 1552 MU which was shared by the party States in the ratio prescribed by NWDT Award.

Hydromet Network in Narmada Basin

In pursuance of the final decisions and directives of NWDT vide clause XIV, Sub-

Clause 8(3)(v), Narmada Control Authority is implementing the Hydromet Network which, inter-alia, comprises setting up a Real Time Data Acquisition System (RTDAS) in the Narmada basin. The upgradation of specified key gauge and discharge stations under NCA has been entrusted to Central Water Commission on deposit work basis. A turnkey contract was signed with M/s. ECIL in September, 1996 for an accepted tender amount of Rs.12.85 crore for implementation of RTDAS comprising of twenty six remote stations (RS) in the basin and a Master Control Centre (MCC) at Indore.

The Remote stations have been configured to collect data on various hydro meteorological parameters namely, water level, rain fall, evaporation, solar radiation, wind speed and direction, relative humidity and ambient temperature in real time mode and automated on-line communication of the same to MCC through Data Relay Transponder (DRT) on-board satellite KALPANA-I. The MCC at Indore has already been established. The planned computerized network, operating in real time environment and free from such snags, will improve efficacy, accuracy and also warning time for safety of various major dams including Sardar Sarovar and Indira Sagar project on river Narmada round the year and shall help in efficient integrated reservoir operation including regulated releases from Indira Sagar Project to Sardar Sarovar Project and a holistic flood management in the basin. It will also be useful in proper accounting and apportionment of Narmada water among the beneficiary states in accordance with the mandate given by NWDT.

Due to the delays in commissioning the project, the Permanent Standing Committee of SSCAC requested the Secretary, MOWR and Chairman, NCA to convene a meeting of the senior officials of the Deptt. of Atomic Energy, NCA, ECIL and the party states to expedite completion of the project. Accordingly, Secretary (WR) and Chairman, NCA has so far convened three Review meetings for taking steps to expedite completion of the project. Following these meetings, M/s. ECIL have completed the field activities related to the installation and commissioning of the stations. Stable communication has almost been achieved with regard to the data communication as demonstrated during monsoon, 2005. As regards the demonstration and calibration of water management software, inflow water level forecast were formulated but those were not within the requisite accuracy. M/s. ECIL are working in association with their foreign associates for improving the accuracy in order to demonstrate the assured performance in totality during the next monsoon season as per the conditions of the contract. M/s. ECIL were granted time extension for commissioning of the project during monsoon 2005 and also for extending the completion period up to 31st December, 2005.

Annual Water Account of Narmada Basin

Pursuant to the directives contained in the Sub-Clause-8 under Clause-XIV of the NWDT award, NCA has been preparing Annual Water Account for the Narmada Basin after collecting the water utilization data from the party states on actual area irrigated in each season by different categories of the projects, withdrawals for domestic, municipal and industrial uses. The authority has also been mandated by the award to determine the volume of water flowing in the river Narmada and its tributaries in a water year (1st July to 30th

June). Annual Water Accounts up to the year 2003-04 have already been published by the Authority while draft report for the water year 2004-05 has been finalized and being issued.

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, Government of India, 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 from the Central Water Commission. The secretariat of the Committee is located at Vadodara.

SSCAC Meetings:

Two meetings of the SSCAC were held during the year 2005-2006 upto 1st December 2005. The 72nd meeting of the SSCAC was held on 16th May 2005, wherein important decisions were taken on matters related to following issues:

- Payments of Share cost of Sardar Sarovar Project by the party states.
- Proceedings of the 90th Permanent Standing Committee (PSC) meeting.
- Approval of the Annual Development Plan (2005-2006) of Unit-I (Dam and Appurtenant works) and Unit-III (Hydro Power works).
- Progress review of Unit-I (Dam and Appurtenant) works and Unit -III (Hydro Power works).
- The 73rd special meeting of the SSCAC was held on 3rd August 2005, approved the Estimate for construction of Garudeshwar Weir/Draft Tender Paper.

Permanent Standing Committee Meetings:

The Sardar Sarovar Construction Advisory Committee (SSCAC) 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.

The 91st meeting of the PSC of SSCAC was held on 7th June 2005 where in following issues were discussed:

- Claim put forth by M/S Jai Prakash Associates on account of shortfall in concrete progress during the various working seasons from 1993-1994 to 1997-1998 due to the restrictions imposed in raising the spillway of Sardar Sarovar Dam.
- Review of the progress of Unit-I (Dam and Appurtenant works) and Unit-III (Hydro Power works) of Sardar Sarovar Project.

- Review of the progress of Real Time Data Acquisition System (RTDAS) in Narmada basin.

Progress of Main Dam Works

The construction of the main spillway portion of the dam had been held up for over five years due to the writ petition filed by Narmada Bachao Andolan in the Supreme Court of India. The final judgment on the case was delivered by the Supreme Court on 18th October 2000, in which the Court cleared raising of the dam up to EL 90.0 m, and also gave directions for further construction of dam as per the award of the Narmada Water Disputes Tribunal. As per Court's directions, the permission for further rising of dam is now to be given by the NCA, after obtaining clearances from the Resettlement and Rehabilitation Sub-Group, and in consultation, with the Grievances Redressal Authorities (GRA's) of Gujarat, Maharashtra and Madhya Pradesh.

Subsequent to the final order of Supreme Court, the NCA in its 61st meeting held on 17th November 2000 approved the programme of dam construction as per details given below:

Dam Height (EL)	Time Frame	
	Completion of R&R	Completion of Dam
100.0m	December 2001	June 2002
110.0m	December 2002	June 2003
121.92m	December 2003	June 2004
138.68m	December 2004	June 2005

The NCA's stipulated target however was not achieved due to the slow progress of Resettlement and Rehabilitation 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 3.0m high hump over blocks 31 to 45 for the safety of downstream stilling basin. The said work was completed by the end of June 2003. In its 70th meeting held on 12th & 13th March 2004, NCA gave permission to raise the spillway block nos. 30 to 46 up to EL 110.64 m, work for which was completed before the monsoon of 2004. The status of overall progress of works for the month ending October 2005 is given in below.

Particulars	Revised Est. Qty.	Progress up to October 2005	% work completed
Excavation (Lakh Cu.m)	64.00	63.58	99.34%
Concreting (Lakh Cum)	68.20	63.79	93.53%

Progress of Canal Head Power House (CHPH)

The Civil and Electrical works of Canal Head Power House were completed in Jan'98. After the height of dam reached the Minimum Draw Down Level (MDDL) (110.64 m), the CHPH units started generating partial power from 16th Aug'04.

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. The work of further excavation in the River Bed Power House cavern and concreting have also commenced, and the status of progress of civil work at the end of Oct'05 is given below:

Particulars	Est. Qty.	Progress upto October 2005	% work comple - ted
Open Excavation (Lakh Cu.m).	17.15	17.033	99.32%
U.G. Excavation (Lakh Cum).	7.32	6.876	93.93%
Concrete (Lakh.Cu.m.)	3.35	3.110	92.83%

The erection of electrical components commenced in June 2000, and are progressing satisfactorily. Unit No. I, II, III & IV of RBPH were commissioned on 1st February, 30th April, 30th August, & 28th October 2005 respectively. Unit No. V & VI of RBPH are in advanced stages of completion. The last unit of RBPH is expected to be commissioned by May 2006.

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 5.5 m diameter tunnels 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 97.54 m and 441.66 cumecs (15000 Cusecs) at reservoir level of 110.67m.

The work of IBPT is almost complete except cut & cover portion. The remaining work of cut & cover portion is in progress. Concrete around the steel liner is in progress. The overall progress of IBPT works at the end of June 2005 is given below:

Particulars	Est. Qty	Progress up to June 2005	% Work completed
Open Excavation (Lakh cu.m.)	7.38	7.346	99.53%
Tunnel & Shaft Excavation (Lakh cu.m.)	0.35	0.318	90.86%
Concrete (Lakh Cu.m)	1.60	1.354	84.61%
Installation of gates (Th. Tonne)	2.610	1.800	68.96%

BANSAGAR CONTROL BOARD

Organisation & Composition

The Bansagar Control Board was set up by the Government of India through a Resolution in January 1976. The Resolution was amended in 1990. The Resolution was in accordance with an agreement reached between the Governments of Madhya Pradesh, Uttar Pradesh and Bihar on 16th September 1973 for sharing the waters of River Sone and the cost of the Bansagar Dam. After amendment the main features of the resolution are as below: -

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

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

Bansagar Dam Project

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

The benefits and cost of the dam, including land acquisition and rehabilitation, are shared by Madhya Pradesh, Uttar Pradesh and Bihar in the ratio of 2:1:1. The project was originally estimated to cost Rs 91.30 crore. The revised cost of the project at 1991 price level is Rs 936 crore [Civil Works Rs 300 crore and Land Acquisition & Rehabilitation (LA&R) Works Rs 636 crores]. Project authorities have updated the cost estimate based on Madhya Pradesh Unified Civil Schedule of Rates (UCSR) 1998 to Rs 1054.96 crores (Civil Works Rs 391.30 crore and LA&R Works Rs 636.66 crores) which is yet to be approved by the Executive Committee of BCB.

Components of Bansagar Dam

The Bansagar dam envisages construction of –

i) 67.5 m high masonry dam including rock fill flanks across the Sone river just downstream of the gorge at Kusumah (Deolond). Length of masonry dam, left rock fill dam and right rock fill dam are 670.00 m, 161.00 m and 185.00 m respectively.

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.

ii) 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 towards stabilizing irrigation through old Sone Canal system.	0.94 lakh hectare

Power Benefits-

i	Power generation in Madhya Pradesh	425 MW

Completion Schedule

As per construction programme approved by the Executive Committee in its 70th meeting held on 22.07.2005, it is proposed to complete the dam as per following schedule, provided funds as per the construction programme are provided by the participating States of Madhya Pradesh, Bihar and Uttar Pradesh.

Dam up to Crest level: Since completed in June 2000.
Dam up to Top Bund Level : By Nov'05 (Full height with Gates)

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.). Works on Spillway Piers & Bridge (Deck Slab) have almost been completed. Work on installation of 18Nos. Radial Crest Gates and Stop-Log Gates are in progress and now targeted to be completed by March 2006. All construction sluices have been plugged and gates lowered. Works on installation of Irrigation Sluice Gates have been fully completed. Work on all the six Saddles have been completed.

The dam at its full height will submerge 336 villages. According to Socio-Economic survey conducted in 1980-81 approximately 1.5 lakh PAP's of 23,390 families are likely to be affected. Total 56,428-hectare land is coming under submergence, out of which 34,765-hectare is private land, 17,185-hectare is revenue land and 4,478-hectare is forestland. All private land coming under submergence have been acquired and PAP's rehabilitated. R&R Programme is being implemented based on norms approved by the Executive Committee and orders issued by Government of Madhya Pradesh. Comprehensive R&R Policy for the project has been finalized.

Budget & State Shares:

The Budget provision made for the project; sub-head wise expenditure during the financial year 2004-05 and cumulative expenditure up to March 2005 is as under-

(Rupees in Crores)

Sl. No.	Sub-head	Budget Provision	Expenditure during 2004-05	Cumulative expenditure up to 3/2005
1	2	3	4	5
1.	Establishment	12.666	10.548	126.51
2.	Tools & Plants	0.002	0.008	2.07
3.	Suspense (debit)	0.10	0.056	148.32
4.	Works	226.54	211.819	994.71
Gross Total		**239.308**	**222.431**	**1271.61**
5.	Suspense (Credit)	0.10	0.362	140.33
Net total		**239.208**	**222.069**	**1131.28**

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 31.03.2005 is as under-

(Rs in crores)

Total Expenditure	**Share Due** **Share Received**			**Balance Share**		
	M.P.	**U.P.**	**BIHAR**	**M.P.**	**U.P.**	**BIHAR**
Up to 31.03.2004: 909.216	**454.608** ***478.405***	**227.304** ***211.249***	**227.304** ***219.562***	**(+)** **23.797**	**(-)** **16.055**	**(-)** **7.742**
During 2004-05 up to 03/2005: 222.07	111.035 *227.070*	55.5175 *0.000*	55.5175 *0.000*	(+) 111.035	(-) 55.5175	(-) 55.5175
Total as on 31.03.2005: 1131.286	**565.643** ***700.475***	**282.8215** ***211.249***	**282.8215** ***219.562***	**(+)** **134.832**	**(-)** **71.5725**	**(-)** **63.2595**

BETWA RIVER BOARD

Organisation and its Composition

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

The Union Minister of Water Resources is the Chairman of the Board. Union Minister of Power, Union Minister of State for 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 1.381akh ha. in Uttar Pradesh and 1.21 lakh ha in Madhya Pradesh with power generation of 45 MW through Rajghat Hydro Electric Project at the toe of dam on left flank. The cost as well as benefits of the project are to be shared equally by both the States. Construction work of Dam and Power House is almost complete.

Land Acquisition

The dam submerges 38 villages in U.P and 31 villages in M.P State. Compensation in M.P area is almost 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 up to FRL of RL 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 Work

The estimate of Rajghat Hydro electric Project at 1997 price level was Rs. 131.26 crores which included Rs. 58.41 crores for the civil works. The further revised cost of the civil works of Power House is Rs. 66.89 Crores at December 1999 price level and same has been furnished by BRB to MPEB. MPEB have contributed Rs, 59.51 crores The total expenditure incurred in civil works of Rajghat Power House till June 2005 is 62.35 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, 1419, 1431 & 972 lakh units during the year 1999-2000, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05 & 2005-06 up to 05.12.2005 respectively.

Utilization of present storage

The Phase-l of the construction of Dam up to Spillway crest level was completed in 1992 and since then the reservoir storage is being utilized in downstream in Betwa Canal system (U.P.) and Bhander Canal System (U.P.). The impounding of water above Crest level has been started since 1999-2000.. The Reservoir (FRL 371.00m) filled up to the following level during the last five years is given below;

SI. No.	Year	Filling level
1	1999-2000	365.70 m
2	2000-2001	366.00 m
3	2001-2002	368.35 m
4	2002-2003	367.00 m
5	2003-2004	370.00 m
6	2004-2005	370.20 m
7.	2005-2006	369.65 m

Financial Position of BRB

The financial position of Rajghat Dam and Rajghat Power House Project are given below Tables.respectively.

Rajghat Dam

(Rs. In Crores)

Sl. No.	Item	U.P.	M.P.	Total
1.	Apportioned cost as per revised cost estimate	150.300	150.300	300.600
2.	Contribution received upto 10.9.05	132.850	150.305	283.155
3.	Balance to be contributed as on 10.9.05	17.450	10.08	27.53
4.	Net expenditure as on 30.6.05			275.38
5.	Balance available with BRB as on 30.6.05			7.775

Rajghat Power House

Detail	Civil works by BRB(Rs.in Crores)	E/M works by MPEB(Rs.in Crores)
Revised cost estimate of work component	66.89	72.85 .
Contribution received up to 30.6.05 (Rs crore)	59.51	Expenditure has been made by MPSEB directly
Balance to be contributed	7.38	
Net expenditure incurred upto 30.6.05	62.35	
Balance available with BRB as on 30.6.05	(-) 2.84	

TUNGABHADRA BOARD

Introduction

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

Organization

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

Status of Activities

Irrigation

The Tungabhadra Reservoir filled up to its full reservoir level this year. The inflow into the reservoir from June to November, 2005 was 9,509.346 Million Cumec (Mcum) (335.782 Thousand Million Cubic feet (TMCft.).

The utilization of water by the States of Karnataka and Andhra Pradesh till end of November 2005 was 1,448.965 Mcum (51.164 TMCft) and 837.536 Mcum (29.574 TMCft) respectively as against the likely abstraction of4,248 Mcum (150.000 TMCft) for the water year 2005-2006. Evaporation losses from June to November 2005 were 14.287 Mcum (5,448 TMCft) to be shared by Karnataka and Andhra Pradesh in the ratio of 12.5 :5.5. A total quantity of 3381.720 Mcum (119.411 TMCft) of water has out flowed over spillway.

Hydro Power

Two Power Houses are maintained by the Tungabhadra Board, with a total installed capacity of 72 MW, and a target of 132 million units of power generation is envisaged during the water year 2005-2006. Against this the power generated till end of November, 2005 was 127.93 million units. The power generated is shared between the States of Karnataka and Andhra Pradesh in the ratio of 20:80.

Mini Hydel Power Plant

A Mini Hydel Plant at the head of Right Bank High Level Canal of the Tungabhadra Project under Build, Operate, Own and Transfer (BOOT) system through an Independent Power Producer viz., M/s NCL Energy Ltd., Hyderabad has been commissioned on 27-10-2004. The mini Hydel plant comprised 3 units of 2.75 MW each and generated 20.89 million units upto November 2005. The Power generated are purchased by the Transmission Corporations of Karnataka and Andhra Pradesh in the agreed ratio of 20:80.

Fisheries

The Tungabhadra Reservoir has a water spread area of 378 sq km at full reservoir level affording tremendous scope for development of fisheries. Quality fish seeds are reared in the Board's Fish Farm to meet the demand of the public and for stocking in the Reservoir to increase the biomass. The fishing rights of the Reservoir was auctioned for the year to a local Fisheries Society for Rs. 35,01,125/-. 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 three meetings till the end of November, 2005.

UPPER YAMUNA RIVER BOARD

Introduction

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

Accordingly, vide Resolution No. 10(66)/74-IT dated 11-3-95, the Central Government constituted the Upper Yamuna River Board as a subordinate office under the Ministry of Water Resources. After creation of Uttaranchal State in 2000, the resolution was modified to include Uttaranchal also in the Board.

The Resolution also provided for creation of a Review Committee, to be known as the Upper Yamuna Review Committee, comprising of 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.

Organisation

The Board comprises of Member (WP&P), Central Water Commission as its Chairman, a representative from each of the six basin states, Central Electricity Authority, Central Ground Water Board and Central Pollution Control Board as part-time member and a full time Member-Secretary. The activities of the Board are funded entirely from the contributions by the six basin States. The Board has a sanctioned staff strength of 58, including the full time Member-Secretary.

Functions

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

While the operation and maintenance of the control structures (dams, barrages) will continue to remain with the concerned States, the MoU provides that if there is any dispute regarding regulation of flows

at any of the structures, the Board shall, with the approval of the Review Committee, take over the operation and control of that structure till the dispute is resolved.

Activities

The Board has been making tentative seasonal distribution of water to Basin States at various distribution points and expediting the progress of Renuka, Kishau and Lakhwar Vyasi projects in upper reaches of Yamuna. The Board has also been engaged in the Inter-State issues amongst the basin States related to water distribution and other issues related to benefits and cost sharing from the proposed storage projects in Yamuna Basin. The Board has held 29 meetings so far, the last one being on 6th January, 2006.

CHAPTER 8

INTERNATIONAL COOPERATION 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 in regard to river waters, water resources development projects and operation of international treaties relating to water.

India-Bangladesh Cooperation

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 which is headed by Water Resource Ministers of both the countries. A Treaty was signed by the Prime Ministers of India and Bangladesh on 12th December 1996 for the sharing of Ganga/Ganges waters. The Treaty shall remain in force for a period of thirty years to be renewable by mutual consent. For monitoring the implementation of the Treaty, a Joint Committee has been set up. During the current year the Committee met three times and observed that Joint measurements on Ganga at Farakka (India) and Ganges at Hardinge Bridge (Bangladesh) during lean season (Jan-May 2005) had been held to the satisfaction of both the countries.

36th meeting of the Indo-Bangladesh JRC was held at Dhaka from 19th –21st September 2005 wherein various matters pertaining to cooperation in Water Resources sector, including Tipaimukh Dam Project, Interlinking of Rivers, sharing aspects of waters of common rivers, bank protection works, flood forecasting etc. were discussed. The Indo-Bangladesh Joint Rivers Commission(JRC) recognized that the long term sharing of waters of river Feni should also be examined along with Teesta and other six common rivers already agreed to. It was reiterated that priority should be given to sharing of waters of river Teesta. The JRC also recognized that lean season flows in Teesta will not meet the needs of both the countries and hence any sharing formula of the lean season flows should be based on shared sacrifices. In this spirit the JRC proposed that JCE would meet as soon as possible to jointly determine the modalities and dependable flows for sharing during October to April on the basis of existing data and to report the same to the JRC for evolving a suitable sharing arrangement/agreement.

Indian side had earlier offered to provide free Arsenic testing kits and Arsenic removal plants to Bangladesh as a good will gesture. In this connection Bangladeshi scientists have inspected the equipment at Central Glass and Ceramic Research Institute at Kolkata as per decision taken in the above meeting. It was also agreed that Ministers of Water Resources of both the countries would personally visit the proposed works for bank protection/ minor Lift Irrigation/ Drinking Water Supply Schemes and

would give relevant decision for action by both the Governments.

The existing system of transmission of flood forecasting data on major rivers like Ganga, Teesta, Brahmaputra and Barak during the monsoon season from India to Bangladesh was continued. The transmission of flood forecasting information from India during the monsoon has enabled the Civil and Military authorities in Bangladesh to shift the flood affected population to safer places. During 36th meeting of JRC, The Indian side offered to provide the level, flow and forecast of the river Brahamaputra at Guwahati and advisory forecast of Ganga at Farakka so as to increase the time of advance flood warning.

India-Bhutan Cooperation

A scheme titled "Comprehensive Scheme for Establishment of Hydro-meteorological and Flood Forecasting Network on rivers common to India and Bhutan" is in operation. The network consists of 35 hydro-meteorological/ meteorological stations located in Bhutan and being maintained by the Royal Government of Bhutan with funding from India. The data received from these stations are utilized in India by the Central Water Commission for formulating flood forecasts. A Joint Expert Team (JET) consisting of officials from the Government of India and Royal Government of Bhutan continuously review the progress and other requirements of the scheme. The 21st meeting of the JET was held on 4th – 5th August 2005 at Paro in Bhutan.

The problem of floods created by the rivers originating from Bhutan and flowing to India was also taken up with the Royal Government of Bhutan. In this connection a Joint Group of Experts (JGE) on Flood Management has been constituted between India and Bhutan to discuss and assess the probable causes and effects of the recurring floods and erosion in the southern foothills of Bhutan and adjoining plains in India and recommend to both Governments appropriate and mutually acceptable remedial measures. The first meeting of JGE was held in Bhutan from 1st to 5th November, 2004. The JGE had series of discussions and also made field visits to some of the affected areas which included the sites prone to landslides and dolomite mining areas. Based on their recommendations, the JGE felt the need for a more detailed technical examination and accordingly, agreed to form a Joint Technical Team (JTT) under the Chairmanship of Member (PID), North Bengal Flood Control Commission with a representative each from GSI and Divisional Commissioner, Jalpaiguri and Central Water Commission.

Geo-technical investigations, planning and design works in respect of DPR of Punatsangchu H.E. Project has been taken up by CWC. Design consultancy for specification/ construction stage works of Tala H.E. Project (1020 MW) is being provided by CWC.

India-China Cooperation

In 2002, the Government of India had entered into an MOU with China for sharing of hydrological information on Yaluzangbu/ Brahmaputra river. In accordance with the provisions contained in the MOU, the Chinese side is providing hydrological information (Water level, discharge and rainfall) in respect of three stations, namely Nugesha, Yangcun and Nuxia located on river Yaluzangbu/

Brahmaputra from 1st June to 15th, October every year, which is utilized in the formulation of flood forecasts by the Central Water Commission.

An artificial lake was formed in (June/July, 2004) on Pare-chu in Tibet (China) because of landslide. The bursting of the lake would have caused havoc downstream on the Indian side in Himachal Pradesh to the people and the infrastructure including the Naptha Jhakri H.E. Project. The Government of India kept a close watch on the day to day development in this regard. In order to discuss the situation in Pare-chu, a team led by Shri R.K. Singh, Joint Secretary and Central Relief Commissioner, Ministry of Home Affairs comprising of officers from Ministry of Water Resources, Ministry of External Affairs, Central Water Commission, Geological Survey of India and Central Mining Research Institute held discussions with the Chinese authorities at Lhasa on 19th and 20th September, 2004. The team discussed various possible measures to address the situation and agreed to take up further action through diplomatic channels.

Subsequent to the visit to Lhasa, a technical team visited Beijing (China) from 26th to 29th December 2004 to hold in depth discussion regarding blockade on river Pare-chu and establishment of additional hydrological stations on Langquinzangbu (Sutlej) and Palongzangbu (tributary of Yaluzangbu i.e. Brahmaputra) and Chaoyu (Lohit).

During March, 2005 a Secretary level delegation visited Beijing to discuss the measures to be taken on Pare-chu issue. China agreed for exploring possibility of controlled release of artificial lake water. But before any action could be taken a landslide breached the dam on 26th June 2005.

For monitoring the water level of Pare-chu, two sites in Tibet (China) (downstream of landslide dam/lake site & upstream of lake formed) and two sites in India (one in J&K and another in Himachal Pradesh downstream of landslide dam) have been established for real time data transmission.

In respect of Sutlej (Langquinzangbu), a Memorandum of Understanding has been signed during the visit of the Chinese Premier to India in April, 2005 for supply of hydrological information in flood season beginning from monsoon 2006. The Chinese side has agreed to install hydrological stations in China before monsoon 2006 and transmission of information thereafter in respect of abnormal rise/fall in water level/discharge on real time basis, and continue dialogue in respect of 2 more rivers namely, Palongzangbu (tributary of Brahmaputra) and Lohit (Chao Yu).

India-Nepal Cooperation

With a view to discussing important issues pertaining to cooperation in the field of Water Resources, including implementation of existing agreements and understanding, a Nepal – India Joint Committee on Water Resources (JCWR) headed by Water Resource Secretaries of both countries has been functioning with the mandate to act as an Umbrella Committee for all committees and groups.

A Treaty on Integrated Development of Mahakali (Sharda) River including Sharda Barrage, Tanakpur Barrage and Pancheshwar Multipurpose Project was signed between Government of India and Government of Nepal in February 1996,

which came into force in June, 1997 (Mahakali Treaty). The Treaty is valid for a period of 75 years.

Pancheshwar Multipurpose Project:

Pancheshwar Multipurpose Project is the Central piece of Mahakali Treaty. 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. The Detailed Project Report (DPR) is to be finalised after mutually resolving the pending issues. Joint Group of Experts (JGE) which is monitoring the work, had decided in October 2004 to form a small Joint Group to look into pending issues to facilitate the finalisation of DPR. As a follow up action, the Joint Group held its first meeting at Kathmandu from 19th to 22nd December 2004. Due to developments in Nepal, 2nd meeting could not take place.

The Government of India had also been discussing with Nepal the taking up of Joint Investigation 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. A proposal costing Rs. 29.34 crore for taking up field investigations and preparation of joint DPR including setting up of JPO in Nepal has already been sanctioned by Government of India for this purpose. The preparation of joint DPR is scheduled to be completed in a period of 30 months from the date of setting up of JPO. In addition to irrigation and power benefits, the above project will also have major flood control benefits particularly in North Bihar. As decided in the 2nd meeting of Joint Committee on Water Resources (October 2004) the Joint Project Office has been asked to carry out feasibility study of the Kamla and preliminary study of Bagmati Multipurpose Projects to ascertain the likely constraints in implementation of these projects so that these could be appropriately addressed. Joint Team of Experts (JTE) reviewed the progress of preparation of DPR in its 6th meeting held in Biratnagar, Nepal in May 2005.

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. Financing of works in Nepal is done through MEA and on the Indian side, through MoWR. In this connection, a Standing Committee on Embankment Construction (SCEC) has been constituted which is responsible for planning, design and construction of these embankments. Last meeting (7th) of this Committee was held in May 2005 during which an amount of N.Rs.4.40 crore was recommended by the Committee following which MEA released the amount to HMG/Nepal.

Indo-Pakistan Co-operation

Under the Indus Waters Treaty 1960, India and Pakistan have created two permanent posts of Commissioners for Indus Waters, one each in India and Pakistan. Each Commissioner is 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 2005- 06, the Commission has held:

- its 103rd tour of inspection to Chamera Complex, Ranjit Sagar Dam, Shahpur Kandi and Madhopur Headworks in India during March-April, 2005
- its 94th Meeting in Pakistan in May 2005 and 96th & 97th meetings in June 2005, & November 2005 respectively in India to discuss Kishanganga HEP.
- its 95th Annual meeting in May, 2005 in India
- its 104th tour of inspection to Kishenganga project in India in November 2005
- Its 105th tour of inspection to Mangla Dam, Rasul Barrage, Marala Headworks, Khanki and Qadirabad projects in Pakistan in January,2006

Besides, one Secretary level talk on Tulbul Navigations Lock as part of Composite Dialogue was held in India in June 2005.

On Pakistan's request, World Bank appointed a Neutral Expert in May, 2005 for Expert Determination of Differences raised by Pakistan on the design of Baglihar HEP. India has furnished relevant documents, arranged a visit of Pakistan officers in July, 2005 and another joint visit by Neutral Expert along with the parties in October, 2005 to the project and its model. The Neutral Expert has so far held two meetings with the Parties, the first one at Paris in June 2005and the second one at Geneva in October, 2005. The process is expected to be completed by May 2006.

In fulfillment of the requirements of Indus Water Treaty, the daily data of 280 hydrological sites on six basins, The Indus, The Jhelum, The Chenab, The Ravi, The Beas and The Sutlej of Indus system was sent to Pakistan every month.

Flood warning communications were made by India to Pakistan for their benefit through priority Telegrams, Telephones and Radio Broadcasts during the period from 1st July to 10th October, 2005, for Indus system of rivers.

CHAPTER 9

RESEARCH AND DEVELOPMENT

R&D Programme of Ministry of Water Resources

Ministry of Water Resources (MoWR) provides financial assistance to promote research work in the field of Water Resources Engineering. 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 MoWR support. The Ministry also provides grants to various academic institutions/ research organisations to take up research schemes on specific problems related to Thrust Areas and identified regional problems. The Ministry also supports Seminar/ Symposium etc. on important water related issues and other mass awareness programmes.

The coordination of the Programme for providing financial assistance for R&D 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) have been constituted to provide necessary technical and advisory support for the implementation of R&D programme.

Status of R&D Schemes

In the Tenth Plan, R&D activities of Ministry of Water Resources are integrated through a common programme encompassing those relating to major and medium irrigation; ground water development; and command area development & management in addition to a wide spectrum of mass awareness/publicity programme and related capacity building. During the first three years of the Tenth Plan an amount of Rs. 4.12 crore was released to various institutions in the country for carrying out research schemes.

During the financial year 2005-06, Ministry has approved a programme for implementation of the plan scheme 'Research and Development for Water Resources Management' at a cost of Rs. 10.00 crore. The programme envisages funding R&D schemes and mass awareness activities; carrying out evaluation studies of irrigation projects for socio-economic and environmental impacts, efficiency studies and benchmark studies of irrigation projects.

About 25 new research proposals are under consideration of the Ministry for funding under the R&D programme.

Vision Document

A Vision Document 'Vision for Research and Development in Water Resources' delineating priority areas of research was approved by the Standing Advisory Committee (SAC) of the Ministry headed by Secretary(WR) in September 2005. The Vision Document provides the direction to the future course of R&D in water resources.

CENTRAL SOIL AND MATERIALS RESEARCH STATION

Web-site: http://csmrs.gov.in

Introduction

The Central Soil and Materials Research Station (CSMRS), an attached office of the Ministry of Water Resources, is a premier Institute in the country located at New Delhi which deals with field and laboratory investigations, basic and applied research on problems in geomechanics, concrete technology, construction materials and associated environmental 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 sphere of activities encompasses the following disciplines:

- Soil Mechanics and Foundation Engineering including Soil Dynamics, Geosynthetics, Soil Chemistry and Rockfill Technology
- Concrete Technology and Construction Materials
- Rock Mechanics including Instrumentation, Engineering Geophysics, Drilling Technology for sub-surface characterisation
- Concrete Chemistry, Electronics and Information Technology

Research Activities During The Year

Investigation for projects

Investigation for as many as 40 River Valley Projects and other civil engineering structures have been handled successfully with particular reference to foundation and borrow areas materials characterization for which a large number of laboratory tests have been conducted and detailed technical reports finalized.

Research Schemes

Studies in the following research schemes were carried out during the year 2005-06:

Plan Schemes

(a) Identification and characterization of Dispersive Soils.
(b) Diagnostic Investigations of Existing dams
(c) Study on Landslides
(d) Rock Blasting
(e) Monitoring of Rock Burst by Acoustic Emission Technique
(f) Advanced Mineralogy and Chemistry of Materials of Construction
(g) Development of High Performance Concrete Chemicals
(h) New Construction Techniques.
(i) Behaviour of Concrete under Multiaxial State of Stresses
(j) Structural Testing
(k) Dynamic Characterization of Mass Concrete for Dams

CSMRS has established Geosynthetics Laboratory and upgraded the Rock Mechanics Laboratory.

Self Sponsored Research Schemes

- Prediction of Consolidation Characteristics of Fine Grained Soils

- Effect of pH on Physical and Engineering Properties of Soils
- Use of Fly Ash as a Filter Material for Retention of various Toxic Cations
- Correlation between Point Load Strength and Uniaxial Compressive Strength
- Rock Mass Classification based on Geophysical Properties (P,S Wave & Resistivity)
- Anchoring Materials for Rock Bolting
- Use of Fly ash in Reinforced Concrete for Corrosion Resistance
- Effect of Large Size Aggregate on Compressive Strength of Mass Concrete
- Temperature Study of Mass Concrete
- Correlation of Ultrasonic Pulse Velocity and Strength Characteristics of Concrete
- Potential Reactivity of Coal from a Project to Release Acidity

Indian National Committees

The following two national level committees were constituted by the Government of India for funding/providing financial support to various Research/Educational Institutions for carrying out basic/applied research in the field of Rock Mechanics, Soil Mechanics, Construction Materials and Structures.

The present status of Research Schemes funded by Indian National Committee on Geotechnical Engineering (INCGE) is given as under:

1.	Total No. of Research Schemes sanctioned	:	41
2.	Sanctioned amount of grant-in-aid	:	Rs. 366.96 lakhs
3.	Grant-in-aid released till date	:	Rs. 257.80 lakhs
4.	No. of schemes completed	:	19
5.	No. of schemes partially completed & closed	:	02
6.	State of Art reports printed	:	03
7.	No. of schemes closed	:	02
8.	Schemes likely to be closed	:	05
9.	On-going projects	:	13
10.	New schemes under consideration	:	03

The present status of Research Schemes funded by Indian National Committee on Construction Materials and Structures (INCCMS) is given as under:

1.	Total No. of Research Schemes sanctioned till date	:	21
2.	Sanctioned amount of grant-in-aid	:	Rs. 247.36 lakhs
3.	Grant-in-aid released till date	:	Rs. 173.54 lakhs
4.	Grant released during the year 2004-2005	:	Nil
5.	No. of schemes completed	:	12
6.	No. of schemes under execution	:	08
7.	No. of schemes discontinued	:	01
8.	New schemes recommended for sanction	:	02

The fifth Annual Joint R&D Session of INCGE and INCCMS was held successfully at CSMRS on 24th March, 2005.

Consultancy Works

The Research Station primarily functions as an Adviser and Consultant to the various Departments of Government of India, State Governments and Government of India Undertakings/Enterprises.

Besides contribution to almost all the major river valley projects spread all over the country, the CSMRS has also rendered consultancy to projects in the neighbouring and the middle-east countries like Myanmar, Sri Lanka, Bangladesh, Iraq, Algeria, Afghanistan, Mauritius etc in the past. At present CSMRS is handling a few projects in Bhutan, Nepal and Afghanistan. CSMRS has also imparted training to personnel from within the country/foreign countries in the fields of Geomechanics and Construction Materials Characterization for Civil Engineering Structures connected with river valley projects.

A large number of consultancy works pertaining to river valley projects and connected civil engineering structures were handled in 2005-2006. Some of the important projects handled are given below:

(i) Tehri Dam Project, Uttaranchal
(ii) Sapta Kosi & Sun Kosi Projects, Nepal
(iii) Tala H.E. Project, Bhutan.
(iv) Oil Jetty Project, Port Louis, Mauritius
(v) Loharinag Pala H.E. Project, Koteshwar H.E. Project, Lata Tapovan H.E. Project, Kotlibhel H.E. Project, Uttaranchal
(vi) Salma Dam Project, Afghanistan
(vii) Kishan Ganga H.E. Project, Baglihar H.E. Project, Kirthai H.E. Project (Stage-II), Lower Jhelum H.E. Project, Chutak H.E. Project (J&K)
(viii) Matatila Dam Project, Madhikhera Dam Project, U.P.
(ix) Pandoh Dam, Kutni Dam Project, H.P.
(x) Myntdu Leshka H.E. Project, Umtru H.E. Project, Meghalaya
(xi) Subansiri Middle Project, Arunachal Pradesh
(xii) Omkareshwar H.E. Project, M.P.
(xiii) STPP NTPC SIPAT Project, Bilaspur, Chhatisgarh
(xiv) Research & Development Centre, NTPC, NOIDA, U.P.
(xv) Rangit H.E. Project, Stage – IV, Sikkim
(xvi) Kashang H.E. Project, H.P.
(xvii) Middle Siang H.E. Project, Arunachal Pradesh

CSMRS is carrying out the dam safety and performance studies with the help of Instrumentation at Sardar Sarovar Project, Gujarat and Rihand Dam Project, U.P., Lower Jhelum H.E. Project, J&K and Tehri Dam Project, Uttaranchal. CSMRS is also involved in establishment of Instrumentation Demonstration Centre (IDC) at CWC, New Delhi.

CSMRS also arranged specialized 4 training programmes in the field of Geotechnical Engineering.

River Links

Geotechnical investigations for the following River Link Projects are in progress for National Water Development Agency (NWDA)

- Gandak-Ganga Link Canal Project
- Ganga-Ghaghara Link Canal Project
- Chunar-Sone Barrage Link Project
- Yamuna-Rajasthan Link Canal Project
- Parbati-Kalisindh-Chambal Link Project
- Krishna (Almatti)-Pennar Link Canal Project
- Ghaghara-Yamuna Link Canal Project
- Mahanadi-Godavari Link Canal Project

- Manas- Sankosh-Teesta-Ganga Link Canal Project
- Manas-Sankosh-Teesta Link Canal Project (Stage I)
- Somasila-Pennar-Palar-Cauvery Link Canal Project
- Subernarekha-Mahanadi Link Project
- Farakka-Sunderbans Link Project
- Ganga-Damodar-Subernarekha Link Project.

CSMRS-NGI Institutional Co-Operation Programme

Central Soil and Materials Research Station and Norwegian Geotechnical Institute, Oslo, Norway entered into Institutional Co-operation Programme agreement in the field of "Investigation of Geological Hazards in Dam Reservoirs for Safety of Downstream Structures" for a period of 3 years w.e.f Nov. 2002. Under the programme, Rihand Dam Project (UP), Kadamparai Project, Tamil Nadu, Manikdoh Dam, Maharashtra and Varasagaon Project, Maharashtra have been taken up for investigations. An International Workshop on "Dam Safety" was organised on 21st November, 2005 and attended by 100 delegates from India/ Bhutan and by six experts from Norway, Italy and Germany. The Project is likely to be completed by August 2006.

CENTRAL WATER & POWER RESEARCH STATION, PUNE

Introduction

Central Water and Power Research Station (CWPRS), established in 1916, is the premier hydraulic research institute offering comprehensive R&D support and consultancy services 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 at various institutions besides training of research manpower. CWPRS is recognized as the Regional Laboratory for Economic and Social Committee for Asia and Pacific since 1971.

For providing solutions to complex problems referred to CWPRS, the methodologies adopted include investigations using physical and mathematical models, field investigations, desk studies and / or a combination of these. CWPRS also undertakes allied works such as collection of field data, site investigations using seismic reflection/ refraction surveys, evaluation of site-specific seismic parameters and testing of civil engineering materials and water samples. Another area of activity is calibration of flow meters/ current meters. CWPRS has also 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, data acquisition and control systems for physical model studies, prototype measurements are met by in-house developments. CWPRS, with an interdisciplinary approach in all its activities, thus represents unique services available to the country and the ESCAP region.

Organisation (wapis,mah@nic.in)

The technical activities of CWPRS are carried out through the following ten major laboratories.

- Hydrology and Water Resources Analysis
- River Engineering
- Reservoir and Appurtenant Structures

- Coastal and Offshore Engineering
- Ship Hydrodynamics
- Hydraulic Machinery
- Earth Sciences
- Mathematical Modelling
- Foundations and Structures
- Instrumentation and Control Engineering

Research Activities

CWPRS carries out basic, applied and field oriented research through the ten major laboratories mentioned above under one umbrella at Khadakwasla, Pune to provide safe, economic and rational technical solutions. During April – November 2005 as many as 63 technical have been submitted to various clients.

CWPRS undertakes assignments on "no-loss no-profit" basis. During the year, around 100 new works, pertaining to the three major sectors of water resources, energy and water borne transport, were awarded by various clients to the Research Station.

Some of the important studies carried out by CWPRS are listed below under major heads.

- Hydraulic performance tests for submersible pumpsets for Public Health Department, Jaipur, Rajasthan
- Training measures for left bank of South Koel river near Jhirpani Pump House of Rourkela Steel Plant, Rourkela, Orissa
- Non-destructive testing to evaluate the in-situ quality of the masonry of Vakkieru aquaduct of Kurnool-Cuddapah Canal, Andhra Pradesh
- Blast vibration monitoring during dismantling of the old Jobra Anicut of upstream of the New Mahanadi barrage, Cuttack, Orissa
- Stabilisation of Seer Khad between Jahu Bridge and Bum Bridge, Ghumarwin, Himachal Pradesh
- Flood plane zoning of river Swan downstream of Santokhgarh bridge, Dist. Una, Himachal Pradesh
- Irrigation bye-pass tunnel, service gates and stilling basin, Sardar Sarovar Project, Gujarat
- Ground penetrating radar survey at Prakasam Barrage, Vijayawada, Andhra Pradesh
- Analysis and interpretation of dam instrumentation data (Jan 2003 to Dec 2004) for Indira Sagar Dam, M. P.
- Transient analysis of head race system, Kal HE Project, Maharashtra
- Seismological studies (January to December 2004) for Tala HE Project, Bhutan
- Reservoir sedimentation studies for Lata Tapovan HE Project, Uttranchal
- Estimation of site specific design seismic parameters for Rangit HE Project, Sikkim, Srinagar HE Project, Uttaranchal
- Dynamic response analysis of concrete dam of Myntdu-Leshka HE Project, Meghalaya
- Flushing of sediment from reservoir Sewa-II HE Projct, Jammu and Kashmir
- Spillway and power intakes of
  - Chamera H. E. Project Stage - III, Himachal Pradesh
  - Teesta Low Dam Project, Stage - IV, West Bengal
  - Nimoo Bazgo (Alchi) H. E Project, J & K.

  Myntdu (Leehka) dam, Meghalaya
- Engineering properties of rock material, Koyna HE Project stage IV, Maharashtra
- Revised design of headrace and tailrace channels Omkareshwar Project, MP

- Development of flood warning systems for Lata Tapovan and Tapovan Vishnugad HE Projects, Uttaranchal
- Desilting basin of Uri HE Project Satge - II, Jammu & Kashmir
- Wave flume studies for the design of third stage extension of breakwater at Androth Island, Lakshadweep
- Desk and wave flumes studies for the design of coastal protection works at INS Kardip, Kamorta, Andaman & Nicobar islands
- Underwater seismic reflection survey at Jawaharlal Nehru Port, Nhava Sheva, Navi Mumbai, Maharashtra
- Studies for channel alignment of passenger jetty, Mora Port, Mumbai
- Seismic refraction survey, fast reactor fuel cycle facilities site, Kalpakkam, Tamil Nadu
- Non-destructive studies for assessment of in-situ quality of concrete of 250 MW T.G. foundation of Unit No. 1, New Parli Thermal Power Station, Maharashtra
- Evaluation of remedial measures for prevention of leakage from cooling water reservoir at Kudankulam Thermal Power Station, Tamil Nadu
- Make-up water pumpsump and pipeline optimisation for Tripura Gas Based Power Project (TBGPP), NEEPCo at Monarchak, Tripura
- Intake on River Ganga at Barh, Bihar; River Brahmani, Orissa for Jindal Stainless Steel Ltd.
- Power intake of Kuttiyadi Hydro Electric Project Kerala

Plan Schemes

During 2005-06, the following three Plan Schemes were under implementation.

- Development and Application of Remote Sensing Techniques for Hydraulic & Coastal Engineering
- Upgradation and Modernisation of Research Facilities at CWPRS
- Improvement of Canal Control Through Modern Techniques and Technology

National Institute of Hydrology

Introduction

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

Main Objectives

- To undertake, aid, promote and coordinate systematic and scientific work in all aspects of hydrology;
- To cooperate and collaborate with other national and international organisations 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.

Organisation

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 in the States (for 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 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 four regional centers in order to deal with the area specific hydrological problems of different regions of the country and for providing effective interaction with the States in the region. The 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 six 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) Agricultural Hydrology v) Water Resources Systems and vi) Hydrological Investigations.

Major Research Themes

- Hydrology of extremes
- Impact of land use changes on water resources
- Ground water modeling and management
- Sustainable water systems management
- Surface water modeling 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 studies
- Sponsored and consultancy research

During the year 2005-06, the Institute has published 71 papers in reputed international and national journals and 67 papers in the proceedings of international and national conferences and symposia. About 20 reports based on studies and research in hydrology have been prepared during the year.

Sponsored and Consultancy Research Activities

During the year 2005-06, the Institute has completed studies for four sponsored and consultancy projects that were taken up earlier. In addition four new projects were taken up during the year. Research work continued on projects, which were sponsored in the earlier years. The titles and sponsors of the completed and ongoing projects are given below:

1. Design flood estimation for Bichom Dam. 600 MW Kameng Hydro-Electric Project, Arunachal Pradesh – Sponsored by NEEPCO, Shillong – Completed.

2. Design flood estimation for Tenga Dam, 600 MW Kameng Hydro-Electric Project, Arunachal Pradesh – Sponsored by NEEPCO, Shillong – Completed.
3. Streamflow modeling of Bhagirathi River : Hydrograph separation using Isotope and geochemical techniques – Sponsored by Deptt. of Atomic Energy.
4. Assessment of groundwater quality in 24 metropolitan cities of India – Sponsored by CPCB, New Delhi.
5. Morphological studies of Ghaghra and Satluj River using remote sensing – Sponsored by CWC, New Delhi – Completed.
6. Seasonal characterization of ablation, storage and drainage of melt runoff and simulation of streamflow for Gangotri glacier – Sponsored by DST.
7. Directory of organization working in the area of watershed management – Sponsored by DST.
8. An operational GW model for Palla well fields, NCT, Delhi – Sponsored by CGWB.
9. Integrated hydrological study for sustainable development of two hilly watersheds in Uttaranchal – Sponsored by DST.
10. System simulation study for development of optimal allocation plan for ground water and surface water in parts of western Yamuna Canal area in the State of Haryana – Sponsored by CGWB.
11. Land-use change, watershed services and socio-economic impact in the Western Ghats region – Sponsored by UNESCO.
12. Isotopic characteristics of selected Indian rivers with spatial and temporal variations – sponsored by IAEA, Vienna.

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, Design flood estimation for gauged as well as ungauged catchments
- 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, Conjunctive use of surface water and aquifers
- Fresh water-saline water interactions
- Contaminant transport modeling
- Aquifer remediation, wellhead 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

- 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
- 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.

- Hydrological Instrumentation
- 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 2005-06, the Institute has organized following training & seminar:

1. Flood Estimation and Management, at Guwahati, April 28-29, 2005.
2. Watershed Management, at Jammu during April 29-30, 2005.
3. Management of Shallow Aquifers in Deltaic & Coastal Regions, at Kakinada during May 3-4, 2005.
4. Flood Plain Mapping and Flood risk Zoning, at CWC, New Delhi on June 17, 2005.
5. Remote Sensing & GIS Applications in Water Resources Management, at Roorkee during July 4-8, 2005.
6. Ground Water Modeling with Special Emphasis on Management Issues, at Roorkee during August 18-19, 2005.
7. Decision Support System for Water Resources Planning, at Roorkee during September 19-23, 2005.
8. Hydrological Aspects of Rejuvenation of Urban Lakes, at Udaipur during October 20-21, 2005.
9. Project Hydrology, at Roorkee during November 28- December 2, 2005.

Indian National Committee on Hydrology (INCOH)

The Institute has been providing secretarial assistance to INCOH. The secretariat also publishes a bi-annual journal on hydrology entitled "Jal-Vigyan Sameeksha". The journal is being distributed to about 700 organisations in the country and abroad in order to disseminate and promote knowledge in the field of hydrology. During the year two issues of Jal Vigyan Sameeksha were brought out. Also the INCOH has funded nine international as well as national seminars, symposia, workshops, and conferences in the relevant areas of hydrology and water resources.

The research Advisory Committees of INCOH had approved six Research & Development projects for funding by Ministry of Water Resources.

National Seminar on Hydrological Aspects of Rejuvenation of Urban Lakes, October 20-21, 2005 , Udaipur

Recognizing the importance of the hydrological aspects of urban lakes, and the need for bringing together researchers, managers and engineers responsible for studying and maintaining lakes, and also keeping in view the severe and critical problems being faced by the lakes in urban areas, a two days National Seminar on Hydrological Aspects of Rejuvenation of Urban Lakes was organized by the Institute jointly with the Maharana Pratap University of Agriculture and Technology, Udaipur at Udaipur during 20-21 October, 2005. The Seminar was attended by more than 100 delegates from 17 States of the country. A total of 43 papers were presented.

NIH – IIT, Roorkee Institutional Co-operation Programme

On November 23, 2005, with the approval of Ministry of Water Resources and the Board of Governors of Indian Institute of Technology, Roorkee, a Memorandum of Understanding was signed between NIH and IIT, Roorkee for a period of three years. Through the MOU a nucleus has been formed for promoting excellent quality manpower with a focus on hydrology, water resources and related sciences and pooling the expertise and resources of the two organizations.

CHAPTER 10

UNDERTAKINGS OF THE MINISTRY

Water and Power Consultancy Services (India) Limited

Introduction

Water and Power Consultancy Services (India) Ltd. (WAPCOS), **a "Mini Ratna"** Govt. of India undertaking, is a premier International consultancy organisation. Formally, incorporated as a Company in 1969, WAPCOS has been providing to various domestic and overseas clients, consultancy services in a diverse range of Engineering in Water Resources, Power and Infrastructure Development. WAPCOS is now recognized amongst the top ranking consultancy organizations of the World. WAPCOS has a well knit team of dedicated professionals, and with total backup from State and National level organisations operating in relevant fields, provides a wide range of comprehensive technical services. The quality management systems of WAPCOS' Civil Design Division comply with the Quality Assurance requirements of ISO 9001 : 2000 for Planning, Investigation, Preparation of Pre-Feasibility/Feasibility Reports and Preparation of Detailed Project Reports, Tender Engineering, Designs and Detailed Drawings, Construction Management, Project Monitoring and Special Studies related to Water Resources Projects as certified by AFAQ-EAQA, UK.

Recognition

WAPCOS has been rated as "**Excellent**" by the Department of Public Enterprises for more than twelve years and has been awarded **Prime Minister's MOU Award** for "**Excellence**" for the year 1998-99. WAPCOS is ranked amongst the **top 10 PSEs** for the year 1999-2000 and has received award of **"Excellence"** for achieving MOU targets for the year 2000-2001 from **Hon'ble Vice President of India** and for the year 2001-2002 from **Hon'ble President of India**. **WAPCOS has also been awarded Silver Trophy of "SCOPE Award for Excellence and outstanding contribution to the Public Sector Management-Smaller Public Enterprises Category" and "Enterprises Excellence Award" by Indian Institution of Industrial Engineering for the year 2003-2004.**

Fields of Specialisation

Main fields of WAPCOS Services cover Irrigation, Water Management, Drainage, Ground Water Exploration, Flood Control, Land Reclamation and River Management; Dam and Reservoir Engineering, Power Engineering: Hydro Power Generation, Transmission & Distribution, Rural Electrification; Agricultural Development; Water Supply and Sanitation, Environmental Engineering, Ports & Harbours and Inland Waterways, System Studies & Information Technology and Human Resources Development. WAPCOS has also been venturing into newer fields such as Software Development, Financial Management Systems, Quality Control and Construction Supervision, Roads & Bridges, Technical Education, Infrastructure Development apart from taking turnkey assignments.

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

Business Development has been recognised as an important activity for effective operations. This not only involves coordination and networking, but also completion of proposal cycle i.e. identification of needs for services till submission of proposal. Keeping in view the importance of Business Development for the overall growth of company, WAPCOS is also focussing on relationship management so as to have advance information about prospective projects before these are made Public. WAPCOS is increasingly recognising the needs to strengthen the Business Development in order to facilitate better performance of the Company. WAPCOS has attempted to enhance market penetration through intensified efforts in business development using strategic marketing interventions.

The division monitors the MOU targets as laid by the task force as well as liaisoning for HRD programmes, networking with other organizations like CII, CDC, FICCI, SCOPE, ICID, IPHE, FIEO, EEPC etc. Apart from using conventional system of responding to Notices/Advt. appearing in Newspapers, Magazines etc.; this Division also uses current means of information using Information Technology to have access to latest/first hand information about various upcoming Projects within India and Abroad. The Company's Business Development is also taken up through following activities :-

- Registration with International Funding Agencies
- Scanning of National / Regional Newspapers
- Scanning of websites for downloading business opportunities from UN Development Business; Asian Development Bank; Consultancy Development Centre etc.
- Regular interaction with Indian Embassies abroad;
- Presentations about WAPCOS' capabilities at different forums
- Participation in the Joint Commission meetings

WAPCOS Operations

WAPCOS have successfully completed/ongoing consultancy assignments in 38 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, Arab Bank for Economic Development in Africa, Arab Fund for Economic and Social Development, Kuwait, Food and Agriculture Organisation, International Fund for Agricultural Development, United Nations Development Program, United Nations Organisation, World Health Organisation, West African Development Bank, Indian Technical and Economic Cooperation (ITEC) Programme, Overseas Economic Cooperation Fund etc. Apart from India, WAPCOS is currently engaged in providing consultancy services in Afghanistan, Bhutan, Cambodia, Ethiopia, Eritrea, Mauritius, Mozambique,

Swaziland, Uganda, Zambia and Zimbabwe.

WAPCOS secures projects through national and international competitive bidding and has also established credentials with several Ministries of Govt. of India, State Govts and Foreign Countries. The Company has now established linkages with New Partnership for Africa's Development (NEPAD), Common Market for Eastern and Southern Africa (COMESA), EXIM Bank and National Bank for Agriculture and Rural Development (NABARD) to secure more projects Abroad and also within India. Consultancy services have now been included as one of the components under the Govt. of India Lines of Credit being extended to friendly developing countries and this has also created new market opportunities for WAPCOS.

WAPCOS as a techno-commercial organisation under the aegis of Ministry of Water Resources utilises the talent and expertise developed in the various organisations of Govt. of India and State Govts. WAPCOS is responsible for providing quality time bound services to the clients which is the very essence of its operations. WAPCOS drives its strength from its human resources, which form the backbone of the organisation. The consultancy services are carried out in 3 main Centres i.e. Water Resources, Power and Infrastructure. WAPCOS has the in-built capability to provide a multidisciplinary project team comprising its own core of professionals and also working specialists from its constituents.

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.

National Projects Construction Corporation Ltd.

Introduction

National Projects Construction Corporation Limited (NPCC) an ISO 9001-2000 Certified a Government of India Enterprise was established in the year 1957 as a Premier Construction Company to provide the necessary know how and resources for construction of Canal Systems, Irrigation and River valley Projects, Dams and Barrages, Hydel and Thermal Power Projects,, Industrial Structures, Road and Bridges, Buildings and Town ships, Airfields etc. At present the Corporation is having 89 working units/ 252 sites of National importance. NPCC is one of the few construction Companies in the Government Sector having expertise and equipment for construction of Tunnels, which form a major component for any Hydro-Electric Project.

The Corporation was doing well till 1988-89 but started incurring losses due to various reasons. The Corporation has since taken a number of measures to improve its performance such as aggressive marketing, diversification of activities in to new areas such as Indo Bangla Desh Fencing, Prime Minister Garam Sadak Yojna. As a result of these measures the corporation has been able to achieve order Book position up to

December 2005 Rs 2154.00 Crores. During the current financial 2005-06, NPCC has achieved up to December 2005, turn over of Rs 355.00 crores (provisionally estimated to be Rs.560 crores by March, 2006) as against the Rs 305.00 crores corresponding period of the preceding year 2004-05 thus registering a growth of 82.53 percent.

In view of the remarkable improvement in the performance of the corporation during the current year, the Revival Plan prepared by NPCC has found favour with the Board of Reconstruction of Public Sector Enterprise.(The authorized capital of the company is Rs 30 Crores and its Paid up Capital is Rs 29.84 Crores.)

TURNOVER

The turnover of the Corporation during last five years and the achievement for the current year 2005-06 is given below:

(Rs in Crores)

Year	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06 (likely)
Turn-over	156.89	137.60	227.62	302.88	305.64	560.00

Works Under Execution

At present, the corporation is working on 89 Units/252 sites spread all over the country. These include Irrigation & River Valley Projects, Hydroelectric Projects, Thermal Projects, Industrial Structures & other miscellaneous projects. Some of the major projects in hand are as follows.

(a) Irrigation and River Valley Projects.

- Khuga Dam & Spillway (Manipur),
- Construction of Masonary dam & Allied Civil Works in Jobat Dam(MP), Diversion Channel , Afflux & Left Marginal Bund at Ganga Barrage Kanpur (UP). Meza Link Channel, Bansagr Poshak Canal in Mirzapur (UP), Kalsi Barrage Project.(Tripura)., Galudih canal in Jharkhand.

(b) Hydroelectric Projects.

- Maneri Bhali Project (Head Race Tunnel, Surge Shaft, Pen Stocks) (Uttranchal)

(c) Thermal Projects.

- Construction of New Ash Pond area of NTPC at Talcher Super Thermal Power Project in Orissa.
- Ash Dyke works (Stage I & II) , Off site civil works, Raw Water Reservoir at Sipat STPP in Chatissgarh.
- Off site civil works for Kahalgoan STPP in Bihar.
- Foundation & Super Structure of New Parli Project & Paras for Maharashtra State Power Gen. Co. ltd in Maharashtra.
- Civil , Structural & Architectural work for Birsinghpur Thermal Power Projectin M.P.

Miscellaneous Projects

The Corporation has under-taken several construction assignments relating to Buildings, Roads, Hospitals, Bridges, Flyovers etc. These include:

- Police Line Works in Moradabad & NOIDA , 410 dwelling units for MES at Jhansi in UP .

- Site leveling work for IOCL at Panipat in Haryana.
- Patel Chest Institute in Delhi.,
- Two Nos. Tunnel work for Jammu – Baramulla Rail Link Project for Konkan Railway in J&K State.
- Earthwork & Minor Bridge for new BG line project in Jhalawar, Construction of DMRC main Lab cum Administrative Buildng at Jodhpur in Rajasthan.
- Udaipur- Chattpur Railway works in MP
- Department of Telecommunication Buildingat Guwahati in (Assam),
- RCC Bridge at Kawamara , Nutan Bazar, in Tripura, Fisheries College at Agartala (Tripura), New Legislative Assembly Building at Agartala (Tripura)).
- Assam Rifles Quarters at different locations in the state of Nagaland, Arunanchal Pradesh, Manipur, Mizoram, Meghalaya, Tripura Sikkim & Assam.
- KRIES School at Dharwad , Water treatment Plant &ROB works at Bagalkoat,, Storm water drains at Banaglore in (Karnataka),
- Hostels in Ranchi , ROB between Koderma to Hazaribagh, Koderma - Ranchi Hazaribagh – Brakakana, Konar Tunnel at Banaso in Jharkhand,
- Minor Bridges for Tikiapara-Santaragachi Line, Bondel gate flyover, Parking, Boundry wall, OH Reservoir, Roads, water lines etc under Falta economic Zones in W.B.
- OTM accommodation for M.E.S. at Dehradun in Uttranchal..
- Minor Bridges between Khurda – Bolangir, lanjigarh railway works, highlevel bridge over IB river in Orissa.
- PMGSY Roads works at different locations in Bihar.
- Indo Bangla Border Fencing/Roads works in Tripura & Mizorum.

New works secured

NPCC has secured works valued Rs. 1654.16 crores as detailed below:

(A) Year 2004-05 Rs. 691.90 crores against target of Rs. 350 crores.
(B) Year 2005-06 Rs. 962.26 crores against revised target of Rs. 1000 crores.

The present order book position of NPCC ending December 2005 is Rs. 2154 crores.

Major works secured during current financial year i.e 2005-06 are as under.

- New BG rail link between Khurda Road- Bolangir including earth work minor bridges Km. 12.10 to 36 valued at Rs. 19.29 crores for East Coast Railway
- Excavation of Meza Link channel under Bansagar Project for UP Irrigation valued Rs. 14.60 crores
- Raising of ash dykes for NTPC at Simhadri and Badarpur Thermal Power Projects valued at Rs. 13.88 crores.
- BG Rail line and Raw water reservoir for Paras Thermal Power Project for MSEB Maharshtra valued Rs. 21.28 crores.
- Enhancement in Indo Bangla border fencing works for a value of Rs. 180 crores for Ministry of Home Affairs.
- Enhancement of works under Pradhan Mantry Gram Sadak Yojana in 6 Districts of Bihar for a value of Rs. 270 crores.
- Remodelling of primary and secondary storm water drains, culverts, bridges etc. for Banglore Mahanager Palike under package no. V2VD-3&4 AT Banglore valued at Rs. 71.73 crores.

- Canal works for Bansagar Poshak Canal from RD 13 to 19.5, 30 to 35, 36 to 47.8, 64.6 to 66, 66.8 to 71.15 for a value of Rs. 39.68 crores of UP Irrigation Department.
- Building works for Loknayak Jayaprakash Narayan Engg. College at Chapara Bihar for a value of Rs. 20 crores.
- Border Fencing works with roads in Mizoram having value of Rs. 145 crores for Ministry of Home Affairs.
- Building works for Assam Rifles at various locations in North East States for value of Rs. 108 crores under Ministry of Home Affairs.

CHAPTER 11

ROLE OF WOMEN IN WATER RESOURCES MANAGEMENT

In pursuance of the provisions in 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. Ministry of Water Resources, while issuing guidelines in April 1987, specifically emphasized upon the States to consider representation of women in the Water Users' Association (WUAs) at all levels. Many States have amended their Irrigation Acts or come out with specific Acts on the Participatory Irrigation Management and some of them have made specific provisions for women's participation.

The marginal representation of women, however, is not adequate in view of the magnitude of the problem. Considering the importance of women in terms of their numerical strength and the significant contribution they make to the agriculture labour force, there is a need to encourage participation of more women in Water Users' Associations by strengthening the Acts or by bringing in a new culture among the water users.

CHAPTER 12

PROGESSIVE USE OF HINDI

During the year, effective measures were taken in the Ministry of Water Resources for the Progressive use of Hindi for Official purposes. Efforts were made to ensure compliance of various orders/ instructions issued by the Department of Official Language. Along with translation of important documents, the Hindi Section of the Ministry implements the Official Language Policy of the Union Government in the Ministry and all the organisations under administrative control of the Ministry.

The sub-Committee of the Parliamentary Committee on Official Language inspected various offices of Central Ground Water Board, Central Water Commission, Narmada Control Authority, Water and Power Consultancy Services(I) Ltd. and Central Soil and Material Research Station under the Ministry of Water Resources and suggested some measures for the progressive use of Hindi.

The Official Language Implementation Committee of the Ministry under the Chairmanship of Joint Secretary (Admn.) has been meeting regularly. The Committee has discussed the difficulties being faced in the use of Hindi in the Ministry and its organizations. 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.

Annual noting and drafting competition continued this year also to encourage staff and officers to do their work in Hindi.

To encourage healthy competition among the organizations under the Ministry for doing maximum work in Hindi, the Rajbhasha Vaijayanti Shield has been introduced.

Hindi Fortnight was organized in the Ministry during September, 2005. During the fortnight competitions for Rajbhasha Quiz, Hindi Noting & Drafting, Hindi Essay, Typing and Stenography and Sulekh were organized. Employees and Officers of the Ministry enthusiastically participated in these competitions.

To encourage the staff to do their work in Hindi annual noting and drafting competition continued during the year. Hindi Workshops were also 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.

Director (Admn.) inspected some of the offices of the Ministry of Water Resources situated outside Delhi. Joint Director(O.L) and Assistant Director (O.L) inspected sections of the MOWR and oversaw the compliance of Official Language Policy. Instructions were given for rectification of the deficiencies during such inspections. Regular monitoring of the work being done in Hindi in the Ministry and its attached/subordinate offices was done through quarterly reports. Joint Director (OL) and Assistant Director(OL) delivered lectures in the workshops organized by attached/subordinate offices of the Ministry and apprised the participants about the O.L. policy of the Govt. of India.

CHAPTER 13

ADMINISTRATION, WELFARE AND VIGILANCE

ADMINISTRATION WING:

The total personnel in the various organizations of the Ministry in Group A, B, C and D is 14923. The policies of the Government with regard to welfare, personnel and e-governance are being implemented in the Ministry, A detailed Organisation Chart is given as Annexure II

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 & Central Soil & Materials Research Station. Other aspects of the administration like filling up of posts by direct recruitment/ deputation/ promotion, termination of probation, confirmation, grant of financial upgradation under Assured Career Progression Scheme, release of annual increments, pay fixation, maintenance of Confidential Reports, sanction of TA/LTC advance, House Building Advance, Motor Car/Scooter/Cycle advances, GPF advances/withdrawals, framing/ amendment of recruitment rules, finalisation of pension/family pension cases, leave of all kinds, forwarding of applications etc., are also dealt with.

As part of developing the human resources, 51 officials of the Ministry were sent on training to various institutes to enhance their skills. The Schedule Caste/Schedule Tribe/Other Backward Class's Cell also forms part of the Administration Section. It provides secretariat assistance to the Liaison Officer for the Schedule Caste/Schedule Tribe, and Liaison Officer for Other Backward Classes in discharging their functions on various matters relating to reservation for Schedule Caste/Schedule Tribe/Other Backward Class in Government services and carrying out inspections of reservation rosters and on allied matters in respect of various organisations of the Ministry.

Redressal of Staff Grievances

A Grievances Redressal Cell is in existence in the Ministry of Water Resources which entertains the grievances of staff of all organisations under the Ministry. Joint Secretary (Adm) and Director (Co-ordination & PPP) have been designated as Director of Public Grievances and Director of Staff Grievances, respectively. Due attention is paid for the disposal of grievances within a reasonable period. Most of the grievance received are related to service matters, payment of pensionary benefits etc. Out of 64 staff grievances received during the year, 17 have been disposed off.

Committee on Sexual Harassment of Women Employees

In accordance with the guidelines laid down by the Hon'ble Supreme Court of India to prevent Sexual Harassment of Women Employees, a committee is already functioning to look into the complaints of the women employees working in the main secretariat of the Ministry of Water

Resoures, The committee submits its findings to the Joint Secretary (Admn.) for necessary action. The committee also prepares on annual report on complaints received and action suggested by the committee. During the year no complaint was received by the committee from the women employees of the main ministry.

Minority Welfare

In accordance with the guidelines issued by the Ministry of Welfare (present Ministry of Social Justice & 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 Physically Handicapped

Monitoring of the recruitment of physically handicapped is being done to ensure fulfillment of three per cent 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.

Monitoring of Reservation for SC/ ST/OBC

The Scheduled Caste/Scheduled Tribe and Other Backward Classes (SC/ST/OBC)'s Cell also forms part of the Administration Section. It renders secretariat assistance to Liaison Officers for SC/ ST and for OBC in discharging their functions on various matters relating to reservation for SC/ST/ OBC in Government services and carrying out inspections of reservation rosters. It also advises on allied matters to various organisations of the Ministry

Vigilance

All the disciplinary and vigilance matters pertaining to this Ministry and its organizations are handled by the Vigilance Division of the Ministry under the overall supervision and control of the Chief Vigilance Officer. In other words, it provides a linkage among the various Authorities including the Central Vigilance Commission (CVC) in regard to all disciplinary / vigilance matters. The Vigilance Division is headed by a part time Chief Vigilance Officer who assists the Higher Authorities in the Ministry in all such matter.

With a view to maintain proper interaction among CVC, DOP&T, PMO, Cabinet Secretariat, etc, this Ministry calls for various returns regarding disciplinary matters and monitors the progress of all such cases for their timely finalization. The information of the various cases is also kept updated in Internet software DCM & MIS (Disciplinary Cases Monitoring and Management Information System) as far as possible. Apart from the above, the Vigilance Division maintains the **"**List of Officers of Doubtful Integrity" and the "Agreed List" in consultation with the CBI. The approximate numerical status (as on 31.12.2005), in brief, of various activities, is as under:

a	Complaints under investigations	12
b	Complaints referred by PMO	10
c	Vigilance /Disciplinary Cases of Major Penalty	10
d	Vigilance /Disciplinary Cases of Minor Penalty	04
e	Major penalty/cut in pension imposed	04
f	Minor penalty imposed	02
g	Appeal/Review/ Revision cases disposed of	06
h	Officials against whom sanctions for prosecution have been granted	06
i	Officials presently under suspension	14
j	No of periodical returns sent to CVC/ DOP & T/ PMO	169
k	No of instruction issued/ circulated	11
l	Examination of the intimation of the transition of the Properties (movable & Immovable)	60
m	Submission of Annual Immovable Property Returns.	205
n	No. of vigilance clearance tendered	1280

The Vigilance Division of the Ministry has undertaken the task of conducting "Preventive Vigilance Inspection and Inspection of Works" of various offices of the organizations under the Ministry on regular basis since November, 1999. Till date, the Unit has conducted as many as 26 such inspections. Training for handling the vigilance/ disciplinary matters was also conducted by the Vigilance Division of this Ministry, which proved to be of great use. The "Vigilance Awareness Week" was observed from 07.11.2005 to 11.11.2005 as per the directions of the Central Vigilance Commission.

CHAPTER 14

INITIATIVES IN THE NORTH EAST

Introduction

The northeast region consists of seven sister states having geographical area of 2,55,158 sq. km. Of which 90,573 sq.km. is plain. The region has two main river basins namely, Brahmaputra and the Barak, which form a part of Ganga-Brahmaputra-Meghna river systsem. Northeast India is endowed with enormous water resources. The combined annual flow of Brahmaputra & Barak rivers, before entering into Bangladesh, is the highest among all river basins in the country. In addition to the normal developments, significant initiatives taken by the Organisations of the Ministry for the development of Northeastern region are detailed below.

Brahamputra Board (BB)

A) Pagladiya Dam Project: The preliminary works of Pagladiya Dam Project was initiated as approved by Govt. of India at Rs. 542.85 Cr. (2000 price level).

The project envisages assured irrigation to a gross command area of 54,160 ha., flood benefit to about 40,000 ha. & incidental Hydro Power generation of 3 MW (I.C) 956 ha. of land acquired against 3238 ha. for rehabilitation & resettlement purpose. Different infrastructure works i.e. Roads, Community Halls are presently under execution.

The cost of the project is likely to be revised to Rs. 1069.40 Crore which is yet to be cleared by the PIB / CCEA. The implementation of the project has been hindered due to objection by a Section of Project Affected Families & non completion of Zirat (property) Survey by Govt. of Assam.

B) Harang Drainage Development Scheme:- The scheme was cleared during 9th Plan and revised to Rs.30.49 Cr. during 10th Plan. On completion, this will benefit 11850 ha. chronically drainage congested area in Barak Valley, Assam .

C) Anti Erosion work at Dhola Hatighuli :- An avulsion of River Dibang & Lohit jointly with Noa-Dehing had taken place near Dholla-Hatighuli Area of Assam & resulted in large scale erosion on the left bank including Tea Gardens. The work of diversion of the river Dibang to its original course was taken at a cost of Rs 10.47 Cr (Phase-I) and also diversion of Lohit (combined with Noa-Dehing) at a cost of Rs.5.22 Cr. (Phase-II). The works are planned in phased manner as per morphological studies. The Phase-I has been completed & has successfully divert the river Dibang to its original course and has reduced the erosion substantially on the left bank. The Phase-II works has also shown good results and further improvement are in progress. The Phase - III & IV are being planned after observing the river behavior.

D) Protection of Majui Island, Assam: Majuli measuring about 875 sq. km is a chronically flood and erosion affected island in river Brahmaputra. The protection works of the island was taken up by Board as approved by Govt. of India on the request of Government of Assam

(i) Immediate Measures; To give immediate relief, bare on flood and erosion control at an estimated cost Rs.

6.22 Cr. was taken up during 2003-04. This work has been completed.

(ii) For long term measures the Board had prepared a scheme at an estimated cost of Rs. 86.56 crore. The Phase-I of the scheme costing Rs. 41.28 crore has been approved by the Expenditure Finance Committee in December 2004 and action has been initiated to take up the scheme. The Phase II & III are planned after completion of Physical Model Studies, which are being undertaken at Phase-I and Phase-II respectively.

E) Barbhag Drainage Development Scheme, Assam: The Scheme was approved during 2004 at a cost of Rs. 7.23 Cr. Tendering process is in progress & targetted for completion within X^{th} Plan

F) Kushiabil & Durgajan village at Dimapur (Nagaland): The Scheme was approved during 2004 at a cost of Rs. 3.09 Cr. During the flood in 2004, the river has changed its course. The field survey for the new configuration have been carried out DPR modified and is under process of technical clearance of CWC & targetted for completion within X^{th} Plan.

G) Protection of North Guwahati Township(Rangmahal) from flood and erosion Assam: The Scheme was approved during 2004 at a cost of Rs. 3.05 Cr. The execution is held up due to non-receipt of undertaking from the Govt. of Assam for post construction maintenance Brahamputra Board is working in the zone of north east only and all the works are related to development of North East of India.

Central Water & Power Research Station(CWPRS)

- Site specific design seismic parameters for Debang Multipurpose project, Arunachal Pradesh
- Desk studies for Integrated operation of Reservoirs on Slang river for NHPC in Assam
- Desk studies for spillway and energy dissipation arrangements of Umtru Dam, Meghalaya

Central Soil & Material Research Station (CSMRS)

- Manas-Sankosh-Teesta Link Canal Project, W.B./Assam – Training was imparted to Project officials for collection of soil samples and field tests like SPT & in-situ permeability. The collected samples will be tested at CSMRS.
- Myntdu Leshka H.E. Project, Meghalaya – CSMRS has been appointed as Quality Assurance Consultant for the Construction of Project.
- Field and Laboratory investigations for construction materials were also carried out for Rangit H.E. Project, Stage-IV, Sikkim.
- Training was imparted to the officers and staff of North Eastern Hydraulic and Allied Research Institute (NEHARI), Brahmaputra Board, Guwahati and Engineers of Public Health Engg. Deptt. Meghalaya and Meghalaya State Electricity Board in Laboratory Testing of Cement, Coarse and Fine Aggregates, admixtures, additives including concrete mix design, analysis of data and report writing etc.
- Laboratory investigation of rock and sand samples for their suitability as construction materials for use in

concrete for Subansiri Middle Project, Arunachal Pradesh has been carried out.

National Institute Of Hydrology (NIH)

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

The seven States of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura besides the hilly regions of West Bengal and Sikkim are covered by the Centre. The North Eastern region of the country comprising of seven States has the largest quantum of water resources with abundance of rainfall resulting in severe floods. Also there are serious problems of large-scale soil erosion on hill slopes, which need to be tackled urgently to save the land and people as well as irreparable damage to the ecology of the Region. The Centre has taken up a number of studies in consultation with States of the Region as well as Brahmaputra Board, CWC, CGWB, etc., so as to evolve preventive action. Important among them are: Representative basin studies in basins of Meghalaya and Assam, Ground water quality studies in Assam; Surface runoff studies in Bhrahmaputra river; Flood risk mapping in lower Assam. Earlier the infiltration studies, hydro-metoeorological studies and geo-morphological studies of Dhudhnai basin were completed.

Some of the important study areas for the Centre are:

Flood Estimation, Flood Routing, Non-structural & Structura 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 and Fluoride level in Karbi-Anglong District of Assam

The Centre is involved in the following projects/studies for the year 2005-06:

1. Dam break studies for Kulsi, Jindhal, Noa Dhing and Lohit dams
2. Studies on shifting of three typical rivers of North-East (Kopili, Jia Bharali and Jia Gabharu) using remote sensing.
3. Evaluation of flood and erosion control measures at Majuli Island.
4. Determination of soil hydrologic properties and infiltration modeling in a hilly watershed.
5. Flood estimation of Jadukata Basin with SCS method.

Central Water Commission (CWC)

CWC has a dedicated design unit at headquarters for East and North Eastern region to undertake design and consultancy of multipurpose, irrigation, water supply and hydro electric projects. The work also includes preparation of pre-feasibility and detailed project reports, investigated by the field offices of CWC in North East. Technical appraisal of Pre Feasibility Reports (PFRs) and Detailed Project Reports (DPRs) are also being carried out.

CWC has two regional Chief Engineer Offices i.e. the Chief Enginer, Brahamaputra & Barak Basin Organisation at Shillong looking after the 7 north

Eastern states and office of the 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 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 151 hydrological observation sites in the North East region.

At present, there are 8 projects at construction stage and 16 projects at DPR stage for which design consultancy is being provided by CWC. Detailed hydrological studies and design works in respect of these projects are in progress. In addition, there are 11 projects for which investigations/ preparation of DPR are under progress. CWC is carrying out hydrological observations at 151 sites and is issuing flood forecasts for 26 sites in the NE Region including Sikkim. CWC is also monitoring the progress of 14 major/medium irrigation projects and about 800 minor irrigation schemes being funded under AIBP.

Central Ground Water Board

The Central Ground Water Board is conducting scientific and technical studies for ground water assessment, development and management in the North Eastern Region and has its annual work programme to carry out the work. The major achievements of the North Eastern Region in the year 2005-2006 upto 1ST December 2005 are given below:

Sl. No.	Activities	Achievements
1.	Ground Water Management studies	16700 sq. km
2	Ground Water Exploration	7 wells
3.	Monitoring of Ground Water Wells	Monitored during April, August & November 2005 through a network of 528 Ground Water Monitoring Wells. The water samples were collected during the pre-monsoon monitoring.
4.	Water Quality Analysis	368 samples analyzed for basic constituents and 331 samples have been analyzed for heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc.
5.	Short Term Water Supply Investigations	21 investigations
6.	Geophysical Studies	VES (Vertical Electrical Sounding) – 17 with 0.8 LK resistivety profiling and Bore Hole Logging - 1
7.	Central Ground Water Authority	Mass Awareness Programme – 1 Water Management Training Programme - 1
8.	Estimation of Ground Water Resource of the entire Region based on GEC - 1997 Methodology	Completed

National Projects Construction Corporation Ltd.

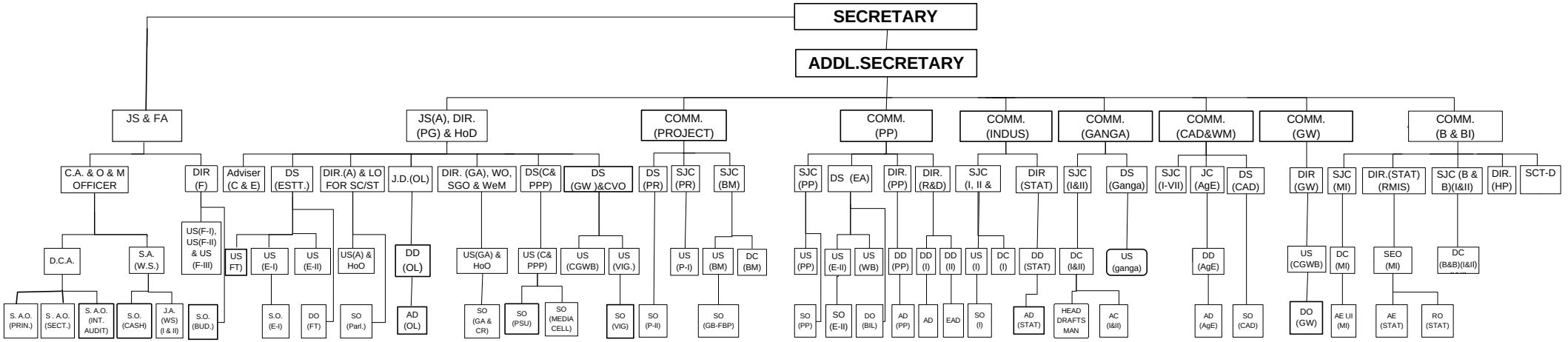
NPCC is presently engaged in construction of buildings works for Assam Rifles in the North Eastern States of Meghalya, Manipur, Tripura, Nagaland, Mizorum and Arunanchal Pradesh having a total value of 395 crores. In addition to this NPCC is also executing work of Indo Bangla Border fencing to the tune of Rs 380 crores in the state of Tripura & Mizorum . NPCC proudly associates itself for working in the deep remote areas and terrorist infested corners of Tripura by constructing Tripura Legislative Assembly, Diversion Schemes, Kalsi Barrage, RCC Bridges, Khuga Dam in Manipur and other Miscellaneous works. NPCC is having total value of works of Rs 998.00 crores in North Eastern States out of which about Rs 375 crores works have already been completed. In spite of disturbed law & order situation NPCC is executing works in North Eastern States thereby contributing significantly in the development of this region.

ANNEXURE – I

STAFF STRENGTH OF THE MINISTRY OF WATER RESOURCES

Sl. No.	Name of Office	Group A					Group B										Group C					Group D					Grand Total				
							(Gazetted)					(Non Gazetted)																			
		Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	Ministry of Water Resources	79	7	-	-	3	41	3	1	-	-	105	15	5	-	7	139	23	5	3	8	85	54	6	2	4	449	102	17	5	22
2.	Controller of Accounts, Ministry of Water Resources	3	0	-	-	-	96	5	-	-	-	-	-	-	-	-	134	43	8	2	-	25	11	2	1	-	258	59	10	3	-
3.	Central Water Commission	554	60	17	3	13	360	58	4	2	-	258	58	10	4	-	1709	213	44	10	58	841	231	87	8	42	3740	620	162	27	113
4.	Central Soil & Materials Research Station	67	12	2	-	3	30	3		-		43	6	2	-	4	119	27	7	2	10	84	30	5	2	3	341	78	16	4	20
5.	Central Water & Power Research Station	146	25	2	1	2	67	10	3	1	0	158	23	13	1	17	451	64	28	12	20	338	8	25	13	11	1160	203	71	28	50
6.	Central Ground Water Board	377	45	9	-	21	320	44	9		16	176	19	7	1	8	1863	178	209	9	90	1319	129	35	4	20	4055	446	135	14	155
7.	Farakka Barrage Project	14	1	1	-	1	20	7	2	1	-	40	5	1	1	-	383	46	13	5	12	221	35	3	4	1	687	91	20	15	10
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		-	-	-	-	-	-	-	-	-		-	-	-	-	4	-	-	-	-	2	-	-	-	-	6	-	-	-	-
10.	Sardar Sarovar Construction Advisory Committee	5	1		-	1	1	-	-	-	-	-	-	-	-	-	7	1	-	-	1	4	2	-	-	1	17	4		-	3
11.	Brahmaputra Board	67	3	0	-	7	18	2	2	-	2	76	4	6	-	-	284	48	20	4	31	153	24	10	4	11	603	81	42	8	60
12.	Betwa River Board	11	-	-	-	-	19	-	-	-	-	17	-	-	-	-	77	7	-	-	-	1	1	-	-	-	125	8	-	-	-
13.	Narmada Control Authority	29	-	-	-	-	10	1	-	-	-	19	1	-		3	60	11	5	2	7	31	9	2	1	1	149	23	8	3	11
14.	National Water Development Agency	62	4	-	-	-	58	7	1	-	-	18	2	-	-	-	366	63	21	6	28	125	31	10	4	-	630	107	32	10	28
15.	National Institute of Hydrology	84	9	2	-	7	-	-	-	-	-	49	5	-	-	-	73	19		2	-	51	18	-	-	-	257	51	2	2	7
16.	Water & Power Constultancy Services (I) Ltd.	260	22	3	1	7	54	7	2	1	-	30	5	2	1	-	116	25	7	1	11	20	8	2	1	-	480	68	16	5	18
17.	National Projects Construction Corporation Ltd.	224	13	1		4	-	-	-	-	-	284	16	-	2	2	325	38	3	5	1	99	12	2	-	-	1148	79	6	7	7
Total																											14194	2035	502	123	505

Organisational Chart of Ministry of Water resources (As on 11.02.2006)



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

ANNEXURE-III

LIST OF POSTAL ADDRESSES OF HEADS OF ORGANISATIONS UNDER THE MINISTRY OF WATER RESOURCES

Sl. No.	Organisation	Name of Head of Organisation	Telephone	Fax
1.	Government of India, Ministry of Water Resources, Room No. 412, IV Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi – 110 001.	Shri J Hari Narayan Secretary	23710305 23715919	23731553
Attached Offices				
1.	Central Water Commission, Room No. 326, Sewa Bhavan, R.K. Puram, New Delhi– 110 066. cwcchairman@netscape.net	Shri R.Jeyaseelan Chairman	26108855	26108614
2.	Central Soil and Materials Research Station, Room No. 309, Hauz Khas, New Delhi – 110 016. csmrs@hub.nic.in	Shri A.K. Dhawan, Director	26967985 26961894	26853108
Subordinate Offices				
1.	Farakka Barrage Project, P.O. Farakka Barrage, Distt. Murshidabad – 742 212 West Bengal.	Shri M.U. Ghani, General Manager	03485-253664	03485-253608
2.	Ganga Flood Control Commission, Sinchai Bhavan, III Floor, Patna – 800 015	Shri C.B. Vashistha, Chairman	0612-2233591	0612-2222294
3.	Central Water and Power Research Station, P.O. Khadakwasla Research Station, Pune –411 024.	Smt. V.M. Bendre, Director	020-24380825	020-24381004
4.	Central Ground Water Board, NH-4, Faridabad.	Dr. Salim Romani Chairman	95129-2413050	95129-2419059
5.	Bansagar Control Board, Samab Colony, Rewa, Madhya Pradesh.	Shri S.K. Haldar, Secretary	07662-226318	07662-242433
6.	Sardar Sarovar Construction Advisory Committee,Narmada Bhavan, A Block, IV Floor, Indira Avenue Vadodara – 390 001.	Shri A.D.Bhardwaj Secretary	0265-2421438 0265-2771382	0265-2437262

Registered Societies				
1.	National Institute of Hydrology, Jal Vigyan Bhavan, Roorkee- 247 667 (Uttaranchal).	Dr. KD. Sharma, Director	01332-272906 01332-272907 01332-272908 01332-272909 (extn. 221) 01332-272718	01332- 272123
2.	National Water Development Agency, 18-20, Community Centre, Saket, New Delhi – 110 017. dgnwda@vsnl.net	Shri R.K. Sharma Director General	26519164	26960841
Statutory Bodies				
1.	Narmada Control Authority, BG-113, Scheme No. 74-C, Vijay Nagar, Indore –452 010.	Shri J Hari Narayan Chairman	0731-2557276 0731-2551144	0731- 2559888 2559886
2.	Brahmaputra Board, Basistha, Guwahati.	Shri M.L.Goyal, Chairman	0361-2307453	0361-2308588
3.	Betwa River Board, Nandanpura, Jhansi –284 003.	Shri J.N. Purohit, Chief Engineer	0517-2480183	0517-2480237
4.	Tungabhadra Board, H. No. 5-9-201/B&B1, Chirag Ali Lane, Hyderabad – 500 001(AP)	Shri V.K. Jyothi, Chief Engineer (CWC) & Chairman	040-23201605	040-23201605
5.	Upper Yamuna River Board CWC 202, "S" Sewa Bhawan R.K.Puram New Delhi 110 066	Sh. C.B. Vashistha, Member (WP&O),CWC & Chairman	011- 261085900	011- 26108590
Public Sector Undertakings				
1.	Water and Power Consultancy Services (India) Limited, 76-C, Institutional Area, Sector – 18, Gurgaon – 122 015.	Shri D. Datta Chairman and Managing Director	23313881 23313502 95124-2399443	95124- 2399443
2.	National Projects Construction Corporation Limited, Plot No. 67-68, Sector 25, Faridabad (Haryana)	Shri Arbind Kumar Chairman and Managing Director	95129-2231269 011-26108150	95129- 2230891

Annexure IV

List Of Postal Addresses Of Directors Of Public Grievances/Staff Grievances In The Ministry Of Water Resources And Its Various Organisations

S. No.	Name of the Organisaton	Address	Name & Designation of PG/ S.G.Officer
1.	Ministry of Water Resources	Room No. 403, 4th Floor, Shram Shakti Bhavan, New Delhi-110001 (Tele Fax No. 23710343)	1. Shri K.S. Ramasubban, Joint Secretary (Admn.) & Director (PG)
		Room No. 216, Shram Shakti Bhavan, New Delhi-110001 (Tele No. 23717129)(Fax No. 23710253)	2Ms Meeta Singh, Deputy Secretary(C&PPP) & Director (SG),
2.	Narmada Control Authority	BG - 113, Scheme No. 74-C, Vijay Nagar, Indore – 452010(MP) (Tele No. 0731-551144) Fax No. 559888	Shri Major Singh, Grievance Officer & Member (Power)
3.	Bansagar Control Board, Rewa	Bansagar Control Board, Samab Colony, Rewa (MP) (Tele No. 07662-226318), 0755-2762059Fax No. 07662-242433 –Fax No. 0755-2558264)	Shri Soumitre Haldar, Secretary & Director (Staff Grievances)
4.	Betwa River Board	Betwa River Board, Nandanpura, Jhansi-284003 (Tele No. 0517-2480183) Fax No. 0517-2480237	Shri R.S. Ram, Secretary & Director (Staff Grievances)
5.	Central Ground Water Board	CGWB, CHQ, Faridabad (Tele No. 95129- 2413050) Fax No.95129-2419059	1. Dr. Javed Raza, Scientist 'B' & Staff Grievances Officer
		CGWB, CHQ, Faridabad (Tele No.95129-2415024,2419106 & Fax No. 95129-2412524	2. Shri Sunil Kumar, Scientist 'D', Public Grievances officer
6.	Central Soil and Materials Research Station	Room No. 309, CSMRS, Hauz Khas, New Delhi – 110 016 (Tel No. 26850025) Fax No. 26853108	Shri S.S. Brar, Chief Research Officer & Director (Staff & Public Grievances)
7.	Central Water Commission	Room No. 326, Sewa Bhawan, R.K. Puram, New Delhi-110066 (Tele No. 26187232) Fax No. 26195516)	Shri O.P. Khanda, Secretary & Grievances officer

8.	Central Water & Power Research Station	Central Water & Power Research Station, P.O. Khadakwasla Research Station, Pune – 411024 (Tele No. 020-4380825) Fax No. 020-4381004)	Shri A.K. Basu, Joint Director & Chairman (Grievance Cell)
9.	Farakka Barrage Project	P.O. Farakka Barrage, Distt. Murshidabad, West Bengal-742212 (Tele No. 03485 – 253285) Fax No. 03485-253608	Shri B.K. Chakravarty, Superintending Engineer (Coord.) & Director (Staff Grievances)
10.	Ganga Flood Control Commission	Ganga Flood Control Commission, Sinchai Bhawan, IIIrd Floor, Patna-800015 (Tele No. 0612-2233591) (Fax No. 0612-2222294)	Shri Bibhas Kumar, Director (MP-II) (Adm) & Director (Staff Grievances) & (Public Grievances)
11.	National Institute of Hydrology	Jal Vigyan Bhawan, Roorkee-247667 (Uttaranchal) (Tele No. 01332-272906, 272909 & 272718 Fax No. 01332-272123	Dr. A.K. Bhar, Scientist F & Chairman, Grievance Cell
12.	National Projects Construction Corporation Limited	NPCC Ltd., Plot No. 67-68, Sector 25, Faridabad (HNA) (Tele No. 95129 -2231272) Fax No. 95129-2231269)	Shri P.K.Bhargava AGM (PMW) Chairman (Grievance Committee) (Staff Grievances/Public Grievances
13.	National Water Development Agency	18-20, Community Centre, Saket, New Delhi-110017 (Tele No. 26852735) Fax No. 26960841)	Shri N.K. Bhandari, Chief Engineer (HQ) & Director (Staff Grievances)
14.	Sardar Sarovar Construction Advisory Committee	Sardar Sarovar Construction Advisory Committee, Narmada Bhavan, "A" Block 4th Floor, Vadodara – 390001 (Tele No. 0265-2421272) Fax No. 0265-2437262 (Telefax)	Shri B.R.K. Pillai, Assistant Secretary & Director (Grievances) & Director (Public Grievances)
15.	Water & Power Consultancy Services (India) Ltd.	76-C, Institutional Area, Sector-18, Gurgaon-122015 (Tele No. 95124-2397394) Fax No. 95124 -2397392	Shri D.S. Pahwa, General Manager (P&A) & Director (Staff Grievances)
16.	Brahmaputra Board	Basistha, Guwahati - 29 Tele No.0361-2307453 & 2307453 Fax No. 0361-2308588	Shri I. Islam, Secretary & Director (Grievances)
17.	Upper Yamuna River Board	B4,First, Community Centre, Block B-1,Janak Puri, New Delhi 1100058 Telephone 25549115,25549151(fax 25549882)	Shri Chetan Pandit, Member Secretary & Director of Grievances

Annexure V

BUDGET AT A GLANCE
(SECTOR-WISE)

(Rupees in crore)

Sl No.	Sector/Organisation/Scheme	Actuals 2004-05		BE 2005-06		RE 2005-06	
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan
1.	2.	3.	4.	5.	6.	7.	8.
I	**Secretariat-Economic Services**	0.84	13.45	3.50	14.43	1.24	19.88
II	**Major & Medium Irrigation**						
1.	Central Water Commission	23.03	76.95	29.70	73.40	25.75	79.93
2.	Central Soil and Materials Research Station	6.04	4.02	5.76	4.08	5.76	4.01
3.	Central Water & Power Research Station	3.41	20.83	5.10	20.12	4.50	22.39
4.	National Water Development Agency	21.00	0.00	25.00	0.00	17.00	0.00
5.	National Institute of Hydrology	3.81	4.22	9.27	4.34	5.20	4.47
6.	Research and Development Programme	2.09	0.00	8.00	0.00	7.85	0.00
7.	National Projects Construction Corporation Limited	0.00	15.80	0.00	15.80	0.00	15.80
8.	Sutlej Yamuna Link Canal Project	0.00	0.00	0.00	25.00	0.00	0.01
9.	Boards & Committees	0.00	1.72	0.00	2.37	0.00	1.52
	Total: Major & Medium Irrigation	**59.38**	**123.54**	**82.83**	**145.11**	**66.14**	**128.13**
III	**Minor Irrigation**						
1.	Central Ground Water Board	67.22	51.39	76.64	49.51	67.51	55.47
2.	Surface Water Schemes	3.46	0.00	7.00	0.00	6.50	0.00
3.	R. & D. Programme	0.00	0.00	1.00	0.00	0.50	0.00
4.	Repair, renovation and restoration of water bodies	12.00	0.00	0.00	0.00	0.00	0.00
	Total : Minor Irrigation	**82.68**	**51.39**	**84.64**	**49.51**	**74.51**	**55.47**
IV.	**Command Area Development**						
1.	Command Area Development Programme	142.10	0.00	199.00	0.00	157.50	0.00
2.	R. & D. Programme	0.66	0.00	1.00	0.00	1.00	0.00
	Total: Command Area Development	**142.76**	**0.00**	**200.00**	**0.00**	**158.50**	**0.00**
V.	**Flood Control**						
1.	Central Water Commission	16.49	34.13	34.37	31.29	27.05	33.89
2.	Flood Proofing Programme	0.00	0.00	0.00	0.00	0.00	0.00

Sl No.	Sector/Organisation/Scheme	Actuals 2004-05		BE 2005-06		RE 2005-06	
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan
1.	2.	3.	4.	5.	6.	7.	8.
3.	Ganga Flood Control Commission	2.09	0.00	2.50	0.00	2.71	0.00
4.	Emergent Flood Protection Measures in Eastern and Western Sectors	0.00	1.50	0.00	3.00	0.00	1.50
5.	Survey & Investigation of Kosi High Dam Project	2.29	0.00	7.00	0.00	9.00	0.00
6.	Maintenance of flood protection works of Kosi and Gandak Projects	3.46	0.00	6.00	0.00	3.74	0.00
7.	Pancheshwar Multipurpose Project	1.49	0.00	2.50	0.00	2.07	0.00
8.	Joint Observation on common Rivers with Bangladesh and neighbouring countries	0.37	0.00	2.50	0.00	0.64	0.00
9.	Critical anti-erosion works in Ganga Basin States	49.00	0.00	100.00	0.00	80.00	0.00
10.	Extension of embankments on Lalbakeya, Kamla, Bagmati and Khando rivers	0.00	0.00	14.00	0.00	6.00	0.00
11.	Critical anti-erosion works in Coastal and other than Ganga Basin States	3.40	0.00	0.00	0.00	0.00	0.00
12.	Improvement of Drainage in Mokama Group of Tals	9.50	0.00	0.00	0.00	0.00	0.00
13.	Schemes for the benefit of North Eastern States & Sikkim		0.00				
	-Brahmaputra Board						
	-Flood Control in Brahmaputra and	16.33		21.76	0.00	21.00	0.00
	Barak Valley	0.00		0.00	0.00	0.00	0.00
	-Pagladia Dam Project	1.00		1.00	0.00	3.00	0.00
	-Harrange Drainage Scheme	4.44		0.00	0.00	0.00	0.00
	-New schemes for Majuli island in Assam, Dihang Project, etc.	3.92		40.00	0.00	26.00	0.00
	Sub Total (S.No.13)	25.69		62.76	0.00	50.00	0.00
	Total : Flood Control	**113.78**	**35.63**	**231.63**	**34.29**	**181.21**	**35.39**
VI.	**Transport Sector**						
1.	Farakka Barrage Project	31.73	22.09	30.40	23.32	30.40	22.73
	TOTAL (I to VI)	**431.17**	**246.10**	**633.00**	**266.66**	**512.00**	**261.60**
VII	A.I.B.P.**			4800.00	0.00		
	GRAND TOTAL			**5433.00**	**266.66**		

Source of financing : Demand No.104 – Ministry of Water Resources for 2005-2006 (excluding AIBP)

Annexure VI

DETAILED ASSESSMENT OF PERFORMANCE OF NATIONAL WATER DEVELOPMENT AGENCY, NEW DELHI

The genesis of setting up of National Water Development Agency, an autonomous organization under the Ministry of Water Resources, its functions, organizational structure etc. have been given in detail in Chapter – 1.

National Water Development Agency (NWDA) is carrying out the feasibility studies of the National Perspective Plan for water resources development on a scientific basis, which inter-alia, envisage diversion of water from surplus river basins to deficit/drought prone areas of the country by interlinking major rivers of the country. The plan includes construction of storage reservoirs to store flood waters and interlinking of river systems for optimum utilization of river waters. The water so diverted will be used for irrigation, drinking and other uses. This plan comprises of two components, namely Peninsular Rivers Development and Himalayan Rivers Development.

Under the Peninsular component, NWDA has completed data collection and water balance studies of 137 basins/sub-basins and 52 identified diversion points, toposheet studies of 58 identified storages and 18 toposheet studies of links alignments and prepared pre-feasibility reports of 18 water transfer links. Based on these water balance studies and pre-feasibility reports, NWDA has identified 16 inter-basin water transfer link proposals for the preparation of feasibility reports under Peninsular Component. Feasibility reports of 14 links have been completed so far and the field surveys and investigations and preparation of feasibility reports of another link is under progress. Moreover, the special studies such as geo-technical investigations, drilling work for geo-technical investigations, socio-economic and environmental surveys, command area surveys etc. of the links are under progress.

In respect of one of the link in Peninsular Component, namely Ken-Betwa link, a tripartite Memorandum of Understanding (MoU) was signed between the Union Minister of Water Resources, Chief Ministers of Government of Madhya Pradesh & Uttarpradesh on 25th August, 2005 in the presence of Dr. Man Mohan Singh, Hon'ble Prime Minister of India for preparation of Detailed Project Report (DPR) of Ken-Betwa link by Central Government.

Under the Himalayan component, NWDA has completed water balance studies at 19 diversion points, toposheet studies of 16 storage reservoirs and toposheet studies of 19 link alignments and prepared pre-feasibility reports of 14 water transfer links. Based on these water balance studies and pre-feasibility reports, NWDA has identified 14 inter-basin water transfer link proposals for preparation of feasibility reports under Himalayan Component. Presently, the work of field surveys and investigations for preparation of feasibility reports of link schemes is on hand. Feasibility reports of two links have been completed so far and the field surveys and investigations including special studies by other agencies for another twelve links remained under progress at various stages during the year 2005-06.

As per NPP, inter-basin water transfer is expected to provide additional irrigation benefits of 35 million hectare i.e.25 million hectare from surface waters and 10 million hectare from increased use of ground waters, raising the ultimate irrigation potential of from 140 million ha to 175 million ha and generation of 34,000 MW of power, apart from the benefits of flood control, navigation, water supply, fisheries, salinity, pollution control and employment generation etc.

Initially, Peninsular River Development Component was taken up by NWDA when it was set up in 1982, it was estimated that Rs. 107.42 Crores would be required for carrying out the various activities. In 1990, when the work of Himalayan Rivers Development Component was also included in the scope of activities of NWDA, the estimate was revised to Rs.181.00 Crores. The expenditure incurred by NWDA since inception up to March, 2005 was Rs.165.08 Crores. During the year 2004-05, the MOWR has provided Grants-in-Aid of Rs. 25.00 Crores under plan for NWDA. The actual expenditure incurred up to 30th November, 2005 during the year 2005-06 is Rs.10.98 Crores.

NATIONAL INSTITUTE OF HYDROLOGY

The National Institute of Hydrology (NIH) is an apex organization in the area of hydrology in the country conducting research in basic and applied aspects of hydrology. It was established in December 1978 with headquarters at Roorkee as an autonomous society under the Ministry of Water Resources. The Union Minister for Water Resources is the President and the Union Minister of State for Water Resources is the vice President of the Society. The Institute is managed, administered, directed and controlled by the Governing Body with Secretary (Water Resources) as its Chairman. Technical Advisory Committee, with the Chairman, Central Water Commission as its Chairman, is responsible for technical scrutiny of the research programmes of the Institute. The Institute has set up four regional centers in order to deal with the area specific hydrological problems of different regions of the country and for providing effective interaction with the States in the region. The 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. Director of the Institute is the principal executive officer of the Society.

OVERALL PERFORMANCE DURING 2005-06

Studies and Research

The Institute carries out basic, applied and strategic research in all aspects of hydrology at its headquarters and regional centers. The research outputs of the Institute are published in the form of reports and papers. During the year 2005-06, the Institute has published 71 technical papers in reputed international and national journals and 67 papers in the proceedings of international and national conferences and symposia. More than 20

reports based on studies and research in hydrology have been prepared during the year. 35 studies taken up during the 2005-2006 will be completed by the 31st March 2006. During the next year 2006-07, 20 Technical Reports and 70 Research Papers are likely to be published. It is also expected that 80 papers will be presented in the various Seminars and Symposia during the year 2006-07. The institute has prepared a vision document covering the state-of-the-art technology in the area of hydrology in India, and worldwide, achievements of the Institute and long term plan for carrying out research covering different facets of hydrology.

Sponsored and Consultancy Projects

The institute has gained expertise and advanced technical knowledge in different areas of hydrology and water resources. The Institute has been undertaking research studies for providing solutions to the real life hydrological problems in the field using advanced techniques. The Institute is also taking up sponsored and consultancy projects of several organization in order to help them in solving various complex and typical field problems. During the year 2005-06, the Institute has completed studies for four sponsored and consultancy projects that were taken up earlier. In addition four new projects were taken up during the year. Research work continued on projects, which were sponsored in the earlier years.

Indian National Committee on Hydrology (INCOH)

The Institute has been providing secretarial assistance to INCOH. In pursuance of its objective of preparing and periodically updating the state-of-the-art technology in hydrology in the country, the secretariat brings out scientific reports covering a variety of topics. The secretariat also publishes a bi-annual journal on hydrology entitled "Jal-Vigyan Sameeksha". The journal is being distributed to about 700 organisations in the country and abroad in order to disseminate and promote knowledge in the field of hydrology. During the year two issues of Jal Vigyan Sameeksha were brought out. Also the INCOH has funded nine international as well as national seminars, symposia, workshops, and conferences in the relevant areas of hydrology and water resources. The research Advisory Committees of INCOH had approved six Research & Development projects for funding by Ministry of Water Resources. One of the major aims of the Committee is to effectively coordinate and act as the focal point for the international Hydrological Programme of UNESCO. This role is being performed by the INCOH very efficiently and India is actively participating in the IHP-VI of UNESCO.

Technology Transfer Activities

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 and conferences etc. have been major activities under the Technology Transfer Programme. During the year 2005-06, the Institute has organized such activities.

ANNEXURE-VII

Audit Observations pertaining to Ministry of Water Resources

Report No. 4 of 2005 (Civil)

Utilisation Certificates

1.2 Utilisation certificates

Consequent on the departmentalisation of accounts in 1976, certificates of utilisation of grants were required to be furnished by the Ministries/Departments concerned to the Controllers of Accounts in respect of grants released to statutory bodies, non-government organisations etc to ensure that these had been properly utilised for the purpose for which these were sanctioned. The Ministry of Water Resources details indicating the position of outstanding utilisation certificates due by March 2004 in respect of grants released upto March 2003 are given below.

Ministry/ Department	**Period to which grants relate (upto March2003)**	**Utilisation Certificates outstanding in respect of grants released upto March 2003 which were due by 31st March 2004**	
Water Resources		**Number**	**Amount**
	1986-87	3	27.01
	1987-88	4	11.89
	1988-89	3	8.80
	1989-90	7	11.46
	1990-91	3	7.17
	1991-92	1	10.29
	1992-93	1	0.03
	1993-94	1	0.25
	1994-95	1	5.13
	1995-96	4	22.66
	1996-97	1	4.71
	1997-98	3	8.90
	1998-99	11	29.69
	1999-00	10	37.03
	2000-01	18	70.03
	2001-02	21	8.53
	2002-03	52	461.96
		144	**725.54**

(The CAG's Report on Union Government Accounts 2003-04)

Disbursements

6.10 The details given below would indicate that major parts of disbursements on grants-in-aid to State/Union Territory governments, capital outlay and investments, were made in the month of March 2004. Since the funds released in March to various organisations cannot be constructively spent during the year, it is not possible to conclude whether these funds were applied during the same year for the purpose for which they were authorised.

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Sl. No.	Description of the Grant and Major Head	Total expdr under major head	Expdr in March	Percent-age of expdr in March to total expdr
137	2705 – Command Area Development	2.57	2.07	81
138	2711 –Flood Control and Drainage	101.09	21.93	22
139	3601 – Grants-in-aid to State Governments	161.04	145.47	90
140	.4702 – Capital Outlay on Minor Irrigation	2.89	2.64	91
141	4711– Capital Outlay on Flood Control Projects	1.78	1.61	90

Unspent Provision of Rs. 100 crore or more

7.4 Unspent provisions of more than Rs 100 crore, need a detailed explanatory note to the Public Accounts Committee, The unspent provisions were attributed by the ministries/departments to some of the schemes failing to take off. Details of the unspent provisions are given below.

(Refers to Paragraph 7.4)

Details of unspent provision exceeding Rs 100 crore under a grant/appropriation

(Rupees in crore)

Sl. No.	Grant No. and Controlling Ministry	Amount of Unspent provision
Civil Revenue -Voted		
24.	102-Ministry of Water Resources	152.35