

ANNUAL REPORT

2003-04



GOVERNMENT OF INDIA
Ministry Of Water Resources

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OVERVIEW

Water is the very essence of life. The strength of water is unmatched. Without water there can be no life at all. In keeping with its importance societies have always strived to manage and harness water in various ways. The Ministry of Water Resources in the Government of India looks after this nature's most precious gift. The Ministry 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 Shri Arjun Charan Sethi as the Union Minister of Water Resources since 29.05.2000. Hon'ble Smt. Bijoya Chakravarty is the Minister of State for Water Resources since 13.1.1999. Shri V.K. Duggal is the Secretary in the Ministry of Water Resources since 4.11.2003. Smt. Sushma Singh Joined the Ministry as Additional Secretary on 6.2.2004. The Ministry has nine wings namely; Administration, Finance, Policy & Planning, Projects, Eastern Rivers, Indus, Command Area Development & Water Management, and Ground Water & Minor Irrigation and Coordination & Evaluation 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 as mentioned in Table at next page, in performing the assigned functions.

NATIONAL WATER POLICY

The Ministry adopted National Water Policy in 1987 and same was subsequently revised. The revised policy was adopted by the National Water Resources Council in its 5th meeting held on 1st April 2002. Recognising water as a precious national asset, the National Water Policy - 2002 embodies the Nation's resolve that planning, development and management of water resources would be governed by National Perspectives. The policy recognizes the drainage basin as the basic unit of planning, development and management of water resources and calls for appropriate measures to optimise utilisation of this resource. The salient features of the National Water Policy -2002 are as under:

- Water is a precious natural resource, a basic human need and precious national asset 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.
- Planning for water resources to be on the basis of the hydrological unit such as a river basin or sub-basin. Appropriate river basin organisations should be established for the planned development and management of the



Hon'ble Union Minister of Water Resources Shri Arjun Charan Sethi flagging off the Jal Yatra at India Gate, New Delhi

MAJOR ACHIEVEMENTS DURING 2003-04

- An amount of Rs.3128.5 crore was released as CLA under AIBP.
- The Command Area Development Programme has been restructured and renamed as Command Area Development and Water Management (CADWM) Programme.
- An amount of Rs.141.45 crore has been released to the States as Central Assistance for implementing CAD Programme.
- The height of Sardar Sarovar Dam was raised to EL 100 m from EL 95 m in June, 2003 and permission for further raising the height from EL 100 to EL 110.64 m was accorded.
- Pagladiya Multipurpose Project with irrigation benefits to 54 thousand hectares and flood protection to 40 thousand hectares taken up for execution.
- Krishna Water Disputes Tribunal constituted.
- Drilled 1339 tube wells for ground water exploration, out of which 98 wells were high yielding.
- Year 2003 celebrated as "Fresh Water Year" and many mass awareness programmes organized.
- Prepared 500 district ground water user maps which can be used by common persons. The maps depicts present situation of ground water development and future prospects.

TABLE

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.

river basins as a whole or sub-basins, wherever necessary.

- 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 projects with an integrated and multi-disciplinary approach having regard to human and ecological aspects including those of disadvantaged sections of the society.
- In the allocation of water, first priority should be given for drinking water, followed by irrigation, hydro-power, ecology, agro-industries and non-agricultural industries, navigation and other uses, in that order.
- The exploitation of ground water should be regulated with reference to recharge possibilities and consideration of social equity. The detrimental environmental consequences of over-exploitation of ground water need to be effectively prevented.
- 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.
-

Action Plan for Implementation of National Water Policy-2002

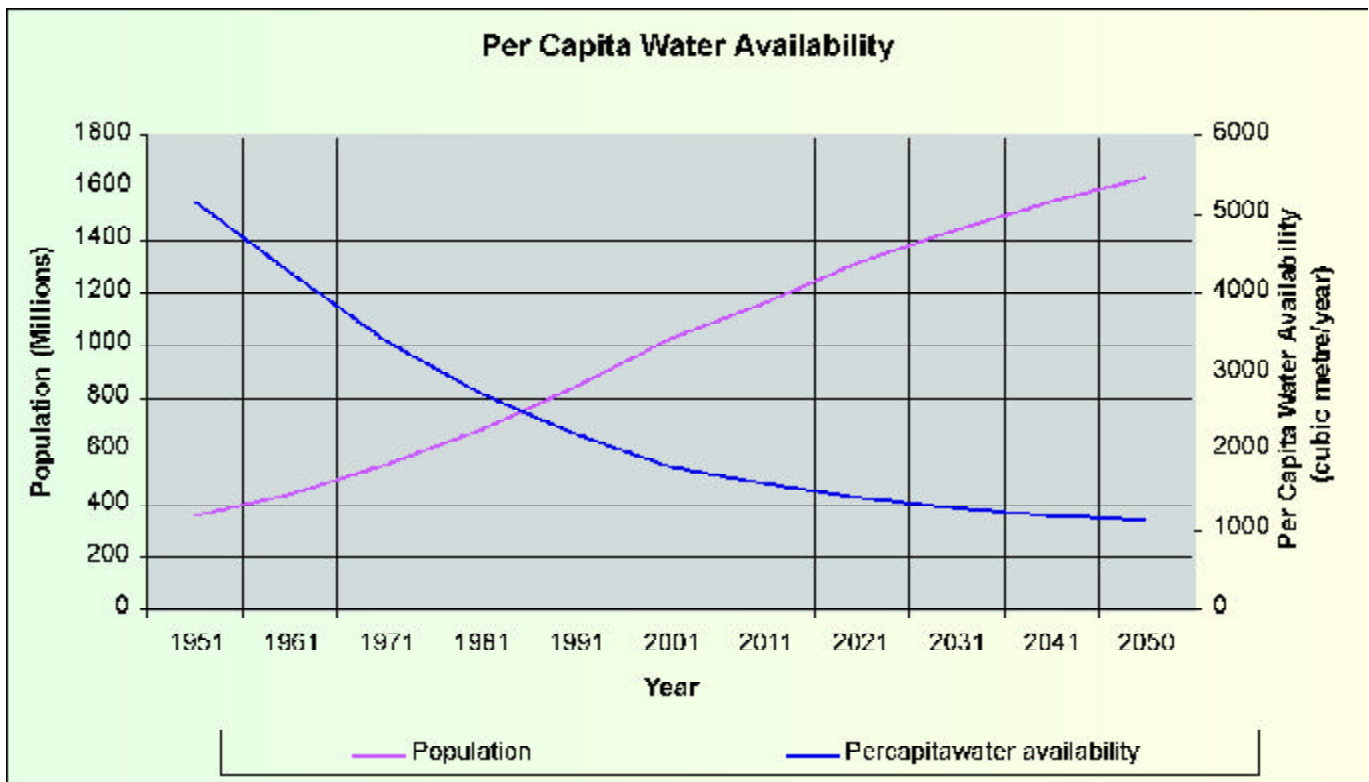
The National Water Policy-2002 envisages that each State shall formulate its own State Water Policy backed with an Operational Action Plan in a time bound manner say in two years to achieve the desired objectives of the Policy.

The Ministry of Water Resources has formulated an Action Plan for implementation of the National Water Policy – 2002. The Action Plan, as finalised after deliberations at various fora has been adopted in the National Conference of Water Resources and

Irrigation Ministers of States/Union Territories Administrations held on 5th February, 2003. The Action Plan has been forwarded to the State Governments/Union Territories for taking follow up action thereon.

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 cu. km. The resources potential of the country, which occurs as natural run off in the rivers is about 1869 cu. km., as per the basin wise estimates of Central Water





School children participating in the Jal Yatra at India Gate, New Delhi

Commission, considering both surface and ground water as one system.

Due to various constraints of topography, uneven distribution of resources over space and time, it has been estimated that presently only about 1122 cu. km. of the estimated average runoff of 1869 cu. km. is utilisable. With increasing population, the per capita availability of water is reducing day by day.

The per capita Water availability has been reduced to about one third since independence.

While population growth rates have stabilized and are expected to gradually diminish over the next several decades, the composition of demand is expected to significantly change as a result of rising income, rapid urbanization and industrialization

ACTIVITIES DURING FRESH WATER YEAR

Mass Awareness Programme

- Curtain Raiser function inaugurated by Hon'ble Prime Minister on 5th February, 2003.
- Jal Yatras organized in various parts of the country.
- Training Programmes in schools all over the country.
- Awareness programmes in remote areas of the country through conventional methods like Street Plays, Puppet Shows, Posters etc.
- Participation in Rail Vigyan Exhibition.

Print and Electronic Media

- Material on Water Conservation published in Outlook, Swagat, India Today, Sarita, Champak, Week, Geography and You, Alive, Saras Salil, Darpan and a number of vernacular magazines.
- Quiz Programme on 'Doordarshan'.
- Programme on Water in 'Turning Point', 'Doordarshan'.
- Spots on 'Doordarshan'.
- Series of programmes on All India Radio.
- Media Fellowship on Water introduced.

Interaction with Policy Matters / Opinion Makers

- Meeting with Members of Parliament.
- Water Summit 2003 (Fresh Water: Conservation and Management) in association with FICCI.
- Rotary International Presidential celebration on Water Management .
- Seminar in association with CII.

Demonstrative Initiatives

- Construction of Rain Water Harvesting Structures in 100 Government Schools through NGOs.
- Construction of Rain Water Harvesting Structures in public buildings in the country.

CHAPTER 1

MAJOR AND MEDIUM PROJECTS

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 of this, despite a 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 ERM 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 20th January 2004 considered further relaxation in criteria and following were included :-

- i) To include grant component in AIBP with 70% loan and 30% grant for general Category states and 10% loan and 90% grant for Special Category State for projects under Fast Track Programme. For projects not under fast track an incentive of conversion of loan to grant criteria as mentioned above shall be given if projects are completed on schedule.
- ii) To extend time limit for completion of Fast Track Projects to 3 working seasons and 6-8 working seasons for projects under normal funding.

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.14670 crore was released for various major/medium/minor irrigation projects as CLA upto 2003-04. Table 1.1

During 2003-04, an amount of Rs. 3128.501 Crore has been released to various State Governments for completion of different major/medium/ minor projects as Central Loan Assistance (CLA) under AIBP upto March 2004. The State-wise details of

(CLA) release under (AIBP) are given in Table-1.2.

Overall Cumulative Release & Benefits

It may be seen that this programme has helped enhancement of creation of additional irrigation potential to the tune of 2195 th. ha. (upto March

2003) 24 Major/Medium Projects have since been completed with the help of this programme (Table 1.3). The ultimate irrigation potential of the projects covered under the AIBP is about 16099 th. ha., out of which about 6552 th. ha. had been created before these projects were covered under the AIBP.

Table 1.1

Central Loan Assistance Released under AIBP to States from 1996-97 to 2003-04

S.No.	State	CLA Released during								Total
		1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	
1	Andhra Pradesh	35.250	74.000	79.670	65.015	95.020	281.660	33.186	205.530	869.331
2	Arunachal Pradesh	0.000	0.000	0.000	7.500	7.500	15.000	1.500	20.000	51.500
3	Assam	5.230	12.400	13.950	14.540	24.077	14.521	16.274	19.2015	120.1933
4	Bihar	13.500	5.150	36.185	129.695	148.440	3.420	14.481	74.644	425.515
5	Chhattisgarh	0.000	4.500	9.500	10.520	13.930	48.200	104.000	74.630	265.280
6	Goa	0.000	5.250	0.000	3.500	61.650	58.000	0.000	2.000	130.400
7	Gujarat	74.773	196.900	423.820	272.700	421.850	581.690	1000.330	650.359	3622.422
8	Haryana	32.500	12.000	0.000	0.000	0.000	0.000	18.000	7.735	70.235
9	Himachal Pradesh	0.000	6.500	5.000	11.047	18.015	3.244	8.150	14.692	66.648
10	Jammu & Kashmir	1.300	0.000	0.000	4.680	10.460	11.070	34.999	21.545	84.054
11	Jharkhand	0.000	8.890	11.640	14.345	9.050	10.820	9.670	1.833	66.248
12	Karnataka	61.250	90.500	94.500	157.140	171.000	492.500	620.850	266.478	1954.218
13	Kerala	3.750	15.000	0.000	0.000	22.400	11.275	5.665	31.000	89.090
14	Madhya Pradesh	63.250	110.000	81.250	95.325	151.328	215.410	220.000	568.440	1505.003
15	Maharashtra	14.000	55.000	50.860	49.875	97.020	39.100	133.134	164.395	603.384
16	Manipur	4.300	26.000	10.780	21.810	1.500	9.360	19.500	15.500	108.750
17	Meghalaya	0.000	0.000	0.000	2.694	5.512	4.470	1.500	1.088	15.264
18	Mizoram	0.000	0.000	0.000	1.433	1.433	2.000	0.750	9.300	14.916
19	Nagaland	0.000	0.000	0.000	2.730	5.000	5.000	2.659	8.000	23.389
20	Orissa	48.450	85.000	71.500	90.250	100.320	168.475	179.570	154.685	898.250
21	Punjab	67.500	100.000	0.000	42.000	55.620	113.690	36.660		415.470
22	Rajasthan	2.675	42.000	140.050	106.665	78.467	96.315	174.385	499.837	1140.394
23	Tripura	3.773	5.100	3.975	34.653	13.883	21.063	13.395	13.377	109.219
24	Tamilnadu	20.000	0.000	0.000	0.000	0.000	0.000	0.000		20.000
25	Uttar Pradesh	43.500	78.000	76.500	286.000	315.900	354.690	359.000	274.785	1788.375
26	Uttaranchal	0.000	0.000	0.000	0.000	0.000	0.000	25.163	25.5525	50.715
27	West Bengal	5.000	20.000	10.000	25.000	26.825	38.608	28.133	3.144	156.710
28	Sikkim	0.000	0.000	0.000	1.360	0.000	2.400	0.750	0.750	5.260
	Total	500.001	952.190	1119.180	1450.477	1856.200	2601.981	3061.703	3128.5010	14670.233

Table 1.2

Statewise details of CLA released under AIBP during 2003-2004

S.No.	State	No. of projects		Amount of CLA released (Rs. in Crore)		
		Major/ Medium	Minor	Major/ Medium	Minor	Total
1.	Andhra Pradesh	9		205.530		205.530
2.	Arunachal Pradesh		565	0	20.00	20.000
3.	Assam	4	63	9.428	9.7735	19.2015
4.	Bihar	4		74.6440		74.6440
5.	Chhattisgarh	4		74.630		74.630
6.	Goa	1		2.000		2.000
7.	Gujarat	5		650.359		650.359
8.	Haryana	1		7.735		7.735
9.	Himachal Pradesh	3		14.692		14.692
10.	Jammu & Kashmir	5	82	12.555	8.99	21.545
11.	Jharkhand	1		1.833		1.833
12.	Karnataka	4		266.478		266.478
13.	Kerala	2		31.00		31.000
14.	Madhya Pradesh	13		568.440		568.440
15.	Maharashtra	11		164.395		164.395
16.	Manipur	2	58	12.500	3.00	15.500
17.	Meghalaya		17	0	1.088	1.088
18.	Mizoram		42	0	9.300	9.300
19.	Nagaland		44		8.000	8.000
19.	Orissa	13	18	147.360	7.325	154.685
20.	Rajasthan	6		499.837		499.837
21.	Tripura	3	396	1.9395	11.4375	13.377
22.	Uttar Pradesh	10		274.785		274.785
23.	Uttaranchal		193	0	25.5525	25.5525
24.	West Bengal	2		3.144		3.144
25.	Sikkim		62	0	0.750	0.750
	Total	103	1540	3023.2845	105.2165	3128.5010

Table 1.3

Major / Medium Projects which have been completed under AIBP

Sl.No.	Name of State/ Project (Started during the Plan)
	<u>Bihar</u>
1.	Bilasi Reservoir (V)
	<u>Chhattisgarh</u>
2.	Shivnath Diversion (V)
	<u>Jharkhand</u>
3.	Latratu (VII)
4.	Kansjore (VII)
	<u>Gujarat</u>
5.	Jhuj (A.P. 1978-80)
6.	Sipu (A.P. 1978-80)
7.	Damanganga (IV)
8.	Karjan (V)
9.	Sukhi (V)
10.	Deo (V)
11.	Watrak (A.P. 1978-80)
12.	Harnav-II (V)
13.	Umaria (V)
	<u>Madhya Pradesh</u>
14.	Upper Weinganga (V)
15.	Urmil (V)
16.	Banjar (V)
	<u>Rajasthan</u>
17.	Jaismand (VI)
18.	Gambhiri (VI)
	<u>Punjab</u>
19.	Ranjit Sagar Dam (VI)
	<u>Uttar Pradesh</u>
20.	Rajghat Dam (V)
21.	Gunta Nala Dam (VI)
22.	Sarda Sayahak (III)
23.	Gyanpur Pump Canal (VII)
	<u>West Bengal</u>
24.	Kangsabati (II)

NATIONAL PERSPECTIVE PLAN FOR WATER RESOURCES DEVELOPMENT

With a view to optimally utilize the water resources of the country, the Ministry has prepared perspective plan. The proposal comprises of two components, namely, (a) Peninsular Rivers Development Component and (b) Himalayan Rivers Development Component. The National Water Development Agency has been carrying out studies of the National Perspective Plan for water resources development.

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 promote scientific development for optimum utilization of water resources in the country and for preparing feasibility reports for interbasin transfer of water from surplus to deficit areas as envisaged in the National Perspective Plan for Water Resources Development. 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 Agency 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. It has two field organizations, each headed by a Chief Engineer, 5 Circles each headed by a Superintending Engineer, 15 Divisions each headed by an Executive Engineer and 8 Sub-Divisions each headed by an Assistant Executive Engineer/Assistant Engineer.

Activities

Inter Basin Water Transfer Proposals

The water transfer links being studied by NWDA in the following components are given at Plate - I.

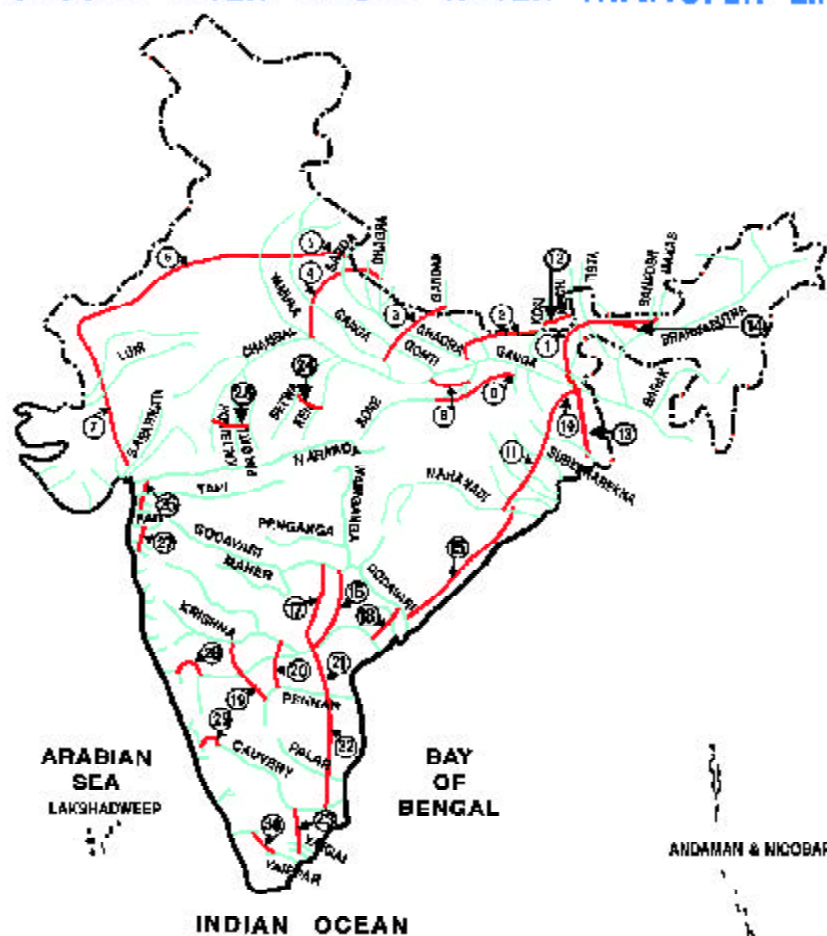
Peninsular Rivers Development Component

The Peninsular Rivers Development is divided into following four major parts:

1. Interlinking of the Mahanadi – Godavari – Krishna – Pennar - Cauvery rivers.

PLATE - 1

PROPOSED INTER BASIN WATER TRANSFER LINKS



HIMALAYAN COMPONENT

NAME OF THE LINKS

- ① BRAHMA PUTRA - GANGA (MSTG)
- 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 GANGA - DAMODAR - SUBERNAREKHA
- ⑪ SUBERNAREKHA - MAHANADI
- ⑫ KOEL - MECHI
- ⑬ FARAKKA - SINDHERRANS
- ⑭ BRAHMAPUTRA - GANGA (JTF) (ALT)

PENINSULAR COMPONENT

NAME OF THE LINKS

- ⑮ MAHANADI (KARNI RHADRA) - GODAVARI (DOWLADEVYRAM)
- ⑯ GODAVARI (NICHAMPALLI LOW DAM) - KRISHNA (NAGARJUNASAGAR TAIL POND)
- ⑰ GODAVARI (NICHAMPALLI) - KRISHNA (NAGARJUNASAGAR)
- ⑱ GODAVARI (POLAVARAM) - KRISHNA (YAMAYWADA)
- ⑲ KRISHNA (ALMATTI) - PENNAR
- ⑳ KRISHNA (ERIEAILAM) - PENNAR
- ㉑ KRISHNA (NAGARJUNASAGAR) - PENNAR (GOMASILA)
- ㉒ PENNAR (GOMASILA) - CAUVERY (GRAND ANICUT)
- ㉓ CAUVERY (KATTALUR) - VARDHA - GUNDAR
- ㉔ KSH-SITWA
- ㉕ PARBATH-KALISINDH-CHAMBAL
- ㉖ PART-TAPI-NARMADA
- ㉗ DAMANGANGA-JHELUM
- ㉘ BEDTI-VARDHA
- ㉙ NETRAVATHI-HETAIVATHI
- ㉚ PANMA - ACHANKOVL - VAIPPRAR

NATIONAL WATER DEVELOPMENT AGENCY

2. Interlinking of the west flowing rivers north of Bombay and South of Tapi.
3. Interlinking of the river Ken with Chambal.
4. Diversion of the west flowing rivers of Kerala and Karnataka to water deficit areas east of the Western ghats.

The Work Related To Peninsular Component Comprises:

Collection of data for 137 basins/sub-basins, water balance studies of 137 basins/sub-basins and at 49 identified diversion points, toposheet & storage capacity studies of 58 identified reservoirs, toposheet studies of 18 links including identification of en route command area, preparation of pre-feasibility reports of 18 links and surveys and investigations of 16 water transfer links for preparation of feasibility reports.

Studies undertaken:

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, 58 reservoir studies, toposheet studies of 18 links including 1 additional study and all pre-feasibility reports.

The field surveys and investigations and preparation of feasibility reports of the following seven links were completed by March, 2003.

1. Par-Tapi-Narmada link
2. Pamba-Achankovil-Vaippar link
3. Ken-Betwa link
4. Godavari(Polavaram)-Krishna(Vijayawada) link
5. Krishna(Srisailem)-Pennar link
6. Krishna (Nagarjunasagar)- Pennar (Somasila) link
7. Damanganga-Pinjal link

The field surveys and investigations and preparation of feasibility reports of the following two links have been completed during the year 2003-04.

1. Krishna(Almatti)-Pennar link
2. Parbati- Kalisindh-Chambal link

The field surveys and investigations and preparation of feasibility reports of the following seven links remained under progress during the year.

1. Mahanadi (Manibhadra)-Godavari (Dowlaiswaram) link
2. Cauvery(Kattalai)-Vaigai-Gundar link
3. Godavari(Inchappalli Low Dam)-Krishna (Nagarjunasagar Tail Pond) link
4. Godavari (Inchappalli) - Krishna (Nagarjunasagar) link
5. Pennar(Somasila)-Cauvery(Grand Anicut) link
6. Bedti-Varda link
7. Netravati-Hemavti link

The topographical surveys of Godavari (Inchappalli)-Krishna (Nagarjunasagar) and the difficult reaches of Godavari (Inchappalli Low Dam)-Krishna (Nagarjunasagar Tail Pond) links proposed by aerial photogrammetry method were entrusted to NRSA, Hyderabad and same are also under progress. The special studies such as geological survey, geophysical investigations, geo-technical investigations, drilling work for geo-technical investigations, construction materials investigations, borrow area survey, socio-economic and environmental surveys, command area surveys, pre-irrigation soil surveys etc. of the above links remained under progress by other agencies such as Central Water Commission, Central Soil & Material Research Station, Geological Survey of India, Andhra University, Consultancy Engineering Services etc.

Himalayan Rivers Development Component

The Himalayan Rivers Development 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. It would also provide the necessary discharge for augmentation of flows at Farakka to inter-alia flush the Calcutta Port and the inland navigation facilities across the country.

The work related to the Himalayan Component comprises:

Water balance studies at 19 diversion points, toposheet studies of 16 reservoirs, toposheet studies of 19 water transfer links, preparation of pre-feasibility reports of 14 water transfer links and survey and investigations of 14 water transfer links for preparation of feasibility reports.

Studies undertaken:

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

The field surveys and investigations and preparation of feasibility report of Sarda -Yamuna link was completed by March 2003.

The field surveys and investigations and preparation of feasibility report of the Ghagra- Yamuna link (Indian territory) has been completed during 2003-04.

The field surveys and investigations and preparation of feasibility reports of the following 12 links

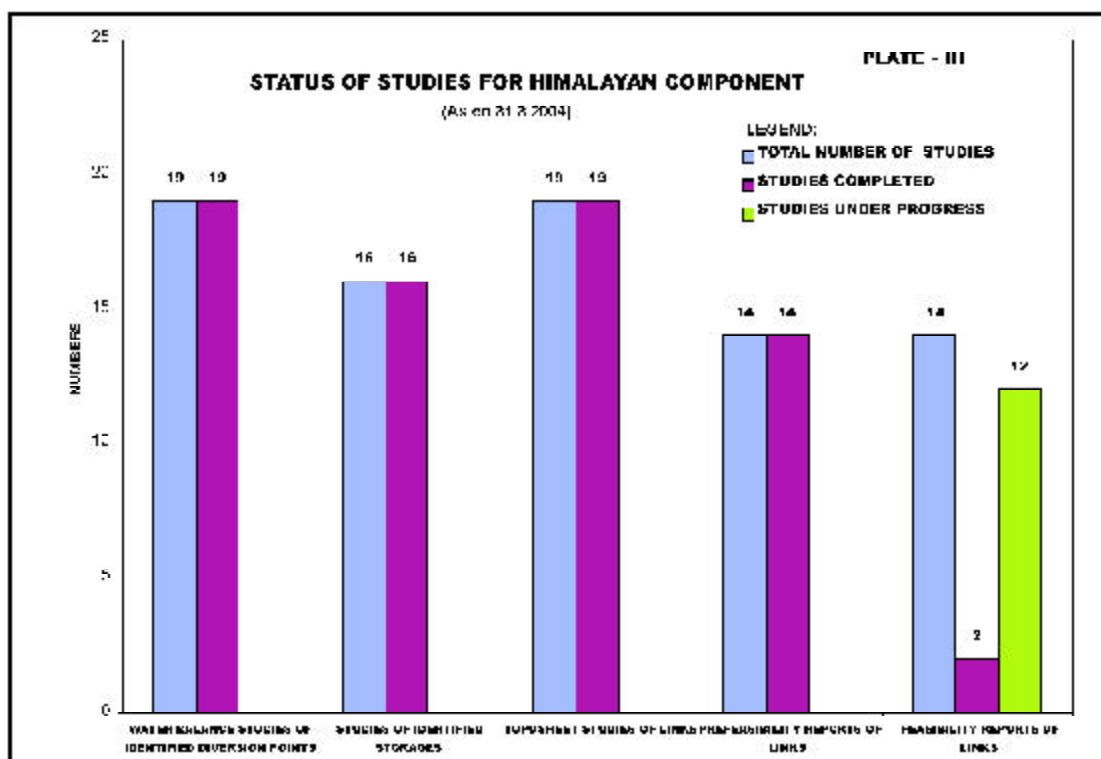
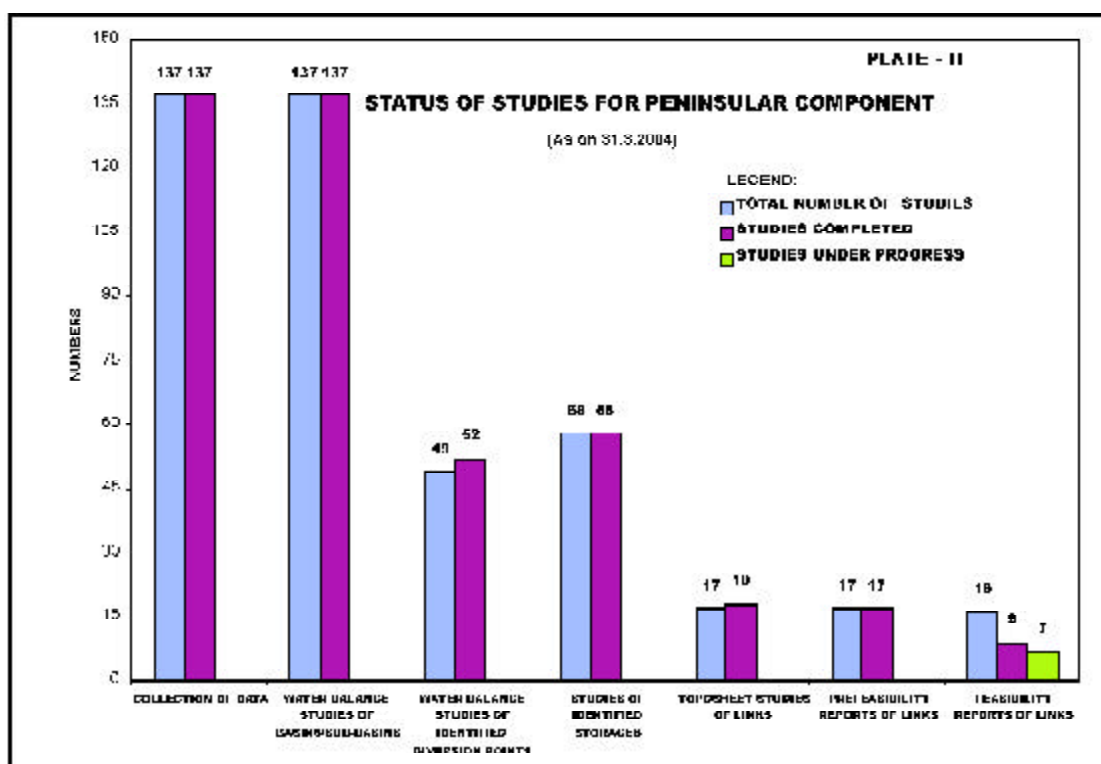
remained under progress during the year.

1. Manas-Sankosh-Tista-Ganga link
2. Ganga-Damodar-Subernarekha link
3. Yamuna-Rajasthan link
4. Chunar-Sone Barrage link
5. Sone Dam- Southern Tributaries of Ganga link
6. Rajasthan-Sabarmati link
7. Subernarekha-Mahanadi link
8. Gandk-Ganga link
9. Farakka-Sunderbans link
10. Kosi-Mechi link
11. Kosi-Ghagra link
12. Jogigopa-Tista-Farakka link (Altr. to Manas-Sankosh-Tista-Ganga link)

The status of studies under Peninsular and Himalayan Components as on 31st March, 2004 is given in **Plate - II** and **Plate - III** respectively.

Constitution Of A Group To Speed Up The Process Of Arriving At Consensus Amongst The States On The Proposals Of Interbasin Water Transfer

In order to speed up the process of arriving at consensus amongst the states regarding sharing of surplus water, a Group has been constituted by the Ministry of Water Resources vide its Office Memorandum No.2/3/2001-BM/265 dt.21.6.2002 under the Chairmanship of Chairman, Central Water Commission with Director General, NWDA as Member-Secretary, Member (WP&P), CWC, Chief Engineer (IMO), CWC and Secretaries of WR/Irrigation Departments of concerned States as Members of the Group. The main functions of the Group are to discuss &



expedite the process of arriving at consensus amongst the States regarding sharing of surplus water in river basins/sub-basins and the quantum of surplus water to be transferred from surplus basins to deficit basins/areas as per the proposals of interbasin water transfer of NWDA, to assist states in arriving at an agreement regarding sharing of costs & benefits by the beneficiary States and other related issues for taking up implementation of

the link schemes and also to discuss the issue of preparation of Detailed Project Reports(DPRs) of various link schemes for which feasibility reports have already been completed by NWDA. Two meetings of the Group were held so far under the Chairmanship of Chairman, CWC with the representatives of Uttar Pradesh & Madhya Pradesh States to sort out the various issues involved in the Ken-Betwa link project.

Task Force on Interlinking Of Rivers

A Task Force on Interlinking of Rivers vide MOWR's Resolution No. 2/21/2002-BM dated 13.12.2002 has been set up with the following constitution:

- | | | | |
|----|-------------------------|---|------------------|
| 1. | Shri Suresh Prabhu, M.P | - | Chairman |
| 2. | Shri C.C.Patel | - | Vice-Chairman |
| 3. | Dr. C.D.Thatte | - | Member-Secretary |

Further, the Ministry of Water Resources vide its Resolutions dated 18.2.2003, 24.2.2003, 24.3.2003 & 15.7.2003, the following ten members were inducted in the Task Force:

- | | | |
|-----|---|--------------------|
| 1. | Shri Deepak Das Gupta, (Retd.) Chairman, NHAI | (Full Time Member) |
| 2. | Shri K.V.Kamath, MD & CEO, ICICI Bank, New Delhi | (Part Time Member) |
| 3. | Shri R.K.Pachauri, Director General, TERI, New Delhi | (Part Time Member) |
| 4. | Shri Piyush Goyal, Chartered Accountant, Mumbai | (Part Time Member) |
| 5. | Shri K.Kasturirangan, Chairman, ISRO, New Delhi | (Part Time Member) |
| 6. | Shri G.C.Sahu, Retd.Engineer-in-Chief, Govt. of Orissa | (Part Time Member) |
| 7. | Dr. K.Hari Babu, MLA, Visakhapatnam, Andhra Pradesh | (Part Time Member) |
| 8. | Dr. B.R.Chauhan, Legal Expert, New Delhi | (Part Time Member) |
| 9. | Shri B.G.Vergheese, Centre for Policy Research, New Delhi | (Part Time Member) |
| 10. | Dr. A. Mohan Krishnan | (Part Time Member) |

MILESTONES

The milestone/time table for achieving the goal of interlinking of rivers as indicated in the above resolution is as under:

- | | |
|---|----------------|
| (i) Preparation of Action Plan-I, giving an outline of the time schedules for the completion of the feasibility studies, detailed project reports, estimated cost, implementation schedule, concrete benefits and advantages of the project, etc. | 30.04.2003 |
| (ii) Preparation of Action Plan-II, giving alternative options for funding and execution of the project as also the suggested methods for cost recovery. | 31.07.2003 |
| (iii) Meeting with the Chief Ministers to deliberate over the project and to elicit their cooperation. | May/June, 2003 |
| (iv) Completion of Feasibility Studies (already in progress). | 31.12.2005 |
| (v) Completion of Detailed Project Reports. (Preparation of DPRs will start simultaneously since FSs in respect of eight river links have already been completed). | 31.12.2006 |
| (vi) Implementation of the Project (10 years). | 31.12.2016 |

The Task Force will provide guidance on norms of appraisal of individual projects in respect of economic viability, socio-economic impacts, environmental impacts and preparation of resettlement plans, devise suitable mechanism for bringing about speedy consensus amongst the States, prioritise the different project components for preparation of Detailed Project Reports and its implementation, propose suitable organizational structure for implementing the project, consider various modalities for project funding and consider international aspects that may be involved in some project components etc.

The Task Force has prepared and submitted the Action Plan-I on 30.4.2003 and Preliminary document of Action Plan – II on 14.8.2003 to MOWR.

Dr. C.D.Thatte had resigned from the post of Member-Secretary, Task Force on Interlinking of Rivers and resignation has been accepted. Shri Suresh.P.Prabhu, M.P has also tendered his resignation from the post of Chairman, Task Force

on Interlinking of Rivers and accepted by the Prime Minister with effect from 31.3.2004.

The Task Force on Interlinking of Rivers for which NWDA is providing secretariat services, has held twelve meetings during 2003-04.

Organisation of National Water Convention

The 10th National Water Convention (NWC) was held at Bhubaneswar during 5th – 7th November, 2003. The Convention was sponsored by the Union Ministry of Water Resources and jointly organized by the State Government of Orissa and the National Water Development Agency (NWDA).

The themes and the sub-themes for Convention were:

Theme A: Integrated Water Resources Development and Management.

- (i) To Evolve Framework and Strategies of Integrated Water Resources Development and Management.

- (ii) Interbasin Water Transfer as probable future solution for meeting the conflicting demands of Water Resources by different sectors.

Theme B: Conservation of Water in Agriculture and Industrial Sectors.

- (i) To Evolve Policies and Strategies in Conservation of Water Resources in Agricultural and Industrial Sector.
- (ii) Present Status of Water Use in Agricultural and Industrial Sector in India.
- (iii) To adopt measures in Reducing/Optimising the Water Uses in Agricultural and Industrial Sector.

47 technical papers were received/ presented from eminent engineers, academicians, researchers etc. Important issues like Integrated Water Resources Development and Management, Evolving Decision Support System & Strategies of Water Resources Development, Integrated River Basin Planning, Problem of water losses in Industry and Agriculture and possible way and means to conserve were discussed during the Convention.

252 delegates from different walks of life and parts of the country participated in the Convention.

The main recommendations of the Convention are: Appropriate River Basin Organisations should be established for Integrated Water Resources Development and Management. The issues involved therein should be addressed at three levels viz., National, Basin and Watershed. Augmentation and

Conservation of water to be adopted in an integrated manner at the river basin level. Regular water auditing should be carried out by all the users and water conservation measures should be evolved and adopted. All feasible sources of water should be judiciously used with the involvement of all the stakeholders. Interbasin transfer of water within the State as well as inter State is essential and viable for meeting the conflicting demands of water in the water short areas along with associated other benefits. Women play a major role in use of water and therefore creation of awareness amongst them on water conservation needs is to be emphasized. Age old village tanks and systems that have lost their storage capacities and utility should be revived. Industries and Municipal bodies should ensure tertiary treatment of effluents so as to maintain the quality of water bodies at desired level. Suitable pricing of water for recovery of O&M charges will have to be effected for sustainability. IWRDM being complex issue, capacity building in the field is essential. Organizations concerned need to provide appropriate training facilities.

Finance and Accounts

The Ministry of Water Resources, Govt. of India has provided Grants-in-Aid of Rs.20.00 Crores under plan for NWDA for the year 2003-04. However final allotment approved by the MOWR is Rs.19.10 Crores. The actual expenditure up to 31st March, 2004 is Rs.19.70 Crores. The shortage of Rs.0.60 Crores was met through the savings of previous years.

Foot Note : The UPA Government in its Common Minimum Programme has indicated that a comprehensive assessment of the feasibility of the project of Intelinking of Rivers of the country, starting with Southern/ Peninsular Rivers will be carried out. This assessment will be done in a fully consultative manner and the possibility of linking sub-basins/basins of the same rivers in states like Bihar will also be explored.

CHAPTER 2

COMMAND AREA DEVELOPMENT PROGRAMME

The existing Centrally Sponsored Command Area Development Programme (CADP) was started in 1974-75 for a systematic development and management of command areas of major and medium irrigation projects in the country to optimize agricultural production and productivity. The main components of the programme are:

- a. On-Farm Development (OFD) works such as development of field channels and field drains; land leveling and shaping; reclamation of waterlogged areas; enforcement of “Warabandi” for equitable distribution of water to individual fields etc.
- b. Selection and introduction of suitable cropping patterns;
- c. Development of ground water to supplement surface irrigation (conjunctive use under Minor Irrigation sector); and
- d. Encouraging farmers for Participatory Irrigation Management.

The programme has been restructured as Command Area Development and Water Management (CADWM) programme to bring greater water use efficiency and wider participation of beneficiaries and is poised for implementation w.e.f. FY 2004-05. Salient feature of the restructured CADWM programme are given in subsequent sections.

Programme Coverage

The existing programme was initiated in 1974-75

with 60 major and medium irrigation projects. So far 310 irrigation projects with a Culturable Command Area (CCA) of about 30 m.ha. spread over 28 States and 2 Union Territories have been included under the programme, out of which CAD works in 162 projects have been completed and Central assistance closed. Twenty three ongoing projects have been clubbed into 8. The restructured programme will thus run in 133 projects during the remaining three years of X Plan.

Programme Implementation

The Command Area Development and Water Management (CADWM) Wing of the Ministry of Water Resources coordinates and monitors the implementation of the Command Area Development Programme at the National level. Progress of the projects under the Programme is monitored through physical and financial progress reports of the programme received from the States. The quality of OFD works is ensured through field monitoring of selected projects by the Central Water Commission and periodic field visits of the officers of CADWM wing. For proper implementation of the programme activities technical guidelines and manuals are circulated to the States from time to time. Review meetings, workshops, seminars on different technical and managerial aspects are held periodically.

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, and Uttranchal, CAD Authorities have not been constituted and the Programme is being administered through the line Departments concerned.

Financing Pattern

Under the existing Command Area Development Programme, Grants are given to State Governments for execution of various CAD activities.

Evaluation of the programme made in the past has revealed that the CAD Programme indicated a positive impact on various important indicators like increase in the irrigated area, productivity and production, irrigation efficiency etc. Another 13 projects are under the process of evaluation.

Financial Achievements

An amount of Rs.2756.14 crore has been released to States as Central Assistance under the existing CAD Programme upto March 2004 since its inception. An outlay of Rs.202 crore has been provided under the Central Sector for implementation of the Programme during 2003-2004 and Rs.141.45 crore was released to the States.

The X Plan outlay for the on-going Command Area Development Programme is Rs.1406 crore. Approved plan outlays and financial releases during the IX Plan and for the year 2002-03 and 2003-04 under X Plan are given in the following table.

(Rs. Crore)

Plan	Year	Approved Outlay	Releases	%age of releases
IX Plan	1997-2002	854.77	764.27	89.41
	2002-2003	202.00	152.16	75..32
X Plan	2003-2004	202.00	141.45	70.02*

* Lower rate of release during 2003-04 is attributed to the late approval of the scheme.

Physical Achievements

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

supply). The physical targets and achievements in respect of the core components of on-farm development works during the IX Plan and year 2002-03, cumulative progress upto March 2003 and targets during 2003-04 are given in the table below:

(Million ha.)

Item of work/ activity	Progress during IX Plan		Progress during 2002-03		Cumulative Progress upto March,03	Targets During 2003-04**
	Target	Achievements	Target	Achievements		
Field Channels	0.950	1.783	0.587	0.471	16.19	0.51
Field Drains	0.10	0.313	0.127	0.138	1.19	0.17
Warabandi	3.000	1.552	0.386	0.34	10.52	0.53

**tentative

The proposed targets under restructured programme for remaining 3 years of X plan period are as under:

(Million ha.)

Item	Restructured CADWM Programme (2004-07)
Correction of system deficiency up to design discharge of 150 cusecs	1.00
Field channel/full package OFD works	0.50
Field drains/intermediate drains/link drains	0.10
Warabandi	0.50*
Reclamation of waterlogged areas	0.05
Renovation of tanks	0.18

* No central assistance is to be provided from FY 2004-05 onwards for this activity

Training Programmes

The Ministry of Water Resources provides financial assistance for training of functionaries and farmers on various aspects of the CAD Programme. The training programmes are meant for officials of the State Government as well as the farmers. While the senior level officers are trained on aspects of policy planning and preparation of action plans, the middle and junior level officers are trained on technical, procedural, implementation aspects. Farmers, on the other hand, are provided education about agricultural development and efficient management of water for irrigation.

Reclamation Of Water-Logged Areas

Despite best efforts for efficient irrigation water management, the problem of water logging has surfaced in many irrigated Commands. The Ministry of Water Resources has, therefore, introduced a component of Reclamation of water-logged areas under the Centrally Sponsored Command Area Development Programme with effect from 1st April, 1996. Under this component 441 schemes of nine States namely Bihar, Gujarat, Madhya Pradesh, Jammu & Kashmir, Karnataka, Kerala,

Maharashtra, Orissa and Uttar Pradesh have been approved till now at an estimated cost of Rs. 44.45 crores for reclamation of 57,123 ha of water logged area. Out of this, an area of about 35000 ha has been reported to be reclaimed by these States upto March, 2003.

Restructured Command Area Development And Water Management Programme

Based on the recommendations of the Working Groups of the Planning Commission on "Command Area Development Programme" and "Private Sector And Beneficiaries Participation in Irrigation Water Management" and the views expressed by the State Governments the existing CAD Programme has been restructured and renamed as "Command Area Development and Water Management" Programme. The restructured programme retains the components of the existing scheme which have been found to be beneficial to the farmers, include a few new components considered necessary for correction of deficiencies in the irrigation system and delete those components which have lost their utility overtime. The details of the components under the restructured programme are as under:

-
- a. Survey, planning and designing of On Farm Development (OFD) works;
 - b. Construction of field channels, now with a minimum of 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 of 10% beneficiary contribution;
 - d. Warabandi (to be continued without central assistance);
 - e. Construction of field drains, intermediate and link drains for letting out surplus water;
 - f. Reclamation of waterlogged areas of irrigated commands using conventional techniques and including bio-drainage wherever applicable, now with a minimum of 10% beneficiary contribution;
 - g. Software components such as trainings of farmers and field functionaries & officials, adaptive trials & demonstrations, action research for Participatory Irrigation Management, seminars/ conferences/ workshops, monitoring & evaluation of the programme etc. through Water and Land Management Institutes (WALMI) and other institutions with hundred percent funding from Government of India;
 - h. Institutional support to Water Users' Associations;
 - i. Establishment cost - 20% of OFD works items (b), / (c), (e), and (f) and;
 - j. R & D Activities, including training of senior level officers, conferences, workshops, seminars etc. arranged directly by the Ministry.
 - k. Correction of system deficiencies above the outlet up to distributaries of 4.25 Cumec (150 Cusec capacity);
 - l. Renovation and de-silting of existing irrigation tanks including the irrigation system and control structures within the designated irrigation commands with a minimum of 10% beneficiary contribution as maintenance fund, the interest from which has to be used for maintenance in future.
 - m. Use of location specific bio-drainage techniques to supplement conventional techniques for reclamation of waterlogged areas as a part of item (vi) under the continuing components.
- The restructured programme is poised to take-off w.e.f. 1st April 2004.
- 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 utilization of irrigation water. The participation of farmers in the management of irrigation would give responsibility for operation & maintenance and collection of water charges from the areas under the jurisdiction of the Water Users' Association. To encourage the formation and functioning of Farmer's Associations, a one time functional grant of Rs. 500 per ha. to be shared by Centre, State and farmers at the rate of Rs. 225:225:50 respectively is being provided, which under the restructured programme, has been enhanced to Rs. 600/- per ha. in the same ratio.
- 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 involving field channels, field drains, water logging, desilting and renovation of tanks etc.

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, Goa, Karnataka, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu and Kerala have either enacted exclusive legislation or amended their Irrigation Acts for involvement of farmers in irrigation management. Some States like Maharashtra and Gujarat had experimented with the idea of farmers' co-operative movement in irrigation management and are in the process of enacting acts for Participatory Irrigation Management (PIM). Other States are also taking steps in this direction.

With effect from August 2003, Participatory Irrigation Management (PIM) has been identified as one of the thrust areas in the water resources sector for the country as a whole and its progress is being monitored by the Prime Minister's Office (PMO) and a Committee of Secretaries. States, which have not yet enacted relevant act to facilitate participation of stakeholders in Irrigation Management, were asked to implement the same. An indicative roadmap and some milestones have also been suggested for promotion of PIM to take a time bound action in the matter.

So far, 41247 Water Users' Associations have been formed in various States covering an area of about 86.82 lakh hectares under different irrigation projects.

Revised Targets under the Restructured Command Area Development and Water Management Programme

The total outlay for the restructured programme for the remaining three years of X Plan is Rs 1002 crore. The details of physical targets for 2004-05 and 2004-05 to 2006-07 are as under:

(Million ha)

No.	Activity	2004-05	2004-05 to 2006-07
1.	Correction of System Deficiency	0.30	1.00
2.	Survey Planning & designing of OFD Works	0.16	0.50
3.	Field Channels/ Full Package OFD Works	0.16	0.50
4.	Field drains/ intermediate drains/link drains	0.03	0.10
5.	Warabandi (central assistance not to be provided)	0.16	0.50
6.	Reclamation of waterlogged areas	0.02	0.05
7.	Institutional support to Water Users' Associations	0.28	0.86
8.	Renovation of Minor Irrigation tanks	0.06	0.18

CHAPTER 3

GROUND WATER AND MINOR IRRIGATION

CENTRAL GROUND WATER BOARD

Organisation

The Central Ground Water Board (CGWB) is a subordinate office of the Ministry of Water Resources. It is responsible for carrying out nationwide surveys and assessment of ground water resources and guiding the states appropriately in scientific and technical matters relating to ground water. The Central Ground Water Board has generated valuable scientific and technical data through regional hydrogeological surveys, ground water exploration, water quality monitoring and research and development. The Board also organizes in-service training programmes for its own as well as other Central and State Government officials. It assists the States in developing broad policy guidelines for development and management of ground water resources including their conservation, augmentation and protection from pollution, regulation of extraction and conjunctive use of surface water and ground water resources. The Board organizes Mass Awareness programmes to create awareness on various aspect of ground water investigation, exploration, development and management.

The Board is headed by a Chairman and has ten Members. The Chairman and four of the Members are on the regular strength of the Board. The Members broadly look after Surveys, Assessment and Monitoring (SAM) Wing; Sustainable

Management and Liaison (SML) Wing; Exploratory Drilling and Materials Management (ED&MM) Wing and Training and Technology Transfer (T&TT) Wing. The Board has 18 Regional Offices, each headed by a Regional Director with seventeen supporting Engineering divisions and Ten State Unit Offices for undertaking various field activities in the country.

For the purpose of regulation and control of ground water development and management the Central Ground Water Authority (CGWA) was constituted on 14th January, 1997 under Environmental (Protection) Act, 1986. Its membership is the same as that of CGWB.

ACHIEVEMENTS

District Ground Water Development And Management Studies

These surveys are carried out to evaluate the impact of various developmental activities like withdrawal of ground water, urbanization and introduction of surface irrigation scheme on local ground water regime in time and space. During 2003-2004, an area of 2.08 Lakh sq. km has been covered.

Exploration of Ground Water

The exploration of ground water to study the sub-surface geological and hydrogeological setups and evaluate various aquifer parameters is carried out by the Board with a fleet of 90 drilling rigs (38 Direct Rotary, 38 Down the Hole and 14 Percussion Combination types) and also through outsourcing.



Deep G.W. Exploration - Water well drilling rig.

During the year 1339 wells have been constructed against a target of 1317. Out of these 98 were high yielding.

Monitoring Through the National Hydrograph Network Stations

The Board is monitoring the ground water levels in the country four times a year (Jan/May/Aug/Nov) through a network of 15236 National Hydrograph Stations. The 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 2003 and Jan, 2004 is completed in all the Regions and respective reports have been submitted consisting the fluctuation of water levels compared to monitoring of previous year, Decadal average and pre-monsoon monitoring.

Studies on Ground Water Recharge

The Board implemented Central Sector Scheme during IXth Plan on pilot basis for Artificial Recharge of ground water at an estimated cost of Rs. 35.81 crores. The scheme was implemented in Over-Exploited, Dark and Grey Blocks, potential areas having surplus monsoon runoff and sufficient subsurface storage and also in areas of ground water pollution and hilly terrains. Percolation tanks, Check dams, Recharge wells, Recharge shafts/pits, spring development and sub-surface dykes have been constructed, under this scheme, 174 projects in 27 states/UTs in the country were taken up for construction of various recharge structures.

The objective of the scheme was to evolve standard and economic designs of recharge structures for various types of hydrogeological setups. The construction of these structures has helped in

arresting the decline in the ground water table and provided additional irrigation benefits. Besides, augmenting the recharge to ground water, this scheme also helped in upgrading the technical competence and skills of the personnel in the States and NGO's for taking up such works at other places.

During the year 2003-2004, 33 on-going projects in the 13 States/UTs were completed. In 23 projects in 9 States/UTs the civil work is 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. Recommendations are being made for inclusion of

provisions for Conjunctive Use of Surface and Ground Water and periodic monitoring of ground water regime in the command areas of the projects. Apart from this the Board is also scrutinizing the reports of National Water Development Agency, use of ground water for use in power plants and other miscellaneous infrastructural projects. Two proposals for projects located in Orissa & Chattisgarh and U.P. were scrutinised during the year.

Reports, Maps and Atlases

These reports have been categorised as project reports, survey reports, district reports, state reports, basic data reports, maps and atlases. During 2003-2004, 21 Ground Water Year Books, 2 State Reports and 2 Hydrogeological atlases were prepared. 5 Hydrogeological atlases of Chandigarh,



Hon'ble Union Minister of Water Resources Shri Arjun Charan Sethi releasing the district Groundwater Map at CGWB, Faridabad.

Chhattisgarh, Jharkhand, Andaman & Nicobar and Lakshadweep have been edited and are under final compilation. The Board had prepared Hydrogeological Map of India on 1:2 million scale and the same was released by the Hon'ble Minister of water Resources on 12/12/2003.

Basic Hydrogeological Research /Special Studies

During the year 2003-04, six studies are undertaken by the Regional Offices of the Central Ground Water Board. In Punjab water level behavioural studies of shallow and deeper aquifers in Patiala district Ropar districts were taken up and report is under compilation. In MP two studies namely Study of efficiency of different well development methods in alluvial area of Hoshangabad district. Hydrogeological study of geothermal springs in Hoshangabad and Chhindwara district is completed and the report is under compilation. In Chhattisgarh study of springs in Raigarh distt. is completed and report writing is under progress. In Guwahati Problem of water logging and remedial measures are being suggested.

Water Quality Analysis

There are 16 well equipped Regional Chemical Laboratories and one at CHQ, Faridabad to carry out chemical analysis of water samples collected from National Hydrograph stations, and those collected during Ground Water Exploration, Systematic Hydrogeological surveys, Short Term

Investigations etc. Thirteen laboratories are equipped with Atomic Absorption Spectrophotometer to carry out the analysis of toxic elements and heavy metals at micro level. Four chemical laboratories are equipped with Gas Chromatograph (GC) to take up the analysis of organic pollutants (Pesticides etc). Fourteen laboratories are equipped to carry out bacteriological analysis. During the year 19,402 samples have been analyzed for basic/specific constituents and 10,423 samples have been analyzed for Arsenic and heavy metals such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc. In addition 30 samples for organic constituents and 84 samples for pollution have also been analysed.

Conjunctive Use Studies

Conjunctive Use Studies aimed at devising strategy for optimum utilization of surface water and ground water has been taken up in three command areas.

1. Conjunctive use of ground water & surface water in Sri Ram Sagar command, A.P.
2. Conjunctive use of ground water & surface water in Rushikulya Command, Orissa,
3. Conjunctive use of ground water & surface water in West Yamuna Canal Command, Haryana

The above three studies are completed and modeling studies are under progress.

Research & Development Schemes

Central Ground Water Board under its R&D programme with the approval of Indian National Committee of Hydrology (INCOH) has under taken eight schemes in association with state governments and universities as listed below.

Sl No.	Project Name	Implementing Agency
1.	Impact of Urban, Industrial & Agricultural Pollution in Surface and Ground Water in and around Hyderabad and Secunderabad -A.P.	Dept. of Geology, Osmania University, Hyderabad, A.P .
2.	Hydrofluorosis in Halia River, Environs; Nalgonda district, A. P. A case study of Intensity and Source.	Dept.of Geology, Osmania University, Hyderabad,.A.P.
3.	Study of Trace Metal in Surface and Sub-surface Water in and around Tirupati.	Dept. of Geology. S. V. University, Tirupati..
4.	Impact of Urbanisation on Ground Water- A Study from Jaipur City & its Hinterland,	Dept. of Geology, Univ. of Rajasthan, Jaipur .
5.	Cause effect & Remedial measure of Arsenic contamination in Ground Water Aquifers in parts of West Bengal.	State Water Investigation Directorate, Govt. of West Bengal
6.	The Effect of Water Logging and Intensive Agriculture on Ground Water Regime in Deltaic Region.	Dept. of Geophysics, Andhra Univ.Vishakhapatnam, A. P
7.	Ground Water Management Studies in Upper Gondwanas of West Godavari District, A. P.	Dept, of Geology, Andhra Univ.Vishakhapatnam,A.P.
8.	Environmental Studies of Surface and Ground Water down stream of Pennar River, A. P .	Jawaharlal Nehru Technology Univ. Hyderabad.

Out of the eight studies, two studies have been completed and final report has been submitted.

Following nine schemes have been approved for implementation by the respective organisations for a total cost of about Rs. 3 crores during the current year.

Sno	Project Name	Implementing Agency
1.	Geohydrological Studies for Augmentation of Spring Discharge in Western Himalayas.	G. B. Pant Institute of Himalayan Environment & Development, Garhwal
2.	Study of Fluvial Geomorphology and Tectonics of the Khari- Mashi drainage Basin, Rajasthan for data base preparation and ground water recharge capability Assessment.	Birla Institute of Scientific Research, Statue Circle, Jaipur.
3.	Ascertaining Arsenic Mobilization in soil - water -plant systems and exploring the possible remedial measures.	Bidhan Chandra Krishi Viswavidalaya, Kalyani, Nadia, West Bengal.
4.	Feasibility study of Artificial Recharge in Kongal River Basin, a Hard Rock Region Nalgonda District, A,P	NGRI, Hyderabad

5.	Studies in Salt Water Intrusion in Coastal Dakshin Kannada District, Karnataka	Karnataka Regional Engineering College, Srinivasnagar, Surathkal
6.	Water harvesting and water conservation in Imphal East I block, Imphal East distt. Manipur.	Research & Development Division, Manipur Science & Technology Council, Imphal, Manipur
7.	Ground water modeling and aquifer vulnerability studies in Yamuna-Krishni sub-basin, Mujafarnagar, distt U.P.	Deptt. Of Geology, Aligarh Muslim University
8.	To assess the impact of septic tanks on ground water and spread of wate borne diseases, and to identify means to solve the problems created by the waste water in Balrampur distt U.P.	Deptt. Of Civil Engineering Jamia Millia Islamia, New Delhi.
9.	Ground water behaviour in connate water areas and hard rock terrains of Orissa with respect to different schedules of pumping and varied draw down conditions.	Directorate of Ground water survey and investigation, Bhubaneswar, Govt. of Orissa.

Further, during the current plan period ten R&D projects are proposed to be taken up.

CENTRAL GROUND WATER AUTHORITY (CGWA)

The achievement of various activities during the year is as follows

I Declaration of 32 blocks/ areas / corporations as notified areas for registration of ground water abstraction vide notification in Gazette of India, Extraordinary, Part III , Section-4 dated 9th October.

II. Mass Awareness Programme

The year 2003 was declared as Freshwater Year and special thrust was given for creating the mass awareness for about conservation and augmentation of water resources among the users policy makers etc. During the year, under this activity following are the achievements.

a) The Board has organized 52 Mass Awareness programme for ground water conservation, artificial recharge, ground water protection in

which around 12100 persons participated.

b) The Board has organized 47 water management training programmes in different parts of the state for designing rain water harvesting structures for augmenting the water. During the training around 1800 persons were trained.

c) Mass awareness through Media

For propagating the importance of water conservation protection and augmentation following programmes have been undertaken.

- Broadcasting of two spots on AIR.
- Telecast of one spot on Doordarshan.
- Broadcast of “Boond Boond ki Baat” every Monday between 900hrs & 1000hrs on AIR FM.
- Three films produced on rainwater harvesting in rural and urban area and ground water pollution

- Released 5 lakh Meghdoot post cards in 13 states/UTs
 - Slogans displayed on 21 Mail Vans in 4 States
 - Slogans painting on 1000 letter boxes complete in 34 States / UTs.
 - 5 Web sites launched.
 - 5000 copies of Rainwater Harvesting guide are printed and distributed free of cost.
- III. Registration of persons/ agencies engaged in the business of drilling and allied works – 1650 drilling agencies registered.
- IV. Evaluation of proposals of industries/ projects seeking ground water clearance - Ground water clearance accorded to 21 industries/Projects.
- V. Ground Water Clearance to Mineral/Packaged Drinking Water Agencies - Eight agencies were accorded ground water clearance for packaged drinking water.
- VI. Public Notices : Two Public Notices were issued during the period-
- (i) **Public Notice No. 3/2003:-** This Public notice was published in leading dailies in third week of June, 2003, extending last date to 30th November, 2003 for adoption of roof top rain water harvesting systems by Group Housing Societies in NCT, Delhi, Group housing societies/ institutions/ schools/ hotels/ industrial establishments/ farm houses in notified areas of South & South west districts of NCT, Delhi; Municipal Corporation of Faridabad and Ballabhgarh; Faridabad district, Haryana; Municipal Corporation of Ghaziabad, Ghaziabad district, U.P; Gurgaon town and adjoining industrial area of Gurgaon district, Haryana.

(ii) **Public Notice No. 4/2003:-** The notification of 32 critical areas for registration of ground water abstraction structures in states of Andhra Pradesh, Haryana, Madhya Pradesh, Punjab, Rajasthan, was published in November, 2003 in leading national newspapers of the respective states.

VII. Regulation of Ground Water Development

The Authority is regulating the ground water development in 11 notified areas 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, Diu; Municipal Corporation of Ghaziabad, Ghaziabad distt. U.P.; Hotwire block, Japer distt., Rajasthan; Haldia Municipal area, East Medinipur distt., W.B.; Gandhinagar Taluka, Gandhinagar distt., Gujarat and Gurgaon town and adjoining industrial areas, Gurgaon district, Haryana.

VIII Complaints received regarding violation of the directives of the Authority have been forwarded to respective Deputy Commissioners for legal action.

Rajiv Gandhi National Ground Water Training and Research Institute

During 2003-2004 seven training courses comprising five courses for technical / scientific and two for administrative staff have been conducted. In all 144 trainees attended the trainings.

Geophysical Studies

As an integral part of its activities, the Board undertakes geophysical studies to support and supplement hydrogeological surveys, ground water

exploration and short-term water supply investigations. Besides these studies, geophysical techniques are also used to demarcate bedrock configuration and thickness of overburden and saline-fresh water interface and ultimately help in carrying out hydrogeological studies, well construction etc. So far 1691 Vertical Electrical Sounding and 163 bore hole logging has been completed in the various parts of the Country.

Short Term Water Supply Investigations

These investigations are carried out for locating sites for ground water structures and designing of tubewells and water lifting devices to provide a dependable water supply system in rural and urban areas, Railway and industrial establishments with priority being given to Defence Organisations. During 2003-2004, 247 investigations have been carried out.

Data Storage And Retrieval

The Board is collecting voluminous data from on various aspects of ground water investigation, development and management. The task of design, analysis and development of software for organization, management and analysis of the data generated has been completed under Hydrology Project. The data of ground water level from the National Hydrograph Network Stations has been computerized.

Ground Water User Maps

- District Ground Water User Maps for 500 districts have been prepared for dissemination of ground water related information to the public.
- Maps of 9 States namely Haryana, Himachal Pradesh, Madhya Pradesh, Tamilnadu, Punjab, Uttar Pradesh, Rajasthan, Pandicherry and Karnataka released.

Estimation Of Ground Water Resource Based On GEC - 1997 Methodology

As per the National Water Policy 2002, the ground water resource potential is to be re-assessed periodically on scientific basis. Accordingly, the ground water resource of the entire country is being presently re-assessed based on the latest methodology GEC – 97. Twelve States / UT have re-assessed the ground water resource potential.

Land and Buildings

During the year construction of Office buildings for the HQ office at Faridabad and North Western Regional Office at Chandigarh was completed and the construction was in progress for the office buildings at Bangalore and Hyderabad. The HQ office building at Faridabad was inaugurated by the Hon'ble Union Minister of Water Resources, Shri Arjun Charan Sethi on the 12th Dec.2003.

MINOR IRRIGATION

Minor Irrigation Schemes are those Ground Water and Surface water schemes, which have a Culturable Command Area (CCA) up to 2000 hectare individually. Ground Water development is primarily done through individual and cooperative efforts of the farmers with the help of institutional finance and their own savings. 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 M.ha. As per Census of minor irrigation schemes conducted by the Ministry for the year 1993-94, the irrigation capacity created in the Minor irrigation sector covers about 2/3rd of the country's total irrigation capacity.

Rationalisation Of Minor Irrigation Statistics (RMIS) Scheme

A centrally Sponsored Plan Scheme “Rationalisation of Minor Irrigation Statistics (RMIS)” is under implementation. Under the RMIS Scheme, a Census of the Minor Irrigation projects is conducted every five years to create a reliable database for planning the development of the Minor Irrigation Sector. A sample survey on Minor Irrigation Schemes is also conducted. In between the two censuses under the scheme, Statistical Cells have been created in the nodal departments of 30 States/UTs. So far the State of Jharkhand has not created the Statistical Cell, the UT of Pondicherry has created Statistical Cell from their own and there is no need for creation of Statistical Cell in the UTs of Chandigarh, Daman and Diu and Lakshadweep because of insignificant MI authority. These Cells are responsible for collection of Quarterly

Progress Reports on development of Minor Irrigation from concerned Departments and furnish the same to this Ministry. The Officers/Staff posted in the Statistical Cells also help in conduct of Census as well as Sample Survey pertaining to Minor Irrigation Schemes. The Quarterly Progress Report data received from the Statistical Cells from States and UTs is processed in the Ministry for preparation of up to date statistics of progress of Minor Irrigation Schemes.

A Sample Survey on Status of Minor Irrigation Schemes with reference year 1998-99 has been completed in all the States/UTs except in Madhya Pradesh.

The 3rd Census of Minor Irrigation Projects with reference year 2000-2001 is being conducted in all the States/UTs. All the States/UTs except Goa, Gujarat, and Maharashtra & Manipur have furnished



Hon'ble Union Minister of Water Resources Shri Arjun Charan Sethi inaugurating the Bhujal Bhawan, Headquarter of CGWB, Faridabad.



Inauguration of training on "Rainwater Harvesting for Women Water Managers" - 23-24 March, 2004

CD containing data relating to the 3rd Census of Minor Irrigation Schemes with reference year 2000-01. The computerised data furnished by the 29 States/UTs on Compact Disk (CD) has been validated by National Informatics Centre, Ministry of Water Resources. The district wise Census reports are being scrutinized in Central Census Cell.

The sample check of the 3rd Census data, monitoring the progress of the States/UTs and National Informatics Centre, Ministry of Water Resources, scrutiny and examination of district wise reports of States/UTs is being done by the Minor Irrigation (Statistics) Division, Ministry of Water Resources. Sample check has been completed in 27 States/UTs. Census data in respect of Andhra Pradesh, Chandigarh & Pondicherry has been finalised.

CHAPTER 4

EASTERN RIVERS & FLOOD CONTROL

FLOOD MANAGEMENT

Although flood management falls within the purview of State Governments, however 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 2003-04 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 of Bihar, Uttar Pradesh, Uttaranchal and West Bengal by the respective state governments; and in and around Farakka Barrage Project by Farakka Barrage Project Authority (FBPA), a Centrally Sponsored Scheme "Critical anti-erosion works in Ganga basin States", was sanctioned in January 2001, which also continued during the first two years of X Plan. During the year 2003-04, an amount of Rs.9.355 crore has been released to these States besides Rs. 12.5 crore incurred by Farakka Barrage Project Authority. For identification of the critical schemes to be taken up during the remaining 3 years of the X Plan (2004-07), a Committee was set up under the Chairmanship of Chairman, GFCC comprising of members from the MOWR, CWC, CWPRS, FBPA and concerned States of U.P., Uttaranchal, Bihar,

Jharkhand & West Bengal. The Committee was also asked to review the recommendations contained in the earlier reports on the subject. The Committee identified prioritized schemes in consultation with the State Governments. Based on the recommendations of the above Committee, another Centrally Sponsored Scheme at an estimated cost of Rs. 178.85 crore with a central share of Rs.136.17 crore has been approved 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 to take up critical anti erosion works.

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 Governments to take up works.

(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, is in operation 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. During the year 2003-04, an amount of Rs.4.18 crore in respect of Kosi project and Rs.1.21 crore for Gandak project was reimbursed to the State Governments of Bihar and Uttar Pradesh respectively.

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

The scheme is in operation 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 certifying the 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.46 crore has been provided as outlays in the Xth Plan against which Rs.1.50 crore has been released to the Government of Bihar. The Government of India through Ministry of External Affairs is providing funds to His Majestic Government of Nepal for execution of works on the Nepalese side.

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

Government of India has sanctioned in February 2004, a Centrally Sponsored Scheme estimated to cost Rs.54.57 crore with a central share of Rs.49.62 crore to take up works relating to improvement of drainage in critical areas of the country. The scheme aims to improve the drainage conditions of critical areas affected due to floods in the States of Andhra Pradesh, Bihar, Orissa and Uttar Pradesh with central share of Rs.5.45 crore, Rs.27.39 crore,

Rs.13.13 crore and Rs.3.65 crore respectively. The scheme among other benefits will also increase the agricultural production in these areas. The works under the scheme shall be executed by the respective State Governments and completed by March 2007 within the Xth Plan period.

(v) Flood Proofing Programme in North Bihar

Flood Proofing Programme in North Bihar has also been continued for implementation during the first two years of the Xth Plan. An amount of Rs.1.25 crore was released to the State Government of Bihar during the year 2003-04. The scope of this scheme is proposed to be enlarged to include the States of Bihar, Uttar Pradesh, West Bengal, Orissa, Assam and Andhra Pradesh for implementation during 2004-2007. The formulation of the scheme will depend upon the evaluation of performance of the completed works in Bihar.

BRAHMAPUTRA BOARD

Introduction

The Brahmaputra Board, an autonomous 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 Valleys and extends over all the seven states of North-East Region of the country.

The main functions assigned to the Board are to carry out survey and investigation and to prepare Master Plan for the control of floods, bank erosion and improvement of drainage congestion, giving due importance to the development and utilization of Water Resources of the Brahmaputra and Barak Valleys for irrigation, 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 the Central Government and to take up construction & maintenance of the projects approved by the Central Government and works connected there with as proposed in the Master Plan and also to maintain and operate such dams and works.

Organisation

The Board consists of 4 full-time Members comprising the Chairman, the 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 Departments of Government of India, namely Central Water Commission, Central Electricity Authority, India Meteorological Department and Geological Survey of India.

In pursuance of the Brahmaputra Board Act 1980, a High Powered Review Board to oversee the works of the Brahmaputra Board was constituted in 1982 consisting of the Union Minister for Irrigation (now renamed as Water Resources) as Chairman, Chief Ministers of Assam, Manipur, Meghalaya, Nagaland, Tripura, Arunachal Pradesh and Mizoram and Union Minister of State for Power, Union Minister/Minister of State for Agriculture, Union Minister/Minister of State for Surface Transport, Secretary Ministry of Water Resources, Government of India, Chairman, Central Water Commission as Member and Chairman, Brahmaputra Board as Member-Secretary. Member (River Management), CWC is a permanent invitee to the meetings of the High Powered Review Board.

Activities of Brahmaputra Board:

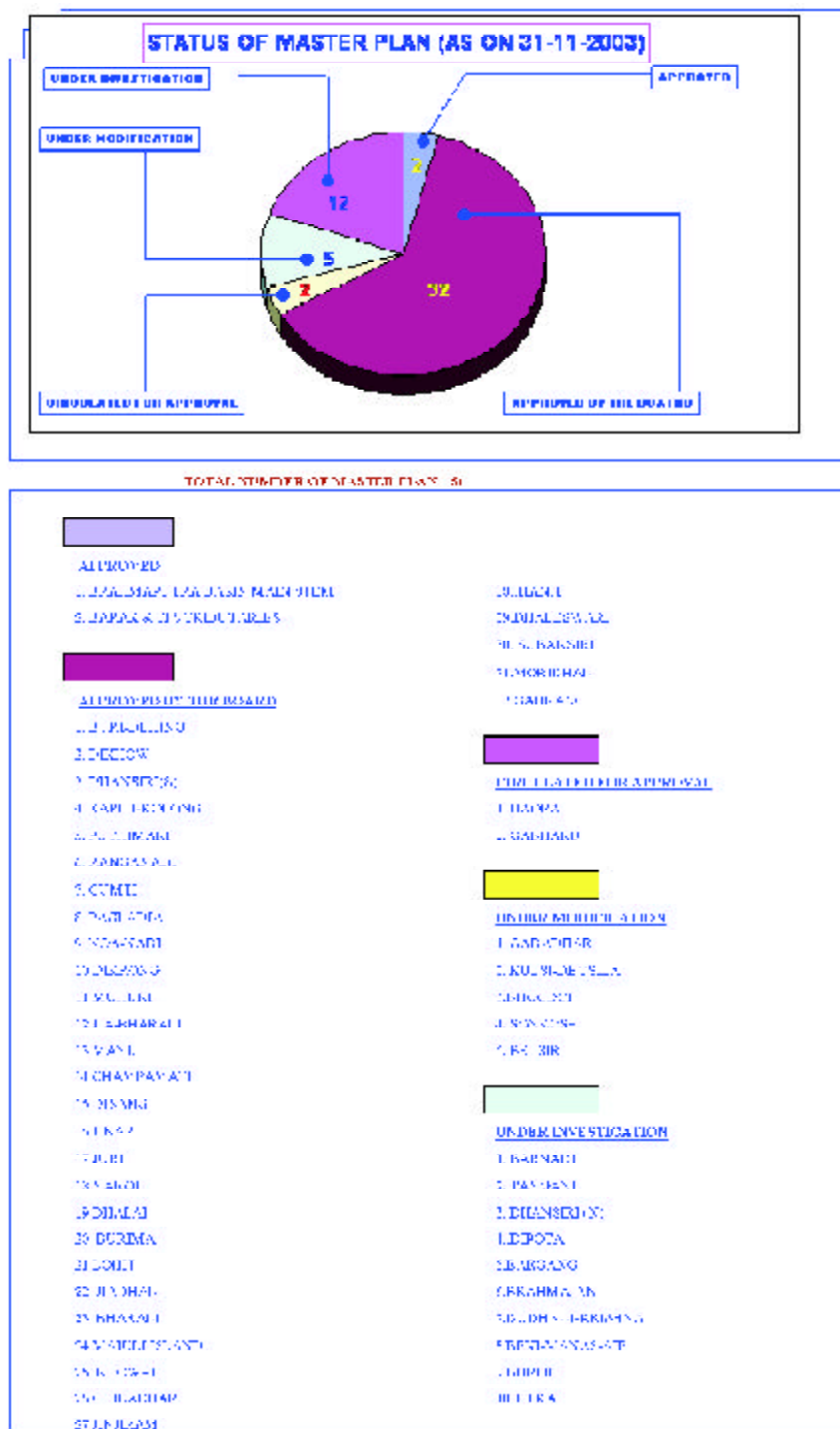
The Master Plan Part-I (main stem of Brahmaputra)

and Master Plan Part-II (Barak and its tributaries) were approved during 1997. The approval was accorded after incorporation of compliance of all comments/ observation received from the State/ Central agencies and members of Board. The formulation of draft Master Plan Part-III comprising 41 numbers of tributaries of the river Brahmaputra and 8 rivers of Tripura was started during 1989-90 and completed in March, 1993. These were circulated to all the Departments/Agencies concerned. On the basis of comments/suggestions received from various State /Central Govt. Departments, these Master Plans were modified. So far Brahmaputra Board has cleared 32 numbers of Master Plans. 27 Master Plans have been approved by Government of India during the current year. The status of various Master Plans is given at Table 4.1.

Brahmaputra Board has identified 34 nos. of Drainage congestion areas in Brahmaputra and Barak Basins. Out of these, 22 nos. are in Brahmaputra Basin, 8 nos. in Barak Basin and 4 numbers in Tripura. Out of above one Scheme is under execution by the Brahmaputra Board while the others are at different stages of investigation and preparation of DPR.

Brahmaputra Board is preparing Detailed Project Reports for various Multipurpose Projects, which are at different stages of progress.

The North Eastern Hydraulic & Allied Research Institute was established at North Guwahati with facilities of Hydraulic, Soil Testing, concrete and Rock Mechanics Laboratory. Under the guidance of CSMRS, CWPRS, the Brahmaputra Board has successfully carried out sample testing as requisitioned by various organizations like NEEPCO, CWC, NEC, NHPC, State Govts of Assam, Manipur, Meghalaya and Mizoram for various on going projects in the N.E. Region.

Table 4.1

Schemes under Execution by Board:

A) Pagladiya Dam Project: - On receipt of clearance from Govt. of India, Brahmaputra Board has started execution of preliminary works of Pagladiya Dam Project. The project has the following three main components-

- i) Unit 1 - Dam and appurtenant.
- ii) Unit 2 - Canals & Drainage work
- iii) Unit 3 - Power

The project is to provide assured irrigation to a gross command area of 54,160 ha., flood benefit to about 40,000 ha. & incidental Hydro power generation of the order of 3 MW (installed capacity)

Board has so far acquired 956 ha. of land out of total requirement of 3238 ha. for rehabilitation & resettlement purpose of project affected families. Different infrastructure work i.e. roads, community Halls are presently under execution.

The approved cost of the project is Rs. 542.90 crore. However, the Board has framed a revised cost estimate amounting to Rs. 1049.16 crore. The revised cost estimate is under process for approval of PIB and CCEA. In the meantime documents for pre qualification for construction of Dam & Spillway is in the process of finalization.

B) Harang Drainage Development Scheme:- Harang Drainage Development Scheme with an estimated cost of Rs. 30.49 crore is presently under execution by the Board. The scheme is likely to be completed by March, 05. On completion of the schemes, there will be benefit of 11850 ha. of chronically drainage congested area of Barak Valley in Assam

C) Avulsion of Brahmaputra at Dholla Hatighuli in Assam:- As part of the anti-erosion measures a Scheme, namely, Avulsion of Brahmaputra at Dholla-Hatighuli in Assam at an estimated cost of Rs. 10.47 crore was taken up for execution by Brahmaputra Board during the year 2002-03 major portion of which was completed last year. The remaining portion of the above Scheme and the Phase-II at an estimated cost of Rs. 5.22 crore is being executed during the current year based on the recommendations of a Committee consisting of experts from Brahmaputra Board, Central Water Commission, Central Water & Power Research Station, Pune and State Government.

D) Protection of Majuli Island:- On the basis of the recommendations made by the Expert Committee, the Brahmaputra Board has taken up immediate measures for the protection of Majuli Island through a Scheme which has been approved by Govt of India at an estimated cost of Rs. 6.22 crore. The works are in full swing and are expected to be completed before the onset of monsoon.

E) Besides above, the Govt of India also approved the following schemes for implementation by Brahmaputra Board:-

1. Protection of North Guwahati township (Rangmahal) from flood & erosion of river Brahmaputra (Estimated cost: Rs.305.00 lakh)
2. Protection of Kushiabil & Durgajan village at Dimapur (Estimated cost: Rs.309 lakh)
3. Barbhag Drainage Development Scheme (Estimated cost: Rs. 723 lakh)

The preliminary works in respect of the above Schemes is also being initiated by the Board.

GANGA FLOOD CONTROL COMMISSION

Introduction

Ganga Flood Control Commission (GFCC), 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 Year 2003-2004:

Updating Of Comprehensive Plans For Flood Management :

Comprehensive Plans for flood management for all the 23 river systems of the Ganga basin have already



Bank protection works at chandpur dhamaun on left Bank of River Ganga

been prepared between 1975 and 1990. The updating of the Comprehensive Plans is being taken up which is a continuing activity of GFCC. Upto March 2003, Comprehensive Plans for 19 river systems have been up-dated.

This year, updating of Comprehensive Plans for the Ganga Main Stem, the Sone and the Gandak river system have been undertaken.

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 2003. Survey work in respect of waterways under bridges on main course of river Ganga from Buxar to Sahebganj planned for the year 2003-04, have been completed and report is under finalisation.

Monitoring of important flood management schemes

GFCC is monitoring 7 important flood management schemes namely (i) Buxar Koelwar embkt. scheme in Bihar (ii) Badlaghat Nagarpara embankment scheme in Bihar (iii) Ghea-Kunti basin drainage scheme in W.B (iv) Tamluk basin drainage scheme in W.B (v) Urgent Development works of Sunderban area in W.B. (vi) Punpun right bank embankment scheme, Phase-I in Bihar, and (vii) 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 in Nepal portion.
- Flood proofing programme in North Bihar.
- Raising, Strengthening and Extension of embankments of Lalbakeya, Kamla, Bagmati

and Khando rivers (Presently the works of raising and strengthening of embankments on Lalbakeya and Bagmati river in Indian portion are under progress).

- Critical anti-erosion schemes being executed by the states of West Bengal, Bihar, 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 2003, 17 weekly flood bulletins were issued. The Annual flood report for the year 2002 in respect of Ganga basin has also been prepared and circulated to all concerned. The Annual flood report for the year 2003 has been completed.

Performance evaluation of flood management schemes

During the year 2003-2004, the work on performance evaluation study of Lucknow Town Protection scheme in U.P. has been completed by the consultant and the final report has been submitted.

Technical examination of flood management schemes

Technical examination of the schemes is a continuing activity of the Commission. During the year 2003-2004, 34 Flood Management Schemes of the Ganga basin were examined up till March, 2004 out of which 8 schemes have been cleared. For 26 other schemes pertaining to various Ganga basin states, observations of GFCC have been sent to the concerned State Govts. for compliance. 4 flood proofing schemes of North Bihar have also been examined and the observations of GFCC have been sent to the concerned authorities for compliance.

Meetings

- A Seminar on flood problems faced by farmers of Tal area and their solutions was organised in Rajendra Agricultural University at Pusa, Samastipur, Bihar, on 29.12.2003, by GFCC, under the Freshwater Year – 2003 Programme of Government of India. In the Seminar, an in depth discussion was made involving engineers, agricultural scientists and farmers.
- Chairman, GFCC led the Committee set up to identify the critical anti-erosion schemes in Ganga Basin for inclusion under CSS for X plan (2004-07), report was prepared and submitted to the Ministry of Water Resources.
- 11th meeting of Steering Committee on flood proofing programme was held at New Delhi on 22nd October 2003.

Committees

Maintenance of flood protection works of Kosi and Gandak

The Kosi High Level Committee (KHLC) and the Gandak High Level Committee (GHLIC) under the leadership of the Chairman, GFCC, inspected flood protection measures taken for the Kosi and right bank of the Gandak in November 2003 at Kusinagar and Birpur respectively and made recommendations for the protection works to be undertaken before the flood season of 2004.

Standing Committee on inundation problem between India and Nepal

Standing Committee on inundation problem between India and Nepal was setup in the year 1986 in pursuance of the decision taken by the Prime Minister of India and His Majesty, the King of Nepal during discussion on 8th December 1985 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. So far 12 meetings have been held.

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 five meetings of the sub-committee have been held. The last meeting was held in November-December, 2003, in which various issues regarding construction of embankment on Lalbakeya, Bagmati, Kamla & Khando rivers were discussed.

The works on raising & strengthening of embankments on Lalbakeya river both in India and Nepal is in progress. The work on Bagmati river in Indian portion which was held up since July, 2002 has been resumed by Government of Bihar in January, 2004 on repeated persuasion of GFCC. The work on Bagmati embankment in Nepal portion has also been taken up.

FARAKKA BARRAGE PROJECT

Introduction

The problem of deterioration of Calcutta Port had drawn the attention of Engineers and politicians from time to time and numerous investigations were carried out on the Bhagirathi-Hooghly System to find a permanent solution of the problem related to gradual and continued deterioration of flow over various years which limited the draft in Hooghly for vessels and the vessels could travel upto the river bank and enter the Port. The Bhagirathi river which was earlier taking off from the Ganga about 40 km downstream of Farakka Barrage is one of the

important channel feeding the Hooghly system. The gradual silting of the off-take point of the Bhagirathi was found to be the main reason for reduced upland supplies into the Bhagirathi-Hooghly system. The problem was critically examined by several experts appointed by the Govt. of India who advised the construction of a Barrage across the GANGA at Farakka and a canal off taking the upstream of the Barrage to Bhagirathi for diversion of 40,000 cusecs continuous supply of water into the Bhagirathi-Hooghly system in order to prevent the deterioration of the Calcutta Port further and for its gradual improvement. Accordingly, the scheme for construction of the Farakka Barrage and ancillary structures was approved by the Govt of India.

Objectives

The increased upland supplies from the Ganga at Farakka into Bhagirathi have improved the navigability, reduced salinity in the system and ensured sweet water supply to Kolkata and surrounding areas from Farakka to Kolkata since its commissioning in 1975. The road cum rail bridges built across the river Ganga at Farakka establishes direct communication link to the north-Eastern states, Sikkim, Bhutan & Nepal.

The Hooghty-Bhagirathi, the Feeder Canal, and the navigation lock at Farakka form a part of the Haldia - Allahabad Inland Waterway (National Waterways No. 1) which has opened a new era of inland Navigation at a cheap rate.

The principal components of the project

- A 2245 metres long barrage across the river Ganga with 109 no. bays of 18.29m each. Head Regulator of 11 no. bays of 12.20 metres each on the right side of the Barrage.
- A 213 metres long barrage across the river Bhagirathi at Jangipur with 15 Nos. bays of 12.20 metres each.
- 38.38 K.M long Feeder Canal with 1133 cumecs (40000 cusecs) carrying capacity, taking off the head Regulator on the right of the Farakka barrage.
- Navigation locks at Farakka, Jangipur & Kalindri, Lock Channels, Shelter basins, Navigation lights and other infrastructures.
- Left Afflux Bundh of Farakka Barrage of 33.79 K.M length and Left Afflux Bundh of Jangipur Barrage 16.31 KM length.
- Anti Erosion measures, River Training Works, and flood protection works.
- 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
- Bagmari syphon at RD 48.0 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 complete fully. The anti erosion works in upstream and downstream 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.

For above, there are many Committees under whose guidance the works of Farakka Barrage Project are being carried. These Committees are:

- 1) The Farakka Barrage Control Board.
- 2) The Technical Advisory Committee (TAC) under the Chairmanship of Member (D&R), CWC with two subcommittees (a) Gate regulation committee, (b) Canal Study Group.
- 3) Committee for monitoring the progress under the Chairmanship of Member (D&R), CWC.

Progress of Works

All the principal works concerned with the two Barrages (Farakka Barrage and Jangipur Barrage), Feeder Canal and other structures have been completed well before schedule. The Farakka Barrage was inaugurated in 1975.

4 (four) spare gates have been procured along with 22 slop logs.

In the river Ganga, severe erosion is taking place in the districts of Malda & Murshidabad since long back

as such, the project has taken up flood protection works in 11.0 KM upstream & 6.9 KM downstream of Farakka Barrage and in the river Ganga/Padma along left afflux bundh of Jangipur Barrage in a length of 16.3 KM {Major protection works have been completed and the balance work is proposed to be completed before June, 04}.

38.38 KM of Feeder Canal along with several structures, inspection roads and several Free Ferry Service are being maintained adequately to ensure supply of water to Canal to the designed capacity of 40000 cusecs. Protection works of bed, bank & slope of Feeder Canal at various locations (as per recommendation of Canal Study Committee) were completed. The special repair of Farakka Barrage gates (109) and Jangipur Barrage 15 nos is expected to be completed by June, 04.

CHAPTER 5

EXTERNAL ASSISTANCE FOR DEVELOPMENT OF WATER RESOURCES

Introduction

The Ministry of Water Resources assists the State Governments in tying up external assistance from different funding agencies to fill up the resources gaps both in terms of funds and technological update for rapid development of country's water resources. The World Bank continues to be the primary source of external assistance in the water resources sector. Assistance is also being availed from the Asian Development Bank, European Economic Commission and other sources like the Japanese

Bank for International Cooperation (JBIC) Kreditanstalt fur Wiederausbau (KfW)- Germany, and France etc. on a bilateral basis.

Externally Aided Projects

There are 18 on- going externally aided projects with external assistance from the World Bank, European Economic Commission (EEC) and other bilateral agencies/countries like France, Germany and JBIC, Japan in various States. A brief of these projects is as follows:-

A. MULTILATERAL ASSISTANCE

WORLD BANK

S.No	State	Name of Projects	Date of Agreement/ Completion	Assistance amount in Million Donor Currency	Type of Assist- ance	Cumulative Disbursement During 2003-04 Million US\$/SDR Rs. in Crores
1	Andhra Pradesh	Andhra Pradesh Irrigation Project-III Cr.2952-IN Ln-4166-IN	03.06.1997 31.07.2004	SDR 108.100 =(US\$ 150)	Credit	SDR 108.100 Rs.687.075
2.	Andhra Pradesh	A.P. Economic Restructuring Project (Irrigation component) Ln-4360-IN	<u>04.02.1999</u> 31.03.2004	US\$ 130.00 US\$ 170	Loan Loan	US\$ 94.898 Rs.447.967 US\$ 117.78 Rs.539.491

3.	Karnataka	Karnataka Community Based Tank Management Project CR.3635-IN	<u>06.06.2002</u> 31.1.2009	SDR 80	Credit	SDR 3.740 Rs.24.493
4.	Orissa	Orissa Water Resource Consolidation Project Cr.2801-IN	<u>05.01.1996</u> 31.3.2004	SDR 194.800	Credit	SDR 170.417 Rs.989.013
5	Rajasthan	Rajasthan Water Sector Restructuring Project Cr.3603-IN	<u>15.3.2002</u> 31.3.2008	SDR110	Credit	SDR 7.773 Rs.49.447
6	Tamil Nadu	Tamil Nadu Water Resource Consolidation Project Cr.2745-IN	22.09.1995 31.3.2004	SDR 161.900	Credit	SDR 147.449 Rs.883.168
7	Uttar Pradesh	UP Water Sector Restructuring Project Cr.3602-IN	<u>08.3.2002</u> 31.10.2007	SDR 117	Credit	SDR 5.941 Rs.37.008
8.	Multi-State	Hydrology Project	<u>22.9.1995</u> 31.12.2003	SDR 75.1	Credit	SDR 71.802 Rs.429.448
					Sub Total	Rs.4087.110

EUROPEAN ECONOMIC COMMUNITY - Grant

S.No	State	Name of Projects	Date of Agreement/ Completion	Assistance amount in Million Euro	Cummulative disbursement upto 31.10.2003 Million Euro Rs. in Crores
9.	Orissa	Orissa Minor Irrigation Project	<u>03.07.1995</u> 31.12.2004	Euro 10.700	Euro 3.474 Rs.17.960
10	Pondicherry	Tank Rehabilitation Project	<u>21.02.1997</u> 31.12.2004	Euro 6.650	Euro 1.742 Rs.7.657
11	Maharashtra	Saline Land Reclamation Project-II	<u>11.7.1995</u> 31.12.2005	Euro 15.500	Euro 13.799 Rs.55.219
				Sub Total	Rs.80.836

B. BILATERAL ASSISTANCE
(JBIC JAPAN – Loan)

S. No	State	Name of Projects	Date of Agreement/ Completion	Assistance amount in Million DC	Utilization / disbursement upto 31.10.2003 Million
12	Andhra Pradesh	Modernization of Kurnool-Cuddapah Canal	25.01.1996 26.02.2005 31.3.2004 31.3.2009	Yen 16049 Yen 4773 (Trenche-II)	Yen 13377.861 Rs.573.614
13	Madhya Pradesh	Rajghat Canal Major Irrigation Project	25.02.1997 29.05.2006	Yen 13222	Yen 8152.864 Rs.318.622
14	Orissa	Rengali Irrigation Project	12.12.1997 31.12.2004 31.3.2004 31.3.2007	Yen 7760 Yen 6342 (Trenche-II)	Yen 6024.549 Rs.231.670
GERMANY				Sub Total	Rs.1123.906
15	Maharashtra	Minor Irrigation Project	31.12.1998 30.12.2006	Eur 23.008	Eur 2.904 Rs.13.933
16	Himachal Pradesh	Minor Irrigation & Rural Water Supply Project	31.10/2002 31.12.2005	DM 5.20	Eur 0.00 Rs. 0.00
FRANCE				Sub Total	Rs.13.933
17	Gujarat	Hydroplus Fusegate System	10.12.1998 30.06.2003 *	FF 34.74 Subtotal	FF 33.99 Rs.23.33 Rs.23.33
				Grand Total	Rs.5329.115

Note : Rupee value against the donor currency as applicable in October, 2003

* Recommended for extension upto June, 2004

Achivements During 2003-04

During the financial year 2003-2004 disbursement of an amount of Rs.919.20 Crore has been received from the World Bank, EEC and other Bilateral Agencies and utilized by the State Governments and Government of India for implementation of various externally aided Projects in the Water Resources Sector.

Major Externally Aided Projects

Hydrology Project and the Water Resources Consolidation Projects – both projects assisted by World Bank are major projects. The details are given below:

HYDROLOGY PROJECT

The Hydrology Project is being implemented with International Development Association (World Bank) assistance of SDR 75.1 million under a credit agreement with Government of India. The credit effectiveness of the project began on 20.12.95 and the extended closing date was 31st December, 2003. The Government of Netherlands is also providing a grant-in-aid of Euro 14.64 million in the form of technical assistance under a bilateral Indo-Dutch agreement.

The Project is being implemented by nine States viz., Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu and six Central agencies viz., MOWR (proper), CWC, CGWB, IMD, NIH and CWPRS.

The project enabled establishment of a functional Hydrological Information System (HIS) and an improved institutional capacity of implementing agencies to build, operate and utilize the HIS to the benefit of different user groups. The development of data bases would support major aspects of

National Water Policy, particularly with regard to water

allocation and planning and management of water resources development at the national, state, basin and project level. To realize the objective, the hydrology project supports :-

- Upgrading and expanding physical infrastructure for all aspects of data, viz. collection, collation, processing, storage and dissemination.
- Provision of equipment and material.
- Institutional strengthening including technical assistance and training.
- New buildings, laboratories, computer hardware and incremental, operating and maintenance costs.

Financial progress

The total expenditure upto Sep 30, 2003 is Rs. 564.34 crores which is 92% of the revised total project cost (Rs.611.66 crores). The overall component-wise financial progress is as given in Table 5.2.

Table 5.2

Sl. No.	Component	Allotment	Expenditure	Financial progress as on 30.9.2003 in %
1	Civil works	172.77	169.69	98
2	Equipment and materials (goods)	219.57	195.51	89
3	Training and studies	12.11	10.22	84
4	Incremental staff salaries and recurrent costs	179.95	188.94	107
	Sub-total	580.40	564.34	97
5	Contingencies @ 8.8%	31.26	-	-
	TOTAL	611.66	564.34	92

Physical progress

Physical progress of the infrastructure development upto Sep 30, 2003 of the major components of the project is given in Table 5.3.

Table 5.3

Sl. No.	Item	Target	Achieved	Achievement percentage
1	River gauging sites	916	916	100
2	Meteorological stations	436	436	100
3	Observation wells	7912	7889	100
4	Water quality	274	258	94
5	Buildings	1574	1548	98
6	Computer	656	620	95
7	Vehicles	573	528	92
8	Training	30681	29313	96
9	Incremental staffing	3168	2439	87

The reimbursement received upto 10.11.2003 is 69.63 million SDR out of total credit of 75.1 million SDR which is about 93%.

Achievements of Hydrology Project

Monitoring network – The noteworthy gains in the area of data collection surface water, and ground water and water quality have been (a) optimization of network within the agency and integration of monitoring networks between different agencies operating in the same domain; (b) upgrading of domain specific monitoring networks; (c) introduction and operationalization of high frequency, error free data collection mechanisms; (d) establishment of time-specific and location-specific water quality monitoring network and (e) uniform and standardized measurement methodologies and techniques.

Certified software for data entry, processing, analysis and storage -Uniform and certified software have been adopted in Hydrology Project. Surface Water Data Entry System (SWDES) and

Ground Water Data Entry System (GWDES) are being used for data entry. Similarly for data processing, Hydrological Modeling System (HYMOS) has been adopted and Ground Water Data Processing Software is under advance stage of preparation.

Establishment of permanent data centre in the participating States, CWC and CGWB and inter-agency data exchange – Establishment of active links between various field level data collection units and multi location data processing centres has been one of the key contributions of the Hydrology Project. In total the Hydrology Project has established 390 data entry and processing centres at various levels and 31 data storage centres at the apex levels.

Standard procedures for data collection, analysis and storage –Hydrology Project has

formalized standard procedures for data collection, analysis and storage and framed them in the form of HIS protocols. These procedures have been accepted and translated into uniform institutional practices across the States and agencies which is a clear and crucial gain from Hydrology Project.

Training – One of the major gains from the Hydrology Project has been extensive skill building of HIS staff across levels. Over 9000 people at the top, middle and field levels have been trained in HIS concepts.

Reference manual for HIS operations – The HIS reference manual for surface water domain covering various operational, maintenance and management aspects of HIS has been documented and circulated to all the agencies for use at all the levels.

R&D Projects – The Hydrology Project has initiated Some innovative R&D projects like Integrated River Basin Planning and Management in Sabarmati and Godavari basin, solute transport modeling studies in Kerala etc.



National Data Center CGWB, CHQ Faridabad

Computerized historical data – Before the present hydrology project, the implementing agencies had a large store house of historical data which has been converted into computer compatible formats following several stages of validation.

WATER RESOURCES CONSOLIDATION PROJECTS (WRCP)

The Water Resources Consolidation Project (WRCPs) are the new generation irrigation projects assisted by the World Bank. The WRCP cover three States namely Haryana, Tamil Nadu and Orissa. The WRCP in Haryana is already completed. The project in Tamil Nadu and Orissa

are ongoing. The WRCPs deal with the irrigation sector in its entirety and State as a whole to realize the basic objective postulated in the National Water Policy. The main objectives of WRCP are: improving institutional and technical capability of managing the State's water resources, planning of water resources by river basin across all uses of water, improving agricultural productivity through rehabilitation and completion of irrigation schemes and farmers' participation, assuring sustainability of infrastructure and the environment etc. The expenditure incurred by these States of WRCPs is reimbursed by the World Bank.

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, Navigation, Drinking Water Supply and Water Power Development.

ORGANISATIONAL SETUP

The Central Water Commission is headed by a Chairman. 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. The activities of the wings are carried out by 18 functional units in the headquarters, each headed by a Chief Engineer level officer. The National Water Academy located at Pune is also a part of the Commission. Besides, the Commission has 13 Regional Field Organisations, each headed by a Chief Engineer.

ACTIVITIES

The activities of CWC may be summarized as follows:

Resource 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

Execution of Water Resources Development Projects

- a. Project Monitoring
- b. Advice on various Planning and Design problems encountered during construction

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 & Models for Water Resources related Problems
 - (ii) Remote Sensing Technology
 - (iii) Studies on Sedimentation

Standardization and Documentation

- a. Preparation of BIS Codes related to Water Resources
- b. Preparation of Manuals/ Guidelines
- c. Mass Awareness
- d. Regional Hydrological Studies

Guidance/Advisory Role

- a. Organization of Trainings/ Workshops
- b. Representation on various Committees/ Boards

Technical Support to Ministry of Water Resources and Departments of Government of India.

MAJOR ACTIVITIES

Hydrological Observations

Hydrological parameters of river flow forms the basis for formulation of the Water Resources Projects, Bridges and Navigational System etc. Therefore, for their long term planning, design and management, the availability of reliable hydrological data is of prime importance. Central Water Commission maintains a network of 953 Hydrological Observation stations on various inter-state and international rivers. Observations for water level, discharge, silt and water quality are made and stored, after due processing at the Central Data Bank. In addition, rain gauges are also installed at most of the hydrological observation sites of CWC. The implementation of World Bank assisted 'Hydrology Project' has also helped in improvement in the quality of the data and its processing, storage and retrieval. Hydrological Information System (HIS) comprising of comprehensive, easily accessed and user friendly database covering all aspects of the hydrological cycle has been established for the peninsular India under the project. Comprehensive hydrological data banks have been successfully established in the regional data centres in the states and Master Control Data Centre at Delhi. Buoyed with the success of the Hydrology Project, the Government is contemplating to horizontally extend the gains made in the Hydrology Project to other states under the second phase of the project.

Water Quality Monitoring

Collection of water samples at hydrological observation sites of CWC for estimation of water quality is an important activity. CWC monitors water

quality at 371 key stations through a network of 286 water quality laboratories of different levels (258 Level-I Laboratories, 24 Level-II Laboratories and 4 Level III/II⁺ Laboratories). These are fully equipped with modern equipment.

Survey and Investigation

Survey and Investigation of major and medium water resources projects are taken up by Central Water Commission with the concurrence of concerned State Government or the Central Government. So far, 213 major and medium projects have been investigated by CWC and the Detailed Project Reports (DPR) have been prepared and submitted to concerned authorities. At present 14 projects in the country are under investigation by CWC.

CWC has also carried out investigation of a number of projects in the neighbouring countries (28 in Bhutan, 2 in Myanmar and 5 in Nepal). Pancheshwar Multi Purpose Project has been investigated by Joint Project Office – Pancheshwar Investigation (JPO-PI). The Joint DPR could not be completed due to some outstanding issues still to be resolved by the Joint Group of Experts (JGE) of Nepal and India.

Hydrological Studies

Detailed Hydrological studies are carried out by CWC at various stages of the project for assessment of quantities of available water and its time distribution, estimation of design flood and estimation of 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. At present studies in respect of 29 projects are in hand.

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 hydrometeorological data have been brought out by CWC which are extensively used by various State Governments and Central Government Departments/ Organizations. Such models are available for 23 sub-zones out of the 26 sub-zones in which the country has been divided.

Design

The Central Water Commission is actively associated with design of almost all the major water resources projects in the country by way of design consultancy or during technical appraisal of the projects. A number of projects in the neighbouring countries have also been designed. At present, CWC is carrying out design in respect of 107 projects. In addition, specific problems in respect of 12 projects have also been referred to CWC.

Under the 50,000 MW initiative launched by Hon'ble Prime Minister, Pre-feasibility Reports for 162 potential hydroelectric projects in various parts of the country are under preparation by various consultants appointed by Central Electricity Authority. CWC plays a major role in the preparation of these reports by way of hydrological studies, project layout, project planning etc.

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 is critical for their safety. The Dam

Safety Organization of CWC acted as the nodal agency in implementation of the World Bank assisted “Dam Safety Assurance and Rehabilitation Project (DSARP)” in which 4 states participated. After seeing the performance and benefits obtained from this programme, a fresh proposal named “Dam Safety Assurance, Rehabilitation & Disaster Management Project (DSARDP)” has been prepared which has 11 participating states, namely Andhra Pradesh, Bihar, Chattisgarh, Gujarat, Jharkhand, Kerala, Maharashtra, Tamilnadu, Uttar Pradesh, Uttaranchal and West Bengal. The proposal has been cleared by Planning Commission and DEA and has been sent to World Bank for consideration.

Environmental Management and Rehabilitation-Resettlement Issues

Central Water Commission is represented in the National level Environmental Appraisal Committee for River Valley and Hydro-electric Projects set up by the Ministry of Environment & Forests for recommending environmental clearance to River Valley and Hydro-electric Projects. A National Environmental Monitoring Committee for River Valley Projects has been set by the Ministry of Water Resources to monitor implementation of Environment Management Plan and observance of environmental safeguards as per environmental clearance. Member (Water Planning & Projects) is the Chairman of this Inter-ministerial multidisciplinary Committee having representatives from Ministries of Environment & Forests, Agriculture & Co-operation, Tribal Affairs and Water Resources, besides Planning Commission.

Project Appraisal

Techno-economic appraisal of irrigation, flood control and multipurpose projects proposed by the State Governments is an important activity of Central Water Commission. Since 1961 Central Water Commission has appraised more than 1400

projects. The appraisal of the project ensures that the project proposal is in tune with overall development plan; the basic planning of the project is reliable; and investigations are as per established norms. It is also established through the project appraisal 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 establishment of techno-economic feasibility of the project, the Advisory Committee on irrigation, flood control and multipurpose projects headed by Secretary, Water Resources, considers the project for acceptance and thereafter recommends it for investment clearance by the Planning Commission. Power projects proposed by State Electricity Boards/ Private Sector are scrutinized in CWC from hydrology, civil design, interstate and cost angles in case of Hydel Projects and for establishing water availability for cooling and other purposes in case of Thermal Projects. The process of Project Appraisal involves examination of the various features of project simultaneously by different specialized units of CWC in order to carry out the work in the shortest possible time to ensure early appraisal and clearance. The suggestions for improvement/ modifications are suitably incorporated in consultation with project authorities.

During the year 2003-04, technical examinations of 21 projects were completed and 15 projects cleared by the Technical Advisory Committee. 82 schemes (33 Major & 49 Medium) 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, 28 schemes and 2 Water Sector Re-structuring Projects are under various stages of appraisal.

Project Monitoring

Central Water Commission monitors the progress of selected ongoing irrigation projects. Each project under general monitoring is visited by the monitoring team at least once in a year and detailed monitoring report is prepared and issued to all concerned for necessary action. At present CWC is carrying out general monitoring of 146 ongoing major, medium and Extension Renovation and Modernization (ERM) projects.

The major, medium and selected minor surface water irrigation projects receiving Central Loan Assistance under Accelerated Irrigation Benefits Programme (AIBP) are also monitored by CWC. As a part of AIBP monitoring, the projects are inspected twice a year and monthly expenditure reports are collected. The recommendations of CWC form the basis for release of funds by the Ministry of Water Resources/ Ministry of Finance. CWC is monitoring 140 major and medium projects under AIBP.

Flood Forecasting and Inflow Forecasting

The Commission has a network of 137 Forecasting stations to cover most of the interstate flood prone rivers, besides inflow forecasts for 29 major reservoirs of the country. Close liaison with the local civic authorities is maintained to communicate advance warning for taking up appropriate safety measures. 6600 flood forecasts were issued during the monsoon period of 2003.

To make the flood forecasts more accurate, effective and timely, CWC is continuously updating and modernizing its flood forecasting system. During the IX Plan, Modernisation of inflow forecasting services in Mahanadi & Chambal basins was taken up with a view to improve the quality and accuracy of the forecasts as well as to increase the warning time to forecast through (i) Automated data collection and

transmission (ii) Use of Satellite based communication (iii) Improvement of forecast formulation techniques using computer based catchment models (iv) Modernisation of monitoring of forecasting system through VSAT communication. This scheme is of immense help to the project authorities to know well in advance about the quantum of water likely to be received at various dam sites and flood prone cities so that they can take advance action for suitable reservoir regulation for ensuring safety of the dam as well as property and livestock. During the X Plan it is proposed to extend this system to Brahmaputra, Barak, Damodar, Krishna, Godavari, Yamuna, Ghaghra, Rapti and Sutlej river basins.

Reservoir Level Monitoring

The weekly storage positions in 71 important reservoirs throughout the country are monitored and this forms the important input for Ministry of Agriculture's Crop Weather Watch Group. CWC also co-ordinates with ICAR, Planning Commission, India Meteorological Department and other organizations so that research findings related to crop water requirement and cropping patterns are put to practical use.

Application of Remote Sensing Technique in Water Resources Sector

The remote sensing technique is an extremely time and cost effective tool for the resource management. The water sector is no exception to this rule. The Central Water Commission has been using this technology increasingly for the studies of reservoir sedimentation and identification of areas affected by salinity and water logging since the IX Plan period. During the X Plan, 20 reservoirs shall be covered for sedimentation studies while the plan is already under execution for the mapping of water logged and salinity affected areas in the country by using this technology.

Benchmarking of Irrigation Projects

Benchmarking in irrigation system 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 for Benchmarking of Irrigation Systems in India has been set up by MoWR. CWC is playing an active role as a coordinator as well as a facilitator by way of providing technical support to the State Governments. During the X Plan 4 national level and 20 project level workshops on Benchmarking of Irrigation Projects are to be conducted. One National Level Workshop on Benchmarking of Irrigation System in India under this scheme was organized in October, 2003 at Tezpur (Assam). The second workshop was held at Bhubaneswar in March, 04.

Irrigation Performance Overview of Completed Irrigation Projects :

Like any other developmental project, Water Resources projects are also conceived, formulated and implemented with well defined objectives. The formulation is made on certain assumptions based on learning about nature which cannot be predicted accurately despite best of the efforts and technological aids. Moreover, socio-economic and environmental aspects also play an important role in formulation of the project. Thus, difference in achievements with reference to set objectives make it imperative on the part of Project Authority to carry out periodic performance evaluation of the project in order to assess its efficiency and to take remedial measures wherever warranted. Keeping these objectives in mind, the Central Water Commission has taken up the performance evaluation studies of completed irrigation projects covering the socio-economic, agro-economic, environmental aspects etc.

Performance Evaluation Studies of Irrigation Projects were taken up in the country for the first time in early seventies. Performance Evaluation Studies of 13 major and medium irrigation projects located across the country have been successfully accomplished by CWC till the end of the IX Plan. 31 more such studies are planned for X Plan period.

Hydrographic Survey of Important Reservoirs

Capacity Survey by Hydrographic method of select reservoirs was initiated during the VIII Plan and continued through the IX Plan period. At the end of IX Plan, a total of 19 reservoirs were covered under the scheme and 15 more reservoirs are planned to be covered under the scheme during X Plan period. Work on three reservoirs namely Watrak (Gujarat), Warna (Maharashtra) and Ravisankarsagar (Chhattisgarh) is in progress.

Others

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

National Water Academy and Other Training Activities

National Water Academy at Pune is envisaged to function as Centre of Excellence for in-service training of Water Resources Engineering Personnel of State Government, Central Water Commission and other Central organizations. So far, National Water Academy, Pune has conducted 120 courses,

in which 2570 officers (760 from CWC and 1810 from State Governments and other Central Government agencies) have been trained. In addition, the Training Directorate at Headquarters has organized about 330 courses on various topics related to Water Resources Development. More than 10,000 officials of various State Governments and Central Government Organizations/ Departments have undergone training through these courses. During the year 2003-2004, 33 courses at NWA, Pune and 32 short term courses at CWC Hqr. at New Delhi were organized.

Advisory Role of Central Water Commission

CWC officers are represented on various committees/Boards etc. of different organizations

and make valuable contribution. Also, the Chairman, Members and other senior officers of Central Water Commission preside over a number of important Committees dealing with the technical matters in Water Resources sector.

Interaction with Ministry of Agriculture

Apart from its active association with the Crop Weather Watch Group, 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 disaster like flood, cyclone, drought etc.

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.

INTER-STATE WATER DISPUTE TRIBUNAL

CAUVERY WATER DISPUTE TRIBUNAL (CWDT)

Progress in Adjudication of the Dispute before the CWDT:

The dispute relating to sharing of Cauvery water among States of Karnataka, Kerala, Tamil Nadu and Pondicherry was referred to the Cauvery Water

Disputes Tribunal constituted on June 2, 1990. During the last 13 years, the Tribunal has taken on record statement of cases of the party States, voluminous documents filed by the party States in support of their statement of cases and Affidavits and Statements filed by the Expert witnesses produced by the party States. 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. The Tribunal has completed the cross-examination of witnesses of one party State by other party States and concluded the arguments on the issues related to 1892 and 1924 Agreements framed by it. During the current year, the Tribunal has taken up the arguments on the issues relating to availability of water, surface flows, additional and alternative sources of water etc. The Tamil Nadu has completed the arguments on these issues. The arguments by the Karnataka in the form of reply of Karnataka to the arguments of Tamil Nadu are continuing.

Monitoring of the Implementation of Interim Order of CWDT

As per CWDT Order of June, 1991 the State of Karnataka is required to release water from its reservoirs so as to ensure 205 Thousand Million Cubic Ft.(TMC) of water in Mettur reservoir of Tamil Nadu in a water year. The 205 TMC of water is to be ensured in a fixed monthly and weekly pattern. The Central Government has published the Order of the Tribunal under Section 6 of the Inter State

Water Disputes (ISWD) Act, 1956 in 1991, thus, making the Order final and binding on the parties to the dispute. The Order of the Tribunal is to be given effect by the party States. Further, under the provisions of Section 6 A of the ISWD Act, 1956, the Central Government has notified a Scheme called Cauvery Water (implementation of the Order of 1991 and all subsequent Related Orders of the Tribunal) Scheme, 1998, consisting of Cauvery River Authority and Monitoring Committee. 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 17th, 18th and 19th meetings respectively on 9th June, 7th August and 1st September, 2003. The important point for discussion and decision in these meetings of the Monitoring Committee was evolving a formula for sharing the distress situation in Cauvery basin due to deficient rainfall. The Monitoring Committee finally evolved a Distress Sharing Formula with the support of States of Tamil Nadu, Pondicherry and Kerala. The State of Karnataka, however, did not agree to the adoption of the proposal formula. The 20th Meeting of the Monitoring Committee under CRA was held on 19th January, 2004. The report of the same was sent to CWDT.

MANDOVI RIVER WATER DISPUTE

Mandovi river also known as Madei/Mahadayi is a short-length west-flowing inter-State river on the

western coast of India. The main river Madei originates in the Western Ghats in Karnataka and runs for 35 km. in that State and then enters Goa territory. It flows for another 52 km in Goa State before debouching into the Arabian Sea near Panaji, capital of Goa State. A few small tributaries of the Mandovi river basin drain areas in Maharashtra State also. Thus, the States of Maharashtra, Goa and Karnataka are the basin states of the Mandovi inter-State river.

For the last 30 years, the State of Karnataka and Goa had disagreement over Karnataka's constant and persistent attempts to divert the limited Mandovi river waters generated from the basins in its tributaries to outside the basin. 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 keeping in view priority of the use of water within basin as also to decide the machinery to implement the decision of the tribunal etc.

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 reconciliation in the discrepancies in the data and yield figures has not been achieved so far. The delay has been caused due to insistence of Government of Goa for supplying raw data of CWC site at Ganjim in Goa. MOWR has subsequently allowed CWC to supply the raw data to Government of Goa in July, 2003. At the same time, the Chief

Minister of Goa in his letter addressed to Prime Minister in June, 2003 had expressed the desire of his State to settle the long-standing issues with Karnataka through negotiations. The Government of Goa has very recently obtained the raw data of Ganjim site of CWC.

KRISHNA RIVER WATER DISPUTE

The State of Karnataka in September, 2002 made a complaint under Section 3 of the Inter-State River Water Disputes Act, 1956 to the Government of India for constitution of a water disputes tribunal and referring to the tribunal the dispute relating to sharing of surplus water of Krishna river between the basin States, raising of the height of the Alamatti dam upto 524.256 m. by the State of Karnataka and maintaining adequate summer flow in Bheema river in the Krishna valley at the Inter-State border during the months of November to May in every water year. The Government of Maharashtra also made a complaint under the said Section of the Inter State River Water Disputes (ISRWD) Act, 1956 for constitution of and referring to the tribunal the dispute relating to sharing of surplus water of Krishna river, issues relating to submergence of territory of Maharashtra by Alamatti dam, Hippargi barrage project, construction of Bheema barrage project and review and reassessment of available water in the Krishna river. Similarly, the Government of Andhra Pradesh also made a request under the said Section for constitution of Krishna Water Disputes Tribunal and referring to the Tribunal the dispute relating to unauthorized construction of the Alamatti Dam by Karnataka, wrongful utilisation of waters of Tungabhadra river and from Tungabhadra dam by Karnataka and violations of the award in Bheema sub-basin by Maharashtra.

The Government came to the view that negotiated settlement of the issues raised by the States of

Karnataka, Maharashtra and Andhra Pradesh is not possible and, therefore, on 23.8.2003 decided to constitute the Tribunal and refer to the Tribunal the complaints of the Krishna basin States for adjudication and decision

As per the Inter-State River Water Disputes (ISRWD) Act, 1956, the Tribunal shall consist of a Chairman and two other Members nominated in this regard by Chief Justice of India from among persons who, at the time of such nominations, are Judges of the Supreme Court or of a High court.

The Chief Justice of India was requested to nominate suitable serving Judges to function as Chairman and Members of the Tribunal. Nominations of the serving Judges have been received and the Tribunal is being constituted.

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 comprising references from the Central Govt. and references received from Govts. of Punjab, Haryana and Rajasthan seeking explanation/guidance on certain points in the report. Further report of the Tribunal is yet to be received.

One of the Members of the Tribunal had resigned on 4th Jan, 1999 and Notification appointing Hon'ble Justice M.Y. Eqbal, a sitting Judge of the Jharkhand High Court at Ranchi, has since been issued on 10th June, 2003. The period for forwarding of further report by the Tribunal has also been extended upto 5th August, 2004. The Tribunal has held further hearings in January and March, 2004.

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 waters, 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 and 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 and Forests, Social Justice and 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. A copy of actual position of staff is at Annexure-I.

The Review Committee of the Narmada Control Authority (RCNCA), headed by the Union Minister of Water Resources, can suo-moto or on the

application of any party State or Secretary to the Government of India, Ministry of Environment and Forests, review any decision of the Authority. In urgent cases, the Chairman of the Review Committee can, on an application of the Government of any party State, or the Secretary to the Government of India, Ministry of Environment & Forests, grant stay of any order of the Authority pending final decision or review.

Meetings of Narmada Control Authority

The Narmada Control Authority held five meetings during the year 2003-04 (66th meeting on 14.5.2003, 67th meeting on 30.7.2003, 68th meeting on 11.12.2003, 69th meeting on 28.1.04 and 70th meeting on 13th March, 2004 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. Permission to raise spillway blocks No.30 to 46 from EL 95.0 m to EL 100.0 m and construction of 3 m high humps over the blocks No.31 to 45 and maintenance of reservoir level in Sardar Sarovar at or below EL 100 m. during the non flood season was given by NCA in its 66th emergency meeting. Further in its 70th meeting, NCA had given permission to raise the Sardar Sarovar dam to EL 110.64 m.
2. Finalised the Annual report of NCA for the year 2002-03.
3. Finalised the Revised Estimate for 2003-04 & Budget Estimate for 2004-05.
4. To submit the issue of sharing cost of R&R component of the SSP, Review Committee for Narmada Control Authority for

consideration & decision.

5. NCA to participate in Simhastha Kumbh Mela at Ujjain in 2004 with a view to project the constructive policies of Govt. towards Water Resources Development.
6. NCA in its 69th meeting decided that the Mechanism involving non structural measures suggested by NCA & CWC including provision of limit switches for control and operation of Irrigation Bye Pass Tunnels be adopted, however, CWC shall further examine the technical feasibility of the proposal for providing goose neck tunnel option.

Meetings of Review Committee of RCNCA :

Two meetings of the Review Committee for Narmada Control Authority (RCNCA) i.e. 10th & 11th were held at 29th January'04 and 12th Feb.'04 and the Agenda of Preparedness for the raising of dam height of Sardar Sarovar Project to EL 110.64 m.

was discussed. The Secretary, Social Justice & Empowerment in 10th meeting, was directed to submit a report on status of R&R issues which would serve as an input for arriving at a decision on concurrent raising of dam height with the R&R work in Maharashtra. The representative of Maharashtra informed during the meeting that the completion of R&R of all the PAFs at EL 110.64 m. would take about 4 months i.e. by May end. In the 11th meeting, the Review Committee decided that Govt. of Maharashtra will complete verification of all PAFs at 110.64 m. by end of May, 04.

Sub-Groups/Sub-Committees

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

1. Resettlement & Rehabilitation Sub-Group under the Chairmanship of Secretary, Union Ministry of Social Justice and Empowerment.
2. Environment Sub-Group under the Chairmanship of Secretary, Union Ministry of Environment & Forests.
3. Rehabilitation Committee under the Chairmanship of Secretary, Union Ministry of Social Justice & Empowerment.
4. Narmada Main Canal Sub-Committee under the Chairmanship of the Executive Member, Narmada Control Authority.
5. Hydromet Sub-group under the Chairmanship of the Executive Member, Narmada Control Authority.
6. Power Sub-Committee under the Chairmanship of Member (Power), Narmada Control Authority.
7. Five meetings of Resettlement & Rehabilitation Sub-group and one meeting each of Environment Sub-group, Hydromet Sub-group, Narmada Main Canal Sub-Committee and Power Sub-committee were held till the end of March, 2004.

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 programmes of Indira Sagar Project & Sardar Sarovar Unit-II Canals with a view to obtaining 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 the 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 & 30th September, 2003 in respect of these two projects were brought out by the NCA.

Resettlement and Rehabilitation Activities.

The Resettlement and Rehabilitation 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) Award. 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

Narmada Water Disputes Tribunal (NWDT) Award.

The R&R progress is being monitored effectively by the monitoring machinery i.e Resettlement & Rehabilitation (R&R) Sub-Group of the Narmada Control Authority, chaired by the Secretary to the Government of India, Ministry of Social Justice and Empowerment. In addition, a Rehabilitation Committee headed by the Union Secretary for Ministry of Social Justice and Empowerment also makes field visits to the submergence villages and R&R sites and the observations/ suggestions of the Committee are being complied with by all the party States.

The Table given below indicates Overall cumulative progress of Resettlement & Rehabilitation of Project Affected Families (PAF) upto February, 2004

State	Total Project Affected Families (No.)	Total PAFs Resettled (No.)	Balance Families to be resettled. (No.)
GUJARAT	4728	4726	2
MAHARASHTRA			
a) In Gujarat	999 ^{\$}	846	153
b) In Maharashtra	2222 ^{\$}	2075	147
Total	3221	2921	300
MADHYA PRADESH			
a) In Gujarat	14124*	5018	9106*
b) In Madhya Pradesh	18890*	9332	9558*
Total	33014	14350	18664
Grand Total	40963	21997	18966

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

* This number may change after taking option of PAFs and Land Acquisition Award/ declaration of genuine PAFs by GRA.

Energy Management Centre Of Narmada Control Authority

An Energy Management Centre (EMC) has been set up by the Narmada Control Authority at Indore to monitor the sharing of Power generated at Sardar Sarovar Project by the party states. The total work of the EMC, estimated to cost to Rs. 3.69 crore, was divided into four packages. Package I, awarded to BHEL, comprises of microprocessor based Remote Terminal Units (RTUs). The RTU at Canal Head Power House (CHPH) has been installed and pre-commissioning tests carried out. Package II, also awarded to BHEL, comprises of Supervisory Control and Data Acquisition (SCADA) system, associated software and communication equipment. SCADA equipment at Energy Management Centre (EMC), Indore and Western Region Load Despatch Centre (WRLDC), Mumbai have been installed and data transfer between EMC and WRLDC has been tested and being received at EMC, Indore over a leased data circuit. The commissioning of alternate route for transmission of data from SSP to EMC, Indore via SSP-Nagda-Indore is being reviewed and use of BSNL leased line in place of optical fiber network and PLCC network as earlier proposed etc. for transmission of data is being explored. Package III, comprises auxiliary equipment like Uninterrupted Power Supply (UPS) System, Diesel Generator (DG) Set, Air Conditioning System, Multi Channel Voice Logging Recorder, lighting, Fire detecting alarm etc. All the equipment under this package have been installed at EMC and work completed. Package IV, awarded to M/s INTRAX, comprises of Time of the day (TOD) meters. All the equipment under this package have been received and will be installed at the River Bed Power House (RBPH) control room when it is ready. One No. TOD meter (combined KWH & K VARH meter with tariff attachment) has been temporarily installed at SSP, CHPH control room.

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 of 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 turn key contract was signed with M/s ECIL in September 1996 for an accepted tender amount of Rs. 12.85 crores for implementation of Real Time Data Acquisition System (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, rainfall, 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 METSAT satellite (renamed as KALPANA-I). The MCC at Indore has already been established. After launch of the new satellite KALPANA-I in September 2002, Twenty-four out of Twenty-six stations in the network have been energized and tuned to KALPANA-I and the remaining two stations are under the process of optimization with the new satellite and the work is scheduled to be completed by April, 2004. M/s SM Tech. U.S.A.- the foreign associates of M/s ECIL, have developed the application software for the Water Management System in the Narmada Basin. The water management software was integrated by them in mid December'03 in association with M/s ECIL.

Of late, the Project is in advance stage of implementation and has been rescheduled to be tested during the monsoon of 2004. 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 Project & Indira Sagar Project on river Narmada round the year, 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.

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 upto the year 2001-02 have already been finalized and published by the Authority and draft report for the water year 2002-03 is finalized and being issued.

Visit of Senior Officers to Itaipu H.E. Project (Brazil) and Aswan Dam in Egypt

According to decision taken by Narmada Control Authority, two teams of Senior Officers were sent to visit two Water Resources Projects in Brazil and Egypt. One team, led by Shri V.K. Duggal, Secretary (WR) and Chairman, NCA visited Itaipu Dam in

Brazil/Paraguay from 16 – 18 March, 2004. Whereas, the second team was led by Shri B.S. Baswan, Secretary, Ministry of Social Justice and Empowerment and Chairman, R & R Sub-group, NCA visited Aswan Dam in Egypt from 23 – 25 March, 2004.

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, Revenue, Welfare 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.

Important Decisions

The 69th meeting of the SSCAC was held on 29th July 2003. Some of the important decision taken in this meeting are as follows:

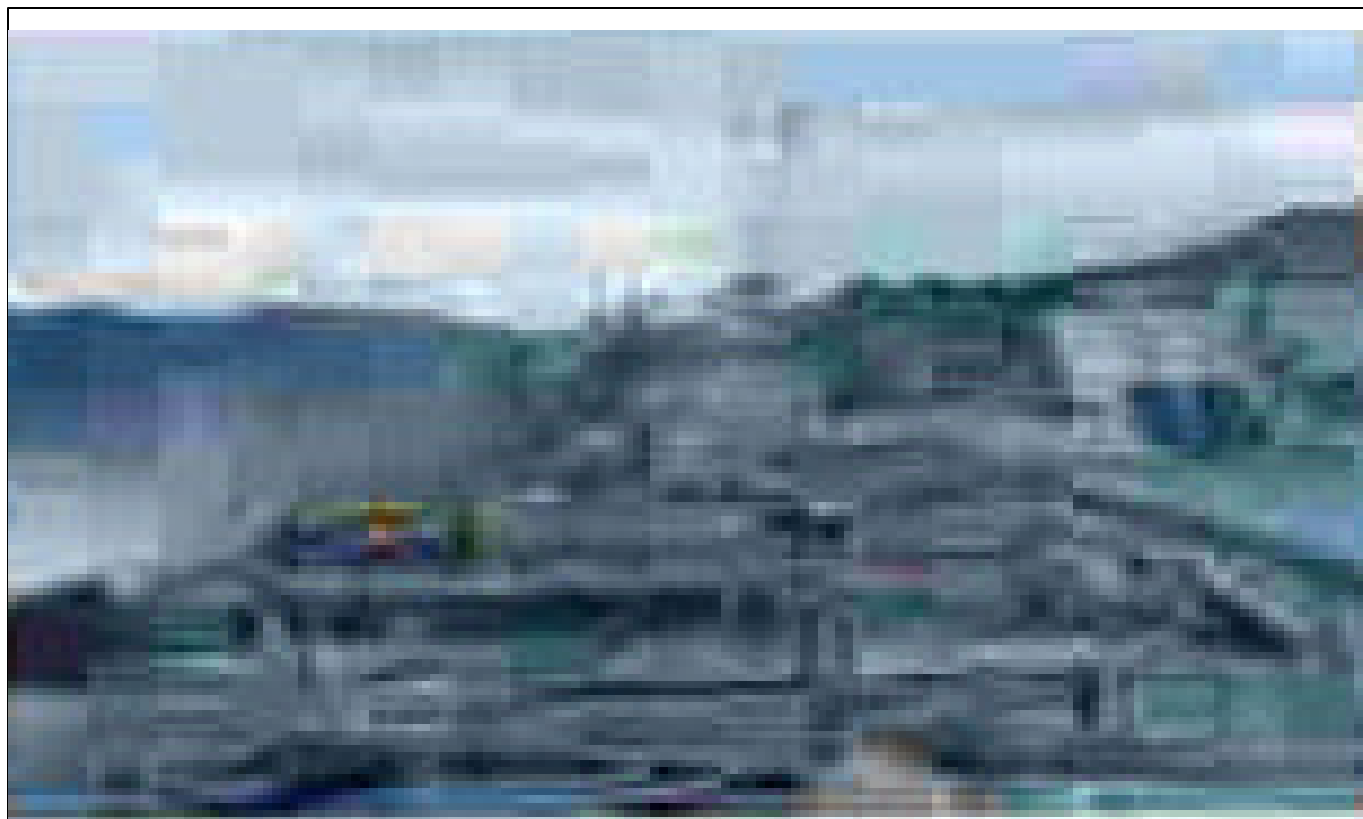
- a) The Committee approved the 1996-1997 price level estimate for the works of Unit-I (Dam & Appurtenant Works) (Excluding B-Land) for Rs.2353.23 crore and Unit-III

- Hydro Power Works) for Rs.2184.75 crores.
- b) The Committee approved the Revised Implementation Schedule (RIS June 2002) of the River Bed Power House of the Sardar Sarovar Project.
 - c) The Committee approved the acceptance of BHEL's offer for supply, supervision and erection of 250 MVA, 13.8/420 KV Generator Motor Transformers for River Bed Power House of Sardar Sarovar Project.
 - d) The Committee noted the progress of Unit-I and Unit-III works and also decided to recommend to the NCA to grant next clearance for dam height not less than 10 m. and not later than February 2004 from the point of view of dam safety considerations.

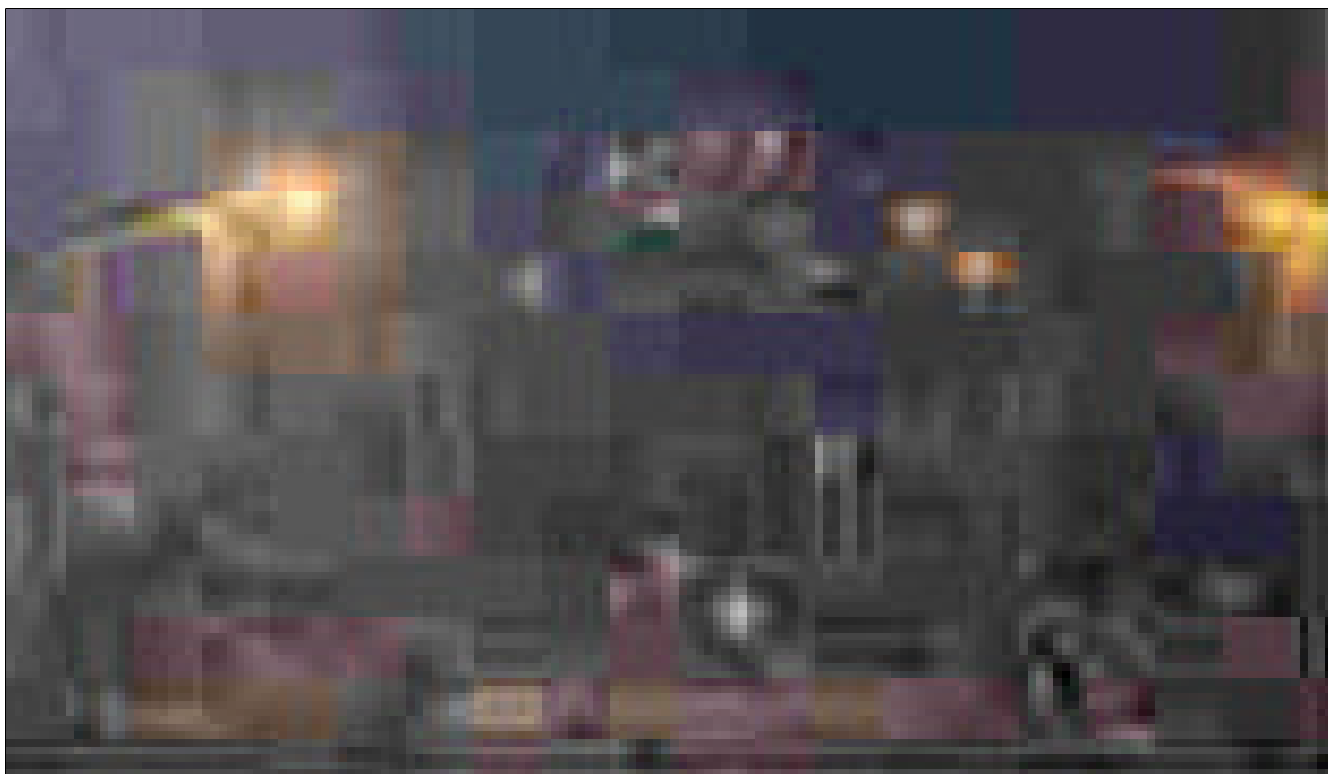
Permanent Standing Committee

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. Two meetings of the PSC were held during this year. The 87th meeting of the PSC was held on 20th May 2003 where in following important decisions were taken:

- a) The Committee reviewed the progress of the Unit-I and Unit-III components of Sardar Sarovar Project and also decided that the Joint



Raising of Sardar Sarovar Dam Height to EL 100M (From EL 95M) Under Progress



Construction under progress in the Underground river bed power house of sardar Sarovar (Narmada) Project

Monitoring Team of CWC and CEA officials should frequently visit the site for keeping a close watch on the progress of River Bed Power House works, vis-à-vis the RIS (June 2002).

- b) The Committee recommended to the SSCAC for granting approval to the acceptance of BHEL's offer for supply of 250 MVA, 13.8/420 KV Generator Motor Transformer for River Bed Power House of Sardar Sarovar Project, for an amount of Rs.25.71 crores.

The 88th meeting of the PSC was held on 15th September 2003, in which following important decisions were taken:

- a) The Committee decided to recommend the (Draft) Annual Development Plan 2003-2004 for approval of the SSCAC with the

observation that GOG's ADP proposal was based on revised contractual rates which were yet to be approved by the SSCAC.

- b) The Committee approved the acceptance of BHEL offer for supply and erection of 24 KV Isolated Phase Bus Ducts and Terminal Equipment for the River Bed Power House on the basis of lowest price, applicable terms and conditions indicated in the tender.

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 raising 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 main dam of the Sardar Sarovar Project was programmed to be raised to a minimum elevation (EL) of 110.0m by June 2003, as per the action plan approved by the NCA (in its 61st meeting held on 17th Nov' 2000) as given in Table-7.1

TABLE-7.1

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) only upto 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. The status of overall progress of works for the month ending March 2004 is given in Table 2.6 . In its 70th meeting held on 12th & 13th March 2004 NCA has given permission to raise the spill way block Nos.30-46 up to EL 110.64 m. Work for which has commenced.

Table 7.2

Particulars	Revised Est. Qty.	Progress upto March 2004	% work completed
Excavation (Lakh Cu.m)	64.00	63.58	99.34
Concreting (Lakh Cu.m)	68.20	61.94	90.83

Progress of Canal Head Power House

The Civil and Electrical works of Canal Head Power House have been completed, and all the five units, each of 50 MW capacity are ready for commissioning. The units will be commissioned for partial power generation when the dam height reaches the level of EL 110.64 m.

Progress of River Bed Power House

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 revised price of the supply contract is 24646.10 million Yen + Rs.35551 crores. The supply of T.G. Sets parts has commenced and material worth 22034 million Yen has been received at site. 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 December 2003 is given in Table 7.3.

Table 7.3

Particulars	Est. Qty.	Progress upto December 2003	% work completed
Open Excavation (Lakh Cu.m).	17.16	16.86	97.25
U.G. Excavation (Lakh Cum).	7.31	6.87	93.98
Concrete (Lakh.Cu.m.)	3.21	2.95	90.77

The erection of electrical components commenced in June 2000, and are progressing satisfactorily. As per the Revised Implementation Schedule (June 2002) approved by the SSCAC, first unit of RBPH is targeted for commissioning by September 2004, with commissioning of other units of an interval of four months, and the last unit will be commissioned in May 2006.

Progress of Irrigation Bye-Pass Tunnel

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.

Presently the works of both the tunnels are in advanced stages of completion, and unregulated water is passing through them to the canal system. The work of tunnel shafts and installation of gates is in progress in both the tunnels. The overall progress of IBPT works at the end of March 2004 is given in Table 7.4

Table 7.4

Particulars	Estd. Qty. (Revised)	Progress upto March 2004	% work completed
Open Excavation (Lakh cu.m.)	7.73	7.62	98.58
Tunnel & Shaft Exc. (Lakh cu.m.)	0.35	0.318	90.86
Concrete (Lakh Cu.m)	1.60	1.24	75.06
Installation of gates (Th. Tonne)	2.610	1.100	42.15

BANSAGAR CONTROL BOARD

Organisation & Composition

The Bansagar Control Board was set up by the Government of India through a Resolution in January 1976. The Resolution was amended in 1990. The Resolution was in accordance with an agreement reached between the Governments of Madhya Pradesh, Uttar Pradesh and Bihar on the 16th September 1973 for sharing the waters of 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

Benefits from the Project

Irrigation Benefits-

- | | | |
|-------|---|--|
| (i) | Annual Irrigation in M.P. (in the districts of Rewa, Sidhi, Satna and Shahdol). | 249 lakh hectare |
| (ii) | Annual Irrigation in U.P. (in the districts of Mirjapur and Allahabad) | 1.5 lakh hectare |
| (iii) | Annual Irrigation in Bihar | 0.94 lakh hectare towards stabilizing irrigation through old Sone Canal system. |

Power Benefits-

- | | | |
|-----|------------------------------------|---------------|
| (i) | Power generation in Madhya Pradesh | 425 MW |
|-----|------------------------------------|---------------|

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.
- ii) Six low earth dykes, four on the left bank of

Sone River and two on its right bank with a total length of 6.95 km.

Kuteshwar Lime Stone Deposits Protection works.

Completion Schedule

As per construction programme approved by the Executive Committee in its 68th meeting held on 05.01.2004, 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 (Full height)	:	By June'2005

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 is in progress along with installation of 18 Nos. Radial Crest Gates of size 18.29 m X 15.41 m and Stop-Log Gates. All construction sluices have been plugged and gates lowered. Work on installation of Irrigation Sluice Gates have been fully completed. Work on all the six Saddles have almost 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. So far about 30,000 hectare private land of 261 villages have been acquired and PAP's have been resettled. 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 2003-04 and cumulative expenditure up to March 2004 is as given in Table 7.5.

Table 7.5

(Rupees in Crores)

Sl.No.	Sub-head	Budget Provision 2003-04	Expenditure during 2003-04 up to 03/2004	Cumulative expenditure up to 03/2004
1	2	3	4	5
1.	Establishment	12.04	10.27	115.96
2.	Tools & Plants	0.04	0.00	2.06
3.	Suspense (debit)	0.20	0.00	148.27
4.	Works	126.46	124.59	782.48
Gross Total		138.74	134.86	1048.77
5.	Suspense (Credit)	0.20	0.67	139.96
Net total		138.54	134.19	908.81

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 during Financial Year 2003-04 till 31.03.2004 is as in Table 7.6.

Table 7.6

(Rs in crores)

Total Expenditure	Share Due <i>Share Received</i>			Balance Share		
	M.P.	U.P.	BIHAR	M.P.	U.P.	BIHAR
Up to 31.03.2003: 774.624	<u>387.312</u> 364.303	<u>193.656</u> 211.249	<u>193.656</u> 199.072	(-) 23.009	(+) 17.593	(+) 5.416
During 2003-04 up to 03/2004: 134.190	67.095 113.70	33.5475 0.000	33.5475 20.49	(+) 46.605	(-) 33.5475	(-) 13.0575
Total as on 31.03.2004: 908.814	<u>454.407</u> 478.003	<u>227.2035</u> 211.249	<u>227.2035</u> 219.562	(+) 23.596	(-) 15.9545	(-) 7.6415

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 1.38 lakh Ha. in Uttar Pradesh and 1.21 lakh Ha in Madhya Pradesh with power generation of 45 MW through Rajghat Hydro Electric Project at the toe of dam on left flank. The cost as well as benefits of the project are to be shared equally by both the States. 99% work of Dam and Power House has been completed. Remaining work is proposed for completion by June, 2004.

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, compensation has been paid for 36 villages and payment for two villages is under progress.

The filling of reservoir up to FRL of RL 371.00 M may not be possible till the acquisition of land and property in the area coming under submergence is completed.

Planning and present status of Rajghat Power House Works.

The estimate of Rajghat Hydro Electric Project at 1997 price level was Rs. 131.26 crores which included Rs. 58.41 crores for 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 on civil works of Rajghat

Power House till July 2003 is 61.40 crores.

The three units of Power House have been tested and commissioned during 1999-2000. 1047 lakh, 677 lakh and 953 lakh units of power were generated during 2001-02, 2002-03 and 2003-04 (up to 8.12.2003) respectively..

Financial Position of BRB

The financial position of Rajghat Dam and Rajghat Power House Project are given in Table 7.7 and Table 7.8 respectively

Rajghat Dam

Table 7.7

Sl.No.	Item	U.P. (Rs.in Crores)	M.P. (Rs.in Crores)	Total (Rs.in Crores)
1.	Apportioned cost as per revised cost estimate	150.300	150.300	300.600
2.	Contribution received up to 30.9.03	132.850	133.095	265.945
3.	Balance to be contributed as on 30.9.03	17.450	17.205	34.655
4.	Net expenditure as on 30.9.03			260.82
5.	Balance available with BRB as on 30.9.03			3.16

Rajghat Power House

Table 7.8

Detail	Civil works by BRB	E/M works by MPEB
Revised cost estimate of work component	66.89	72.85
Contribution received up to 30.6.03	59.51	Expenditure has been made by MPEB directly.
Balance to be contributed	7.38	
Net expenditure incurred up to 31.7.03	61.40	
Balance available with BRB as on 31.3.03	(-) 1.89	

TUNGABHADRA BOARD

Introduction

The Tungabhadra Board was constituted by the President of India in exercise of the power 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.

Organisation

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

Status of Activities

Irrigation

As the monsoon rains were deficit, in the catchments, the Tungabhadra Reservoir did not fill up to the full reservoir level in the year. The inflow into the reservoir from June to March 2004 was 3286.453 Million Cum(MCum) (116.060 Thousand Million Cubic feet (TMCft)).

The utilization of water by the States of Karnataka and Andhra Pradesh till March 2004 was 1955.448 MCum (69.056 TMCft) and 1025.976

MCum (36.932 TMCft) respectively as against the likely abstraction of 2990.259 MCum (105.60 TMCft) for the year 2003_2004. Evaporation losses from June to March 2004 were 166.05 MCum (5.864 TMCft) to be shared by Karnataka and Andhra Pradesh in the ratio of 12.5 : 5.5.

Hydro Power

Two Power Houses are maintained by the Tungabhadra Board, with a total installed capacity of 72 MW, and a target of 160 million units of power generation is envisaged during the water year 2003-2004. Due to failure of monsoon the power generated till March 2004 was low and was 106.200 million units. The target for 2004-2005 is 160 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

There is a proposal for establishing a Mini Hydel Plant to be located at the Right Bank High Level Canal of the Tungabhadra Project on Build, Operate, Own and Transfer (BOOT) basis. The proposed capacity of the plant is 8.25 MW with an yearly generation of 27 million Units. The project is being set up by M/S NCL Energy Ltd., Hyderabad and the work of the plant is under progress.

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 up to 30-6-2004 to a local Fisheries Society for Rs.34,74,172/-. In order to facilitate preservation of fish catch, the Board is running an Ice-cum-Cold Storage Plant. Quality fishnets are also manufactured in the Fish Net Making Plant run by Board. The

revenue generated on account of selling Ice blocks and fish nets till March 2004 was Rs.27.76 lakhs.

Board Meeting

During the year, the Tungabhadra held two meetings till March 2004.

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 utilisable 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. Subsequently, separate agreement on construction of Hathnikund Barrage on Yamuna was signed on 2nd November, 1994 and agreements on Kishau Dam on Tons river and Renuka Dam on Giri river were signed on 6th November, 1994 by all co-basin States except Rajasthan.

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 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 conducting review of 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 25 meetings so far, the last one being on 13th August, 2003.

CHAPTER 8

INTERNATIONAL CO-OPERATION WITH NEIGHBOURING COUNTRIES

Introduction

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



The Hon'ble Union Minister of Water Resources Shri Arjun Charan Sethi and the Water Resources Minister of Bangladesh Shri Hafiz Uddin Ahmad exchanging greetings at the 35th meeting of Indo-Bangladesh Joint Rivers Commission (JRC) in New Delhi on September 29, 2003 (Monday)

efforts in maximizing the benefits from common river systems which is headed by Water Resources Ministers of both the countries. 35th meeting of the JRC was held at New Delhi from 29th September to 1st October 2003 wherein various matters pertaining to cooperation in Water Resources sector with Bangladesh were discussed. Hon'able Minister (WR), Bangladesh accompanied by other officials also visited the Joint Observation Stations on the Ganga downstream of the Farakka Barrage and the Feeder Canal.

A new chapter in the Indo-Bangladesh relations opened up with signing of a Treaty by the Prime Ministers of India and Bangladesh on 12th December 1996 on 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 two times and observed that Joint measurements on Ganga at Farakka (India) and Ganges at Hardinge Bridge (Bangladesh) during lean season (Jan-May 2003) had been held to the satisfaction of both the countries.

Sixth meeting of joint Committee of Experts (JCE) of Indo-Bangladesh Joint River Commission on sharing of waters of Teesta & other common rivers was held at New Delhi on 20th & 21st January 2004. As decided during the meeting, a Joint Technical Group has been constituted to discuss and examine all pending issues and come up with recommendations on the draft of the terms of reference for the joint Scientific Study to assess the availability and requirement of waters of Teesta and also for the draft of the interim agreements for sharing of the lean season Teesta flows between the two countries.

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 in flood mitigation measures.

India-Bhutan Cooperation

A Joint Expert Team (JET) consisting of officials from Government of India and Royal Government of Bhutan is functioning since 1979 to review the progress and other requirements of the "Comprehensive Scheme for Establishment of Hydro-meteorological and Flood Forecasting Network on rivers common to India and Bhutan." The network consists of 35 hydro meteorological/meteorological stations located in Bhutan which is being maintained by Royal Government of Bhutan (RGoB). The data received from these stations is utilized in India by Central Water Commission for formulating the flood forecasts. The JET which meets at regular intervals every year alternatively in India and Bhutan has so far held 18 meetings. The last meeting in this regard was held in Bhutan in September, 2003. The scheme is fully funded by the Government of India.

The matter relating to problems of floods created by rivers originating from Bhutan was also taken up with RGoB. The RGoB has agreed in principle for setting up of a Joint Team of Experts (JTE) for flood management. The Terms of Reference of the JTE are being finalized.

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 flood season by China to India. In accordance with the provisions contained in the MOU, the Chinese side is to provide 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. The requisite data during the current year from 1st June to 15th October 2003 was received which was utilized in formulation of flood forecasts by Central Water Commission.

The Government has also taken up matter with the Chinese authorities for setting up of additional hydrological stations on Langquinzangbu (Sutlej) and Palongzangbu (Tributary of Yaluzangbu i.e. Brahmaputra). During the visit of Hon'ble Prime Minister of India to China in June 2003, the matter was again raised by the Indian side to which the Chinese side conveyed that they will consider the request and would make plans for mapping the relevant hydrological stations.

India - Nepal Cooperation

A Treaty on Integrated Development of Mahakali (Sharda) River including Sharda Barrage, Tanakpur Barrage and Pancheshwar Multipurpose Project was signed between the 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 from the date of its entry into force. Pancheshwar Multipurpose Project is the Centre 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 the irrigation requirements downstream of Banbasa in Uttar Pradesh, have been completed. The Detailed Project report (DPR) is to be finalised after mutually resolving the pending issues regarding finalisation of re-regulating dam site, cost apportionment between Irrigation and Power, and between India and Nepal.

The Government of India has 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. Based on the agreed Joint Inception Report, it has been decided

to set up a Joint Project Office (JPO) to take up field investigations and preparation of Joint DPR. The proposal at an estimated cost of 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 implementation in the 10th Plan. Required formalities for setting up of JPO in Nepal have been completed and the JPO is likely to be set up shortly on formalization of the Letter of Exchange between India and Nepal defining the agreement / concessions on taxes, customs and other levies etc. The preparation of Joint DPR is programmed to be completed in a period of 30 months from the date of setting up of JPO. Besides irrigation and power benefits, the above project will also have major flood control benefits particularly in the north Bihar.

On the request of HMG' Nepal to inter alia take up field investigations and preparation of DPR in respect of 600 MW Burhi Gandaki Hydro Electric Project, a Technical Team headed by commissioner (ER) visited Nepal during 27th to 30th October 2003 and held discussions with the Nepalese side, wherein it has been agreed to take up field investigations, studies and preparation of the project report by an Indian agency (WAPCOS) for which a MOU is to be signed between the two Governments.

In order to prevent spilling of flood waters from Lalbakeya, Bagmati, Khando & Kamla rivers from Nepal side into Bihar, India and Nepal have agreed to extend the embankments along these rivers in Indian Territory to Nepal and tie to high ground in Nepal with corresponding strengthening of embankments on Indian side. Financing of works in Nepal is done through MEA and on the Indian side, through this Ministry. In this connection, a Committee on Embankment Construction has been constituted which is responsible for planning, design and construction of these embankments. During the year two meetings of this Committee were held at Kathmandu. Based on the recommendation of the

Committee, an amount of Rs.2.70 crore was released by Ministry of External Affairs to HMG/Nepal to take up the construction of embankments on the Nepalese side for river Bagmati. On the Indian side the funds will be released on receipt of proposals from Government of Bihar.

An India-Nepal Joint Committee on Flood Forecasting (CFF) was also constituted to review the existing flood forecasting system on rivers common to India and Nepal and prepare a comprehensive flood forecasting Master Plan. The CFF held three meetings so far and the last meeting was held at Delhi in April, 2003. During the meeting, it was decided to increase the number of hydrometric stations under the existing flood forecasting scheme from 42 to 47. The Nepalese side had also agreed to transmit real time data twice a day in respect of the 5 key hydro metric stations located on Gandak, Kosi, Rapti, Bagmati and Mahananda rivers which has resulted in increased warning time for Gandak from 7 hrs to 12 hrs and for Kosi from 16 hrs to 24 hrs. The Committee also finalised Flood Forecasting Master Plan.

In pursuance to the decision taken on the occasion of the visit of Prime Minister of Nepal to India, a High Level Nepal – India Technical Committee on Inundation problems on Rupandehi (Nepal), / Siddharth Nagar (India) and Banke (Nepal)/Shravasti districts (India) was constituted. The Committee which is headed by Commissioner (ER) on the Indian side has so far held two meetings. In the 2nd meeting held in August 2003, the deliberations could not be concluded which will be continued in next meeting to be held in Nepal in due course.

With a view to discuss 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 Resources Secretaries of both the countries is also functioning with the mandate to act as an Umbrella Committee

of all committee and groups

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 serves as the regular channel of communication on all matters relating to implementation of the Treaty. The two Commissioners together form the Permanent Indus Commission. The 88th meeting of the Permanent Indus Commission (PIC) was held at Islamabad in February 2003 to discuss issues related to Baglihar Hydro Electric Plant, being constructed by the State of J&K on river Chenab. The 89th meeting of the PIC was held at New Delhi during May, 2003 to finalise its report for the year ending 31.03.2003 for submission to respective Governments of India and Pakistan. The 90th meeting of the PIC was held at Islamabad in January 2004 to further discuss issues related to Baglihar plant. The 100th tour of inspection of PIC was undertaken in October, 2003 on the request of Pakistan Commissioner for Indus Waters for visit to the Baglihar H.E. Plant in J&K. Subsequently, the 101st Tour of Inspection of the PIC to Salal and Dulhasti Hydro-electric plants and Head Regulators of Ranbir and Pratap Canals in J&K was also undertaken in March 2004 on the request of Pakistan Commissioner.

In fulfillment of the requirements of Indus Water Treaty, the daily data of 278 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 through priority Telegrams, Telephones and Radio Broadcasts for their benefit during the period from 1st July to 10th October, 2003 for Indus system of rivers.

CHAPTER 9

RESEARCH AND DEVELOPMENT

Ministry of Water Resources promotes research and development on specialized subjects of water resources through its premier research Institutes – viz. CWPRS, Pune in the field of Hydraulic & Hydraulic Structures, river flow regime etc.; CSMRS in the field of Geotechnical engineering and soil & materials characteristics etc.; and National Institute of Hydrology in respect of various facets of Hydrology. Other organizations like CWC, CGWB and GFCC are also associated with studies on specialized subjects. In addition, the Ministry also provides grants to various academic institutions/research organizations 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.

CENTRAL SOIL AND MATERIALS RESEARCH STATION

Introduction

The Central Soil and Materials Research Station, New Delhi, is an attached office of the Ministry. It is a premier organization in the country dealing with field explorations, laboratory investigations, basic and applied research in the field of geomechanics and construction materials, concerning river valley projects construction, safety evaluation of existing dams, etc. 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. The sphere of activities of the Research Station is covered under the disciplines of:

- Soil Mechanics and Foundation Engineering including Soil Dynamics, Soil Chemistry, Geotextiles and Rockfill Technology.
- Rock Mechanics including Instrumentation, Engineering Geophysics, Grout Technology and Drilling Technology for sub-surface characterization.
- Construction Materials and Concrete Technology including Chemistry of Concrete.

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, Srilanka, Afghanistan, Bangladesh, Iraq, Algeria 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. CSMRS is headed by a Director.

Activities during The Year

Investigation for projects

Investigation for as many as 50 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 during the year 2003-2004:

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 also established Geosynthetics Division and the Rock Mechanics Laboratory has been upgraded.

SELF SPONSORED RESEARCH SCHEMES

- Prediction of Consolidation Characteristics of Fine grained Soils
- Effect of PH on Physical and Engineering Prosperities 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

Consultancy Works

A large number of consultancy works pertaining to river valley projects and connected civil engineering structures were handled in 2003-2004. Some of the important projects handled are given below:

Tehri Rockfill Dam Project, Uttaranchal

The activities accomplished during 2003-2004 include gradation, in-situ density and insitu

permeability tests for soil core, filter, shell and riprap materials during the field visits. Soil samples containing phyllitic material from extended Koti borrow area and blended samples were collected and investigated in laboratory for its suitability as core material. A technical note on CSMRS observations on it was submitted to Technical Advisory Committee (TAC) of Tehri Dam. Similarly, samples of soft rock from spillway area of the dam were collected and investigated for its engineering characteristics required by CWC designers. Senior officers of CSMRS participated in the 23rd and 24th TAC meeting at Tehri Dam Project and discussed the above two investigations carried out by CSMRS.

Tala H.E. Project, Bhutan.

For the construction of the project structures, CSMRS was entrusted with the following works at different periods. Testing of concrete cubes of 45 cm size cast with full mix concrete of M12.5 A150 and M20 A75 grades and also cubes of 15 cm size cast with wet screened concrete for the same two grades for determining their compressive strength at 28 days age so as to get co-relation between the strength of full mix concrete and wet screened mix concrete for the two grades. The testing of concrete cubes, reinforcement steel bars (plain), welded steel bars, anchor bolts, Dwydag anchors, couplings were tested in CSMRS and reports submitted to Project.

Salma Dam Project, Afghanistan

The project envisages construction of a 107.5 meters high earth and rockfill dam having a length of 523.4 meters at top on river Hari Rud. The project, 2 Kms downstream of Salma village, is located about 176 Kms east of Herat town. The project shall stabilize the irrigation requirements of the area besides meeting additional irrigation needs. The project will also generate 40 MW (13.33 MW x 3) power.

A senior officer of CSMRS accompanied an interdisciplinary group of experts who visited the project on the request of WAPCOS (I) Ltd., New Delhi. During the visit, soil samples from impervious core of the dam from three identified Salma, Dekhan and Sherkhaj borrow areas were collected to evaluate their engineering characteristics for ascertaining their suitability. Similarly, several big and small shoals were identified both upstream and downstream of the dam. Sand and gravel samples were collected from the shoals to determine their suitability as a construction material. After laboratory investigations, a report on borrow area soil samples and fine and coarse aggregates was prepared. Observations and recommendations of the laboratory findings on soil, sand and gravels as construction materials were made.

Subansiri Middle Project (Kamala), Arunachal Pradesh

CSMRS field party visited the borrow areas of SMR – 1 and SMR – 7 quarries and conducted the field tests so as to arrive at an average prototype gradation curve of the blasted rockfill material. Large size Triaxial Consolidated Drained (CD) shear tests were conducted on modeled material.

Landslide Research Project in Bhutan

Two CSMRS officials imparted training to Bhutanese Personnel in installation of Casings and in monitoring the landslide movement with the help of Inclinator in one borehole (B.H 1) and also demonstrated installation of one porous tube Piezometer at 30 m depth in other borehole (B.H 2) at landslide area near Rinchending/Kharbandi located about 5 kms. east of Phuentsholing, Bhutan from 8th August to 22nd August, 2003, successfully.

OTHER CONSULTANCY SERVICES

Consultancy services have also been provided in Rihand Dam Project, UP; Lower Jhelum H.E. Project, Baramulla, J&K; Parbati H.E. Project (Stage-III), HP; Dhauliganga H.E. Project, Uttaranchal; Idukki Dam Project; Bhakra Dam Project; Baglihar HE Project, J&K; and Middle Siang H.E. Project, Arunachal Pradesh; Kol Dam Project, H.P; Vishnugad Tapovan & Loharinag Pala Projects, Uttaranchal.

River Links

The Geotechnical investigations of the following river links are in progress for National Water Development Agency (NWDA)

- Krishna (Almatti)-Pennar Link Canal Project, Karnataka/A.P.
- Parbati-Kalisindh-Chambal Link Project, M.P../Rajasthan
- Ghaghara-Yamuna Link Canal Project, U.P.
- Sharda-Yamuna Link Canal Project, U.P.

- Mahanadi-Godavari Link Canal Project, Orissa/A.P.
- Chunar-Sone Barrage Link Project, Bihar/U.P.
- Yamuna-Rajasthan Link Canal Project, Rajasthan
- Manas-Sankosh-Teesta Link Canal Project (Stage I), Assam/W.B.
- Teesta-Mahananda-Ganga Link Canal Project (Stage II), W.B./Bihar
- Pennar-Palar-Cauvery Link Project, Tamilnadu/A.P.

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 and Construction Materials and Structures.

Indian National Committee on Geotechnical Engineering (INCGE)

The Present Status of Research Schemes is given as under:

1.	Projects being funded (on date)	39
2.	New Research Schemes sanctioned	—
3.	Research Schemes completed	01
4.	No. of schemes already closed	17
5.	No. of schemes recommended for closure	06
6.	On-going schemes	12
7.	New Schemes under construction	03

8.	Sanctioned amount (Grant-in-Aid)	Rs.333.75 lakhs
9.	Amount released (Grant-in-Aid)	Rs.236.40 lakhs

XVIIIth Meeting of INCGE and Joint R&D Review Session of INCGE and INCCMS was held at GERI, Vadodara on 19-20.03.04.

Indian National Committee on Construction Materials and Structures (INCCMS)

The Present Status of Research Schemes is given as under:

1.	Total No. of Research Scheme sanctioned	21
2.	Sanctioned amount of grant-in-aid	267.83658 lakhs
3.	Grant-in-aid released till date	161.1567 lakhs
4.	No. of Schemes completed	11
5.	No. of schemes under execution	09
6.	New Schemes under consideration	05
7.	No. of schemes recommended for closure	01

The INCCMS comprises of 21 members. Out of these, 9 members are permanent members.

IGNOU STUDY CENTRE AT CSMRS

A Study Centre 0744 P of Indira Gandhi National Open University (IGNOU) is under operation in CSMRS since January, 2001 for the courses of Bachelor of Technology in Construction Management (BTCM) and Bachelor of Technology in Water Resources Engineering (BTWRE). During the Session January to December, 2003, overall 170 Nos. of students have been enrolled for these courses. The classes have been organized on every Saturday and Sunday. CSMRS officers are working as counsellors for different subjects. The session is running successfully.

CSMRS-NGI INSTITUTIONAL CO-OPERATION PROGRAMME

CSMRS and Norwegian Geotechnical Institute, Oslo, Norway have 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) has been taken up for detailed investigations.

CENTRAL WATER & POWER RESEARCH STATION,

Introduction

Central Water and Power Research Station (CWPRS), Pune established in 1916 is a premier national institute offering comprehensive R&D support consultancy and advisory 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, aiding and

promoting research activities at various institutions besides training of research manpower.

The studies are carried out on physical and mathematical models or by Desk studies for providing solution of various complex hydraulic and hydrologic problems. In addition CWPRS also undertakes allied works such as collection of field data, site investigations using seismic reflection / refraction surveys, evaluation of site specific seismic parameters, testing of civil engineering materials and water samples. Calibration of flowmeters / currentmeters is also carried out. CWPRS has made a significant progress in application of Remote Sensing technique for providing solutions of river and coastal engineering problems.

Organisation

The activities of the Research Station are carried out through ten major laboratories in the disciplines viz. 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

The website of CWPRS wapis@mah.nic.in

Dissemination of Technical Information

During the year 2003-04 around 70 research papers have been presented / published by CWPRS in various journals / conferences / workshops / seminars etc. One technical memoranda titled "Controlled blasting for rock excavation in civil engineering application" has been published. Also 100 officers have been trained in various disciplines and 8 workshops / national seminar / conference were organised.

Research and Studies

During the year 2003-04 around 120 technical reports are expected to be submitted to various clients. The Research Station undertakes the assignments on no loss – no profit basis. During 2003-04, about 123 new works amounting to Rs.9.50 crore from the three Major sectors viz. water resources, energy and water borne transport etc. are expected. The important projects handled are:

Design of Proposed Punpun Barrage, Bihar

Government of Bihar has proposed a barrage on River Punpun near Hamidnagar in Aurangabad District mainly to meet irrigation demand in the lower basin east of Punpun. Model studies for the barrage were conducted to decide location, orientation and waterway of barrage, alignment and design of river training works such as guide bunds, location and orientation of head regulator, afflux, energy dissipation arrangements etc.

Studies for Proposed Bridges on River Kosi Near Nirmali, Bihar

National Highway Authority of India (NHAI) and Northeastern Railway have proposed to construct road and railway bridges side by side at about 40 km downstream of Kosi barrage near Nirmali town. A technical committee under the chairmanship of Member (Technical) of NHAI has been constituted to examine the feasibility of this proposal and to finalize various technical parameters. As per recommendations of the committee, mathematical and physical model studies were carried out to study the Location and alignment of the bridges, Flow conditions at bridge sites with and without bridge, Waterway of the bridge and corresponding afflux, Design of guide bunds, approach embankments and protection of existing flood embankments.

Studies For Proposed Kalindi Bypass Along River Yamuna at Delhi

The Public Works Department, Delhi, has proposed to construct bypass from Kalindi Colony ring road to Kalindi Kunj road No.13-A along river Yamuna at Delhi. Model studies were carried out to examine the technical feasibility of proposed Kalindi bypass road in a mobile bed model of river Yamuna at Delhi. Studies indicated that due to construction of the proposed bypass road on the right side, the effect of rise in water level and velocity would be negligible on the left bank as well as on the existing hydraulic structures.

Studies For Ghatghar H.E. Project, Maharashtra

Ghatghar pumped storage project is first of its kind in Maharashtra State. The installed capacity of two reversible pump turbine/generator motors is of 250 MW in an underground power house complex with a design head of 420 m. The project envisages construction of two dams forming two reservoirs. Upper reservoir on river Pavana near village Ghatghar in Ahmednagar district, the lower reservoir is on Shahi Nalla near village Chonde Budruk in Thane district. The water conductor system consists of approach channel, intake structure and pressure shaft leading water to the underground power house.

Studies at Koyna Dam, Maharashtra

Maharashtra Krishna Valley Development Corporation has proposed to develop three major irrigation schemes Tembhur, Takari and Mhaishal on Krishna river. The source of water for these schemes will be Koyna reservoir and rivers Krishna, Koyna and their tributaries.

CWPRS was associated with various studies such as geophysical survey, evaluation of dynamic modulus of elasticity of concrete and rock samples,

site specific earthquake ground motion and analysis of instrumentation data.

Studies for Parbati H.E. Project, Stage-II, Himachal Pradesh

The river Parbati originating from Mantalai lake in Himachal Pradesh at an elevation of El. 6300 m is a left bank tributary of Beas river. The catchment area is 1155 sq.km and observed maximum flood is 369 cumec. About 84% of the catchment area is snow covered and the river has a very steep slope of 53 m/km.

Parbati H.E. Project, Stage –II in Himachal Pradesh envisages construction of a 85 m high concrete gravity dam in Kullu district. The powerhouse having installed capacity of 800 MW will be equipped with four Pelton turbines each of 200 MW rated capacity (gross head 862 m).

Studies for 500 Mw Prototype Fast Breeder Reactor at Kalpakkam

CWPRS has undertaken studies to select a suitable location and type of intake and outfall structures of PFBR, As a first stage, field data collection, to provide the input data for the model calibration, was carried out. Sophisticated field equipments like self-recording tide gauge, current meters, water samplers etc. were used for this purpose.

Taking into consideration the seasonal changes in currents and different lengths of outflow channel/guided bund/sand spit etc. several cases of locations of PFBR/MAPS outflow were examined using mathematical model MIKE21 and two alternatives were evolved.

Design of Seawall at Tithal, Valsad, Gujarat

The design of seawall supplied by the Damanganga Project Circle, Government of Gujarat was suitably modified by considering various site constraints such

as non-availability of heavier stones (about 50 or 100 kg), construction machinery like crane and time span in which the work is to be completed in view of the impending erosion. The modified design consisted of a seawall with flexible Gabions filled with 20-40 kg stones. These gabions are easy to handle at the site and the section can be constructed speedily, minimizing the use of sophisticated machinery and heavy stones.

A 330m long seawall with Gabions was constructed in front of the temple and the same has provided protection to the eroding coast successfully during the monsoons.

Studies for Proposed Passenger Water Transport Terminals on West Coast of Mumbai

The mega city of Mumbai is facing deep crisis as regards its commuted transport system, as its land base infrastructure of roads and suburban railway have been loaded beyond limits. As an alternative commuting system, the Maharashtra State Road Development Corporation (MSRDC) have a proposal for development of Passenger Water Transport Terminals at five locations on the west coast of Mumbai namely, at Nariman point, Bandra, Versova, Marve and Borivali in Manori creek. The proposal consists of providing jetties and other terminal facilities at these locations for berthing of Catamarans and Hovercrafts requiring maximum draft of 2.5m.

Studies for Reliance Project at Kakinada, Andhra Pradesh

The following studies were conducted at CWPRS for The Reliance Industries Limited (RIL) to bring the gas from offshore platform to an onshore terminal through a pipeline laid on sea bed and Gautami – Godavari river bed. The plant will consist

of facilities for processing of gas, storage and distribution system for further transportation to Andhra Pradesh and Maharashtra states

Studies for Dumping Grounds At Jawaharlal Nehru Port, Mumbai

The Jawaharlal Nehru Port (JNP) one of the major ports of India is considering deepening and widening of its navigational channel to enable entry of fourth and fifth generation container vessels. In order to examine various aspects of disposal of the capital dredging, CWPRS carried out model studies to identify suitable sites for dumping of dredged material after verifying the dispersion of material from the proposed dumping grounds. It was also considered necessary to study dispersion of the resuspended material due to dredging operations in the channel from an environmental point of view. The adequacy of the present dumping grounds for disposal of maintenance dredging material, which would arise after deepening and widening of the channel, was also to be studied. These studies were carried out by developing mathematical models for flow, dispersion and sedimentation. Extensive field data has been collected in the offshore region for calibration of these models and also for corroborating the studies.

NATIONAL INSTITUTE OF HYDROLOGY

Introduction

The National Institute of Hydrology (NIH) was established by the Government of India in 1978 with its headquarters at Roorkee as an autonomous society, fully aided by the Ministry of Water Resources.

The main objectives for which the National Institute of Hydrology has been established are:

- To undertake, aid, promote and coordinate systematic and scientific studies in all aspects of hydrology so as to improve the present practices in planning, design and operation of water resources projects;
- 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 to equip this with books, reviews, magazines, and other relevant publications and;
- To do all other such things as 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 regional centres 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.

Consultancy on World-Wide Basis

The Institute has developed capability to take up world-wide consultancy projects in the following areas:

1. Project Hydrology related studies.
2. Reservoir operation and assessment of sedimentation.
3. Flood frequency analysis and flood plain zoning.
4. Ground water modelling
5. Remote sensing & nuclear applications in hydrology

The Institute Celebrated Its Silver Jubilee

The NIH celebrated its Silver Jubilee (25th Anniversary of Foundation Day) on 16 December, 2003 with great enthusiasm. As part of the year long celebration of the Silver Jubilee of the Institute a series of lectures are proposed to be organised. So far the following lectures were organized:

1. Watershed Modelling – A Historical Perspective, Problems and Future outlook by Prof V P Singh, University of Louisiana USA on 6th January 2004
2. Reversal of Stress through Meditation by Dr Pranav Pandya, Shanti Kunj, Hardwar, Uttaranchal on 16th February 2004
3. Environmental Flow and Hydrology by



Sri Sur Vir Sajwan, Honourable Minister for Irrigation, Uttaranchal State and Prof. Prem Vrat, Director, I.I.T. Roorkee lighting the lamp at the Inauguration of Silver Jubilee Celebrations of National Institute of Hydrology

Mr Vladimir U Smakhtin International Water Management Institute Sri Lanka on 15th March 2004

National Symposium on “Future Challenges In Water Resources” (In Hindi)

A National Symposium in Hindi on “Jal Sansadhan Ke Kshetra Me Bhari Chunauiyan” (Future Challenges in Water Resources) was organised by NIH on 16-17 December, 2003 on the occasion of International Fresh Water Year and Silver Jubilee Celebration of the Institute.

During the two-day symposium, 79 research papers were presented by the authors and keynote speakers. Delegates from 12 States participated in the symposium and deliberated on various issues relating to challenges in water resources sector in

the coming years. The technical sessions of the symposium were on seven main themes, namely:

- Water Conservation
- Interlinking of river waters
- Flood and drought management
- Surface and groundwater availability
- Groundwater pollution
- Environment and water quality
- Effect of water resources on socio-economic development

Water Conservation Campaign

On an appeal to the nation by Hon'ble Prime Minister, Shri Atal Bihari Vajpayee on water conservation, the Institute observed July and August

2003 as 'Water Months'. Towards this objective the Institute organised mass awareness campaign on water and environment by organising seminars, workshops and debates, quiz and science shows for the students from schools/colleges at Headquarters (Roorkee) and its regional centres.

Holistic Evaluation of Interlinking of Rivers

The Institute has taken up a project to study hydrological, social, economical, environmental and ecological feasibility of one representative link of the peninsular component of the National Perspective Plan for interlinking of rivers. The work has commenced in January'04 and will be completed in two years time.

International Status of Nuclear Hydrology Laboratory

The nuclear hydrology laboratory at NIH has been recognised at national and international levels. The facilities available at the laboratory for sediment and water dating are proposed to be further upgraded in 2004 for stable isotopic measurements. The International Atomic Energy Agency, Vienna, Austria has decided to involve NIH to carry out an integrated river isotopic study in India. In addition, NIH has also established twelve stations at various places in India to collect the precipitation samples and water sampling has been started for Ganga, Yamuna and Brahmaputra rivers.

Hydrology Project

The Institute had actively participated in the successful implementation of the Hydrology Project. Two training courses on HYMOS and one training course on Project Hydrology were organised by the Institute.

Scientists of the Institute participated in the Training of Trainers course on GEMS Ground Water Data Processing Software and WISDOM Software. Studies on four Research and Development projects

taken up as part of Hydrology Project, were completed and reports submitted.

Studies and Research

The studies and research in the Institute are being carried out by seventeen scientific divisions at Roorkee and two Centres for Flood Management Studies and four regional Centres, 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 2003-04, studies and research have been carried out on various areas of hydrology. Based on these about one hundred reports are being published. Besides, nearly 80 research papers have been published in national and international journals and proceedings of national and international conferences/seminars and symposia.

Since the inception of the Institute, besides carrying out regular basic and applied research and development studies, the Institute and its regional centres have also taken up strategic research referred to it by the Central and State Government Organisations and Public Sector Undertakings. During 2003-2004 work on nine sponsored projects continued and research on four new projects was taken up.

Estimation of Irrigation Return Flow in Lokapavani area of Krishnaraja Sagar Command, Karnataka

The project has the following objectives:

- Quantification of return flow vis-à-vis for varying irrigation supplies.
 - Development of methodologies for conducting similar studies in other command areas and setting up criteria for assessing the validity of the results beyond the specific studies sites.
-

The overall project responsibilities, those include guiding, collaborating organisations in the instrumentation and data collection activities, analyses of data, preparation of thematic maps, and modelling exercises etc. were with the National Institute of Hydrology, Water Resources Development Organisations, Government of Karnataka, and Department of Mines and Geology, Government of Karnataka gave the support to collaborating organisations on surface water data and groundwater data collection activities respectively. The research outputs of the project have been brought out in three volumes as titled below, followed by an executive summary:

- Surface and subsurface data compilation analyses and lumped water balance of the Lokapavani area in Krishnaraja Sagar Command (Part-I).

- Estimation of Irrigation Return Flow using process level modelling (Part-II).
- Distributed modeling of the hydrologic systems of the Lokapavani area in Krishnaraja Sagar irrigation command using MIKE SHE WM MODULE (Part-III).

Hydrological Studies on Gangotri Glacier

NIH has carried out hydrological studies on Gangotri Glacier, which is one of the biggest glacier of Himalayas. The hydrological data was collected for last 4 years. Analysis of hydro-meteorological data suggests that the total rainfall and its distribution over the summer season are found to be much variable from year to year. Average seasonal (May-October) rainfall for the Gangotri Glacier is observed to be about 274 mm. Temperature records show that average daily maximum and minimum



Creating awareness towards water quality among school children in rural areas

temperatures over the summer season were computed to be 14.9°C and 4.1°C, respectively. Monthly flow observed during four years shows that July and August experienced higher discharge during summer period. The discharge shows increasing trend from May onward, reaches to its highest value in July and then starts reducing.

The conceptual hydrological model developed for the Gangotri Glacier was used to simulate daily streamflow from Gangotri Glacier for all the years. Results show efficiency of the model of more than 90% for all the years.

Watershed and Hydrology

The film is an attempt to understand the importance of hydrology in watershed development and focuses on the needs of watershed studies in small, hilly watersheds, and presents a case study in two watersheds in Tehri-Garhwal area of Uttaranchal. It shows how available surplus water from springs and streams, especially during monsoon season, can be effectively stored and used during non-monsoon months. The film is also an attempt to understand the importance of community participation in watershed development, and shows how involvement of stakeholders can solve the local problems related to water and other natural resources.

Indian National Committee on Hydrology (INCOH)

The Indian National Committee on Hydrology (INCOH) is the apex body under the Ministry of Water Resources (MOWR) with the responsibility of coordinating activities concerning hydrology in the country. The Committee has its members drawn from central and state government agencies as well as experts from academic and research organizations.

INCOH provides technical support to MOWR in selecting the research schemes and studies for

funding in the area of hydrology. Till date, under INCOH, Ministry of Water Resources, Government of India has sanctioned twenty - seven research schemes under "Research Schemes Applied to River Valley Projects" relating to "Surface Water" & ten schemes related to "Ground Water". Out of these schemes, twenty three schemes have been completed successfully. During the year 2003-2004, three schemes have been completed.

In pursuance of its objective of preparing and periodically updating the state-of-art in hydrology in the country, the Committee has brought out twenty-five reports. During the year 2003-2004, two reports have been completed.

INCOH has also supported a number of activities, which include seminars, symposia, conferences, workshops, courses etc. for dissemination of hydrologic knowledge and promoting education and training. During the year 2003-2004, the Committee provided technical assistance and funds to thirteen activities. Recommendations of such activities are circulated to relevant organizations in the country.

The Committee is also participating in the activities of International Hydrological Programme (IHP) of the United Nations Educational, Scientific and Cultural Organization (UNESCO) by organizing regional courses and workshops. The Committee has actively contributed to the five phases of International Hydrological Programme of UNESCO. Number of activities has been taken up by INCOH to achieve this objective. The VIth phase of International Hydrological Programme of UNESCO has commenced from the year 2002 and will end in the year 2007. The main theme of IHP-IV is devoted to water interaction with various systems emphasizing the need to look at social changes ahead and associated risks. During the year 2003-2004, India's participation in IHP-VI was finalised.

CHAPTER 10

UNDERTAKINGS OF THE MINISTRY

WATER AND POWER CONSULTANCY SERVICES (INDIA) LIMITED

Introduction

Water and Power Consultancy Services (India) Limited (WAPCOS), New Delhi is one of the Mini Ratna Public Sector Enterprise of Government of India. It was set up in the year 1969 to channelise Indian expertise in the fields of Water & Power Sectors and allied fields for the benefit of developing countries. It provides services in a wide range of activities covering pre-feasibility studies, feasibility studies, field investigations, detailed engineering, construction management, commissioning and testing, operation and maintenance, quality assurance & management, and human resources development. The main fields of WAPCOS operations cover Irrigation, Drainage, Ground Water Exploration, Minor Irrigation, Flood Control, Watershed Management, Hydro Power Engineering, Thermal Power Transmission and Distribution, Water Supply and Sanitation (Rural & Urban), Environmental Engineering, Ports & Harbours, Rural and Urban Development, Roads and Highway Engineering, System Studies and Information Technology and Human Resources Development.

International Operations

WAPCOS is registered with various international funding agencies like World Bank, Asian Development Bank, African Development Bank, Arab Fund for Economic and Social Development,

Kuwait Fund for Arab Economic Development etc. and also handles ITEC programmes including Water Resources Projects funded by JBIC, Japan. It has been providing consultancy services in India, Asia and Africa. WAPCOS has been accredited with ISO 9001.

Recognition of Merit

- Rated as “Excellent” by the Department of Public Enterprises since 1993;
- Ranked amongst the top ten PSEs for the year 1999-2000.
- Awarded the ‘Merit Certificate’ for “Excellent” Performance during 1999-2000 and 2000-2001 by the Vice President of India.
- Awarded the “Merit Certificate for Excellence” by His Excellency President of India for the year 2001-2002.

In recognition of its contribution in the Water and Power Sectors, WAPCOS has been elected as a Member of the Governing Body of Consultancy Development Centre, an autonomous body supported by DSIR, Ministry of Science & Technology and as Vice President of the Governing Council of Consulting Engineers Association of India (CEAI) for the years 2001-2005.

Technical Activities

The activities of the Company are carried through various Centres. The activities during the Financial

Year 2003-2004 are reported below :-

Commercial And Informatics Centre

Foreign Projects:

- DPR for Rehabilitation of West Baray Irrigation Project in Siem Reap Province, Cambodia under Indo-Cambodia Co-operation.
- Hydrological study of Ta-Prohm Temple Complex, Siem Reap, Cambodia for Archaeological Survey of India (ASI), Govt. of India.

Indian Projects

- Small Grants Facility (SGF) for Water Sector, Ministry of Environment & Forests, Govt. of India
- Water Quality Monitoring in Allahabad, Nellore, Sehore and Kangra Districts, RGNDWM, Ministry of Rural Development, Govt. of India.
- Implementation of Water Harvesting Schemes in U.T. of Dadra and Nagar Haveli for U.T. Administration
- Water Resources Scoping Study in Eastern Tribal Belt of Gujarat for Gujarat Water Supply and Sewerage Board
- Support Agency for Project Gram Panchayats, '**Jal Nirmal Project**' for Karnataka Rural Water Supply and Sanitation Agency
- DPR for Water Harvesting Schemes and Construction Supervision in Ghogha Project, Bhavnagar district for Water and Sanitation Management Organisation
- Technical Assistance for Economic Reforms Project, Dept. of Economic Affairs, Ministry of Finance.

Centre For Water Resources And Research & Development

Foreign Projects

- Wabi Shebele River Basin Project, Ethiopia
- Study of Land Drainage System of Mauritius
- Minicipal Dyke Rehabilitation Work, Port Louis, Mauritius
- New Anse Raffin Dam in Rodrigues, Mauritius

Indian Projects

- Rengali Irrigation Sub Project LBC-II (Phase-I) (Govt. of Orissa)
- Kurnool-Cuddapah Canal Modernisation Project (Govt. of Andhra Pradesh)
- Haryana Operational Pilot Project, Haryana
- Godavari Lift Irrigation Schemes, Andhra Pradesh
- Micro Canalisation of Sardar Sarovar Project
- Micro Canalisation Work of SRBC Project, Hyderabad
- GAIL Pipeline Survey Work from Vizag to Secundrabad
- MCS work of IGNP Phase-II, Bikaner, Rajasthan
- Survey and Investigation of GRBC Distributories and Sangam Branch, Bagalkot
- Topographical Survey of Thermal Power Station of Marudhar Power Pvt. Ltd., Raneri

Center For Project Appraisal

Indian Projects :

- Impact Evaluation Study of the Nine Command Area Development Programme
- Assessment of Regionwise Technological Advancement in Irrigation, Management adopted by Farmers.
- Study on Impact of Irrigation System Performance in closing the Gap in utilisation in Chambal and Malprabha Commands.
- Monitoring of Implementation of Waterlogging Reclamation Scheme in CAD Canal Commands of Kerala.
- Study of Waterlogging in Seven Canal Commands covered under CAD Programme.
- Impact Evaluation Study for Haryana Water Resources Consolidated Project, Haryana
- Performance Evaluation Studies of Kangsabati Irrigation Project, West Bengal

Centre For Power

Foreign Projects

- Tala H.E. Project, Bhutan
- Kurichu H.E. Project, Bhutan
- Rural Electrification Master Plan Implementation, Zimbabwe
- Feasibility Study of Thermal and Renewable Energy Sources, Zimbabwe
- Construction of Tubewells (24 Nos.) in Heart Province, Afghanistan.
- Salma Dam Project, Afghanistan
- Mini and Micro Hydel Projects, Afghanistan

- Procurement and Supply of Sub-Stations Equipment to Afghanistan
- Quargah Reservoir Project & Amir Ghazi Dam, Afghanistan
- Khanabad Irrigation Project, Afghanistan

Indian Projects

- Pre-feasibility Report of 71 Nos. Hydel Schemes
- Purulia Pumped Storage Project, West Bengal
- Investigation of Loharinag Pala and Tapavan H.E. Projects (NTPC)
- Accelerated Power Development & Reforms Programme , (Punjab & Delhi)
- Godawari Lift Irrigation Scheme, Andhra Pradesh
- Rani Avanti Bai Sagar Project, Madhya Pradesh
- Malana Sagar-II H.E. Project, Himachal Pradesh
- Design of Railway Tunnels, Jammu & Kashmir

CENTRE FOR INFRASTRUCTURE

Indian Projects

- Monitoring and Evaluation of Uttar Pradesh Sodic Land Reclamation Project, Phase - II - World Bank Assisted Project
- Environmental studies for various mega projects in hydropower, water resources, ports & harbours, mining, industrial sector etc.
- Techno-Economic Feasibility Study of navigation in river Narmada
- Inland Waterways Sector Development Program-ADB funded project.

- Model Studies for Onshore Gas Terminal at Kakinada.
- Transportation of Water from Rutland Island to Port Blair
- Storm Water System of Seelampur and Shastri Nagar Park area in Delhi
- DPR for Development of Port at Maroli, Gujarat
- Design of Sewage Treatment and Disposal System of Port Blair Town.
- Water Intake Scheme for 2x77 MW Lignite Based Thermal Power Plant, Marudhar (Rajasthan) Planning
- Designing of distribution network system of Water Supply for Dwarka, Phase-II, New Delhi.
- Detailed Project Report for Augmentation of Water Supply Scheme for Bishnupur Saroj Lake, Waithou-Pat, Urap, Konthoujam, District Head Quarter areas of Bishnupur District, Manipur State
- Preparation of Feasibility Report on assessment of availability of water from river TEL for setting up an Alumina Refinery in Lanjigarh, Orissa (Sterlite)
- Preparation of Bankable DPRs under the National River Action Plan (NRAP) for Mandsaur and Rewa Towns of Madhya Pradesh
- Renovation & Augmentation of Water Supply Scheme for Daltonganj.

INDIAN NATIONAL COMMITTEE ON IRRIGATION & DRAINAGE (INCID)

The Indian National Committee on Irrigation and Drainage (INCID) is the National Committee for India

for the International Commission on Irrigation and Drainage (ICID). INCID contributes to various ICID meetings/workshops/ congresses and conferences as also to other International conferences. One of the important functions carried out by the INCID is the processing, coordination and monitoring of the R&D Schemes funded by the Ministry. INCID is also involved in bringing out technical publication in the form of manuals, reports, bulletins, seminars, proceedings etc. WAPCOS serves as the main secretariat for INCID and continued to provide secretarial assistance to it during the year under review.

NATIONAL PROJECTS CONSTRUCTION CORPORATION LTD

Introduction

National Projects Construction Corporation Limited (NPCC) an ISO 9000-2001 Certified Company 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. The Corporation has been so far associated with more than 200 Projects of National and International 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 into new areas like environment - connected projects, highways and turnkey jobs etc. As a result of these measures the

corporation has been able to achieve an all time high order Book position of Rs 1169 Crore (as on 31.03.2004). During the year 2002-03 the turn over of the Corporation has considerably increased to 227.62 Crore & so far in the current financial year it has achieved a turn over of Rs. 290.00 Crore .

In view of the marked improvement in the performance of the corporation in the current year, the Revival Plan has been prepared and is under active consideration of the Ministry. The authorized capital of the company is Rs 30 Crores and its Paid up Capital is Rs 29.84 Crores.

Turnover

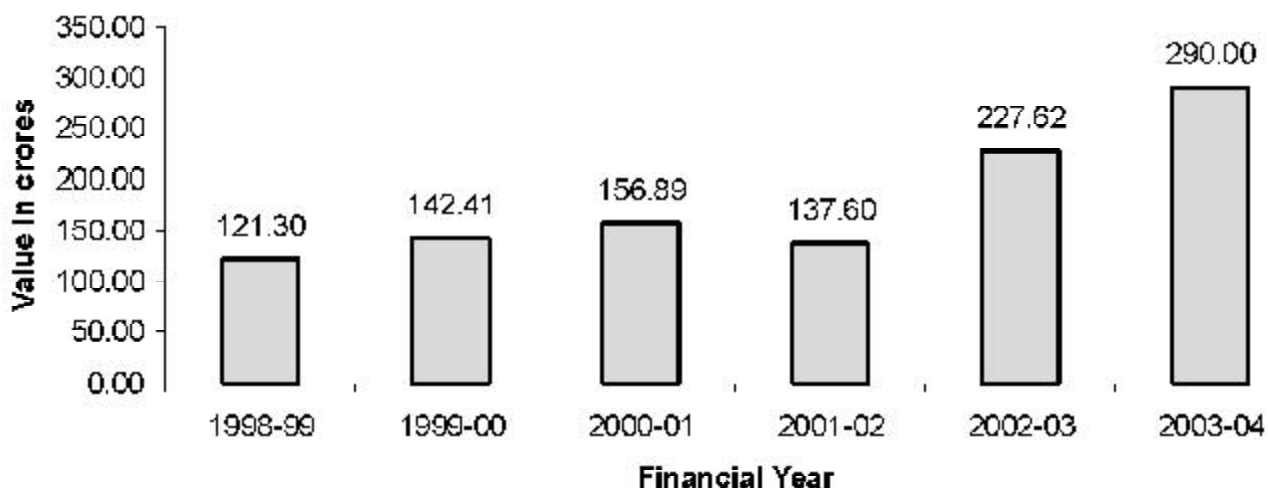
The turnover of the Corporation during last six years and the achievement for the current year 2003-04 is given below :

(Rs in Crores)

Year	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Turnover	121.30	142.41	156.89	137.60	227.62	290.00

The revised target for achieving the turnover for the current year is Rs 250.00 Crore.

TURN OVER DURING LAST SIX YEARS



New Works Secured

Despite several constraints in the tendering, corporation has secured new works for Rs.1040.11 Crore as detailed below.

- A. Year 2002-03 Rs 580.90 Crore against a target of Rs.135.00 crore
- B. Year 2003-04 Rs 740.21 Crore against a target of Rs.250.00 crore.
Order Book position as on 31.03.2004 is Rs.1169.00 Crore

Order Book Position For Last Six Years



Major works awarded to NPCC during the Year

- Construction of Border fencing with roads at Indo Bangla Border by Ministry of Home affairs to the tune of Rs 200 Crore.
- Construction of Fly over at NOIDA by NOIDA Authority to the tune of Rs 84 Crore by Govt. of UP.
- Construction of various buildings to the tune of Rs 14 Crore for Assam Rifles in different states of North East
- Construction of GM building at Hazipur(Bihar) for Eastern Central Railway to the tune of Rs. 10.11 Crores.
- Construction of two nos. Broad Gauge Line Tunnel in Udampur-Katra-Laole section for Konkan Railway Corporation Limited at J&K to the tune of Rs. 230 Crores.
- Construction of site Levelling & Ash Dykes at SIPAT SSTP and Talcher SSTP (NTPC) in Chattisgarh and Orissa respectively to the tune of Rs. 18 Crores (Approx.).

Works under Execution

At present, the corporation is working on 102 Unit / 135 Project sites spread all over the country. These include Irrigation & River Valley Projects, Hydroelectric Projects, Thermal Projects, Industrial Structures & other miscellaneous projects. Some of the projects in hand are as follows.

(a) Irrigation and River Valley Projects.

- Khuga Dam & Spillway (Manipur),
- Jobat Dam, Construction of Masonary Dam and allied Civil Works , Ajnal Aqueduct, Escape Channel & Cross Regulator Works, Bansagar Spillway Bridge and Bariyarpur Datia Canal works, in MP.
- MOHRI Irrigation Project in Tripura.
- Ganga Diversion Channel at Kanpur in UP.
- Barrage across Chitravati River in Bagepall, in Karnataka.

(b) Hydroelectric Projects.

Maneri Bhali Hydro electric Project that includes Construction of Head Race Tunnel, Surge Shaft, Pen Stocks in Uttranchal

(c) Thermal Projects.

- Construction of New Ash Pond area of NTPC at Talcher Super Thermal Power Project in Orissa.
- Permanent Store Building for NTPC Simadhri in A.P.
- Ash pond at Sipat STPP in Chattisgarh.

(d) Industrial Projects & Environmental Projects.

- Thiruvananthapuram Sewerage Scheme in Kerala.

- Storm Water Drain & Water Supply Lines at Bagalkot in Karnataka.
- Sewerage Work at Gwalior in M.P.
- Reservoir Cum Pumping station water treatment at Kalyani and Switchyard foundation at Durgapur in W.B.

(e) Miscellaneous Projects

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

- 62 Schools in Behrampur & Keonjhar District under Prime Minister Relief Fund and Road works under Pradhan Mantri Gram Sadak Yojana (PMGSY) in Distt Gajapati, Cuttack & Deogarh in Orissa.
- Fly over at Shanpur- Sultanpur Noida and Police Line Works comprising of construction of Police Station, Administrative Building & Barracks/Residential Quarters at various places in Distt Gautam Budh Nagar and Moradabad in U.P.
- Up gradtion of Rural Road at Distt Sidhi, Shedol and Roads works at Waidhan under Pradhan Mantri Gram Sadak Yojana (PMGSY) in M.P.
- Kanchipuram Bridge and Road Over Bridge at Trichy in Tamilnadu.
- Guru Ghasi Das University at Bilaspur Chattisgarh.
- Building Complex of Central Institute of Plastic Engineering Technical (CIPET) at Hazipur and Police Lines Quarters at Khagaria in Bihar.
- Torsa River Bridge at Cooch Bihar, Bondelgate Flyover at Kolkata and Regional Engineering

Collage (REC) Girls Hostel Durgapur in West Bengal.

- Department of Telecommunication (DOT) Building at Guwahati in Assam.
- Reinforced Cement Concrete (RCC) Bridge at Kawamara, Fisheries College and New Legislative Assembly Building at Agartala in Tripura.
- Tamluk Digba Rail Link Project, Sira Reservoir and Educational Institutions Society (KRIES). School Complex at Bijapur in Karnataka
- Assam Rifles Quarters at different locations of the North East Region in the state of Nagaland, Arunachal Pradesh, Manipur, Mizoram, Meghalaya and Tripura.

- Building Works of Udyog Sadan at FIE, at Patparganj and Patel Chest Institute in Delhi.
- 30 nos Hostels in Ranchi Area, Bridges at Distt Dumka of Singhbhum and (RCC) Box culverts other ancillary works for Broad Gauge(BG) Line Between Baidyanath and Dumka for Eastern Railway in Jharkhand

Voluntary Retirement Scheme:

The corporation implemented the VR Scheme since the financial year 1991-92 as announced by the Government to reduce manpower, which is one of major contributory factors of the sickness of the corporation. The revised VR Scheme on Gujarat Pattern as announced by the government has been implemented since December 2001. A modified



Rebuilding of Light Bridge over Ajoy River for Indian Railways ,chittaranjan

Voluntary Retirement Scheme enhancing the Ex-gratia by 50% in respect of workmen whose 1997 wage revision is due in accordance with Department of Public Enterprises Guidelines has also been implemented in the corporation since February 2003. As many as 264 workmen has exercised their option for Voluntary Retirement under the modified Scheme upto 31th March 2004.

During the year (January - March 2003 & 2003-04) 284 Nos. employees has exercised option under VRS, out of them 276 Nos. employees have been relieved from the services of the Corporation. Altogether a total number of 2822 employees have been relieved under VR Scheme till 31st March 2004.

CHAPTER 11

ROLE OF WOMEN IN WATER RESOURCES MANAGEMENT AND CONSERVATION

Role of Women

Women in particular contribute significantly in agricultural production. The women workforce time is estimated to be around 70 to 80% of the total work force time in the agriculture sector. Role of women in water resources

management and conservation has been duly recognised. The National Water Policy 2002 while stressing on participatory approach in water resources management, specifically provides for necessary legal and institutional changes to be made at various levels for the purpose of ensuring appropriate role for



Smt Bijoya Chakravarty, Honourable Union Minister of State for Water Resources was the Chief Guest at the Mass Awareness Campaign - Creation of Resource Pool for Women organised by National Institute of Hydrology at Guwahati, Assam on 26th December 2003

women.

Participatory Management – Role of Women

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 the States to consider representation of women in the Water Users' Association (WUAs) at all levels. As a consequence, many States have amended their Irrigation Acts or come out with specific Acts on the Participatory Irrigation Management. Some of the State Governments have taken some initiative and have made specific provisions for women.

“Madhya Pradesh Sinchai Prabandhan Me Krishkon Ki Bhagidari Adhiniyam” enacted in September 1999 ensures all farmer owners, be it men or women, to be a rightful member of the outlet committee. It goes further to ensure that where there are no women members, at least one woman from the area must be taken even if she is not a landowner. Further it ensures that at least one woman shall be nominated to the Governing Body of the Association.

Though the “Andhra Pradesh Farmers' Management of Irrigation Systems Act” of March, 1997 has not made any specific provisions for the women to be represented in the Managing

Committees of WUAs, it is encouraging to note that quite a few women members have been elected as Presidents and Managing committee members. Similar is the story in other States.

Mass Awareness Programme for Women on “Fresh Water”

A one day mass awareness programme for women on ‘Fresh Water ‘ to create a resource pool of women for conducting further mass awareness programs on water related issues was organized on 12th December 2003. Volunteers from All India Women's Conference attended the training programme. The programme was inaugurated by Director, CSMRS and was covered by Doordarshan. Lectures on “Fresh Water-A Global and Indian Scenario” and “Water Conservation-To make water everybody's concern” were delivered. In addition, a water testing kit developed by CSMRS, to assess few important parameters such as Colour, Odour, pH, Total Hardness, Chloride, Fluoride and Iron for its potability has been distributed to volunteers. Volunteers were fully trained to use the kit. This test kit will be used by the volunteers during their mass awareness programme to examine water quality with respect to its conformity with the drinking water limits prescribed in Bureau of Indian Standard. Models and posters on water conservation and rain water harvesting were also displayed. A quiz was also conducted and the participants were asked to answer the questions on facts and figures about the availability of water in the world including India, its various uses and water conservation. Entire programme was interactive in nature and the volunteers took keen interest in the awareness programme.

CHAPTER 12

PROGRESSIVE USE OF HINDI

The Official Language policy is being implemented in all Organisation under the administrative control of the Ministry. Continued measures were taken for progressive use of Hindi for official purpose. The Official Language Implementation Committee of the Ministry meets regularly under the Chairmanship of the Joint Secretary (Admn). Various measures required for progressive use of Hindi are discussed and timely action is taken on the decisions in the meetings. Sufficient progress has been made in the implementation of the Raj Basha Act in the Ministry. Following initiatives in regard to progressive use of Hindi in this year were taken:

- i) Hindi Fortnight was organized in September 2003. Various competitions like Hindi noting/drafting; Hindi slogan; Hindi typing and stenography etc. were organized. On the recommendation of the Parliamentary Committee of Official Language the prize money for the competition for the 1st, 2nd and 3rd position has been increased to Rs.3000/- 2,000/- and 1500/- respectively. Officers and employees of the Ministry and its Organizations enthusiastically participated in the competitions.
- ii) Raj Basha Vijayanthi Shield was introduced in the Ministry to encourage healthy competition amongst organisation for maximum work in Hindi. This year, the 1st and 2nd prize under this Scheme was awarded

to NWDA, New Delhi and NIH, Roorkee respectively.

- iii) Seven officers were nominated for Hindi training. A total of 10 officials were nominated for Hindi typing while 15 were nominated for Hindi stenography.
 - iv) Competition for noting and drafting in Hindi organised during the year to encourage the staff in this direction.
 - v) Workshops were organized with a view to promote use of Hindi in official work and to impart information relating to Official Language Act and regulations.
 - vi) Director (A) inspected various offices of the Ministry of Water Resources outside Delhi alongwith a team of officers of Official Language to oversee compliance of Official Language Policy.
 - vii) Regular monitoring of the work being done in Hindi in the Ministry and its organisations was done through Quarterly Progress Reports.
2. Second Sub Committee of the Parliamentary Committee on Official Language inspected offices of Central Ground Water Board, Central Water Commission and NPCC. The Committee suggested various measures for progressive use of Hindi. These are being implemented.

CHAPTER 13

ADMINISTRATION, WELFARE AND VIGILANCE

The total personnel in the various organizations of the Ministry in Group A, B, C and D is 15,232. 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

E-Governnance

The Ministry of Water Resources has formulated a Five Year Information Technology Strategic Plan in order to identify the needs of the Ministry and identification of areas where IT Services shall be beneficial and conducive to improve efficiency and effectiveness of operations. In order to facilitate the implementation of IT Development Scheme in the Ministry, an IT Division has been set up under the overall supervision of Joint Secretary (Administration) & IT Manager, MoWR. There are two units, one Systems Administration Unit (SAU) headed by Deputy Secretary (Coordination & General Administration) and the other System Coordination Unit (SCU) headed by Director (Technical), National Informatics Centre of the Ministry. The SAU will implement the Five Year Information Technology Strategic Plan under the technical guidance of SCU.

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

(E&GA) have been designated as Director of Public Grievances and Director of Staff Grievances, respectively. Out of 66 staff grievances received during the year, 8 have been disposed off.

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 ACTIVITIES

The Chief Vigilance Officer of the Ministry is responsible for the Ministry of Water Resources (Proper) and all Group –A officers of all the

Organisations under the administrative control of this Ministry where President is the Appointing/ Disciplinary Authority. The Vigilance Unit also appoints Vigilance Officers in 8 Attached & Subordinate Offices of this Ministry while, the CVOs in the 3 Statutory Bodies, 2 Registered Societies and 2 PSUs of this Ministry are appointed after seeking approval of CVC. The position of various cases dealt in Vigilance Wing during the year is given as under:

Nature of cases	Number of cases
Previous years balance	84
New references received	41
Total	125
Total number of cases closed	31

The cases received and in various stages of investigation are being monitored and followed up with CBI and other authorities. Instructions to the organizations are also being issued from time to time for conducting inquiries from time to time. The status of all vigilance and disciplinary cases has been computerized for necessary monitoring by DoPT.

In a case relating to the alleged irregularities in the Taj Corridor Project, the Hon'ble Supreme Court in its interim order dated 18.9.2003 had inter-alia directed to hold the departmental inquiry against CMD, NPCC and the same was completed within time. Action was taken against those found guilty.

“Preventive Vigilance Inspection” of the offices of CWC at Shimla, Unit Office of NPCC at Kolkata, Divisional office of CGWB at Ambala and the office of WAPCOS (Headquarters) New Delhi were covered by Preventive Vigilance Inspection.

The “List of Officers of Doubtful Integrity” and “Agreed List” is being prepared and maintained in consultation with the Central Bureau of Investigation. Necessary direction have been issued to all concerned to not to assign, any sensitive position to the suspected officers appearing in these lists.

The Ministry observed Vigilance Awareness Week this year from 3rd November to 8th November, 2003 as directed by CVC.

Timely submission of the Annual Immovable Property Returns (APRs) by all Group “A” and Group “B” officers of this Ministry and its organizations as stipulated in the CCS (Conduct) Rules is being ensured.

COMMITTEE FOR COMPLAINTS ON SEXUAL HARASSMENT

In accordance with the guidelines laid down by Supreme Court to deal with complaints of sexual harassment of women employees, a Committee headed by a woman has been constituted to look into the complaints of women working in the Ministry of Water Resources. The Committee constituted in the Ministry has held its meetings from time to time, and also met the women employees in the main Ministry and its organizations in Delhi. During the year no formal complaints were received by the Committee. Similar Committees have also been constituted in the organizations under this Ministry. No formal complaint has been received in this Ministry and its organizations pertaining to sexual harassment in the work place.

CHAPTER 14

INITIATIVES IN THE NORTH EAST REGION

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 system. 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.

Central Water Commission

CWC has a dedicated design unit for East and North Eastern region to undertake design and consultancy of multipurpose, irrigation, water supply and hydro-electric projects. The scope of work also includes preparation of pre-feasibility and detailed project report for projects investigated by field offices of CWC in North East or projects undertaken by Brahmaputra Board, NEEPCO, State Govt. departments etc. Technical appraisal of PFRs and DPRs are also being carried out.

At present, there are 9 projects at construction stage for which design consultancy is being provided by CWC. In addition, there are about 16 projects for which Detailed Project Reports (DPR) are under preparation. Detailed hydrological studies and design

works in respect of these projects are in progress.

Brahmaputra Board

Centrally Sponsored Scheme for Brahmaputra & Barak Valley

A Centrally Sponsored scheme has been formulated during the Xth Five year Plan for taking up critical anti erosion/flood control scheme in north eastern region including Sikkim and North Bengal. The estimated cost of the scheme is Rs. 166.68 Crores with Rs. 150 Crores as central assistance. The scheme has been approved by the Expenditure Finance Committee on 8.12.2003. This being a new scheme, it require approval of full Planning Commission and Cabinet Committee on the Economic Affair (CCEA).

The other schemes are as follows:

1. Avulsion of River Brahmaputra at Dholla-Hatighuli in Assam

As part of anti-erosion measures, the Standing Finance Committee has accorded approval to the scheme namely "Avulsion of river Brahmaputra at Dholla-Hatighuli in Assam" in December 2002 at an estimated cost of Rs.10.47 crore. The scheme was taken up for execution during 2002-03. The Brahmaputra Board has completed the first phase of the scheme. The second phase has been taken up based on the recommendations of a Committee consisting of experts from Brahmaputra Board, Central Water Commission, Central Water & Power

Research Station, Pune and State Government.

2. Protection of Majuli Island

A new Central Sector Scheme, viz., “New Schemes for Majuli Island in Assam, Dibang Project, etc. for an amount of Rs.42.00 crore” has been proposed for the Xth Five Year Plan.

As stated above, one component of the scheme “Avulsion of river Brahmaputra at Dholla-Hathighuli” has been approved and taken up by Brahmaputra Board. For the balance amount, Brahmaputra Board had formulated a Memorandum for SFC on New Anti-erosion & Drainage Development Schemes costing Rs.24.81 crore, which, inter-alia include scheme for immediate measures for the Protection of Majuli Island costing Rs.6.22 crore. The SFC was accorded ‘in-principle’ approval by Planning Commission in November 2003. The scheme was approved by the SFC held on 06-01-2004. The work is proposed to be completed in Xth Plan.

National Institute of Hydrology (NIH)

The following important studies were carried out by the NIH Centre for Flood Management Studies for Brahmaputra at Guwahati during the year 2003-04

1. Design Flood Studies for Kameng Basin (AP)- GIUH Approach

Estimation of design flood is one of the most important requirements for safe and economical design of hydraulic structure. For medium and large structures, development of design flood hydrograph is recommended. Unit hydrograph method is mostly used for development of flood hydrographs. In the data scarce basins geomorphological instantaneous unit hydrograph (GIUH) models have been successfully used to develop flood

hydrographs. In this study a GIUH model has been developed using the geomorphological parameters for Kameng Basin in Arunachal Pradesh. The peak of the resultant design flood hydrograph will be helpful in determining the design flood of the proposed dam over Kameng river.

2. Flood Plain Delineation and Risk Zoning in a reach of The Brahmaputra (Gai River)

Gai River is a tributary that emerges from Sissi River along southward direction at 2 Km. north of Sissiborgaon near Tokoubari village. After 1970, a drastic change in the course of this river is recorded, which requires a detailed scientific study to understand the root cause. According to the Flood Control Department of Assam the Gainadi is a too young non regime and peculiarly-unstable sub Himalayan tributary with no defined course of flow. It carries, unlimited silt deposit on its bed that leaves negligible depth of flow by nature.

3. Flood Studies for Assam utilising Remote Sensing and GIS

Flood occurs every year in the Brahmaputra rivers in Assam due to heavy rainfall and drainage congestion. The analysis of spatial extent and temporal pattern of flood-inundated areas is of prime importance for mitigation of flood. In case of flood inundation mapping of large area it will not be feasible to use low resolution data. NOAA/AVHRR (Advanced Very High Resolution Radiometer) data have the potential for flood monitoring due to high frequency of global coverage, high resolution and low cost. In this study, AVHRR data have been used for flood monitoring.

4. Water Availability Study in a Representative Basin

Due to uneven distribution of precipitation, catchment characteristics and predominant hydrometeorological factors in the watershed, all taken as the input, there is wide degree of variation in the runoff taken as output of the hydrological system. Therefore, water availability study or assessment of river flows in different time periods and its dependability has to be carried out to conceive available water resources development projects and ascertain its success for long term operation for a particular purpose for which it was meant for.

The study aims at establishing empirical relationship of runoff with rainfall which is often the only known information in the system and work out a definite out flow pattern

in Dudhnai for the developmental strategy to follow.

Central Soil & Materials Research Station

The following projects in North Eastern States are being investigated by CSMRS:

- Assessment of the construction materials for use in concrete dam of Myntdu Leska Hydro-Electric Project, located at about 140 Kms from Shillong in Meghalaya which envisages construction of concrete gravity dam with installed capacity of 84 MW power generation.
- Field and laboratory soil investigations for the proposed diversion structure of Teesta Hydro-Electric Project Stage II was undertaken.
- Training was imparted to the officers and staff of North Eastern Hydraulic and Allied Research Institute (NEHARI) Laboratories, Brahmaputra Board, Guwahati in laboratory



Infiltration study with Guelph permeameter in a watershed near Guwahati, Assam

testing of rock, coarse and the fine aggregate samples, analysis of data and report writing.

- Technical Comments on the Detailed Project Report of Siyang (Siyon) Project, Arunachal Pradesh were communicated to Central Water Commission.
- A central team headed by Director, CSMRS visited Nowgaon in Assam to assess the threatened submergence of the town being caused by the River Brahmaputra. The report of the findings of the committee was submitted to Central Water Commission.

Central Water And Power Research Station (CWPRS)

- Desk studies for evolving hydraulic design parameters and assessing hydraulic drag and lift forces for the proposed cargo-handling jetty on river Brahmaputra at Pandu, Assam.
- Suggested protection measures for IOCL Plant at Kimin, Arunachal Pradesh.
- Estimation of site-specific ground motion for earthquake resistant design of Pagladiya Dam Project, Assam.
- Seismic Refraction survey at Rolep Project, Sikkim.
- Temporary protection measures were suggested after inspection of site for training the river Disang at Brahmaputra Valley Fertilizer Corporation, Namrup, Dist. Dibrugarh, Assam.
- Senior officers from CWPRS participated in Committee for finalising the proposal for training measures to river Dibang and Brahmaputra at Dholla – Hatighuli area, formulated by Brahmaputra Board, Guwahati.

National Projects Construction Corporation

NPCC is presently engaged in construction of building works for Assam Rifles in the North Eastern States of Meghalaya, Manipur, Tripura, Nagaland, Mizoram and Arunachal Pradesh having a total value of Rs. 170 crore. During the year the work of construction of Border Fencing with roads at Indo Bangla Border in Tripura for the value of Rs. 200.00 crore has been taken up. In Tripura, NPCC has completed Maharani Barrage, Khowai Barrage and Manu Barrage. NPCC proudly associates itself for working in the deep remote areas and terrorist infested corners of Tripura by constructing Tripura Legislative Assembly, Diversion Scheme, Kalsi Barrage, RCC Bridge, Khuga Dam & Dholai Thabi Barrage in Manipur and other miscellaneous works. NPCC is having total value of works of Rs. 531.00 crore in North Eastern States out of which about Rs. 145.00 crore 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.

GENERAL

In October, 2003, a serious problem of erosion occurred in Jakhalbandha area in Nagaon District of Assam. Taking note of this, a central team constituted by the Ministry, which visited the site on 29.11.03 and submitted the report. The report of the central team which suggested to take up the immediate as well as long term measures, was sent to Government of Assam for follow up action. As per the information received from the state Government, they have taken some immediate measures. A Scheme at an estimated cost of Rs. 24.8685 Crores for tackling the problem on long term basis was also submitted to Central Water Commission, which was examined and comments were conveyed to the state Government.

STAFF STRENGTH OF THE MINISTRY OF WATER RESOURCES

Sl. No.	Name of Office	GROUP A					GROUP B										GROUP C					GROUP D					TOTAL Group A, B, C & D				
		Total	SC	ST	P H	O B C	Gazetted					Non-Gazetted					Total	SC	ST	P H	O B C	Total	SC	ST	P H	O B C	Total	SC	ST	P H	O B C
							Total	SC	ST	P H	O B C	Total	SC	ST	P H	O B C															
1.	Ministry of Water Resources(Proper)	64	6				53	6	1	1		87	12	2		7	143	20	4	2***	12	93	50	8	2#	9	440	94	15	5	28
2.	Controller of Accounts, MoWR	3					52	3									210	43	9	2	9	31	13	3	1	1	296	59	12	3	10
3.	Central Water Commission	560	68	16	1	31	434	49	8	4		378	67	12		3	2268	293	54	11	84	927	364	91	7	52	4567	741	181	23	170
4.	Central Soil & Materials Research Station	62	11	2	-	3	37	2	3	-	1	40	6	2	-	4	127	30	9	2	13	95	33	7	2	3	361	82	23	4	24
5.	Central Water & Power Research Station	158	23\$	2	1	2	67	10	3	-	-	142	21	12	2	11	489	67	33	12	19	364	87	25	13	14	1220	208	75	28	46
6.	Central Ground Water Board	389	51	13		20	332	45	10		15	194	31	12		9	1900	373	125	10	77	1466	362	95	5	79	4281	862	255	15	200
7.	Farakka Barrage Project	13	1	1	-	1	41	3	1	-	-	73	17	2	1	1	409	65	8	4	9	270	34	3	5	1	806	116	15	10	12
8.	Ganga Flood Control Commission	22	2	-	-	-	12	1	-	-	-	2	-	1	-	-	41	9	-	-	-	15	5	1	-	1	92	17	2	-	1
9.	Bansagar Control Board	2										1					9					7					19				
10.	Sardar Sarovar Construction Advisory Committee	4					1										7	1				4	1			3	16	2			3
11.	Brahmaputra Board	72	3		0	7	18	2	2		2	76	4	6			284	48	24	4	40	153	24	10	4	11	603	81	42	8	60
12.	Narmada Control Authority	25##					8+1@	1				19	1			3	60	11	6	2%	7	31	9	2	1	1	143+1	22	8	3	10
13.	National Water Development Agency	69	4				70	7	1			11	2				376	62	19	6	25	127	31	9	4		653	106	29	10	25
14.	National Institute of Hydrology	84	9	2	-	7	-	-	-	-	-	49	5	-	-	-	73	19	-	2	-	51	18	-	-	-	257	51	2	2	7
15.	Water & Power Consultancy Services (India) Ltd	247	21	4	1	5	26	4	1	-	-	25	2	2	1	-	146	31	7	3	11	26	13	2	1	-	470	71	16	6	16
16.	National Projects Construction Corporation Ltd	243	15	2		10	-	-	-	-	-	301	19	-	2	5	349	50	4	5*	5*	73	4	1	-	-	966	78	7	7	19
	Total																										15232				

* One incumbent belongs to both category of PH and OBC.

in group D post one physically handicapped employee is also OBC

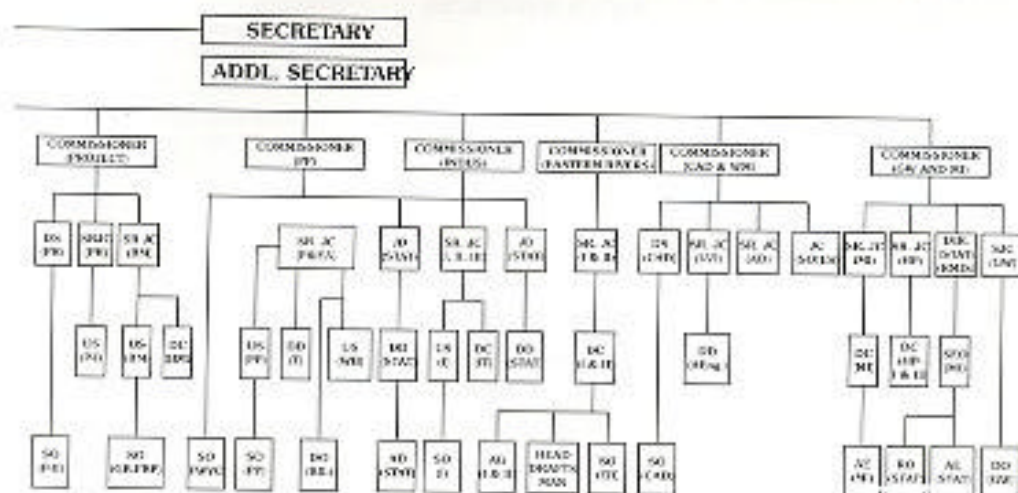
@one officer on deputation

***in group C post one physically handicapped employee is also SC

14 officers in group A and 3 in Group B (total 17) are on deputation.

%out of two PH one belong to OBC category.

MINISTRY OF WATER RESOURCES As on 01-04-2004



OL : Official Language
 CVO : Chief Vigilance Officer
 LO : Liaison Officer
 HOD : Head of Department
 HOO : Head of Office
 SGO : Staff Grievance Officer
 WO : Welfare Officer
 E & GA : Establishment & General Administration
 SR JC : Senior Joint Commissioner
 DC : Deputy Commissioner
 PI : Project-I
 P-II : Project - II
 BM : Basin Management
 GB-FBP : Ganga Basin - Farakka Barrage Project
 JD : Joint Director
 DD : Deputy Director
 GW ESTBL : Groundwater Establishment

AD : Assistant Director
 T : Technical
 BL : Bilateral Aid
 FWYS : Fresh Water Year Cell
 STAT : Statistics
 WB : World Bank
 I : India
 A. D. : Agricultural Discipline
 A. ENG. : Agricultural Engineering
 SFO : Senior Evaluation Officer
 AE : Assistant Engineer
 RO : Research Officer
 RMIS : Rationalization, Minor Irrigation Statistics
 HP : Hydrology Project
 JC : Joint Commissioner
 IT : India Treaty
 P & EA : Policy and External Assistant

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 V.K.Duggal 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.	Shri P.C. Chaturvedi Chairman	95129- 2413050	95129- 2419059
5.	Bansagar Control Board, Samab Colony, Rewa, Madhya Pradesh.	Shri S.K. Halder, Secretary	07662-226318	07662- 242433

6.	Sardar Sarovar Construction Advisory Committee, Narmada Bhavan, A Block, IV Floor, Indira Avenue Vadodara – 390 001.	Shri Indra Raj, Secretary	0265-2421438 0265-2771382	0265- 2437262
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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 V.K. Duggal 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 401, “S” Sewa Bhawan R.K.Puram New Delhi 110 066	Sh. C.B. Vashistha, Member (WP&O),CWC & Chairman	011- 26108150	011- 26108150

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 S.K.Das, Member (D&R), CWC	95129- 2231269 011- 26108150	95129- 2230891

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 Organisation	Address	Name & Designation of PG/ S.G. Officer
1.	Ministry of Water Resources	Room No. 403, 4 th Floor, Shram Shakti Bhavan, New Delhi-110001 (Tele Fax No. 23710343)	1. Shri J.S. Burjia, Joint Secretary (Admn.) & Director (PG)
		Room No. 216, Shram Shakti Bhavan, New Delhi-110001 (Tele No. 23717129)(Fax No. 23710253)	2. D.P.Bhankhwal, Director (E & GA) & 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 Jhu Jhar Singh, Grievance Officer & Member (Power)
3.	Bansagar Control Board, Rewa	Bansagar Control Board, Samab Colony, Rewa (MP) (Tele No. 07662-226318), 0755-2762059 Fax 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 & Fax No. 95129-2412524	2. Shri R.C. Jain, 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, Illrd 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 Harjit Singh, GM (M &P) 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 4 th 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)

Annexure V

BUDGET AT A GLANCE (SECTOR-WISE)

(Rupees in crore)

SI No.	Sector/Organisation/Scheme	Actuals 2002-03		BE 2003-04		RE 2003-04	
		Plan	Non-Plan	Plan	Non-Plan	Plan	Non-Plan
1.	2.	3.	4.	5.	6.	7.	8.
I	Secretariat-Economic Services	0.58	11.01	1.50	11.68	0.86	12.64
II	Major & Medium Irrigation						
1.	Central Water Commission	17.99	68.78	25.98	69.82	23.00	70.60
2.	Central Soil and Materials Research Station	4.54	9.53	5.45	3.95	5.37	3.95
3.	Central Water & Power Research Station	4.35	18.37	4.85	18.79	4.72	19.41
4.	National Water Development Agency	15.30	0.00	20.00	0.00	21.95	0.00
5.	National Institute of Hydrology	2.94	3.27	3.30	3.68	3.50	3.48
6.	Research and Development Programme	2.78	0.00	15.00	0.00	10.79	0.00
7.	National Projects Construction Corporation Limited	0.00	27.00	0.00	14.00	0.00	15.54
8.	Sutlej Yamuna Link Canal Project	0.00	0.00	0.00	1.00	0.00	1.00
9.	Boards & Committees	0.00	1.59	0.00	1.81	0.00	1.69
	Total: Major & Medium Irrigation	47.90	122.54	74.58	113.05	69.33	115.67
III	Minor Irrigation						
1.	Central Ground Water Board	87.67	45.53	98.67	46.11	97.64	46.86
2.	Surface Water Schemes	5.79	0.00	8.00	0.00	8.00	0.00
3.	R. & D. Programme	0.06	0.00	0.55	0.00	0.25	0.00
	Total : Minor Irrigation	93.52	45.53	107.22	46.11	105.89	46.86
IV.	Command Area Development						
1.	Command Area Development Programme	151.39	0.00	201.00	0.00	113.14	0.00
2.	R. & D. Programme	0.77	0.00	1.00	0.00	1.92	0.00
	Total: Command Area Development	152.16	30.24	202.00	0.00	115.06	0.00
V.	Flood Control						
1.	Central Water Commission	21.91	30.24	20.00	29.36	18.50	30.35
2.	Flood Proofing Programme	0.00	0.00	2.00	0.00	1.25	0.00
3.	Ganga Flood Control Commission	1.80	0.00	2.10	0.00	2.10	0.00
4.	Emergent Flood Protection Measures in Eastern and Western Sectors	0.00	1.76	0.00	3.00	0.00	3.00
5.	Survey & Investigation of Kosi High Dam Project	0.00	0.00	1.00	0.00	0.50	0.00

6.	Maintenance of flood protection works of Kosi and Gandak Projects	8.39	0.00	6.00	0.00	5.32	0.00
7.	Pancheshwar Multipurpose Project	4.49	0.00	3.60	0.00	2.75	0.00
8.	Joint Observation on common Rivers with Bangladesh and neighbouring countries	0.19	0.00	2.00	0.00	1.00	0.00
9.	Critical anti-erosion works in Ganga Basin States	28.82	0.00	25.00	0.00	23.25	0.00
10.	Extension of embankments on Lalbakeya, Kamla, Bagmati and Khando rivers	1.50	0.00	5.00	0.00	0.29	0.00
11.	Critical anti-erosion works in Coastal and other than Ganga Basin States	0.00	0.00	2.00	0.00	1.00	0.00
12.	Improvement of Drainage in Mokama Group of Tals	0.32	0.00	2.00	0.00	1.00	0.00
14.	Schemes for the benefit of North Eastern States & Sikkim						
	-Brahmaputra Board	14.00	0.00	20.00	0.00	20.00	0.00
	-Flood Control in Brahmaputra and Barak Valley	0.00	0.00	10.00	0.00	0.00	0.00
	-Pagladia Dam Project	0.00	0.00	45.00	0.00	3.66	0.00
	-Harrange Drainage Scheme	5.00	0.00	5.00	0.00	15.34	0.00
	-New schemes for Majuli island in Assam, Dihang Project, etc.	0.00	0.00	5.00	0.00	10.47	0.00
	Sub Total (S.No.14)	19.00	0.00	85.00	0.00	49.47	0.00
	Total : Flood Control	86.42	32.00	155.70	32.36	106.43	33.35
VI.	Transport Sector						
1.	Farakka Barrage Project	23.69	21.31	25.00	23.98	24.43	23.92
	TOTAL (I to VI)	404.27	232.39	566.00	227.18	422.00	232.44
VII	A.I.B.P.**	3061.70	0.00	2800.00	0.00	2250.00	0.00
	GRAND TOTAL	3465.97	232.39	3366.00	227.18	2672.00	232.44

Source of financing : Demand No. 10 Ministry of Water Resources for 2004-05

** Source of financing: Demand No. 5 Transfer to state & Union Territory Government for 2004-05

ANNEXURE VI

**DETAILED ASSESSMENT OF PERFORMANCE FOR THE YEAR 2003-2004 IN RESPECT
OF THE AUTONOMOUS ORGANISATIONS UNDER THE MINISTRY OF WATER
RESOURCES**

<u>Sl. No.</u>	<u>Organisation</u>
<u>1.</u>	<u>National Water Development Agency</u>
<u>2.</u>	<u>National Institute of Hydrology</u>
<u>3.</u>	<u>Brahmaputra Board</u>

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 - 16.

2. 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.
3. 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 17 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. Presently, the work of field surveys and investigations for preparation of feasibility reports of link

schemes is on hand. Feasibility reports of 7 links have already been completed and such reports for another two links programmed to be completed by March 2004. The field surveys and investigations and preparation of feasibility reports of another seven links remained under progress during the year 2003-04. Moreover, the special studies such as geological surveys, geophysical investigations, geo-technical investigations, drilling work for geo-technical investigations, construction materials investigations, borrow area survey, socio-economic and environmental surveys, command area surveys, pre-irrigation soil surveys etc. of the above links remained under progress by other agencies.

4. 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 report of one link has been completed and such reports for another two links programmed to be completed by March 2004. The field surveys and investigations including special studies by other agencies for another ten links remained under progress during the year 2003-04.

5. The preparation of feasibility reports of all the identified water transfer link schemes under Peninsular and Himalayan components were originally programmed to be completed by the year 2008. However, in view of the setting up of a Task Force on Interlinking of Rivers under the Chairmanship of Shri Suresh Prabhu, Member of Parliament vide Ministry's Resolution No. 2/21/2002-BM dated 13.12.2002 and milestone dates/time table indicted therein, as mentioned in detail in Chapter-17, the programme of preparation of feasibility reports is now being accelerated by NWDA so as to complete the task by the year 2005.
 6. The implementation of the above programme of 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 which will be over and above the ultimate irrigation potential of about 140 million hectare envisaged from major, medium and minor irrigation projects and would generate 34,000 MW of power, apart from the benefits of flood control, navigation, water supply, fisheries, salinity and pollution control etc.
 7. It is mentioned that the implementation of the inter-basin water transfer link schemes can be taken up in a phased manner depending on the priorities of the Government and availability of funds. However, the whole programme of implementation would depend on the seriousness of the States involved to arrive at consensus regarding sharing of surplus water over and above their own needs and the cooperation extended by them to achieve the objectives of inter-basin water transfer. In order to further speed up the process towards implementation of the link schemes, NWDA has prepared detailed 'Action Plans for Implementation' of five links which are identified as intra-basin links or those involving one or two States only. Now, with the constitution of Task Force and milestone dates fixed for the Task Force, it is upto the Task Force to prioritize the different project components for preparation of DPRs and implementation as per their Terms of Reference.
 8. 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, 2003 was Rs. 124.08 Crores. During the year 2003-04, the budget allocation was Rs 20 Crores and the revised budget estimate was Rs. 21.95 Crores. The actual expenditure incurred during the year 2003-04 is Rs. 19.70 Crores. The shortage of 0.60 Crores was met through the savings of previous years.
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Detailed Assessment of Performance of Brahmaputra Board, Guwahati

The Brahmaputra Board was set up under Brahmaputra Board Act (Act 46 of 1980). The main objectives, organizational set up, achievements etc. of the Board are given in Chapter 17

1. Out of 51 Master Plans taken up by the Board, two have been approved by Govt. of India and thirty two have been approved by the Board and are awaiting approval from Govt. of India. During the year 2003-2004, out of remaining 17 Master Plans, two have been completed and are awaiting approval from the Board, 5 are under preparation and 10 are under survey and investigation. Out of 34 drainage development schemes, one is under execution, three are awaiting technical clearance from Central Water Commission (CWC) and 5 DPR are under modifications as per suggestion from CWC and State Governments. Remaining 19 Drainage Development Schemes are under various stages of preparation and investigation. Similarly, out of 11 Nos. of multi-purpose projects, one is under execution and ten are under various stages of survey and preparation of DPR.
2. The Pagladiya Dam Project was cleared by Govt. of India in January, 2001 at an estimated cost of Rs.542.90 crore. The cost of the project has been increased to Rs.1030.00 crore. The revised cost is under examination. The Project envisages construction of earthen dam 25 m. high and 20.63 km. long of Thalkuchi village, about 26 km. north of Nalbari, headquarters of Nalbari district of Assam. Out of a total requirement of 3238 ha. required for

resettlement of 3271 families, Govt. of Assam has allotted 956 ha in 33 locations till now and identified another 18000 ha of land for Resettlement and Rehabilitation (R/R) purpose. The construction of 391 dwelling units in the 10 R/R sites have been taken up. The Revenue Department of the Government of Assam has issued notification under Section 4(1) for all the 33 villages in the project area for the reservoir and construction of dam appurtenant structures.

3. Necessary infrastructures like approach road to dam site, improvement of haul road, setting up of Project Chief Engineer's office at Nalbari has been taken up and construction of security shed and site office at Thalkuchi.
4. Pre-Qualification bids for construction of Pagladiya Dam Project has already been floated and preparation of final tender document is in process. Construction work has already been completed in respect of three numbers of raised platforms for flood affected people (R&D Scheme) along Brahmaputra embankment.
5. The North-Eastern Hydraulic and Allied Research Institute (NEHARI), the construction of which was entrusted to the Board in September, 1985 has already procured and installed most of the equipments with adequate infrastructure facilities. An intensive training in soil concrete and rock testing disciplines work provided to the officers and staff of the Brahmaputra Board with the help of Central Soil & Materials Research Stations, New Delhi.

The fund earned by the NEHARI are as follows:

During 2002-2003	-	Rs.52,40,321.00
Upto Dec' 03		Rs.12,89,000.00

Detailed Assessment of Performance of National Institute of Hydrology

The National Institute of Hydrology (NIH) is a premier institute conducting research in hydrology in the country. 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 vicePresident 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. Director of the institute is the principal executive officer of the Society.

OVERALL PERFORMANCE DURING 2003-04

Studies and Research

The Institute carries out basic, applied and field & laboratory oriented research at its headquarters and regional centres. The research outputs of the Institute are published in the form of reports and papers. During the year 2003-04, the institute has published 40 technical papers in reputed international and national journals and 50 papers in the proceedings of international and national conferences and symposia. More than 140 reports based on studies and research in hydrology have been prepared during the year. The studies taken up during the 2003-2004 will be completed by the 31st March 2004. During the next year 2004-05, 15 Technical Reports and 40 Research Papers are likely to be published. It is also expected that 60 papers will be presented in Seminar and Symposia during

the year 2004-05. 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 the advanced techniques. The Institute is also taking up sponsored and consultancy projects of several organisation in order to help them in solving various complex and typical field problems. During the year 2003-04, the Institute has completed studies for two sponsored and consultancy projects that were taken up earlier. In addition four new projects were taken up during the year. Work continued on nine sponsored/consultancy projects.

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 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 2003-04 INCOH has funded organisation of twelve

international as well as national seminars, symposia, workshops, conferences in the relevant areas of hydrology and water resources. The research Advisory Committees of INCOH had approved ten Research & Development projects for funding by Ministry of water resources. The secretariat is also actively involved for inviting new research projects under the identified thrust areas and their processing for possible funding

Hydrology Project

The Institute has actively contributed to the successful implementation of the World Bank funded Hydrology Project. During the year, as part of the training activities, three training courses were organised. These include two courses on “Basic Surface Water Data Processing using HYMOS” at Roorkee and one course on Project Hydrology at Bhopal.

Under the Hydrology Project, the institute has taken up studies on the following four R&D projects as joint collaborative studies with the respective state organisations:

- I. Freshwater saline water inter-relationship in a multi-aquifer system in coastal Andhra Pradesh.
- II. Estimation of irrigation return flow in Lokapavani area in Krishnaraj asagar command.
- III. Measures for artificial recharge in alluvial and hard rock areas of Maharashtra.
- IV. Data collection and processing for studies on catchments area of Upper Bhopal Lake and its ecosystem.

Works on these projects has been completed during this year.

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, organisation of workshops, training courses, seminars, symposia, conferences, brain storming sessions etc. have been major activities under the Technology Transfer Programme. During the year 200304, the Institute has organised fine training courses/workshops at Roorkee and in the states. One Brain storm session on “Climate change and its impact on Hydrology” was organised at Roorkee in August 2003.

ANNEXURE VII**AUDIT OBSERVATIONS OF C & AG ON THE MINISTRY'S WORKING****Audit observations of C & AG on the Ministry's working**

Deficiencies in implementation of an essential scheme and maintenance arrangements: Failure of Farakka Barrage Project Control Board to synchronise civil and electrical works resulted into Control Tower not serving the intended purpose for over six years, rendering unfruitful expenditure of Rs. 39.79 Lakhs incurred on the civil works.

(Para 13.1 of Report No. 2b of 2003)

Transaction Audit Observations
