ANNUAL REPORT

2017-18

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES,
RIVER DEVELOPMENT AND GANGA REJUVENATION
NEW DELHI

A Bird's-eye view of Tungabhadra Dam

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ABBREVIATIONS

AC-IWRM	Advanced Centre for Integrated Water Resources Management
ADB	Asian Development Bank
AfDB	African Development Bank
AGGS	Association of Global Groundwater Scientists
AIBP	Accelerated Irrigation Benefits Programme
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AR	Artificial Recharge
APILIP	Andhra Pradesh Irrigation and Livelihood Improvement Programme
ASCI	Administrative Staff College of India
ASSOCHAM	Associated Chambers of Commerce and Industry of India
AWA	Annual Water Account
BB	Brahmaputra Board
BCB	Bansagar Control Board
BIS	Bureau of Indian Standards
BOD	Bio-chemical Oxygen Demand
BOOT	Build Operate Own and Transfer
BOP	Border Out Post
BOQ	Bill of Qualities
BRB	Betwa River Board
CAD&WM	Command Area Development & Water Management
CBIP	Central Board of Irrigation and Power
CCA	Culturable Command Area
Cd	Cadmiumn
CEA	Central Electricity Authority
CETE	Composite Ecological Task Force
CFPDS	Committee for Finalization of Protocol for Data Sharing
CGWB	Central Ground Water Board
Ch	Chainage
CLA	Central Loan Assistance
CMC	Cauvery Monitoring Committee
CO	Cobalt
Cr	Chromium
CPCB	Central Pollution Control Board
CPGRAMS	Centralized Public Grievance and Monitoring System
CPSU	Central Public Sector Units
CRA	Cauvery River Authority
CSMRS	Central Soil & Materials Research Station
CSR	Corporate Social Responsibility
Cu	Copper
Cumec	cubic metre per sec
Cusec	Cubic foot per sec
CWC	Central Water Commission
CWES	Central Water Engineering Service
CWPRS	Central Water & Power Research Station
CWDT	Cauvery Water Disputes Tribunal
DBE	Design Basic Earthquake
DDS	Drainage development Scheme

DDRP	Dam Design Review Panel
DDUGJY	Deen Dayal Upadhyaya Gram Jyoti Yojana
DEM	Digital Elevation Models
DHARMA	Dam Health and Rehabilitation Monitoring Application
DoNER	Department of North Eastern Region
DPE	Department of Public Enterprises
DPR	Detailed Project Report
DRIP	Dam Rehabilitation and Improvement Project
DSARP	Dam Safety Assurance and Rehabilitation Project
DSB	Dam Safety Bill
DSO	Dam Safety Organisation
DSR	Daily Status Report
DSS	Decision Support System
DVC	Damodar Valley Corporation
DWRIS	Development of Water Resources Information System
EAC	Expert Appraisal Committee
EFC	Expenditure Finance Committee
e-HRMS	Electronic-Human Resource Management
EIA	Environmental Impact Assessment
EISL	Environmental Infrastructure and Services Limited
ETP	Effluent Treatment plant
e-PAMS	Enabled- Project Appraisal Management System
EPC	Engineering Procurement and Construction
EPFO	Employees Provident Fund Organisation
ERM	Extension, Renovation and Modernization
EW	Exploratory Well
FBP	Farakka Barrage Project
FPARP	Farmers' Participatory Action Research Programme
Fe	Iron
FMBAP	Flood Management and Border Area Programme
FMIS	Flood Management Information System
FMP	Flood Management Programme
GeM	Government e-Marketplace
GFCC	Ganga Flood Control Committee
GGV	Guru GhasidasVishwavidyalaya
GHLSC	Gandak High Level Standing Committee
GIUH	Geomorphological Instantaneous Unit Hydrograph
GLOF	Glacial Lake Outburst Flood
GPI	Grossly Polluting Industries
GRA	Grievances Redressal Authority
GTF	Gange Task fiorce
FR	Feasibility Report
FRL	Full Reservoir Level
GSI	Geological Survey of India
Ha	Hectare
HAD	Hydrological Design Aid
HDPE	High Density Polyethylene
HE	Hydro-electric
HIS	Hydrological Information System
HKKP	Har Khet Ko Pani

HP	Hydrology Project
HPC	High Performance Concrete
HSO	Hydrological Studies Organisation
IBRD	International Bank of Reconstruction and Development
ICPE	International Centre for Promotion of Enterprises
ID	Infrastructure Development
IDS	Infrastructure Development Scheme
IEC	Information, Education and Communication
IL&FS	Infrastructure Leasing and Financial Services
IEISL	IL&RS Environmental Infrastructure and Services limited
IGNTU	Indira Gandhi National Tribal University
IGWC	International Ground Water Conférence
IISC	Indian Institute of Science
IITF	India International Trade Fair
IL&FS	Infrastructure Leasing & Financial Services
ILR	Inter Linking of Rivers
IHHL	Individual Household Latrine
IMD	India Meteorological Department
IMIC	International Micro Irrigation Conference
IMTI	Irrigation Management Training Institute
INC	Indian National Committee
INCCE	Indian National Committee on Climate Change
INCGECM	Indian National Committee on Geotechnical Engineering and Construction Materials
INCGW	Indian National Committee on Ground Water
INCH	Indian National Committee on Hydraulic Research
INCID	Indian National Committee on Irrigation and Drainage
INCOH	Indian National Committee on Hydrology
INCSW	Indian National Committee on Surface Water
IPC	Irrigation Potential Created
IPDS	Integrated Power Development Scheme
IPU	Irrigation Potential Utilized
ISRO	Indian Space Research Organisation
ISRWD	Inter-State River Water Disputes
ITPO	India Trade Promotion Organisation
IWMI	International Water Management Institute
IWRM	Integrated Water Resources management
IWW	India Water Week
JBIC	Japan Bank for International Cooperation
JCWR	Joint Committee on Water Resources
JET	Joint Expert Team
JGE	Joint Group of Experts

JICA	Japan International Cooperation Agency
JPO-SKSKI	Joint Project Office-Sapta Kosi & Sun Kosi Investigation
JRC	Joint Rivers Commission
KHLC	Kosi High Level Committee
KNNL	Karnataka Neeravari Nigam Limited
KWDT	Krishna Water Disputes Tribunal
LI	Lift Irrigation
LTIE	Long Term Irrigation Fund
M	Meter
MAF	Million Acre Feet
M Cum	Million Cubic Meter
MCC	Master Control Centre
MCM	Million Cubic Meter
MDDL	Minimum Drawdown Level
MEE	Multiple Effect Evaporation
M & M	Major and Medium
Mha	million hectare
MI	Minor Irrigation
MMB	Mumbai Maritime Board
Mn	Manganese
MoDWS	Ministry of Drinking Water & Sanitation
MoES	Ministry of Earth Science
MoFPI	Ministry of Food Processing Industries
MoU	Memorandum of Understanding
MoEF	Ministry of Environment & Forest
MoWR	Ministry of Water Resources
MPPGCL	Madhya Pradesh Power Generation Corporation Ltd.
NAPCC	National Action Plan on Climate Change
NAQUIM	National Project on Aquifer Management
NASC	National Agriculture Science Centre
NBO	National Building Organisation
NCA	Narmada Control Authority
NCDS	National Committee on Dam Safety
NCMP	National Common Minimum Programme
NCSDP	National Committee on Seismic Design Parameters
NDSAP	National Data Sharing & Accessibility Policy
NEEPCO	North Eastern Electric Power Corporation Limited
NeGP	National e- Governance Plan
NER	North Eastern Region
NERC	North Eastern Regional Centre
NEHARI	North Eastern Hydraulic & Allied Research Institute
NERIWALM	North Eastern Regional Institute of Water and Land Management
NESCO	North Eastern Electricity Supply Company of Odisha Limited
NGRI	National Geophysical Research Institute
NGRBA	National Ganga River Basin Authority
NGWTRI	National Ground Water Training and Research Institute
NHDC	Narmada Hydro-electric Development Corporation

NHP	National Hydrology Project
Ni	Nickel
NIELIT	National Institute of Electronics & Information Technology
NIH	National Institute of Hydrology
NIH-CFMS	National Institute of Hydrology- Centre for Flood Management Studies
NISC	National Inter-departmental Steering Committee
NLC	Neyveli Lignite Corporation Limited
NLEC	National Level Expert Committee
NLPMC	National Level Programme Monitoring Committee
NLSC	National Level Steering Committee
NMCG	National mission for Clean Ganga
NPCC	National Projects Construction Corporation Ltd
NPP	National Perspective Plan
NRCS	Natural Resources Conservation Service
NRLD	National Register of Large Dams
NSEZ	Noida Special Economic Zone
NSI	National Sugar Institute
NWA	National Water Academy
NWDA	National Water Development Agency
NWP	National Water Policy
NWDT	Narmada Water Disputes Tribunal
NWIC	National Water Informatics Centre
NWM	National Water Mission
NRSC	National Remote Sensing Centre
OCEMS	Online Continuous Effluent Monitoring Stations
OFD	On Farm Development
ONGC	Oil and Natural Gas Corporation
OW	Observatory Well
PAC	Project Advisory Committee
PAF	Project Affected Families
Pb	Lead
PDS	Purpose Driven Studies
PDA	Pancheshwar Development Authority
PDMC	Project Development & Management Consultant
PER	Pre-Feasibility Report
PES	Performance Evaluation Studies
PHED	Public Health Engineering Department
PIM	Participatory Irrigation Management
PIRC	Project Implementation Review Committee
PMA	Project Management Agency
PMC	Project Management Consultants
PMF	Probability Mass Function
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMP	Pancheshwar Multipurpose Project
PPA	Polavaram Project Authority
PMAY	Pradhan Mantri Awas Yojana
PSC	Permanent Standing Committee

PMKSY	Pradahan Mantri Krishi Sinchai Yojana
PZ	Piezometer
QPF	Quantitative Precipitation Forecast
R-APDRP	Restructured Accelerated Power Development and Reform Programme
R&R	Rehabilitation and Resettlement
RFD	Results Framework Document
RMBA	River Management Activities & Works related to Border Areas
RMIS	Rationalisation of Minor Irrigation Statistics
RMOD	Research Management and Outreach Division
RO	Reverse Osmosis
ROS	Reservoir operation system
RRR	Repair, Renovation and Restoration
RRSSC	Regional Remote Sensing Service Centre
RTDAS	Real Time Data Acquisition System
RTSF	Research Technology Support Facility
RTWQMS	Real Time Water Quality Monitoring Station
SAC	Standing Advisory Committee
SCADA	Supervisory Control and Data Acquisition
SCEC	Sub Committee on Embankment Construction
SEZ	Special Economic Zone
SFRC	Steel Fibre Reinforced concrete
SGWCC	State Ground Water Coordination Committee
SJVN	Satluj Jal Vidyut Nigam Limited
SLWM	Solid Liquid Waste Management
SMI	Surface minor Irrigation
SOR	Schedule of Rates
SMP	Sediment Management Policy
SMP	Shoreline Management Policy
SMPG	State Programme Management Group
SS	State Sector
SSCAC	Sardar Sarovar Construction Advisory Committee
SSP	Sardar Sarovar Project
STPI	Software Technology Parks of India
SW	Surface Water
TAC	Technical Advisory Committee
TAMC	Technical Assistance and Management Consultancy
TANGEDCO	Tamil Nadu Generation and Distribution Corporation`
TB	Tungabhadra Board
Th.	Thousand
THDC	Tehri Hydro Development Corporation
TF-ILR	Task Force for Interlinking of Rivers
TMC	Thousand Million Cubic feet
TOE	Team of Experts
TOR	Terms of Reference
TPIA	Third Party Inspecting Agency
TPCEA	Third Party Concurrent Evaluation Agency
TPIEA-EA	Third Party Independent Evaluation Agency – Energy Accounting

TW	Tube Well
TWAD	Tamil Nadu Water Supply and Drainage Board
UNESCO	United Nations Educational Scientific and Cultural Organisation
UPWSRP	Uttar Pradesh Water Sector Restructuring Project
USLE	Universal Soil loss Equation
UYRB	Upper Yamuna River Board
VWDT	Vansadhara Water Dispute Tribunal
VSI	Vasantdada Sugar Institute
WALMI	Water and Land Management Institute
WAPCOS	Water and Power Consultancy Services Limited
WB	World Bank
WBSEDCL	West Bengal State Electricity Distribution Company Limited
WDS	Water Detention Structure
WEGWIS	Web Enabled Ground Water Information System
WESCO	Western Electricity Supply Company of Odisha
WLMI	Water and Land Management Institute
WMO	World Meteorological Organization
WQAA	Water Quality Assessment Authority
WRD	Water Resources Department
WRIS	Water Resources Information System
WUA	Water User Association
WUE	Water Use Efficiency
ZLD	Zero Liquid Discharge
Zn	Zinc

CONTENT

ANNEXURES

ANNEXURES

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1. Overview

Our country is endowed with a rich and vast diversity of natural resources, water being the most precious of them. Water security, water management and its development is of immense importance in all walks of human life and also for all living beings. Integrated water management is essential for environmental sustenance, sustainable economic development of the country and for bettering human life through poverty reduction.

The Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India, is responsible for conservation, management and development of water as a national resource; overall national perspective of water planning and coordination in relation to diverse uses of water; general policy, technical assistance, research and development, training and matters relating to irrigation and multi-purpose projects, ground water management; conjunctive use of surface and ground water, the work relating to rejuvenation of river Ganga, command area development, flood management including drainage, flood-proofing, water logging, sea erosion and dam safety.

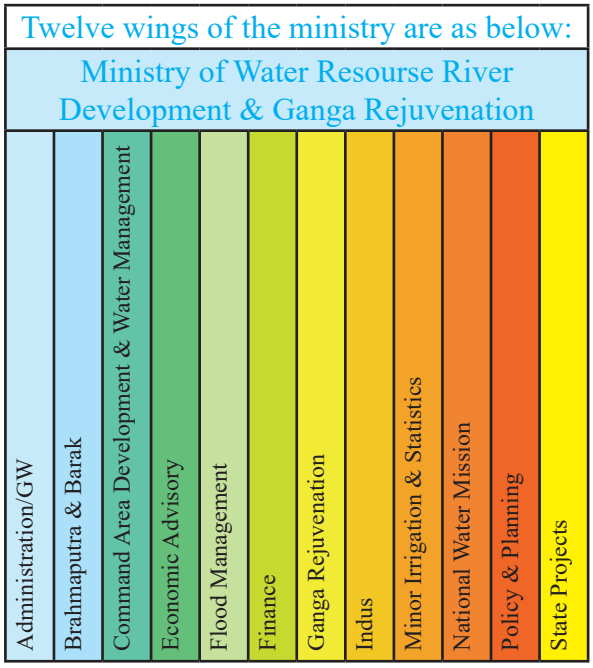
The Ministry has also been allocated the subject of regulation and development of inter-State rivers, implementation of awards of Tribunals, water quality assessment, bilateral and external assistance and co-operation programmes in the field of water resources and matters relating to rivers common to India and neighbouring countries.

The above-mentioned functions of the Ministry are performed through its two attached offices (Central Water Commission and Central Soil and Materials Research Station), seven sub-ordinate offices (Central Ground Water Board, Central Water and Power Research Station, Ganga Flood Control Commission, Farakka Barrage Project, Sardar Sarovar Construction Advisory Committee, Bansagar Control Board and Upper Yamuna River Board), six statutory bodies (Brahmaputra Board, Narmada Control Authority, Betwa River Board, Tungabhadra Board, Godavari River Management Board and Krishna River Management Board), four autonomous societies/body (National Water Development Agency, National Institute of Hydrology, North-Eastern Regional Institute of Water & Land Management) and National Mission for Clean Ganga (NMCG); and two public sector enterprises (WAPCOS Limited and National Projects Construction Corporation Limited).

The Ministry is headed by Hon'ble Union Minister for Water Resources, River Development and Ganga Rejuvenation. Sushri Uma Bharti took over the charge of the Ministry as Union Minister on 26th May, 2014. Shri Vijay Goel and Dr. Sanjeev Kumar Balyan assumed their charges in the Ministry as Ministers of State on 5th July, 2016 and continued till 2nd September, 2017. Shri Nitin Gadkari assumed the charge of Union Minister on 3rd September, 2017 and Dr. Satyapal Singh and Shri Arjun Ram Meghwal also assumed their charges in the Ministry as Ministers of State on the same day. Dr. Amarjit Singh working as Special Secretary in the Ministry took over the charge of

Secretary of the Ministry w.e.f. Ist January, 2017 and continued till 30th November, 2017. After that Shri U.P. Singh took over the charge of Secretary on 1st December, 2017. The organizational chart of the Ministry is at **Annexure-I**. The staff strength of the Ministry is at **Annexure-II**. A list of Heads of Organizations under the Ministry is at **Annexure-III**.

There are at present twelve wings in the Ministry, namely, Administration / GW, Brahmaputra & Barak, Economic Advisory, Flood Management, Finance, Ganga Rejuvenation, Indus, Minor Irrigation & Statistics, National Water Mission, Peninsular River, Policy & Planning, and State Projects.



MAJOR INITIATIVES

NATIONAL GANGA RIVER BASIN AUTHORITY (NGRBA) AND SUBSEQUENT CONSTUTITION OF NATIONAL MISSION FOR CLEAN GANGA (NMCG) AS AN AUTHORITY

NGRBA was established through the Gazette notification of the Government of India (Extraordinary) No. 328 dated 20th February, 2009 with the following objectives:

(a) Ensuring effective abatement of pollution and conservation of the river Ganga by adopting a river basin approach to promote inter-sectoral co-ordination for comprehensive planning and management; and

(b) Maintaining environmental flows in the river Ganga with the aim of ensuring water quality and environmentally sustainable development.

The NGRBA was re-constituted vide notification dated 29th September, 2014 for making suitable changes in the proposed governing structure.

NGRBA was mandated to take up regulatory and developmental functions with sustainability needs for effective abatement of pollution and conservation of the river Ganga by adopting a river basin approach for comprehensive planning and management. The Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD & GR) was the nodal Ministry for the NGRBA. The authority was chaired by the Prime Minister and had as its members the Union Ministers concerned, the Chief Ministers of the States through which Ganga flows, viz., Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal, among others. This initiative was expected to rejuvenate the collective efforts of the Centre and the States for cleaning the river, to ensure that by the year 2020, no untreated municipal sewage or industrial effluent would flow into the river Ganga.

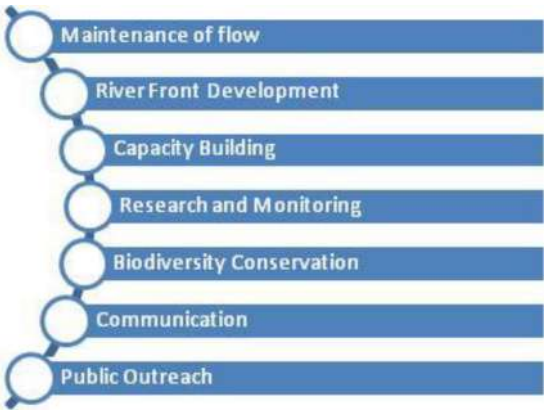
Cabinet approved the Namami Gange programme on 13th May, 2015 as a comprehensive approach to rejuvenate river Ganga and its tributaries under one umbrella. A total of Rs. 20,000 crore was allocated for this project to be spent over the next five years till 2020. This includes funds allocated for ongoing projects to clean river Ganga and new initiatives. All new projects sanctioned under Namami Gange programme were to have 100% funding from the Central Government.

In order to ensure effective and

expeditious implementation of Namami Gange Programme, it was proposed to re-constitute, the Mission as an Authority under sub-section (1), read with clauses (i), (ii), (v), (vi), (vii), (viii), (ix), (x), (xii) and (xiii) of sub-section (2) and (3) of section 3 and sections 4,5,9,10,11, 19, 20 and 23 of the Environment (Protection) Act, 1986 (29 of 1986).

Vide notification no. S.O. 3187(E) dated 7th October 2016 under EPA 1986, NGRBA has been dissolved, consequent to constitution of National Council for Rejuvenation, Protection and Management of River Ganga (referred as National Ganga Council).

"Namami Gange" approaches Ganga Rejuvenation by consolidating the existing ongoing efforts. Namami Gange focuses on cleaning of river Ganga in short term; it also has a comprehensive vision with seven main thrust areas as below:



The key features of re-constitution of National Mission for Clean Ganga (NMCG) as an Authority was granting it the powers to issue directions under Section 5 of the Environment (Protection) Act, 1986.

National Mission for Clean Ganga (NMCG) as an Authority has remarkably raised the pace of the programme by sanctioning 193 projects (including the existing projects sanctioned under NGRBA programme) at an estimated project cost of Rs 19757.85 crore. Out of 193 projects, 49 are completed. These projects pertain to modernization/development of ghats, modernization/development of crematoria, biodiversity centres, trash skimmers for river surface cleaning, Sewerage Infrastructure, Rural Sanitation, fisheries, pilot projects for in-situ treatment of waste water in drains, ghat cleaning, afforestation and medicinal plantations, etc. to be taken up in various towns along Ganga and its tributaries. Further details are given in *Chapter-7*.

SPECIAL COMMITTEE ON "INTER-LINKING OF RIVERS"

On the directions of Supreme Court, a committee called "Special Committee on Interlinking of Rivers" was constituted on 23rd September, 2014 under the Chairmanship of the Union Minister of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD & GR) for the implementation of Inter-Linking of Rivers (ILR) programme. Fourteen meetings of the Special Committee for Inter-Linking of Rivers (ILR) have been held so far (last meeting held on 17.01.2018 at New Delhi), wherein State Irrigation/ Water Resources Ministers along with the Secretaries of various States participated. The Special Committee on ILR takes into consideration all the suggestions / observations of the stakeholders while planning and formulating the ILR projects.

During 2017-18, Special Committee on Inter-Linking of Rivers (ILR) held two meetings on 27.07.2017 and 17.01.2018. Important developments in the meetings include: (i) Special Committee recommended that the ILR projects be included in the list of National Projects with 90% (Centre): 10% (State) funding pattern; (ii) Special Committee decided to organise meeting of six Southern States to discuss various Interlinking of Rivers projects in the region; and (iii) Special Committee considered the modified guidelines for carrying out water balance study in a river basin.

The Sub Committee II on "System Studies for Identification of Most Appropriate Alternative Plan" of the Special Committee

Jal Manthan-4 at Vigyan Bhawan in 28th – 29th July, 2017

on ILR held one meeting on 26.02.2018 and held further discussions on the report of National Institute of Hydrology (NIH) on Mahanadi-Godavari link in light of Odisha's observations. Details of meeting of sub committees etc. are highlighted under the head NWDA in *Chapter-7*.

JAL MANTHAN-4

Jal Manthan-4 was organized on 28th – 29th July, 2017 for holding wider consultations among various stakeholders with a view to evolve strategies for better water resources development and management. During Jal Manthan-4, discussions/consultations between various stakeholders were also held on issues pertaining to Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) and difficulties being encountered in its implementation, Repair Renovation & Restoration of Water Bodies, Command Area Development, Interlinking of Rivers, etc. This was followed by a 'Chintan Baithak' wherein a detailed and in depth review of the schemes being implemented by the Ministry and the future course of action thereon was undertaken.

MAJOR ACHIEVEMENTS UNDER VARIOUS SCHEMES

PRADHAN MANTRI KRISHI SINCHAYEE YOJANA (PMKSY)

During 2015-16, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) was launched with an aim to enhance physical access of water on farm and expand cultivable area under assured irrigation, improve on farm water use efficiency, introduce sustainable water conservation practices etc. The scheme components are being implemented by three Ministries, they are as under:

- **Accelerated Irrigation Benefits Programme (AIBP): Implementation by Ministry of Water Resources, River Development & Ganga Rejuvenation.**
- **PMKSY (Har Khet ko Pani): Implementation by Ministry of Water Resources, River Development & Ganga Rejuvenation.**
- **PMKSY (Per Drop More Crop): Implementation by Ministry of Agriculture and Farmers Welfare (MoA & FW).**
- **PMKSY (Watershed): Implementation by Ministry of Rural Development (MoRD).**

PMKSY has been conceived amalgamating ongoing schemes viz. Accelerated Irrigation Benefit Programme (AIBP) of the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD & GR), Integrated Watershed Management Programme (IWMP) of Department of Land Resources (DoLR) and

the On Farm Water Management (OFWM) of Department of Agriculture and Cooperation (DAC). The scheme is being implemented by Ministries of Agriculture, Water Resources, RD & GR, and Rural Development. MoWR, RD &GR, is to undertake various measures for creation of assured irrigation source, construction of diversion canals, field channels, water diversion/lift irrigation, including development of water distribution systems.

Under MoWR, RD & GR; PMKSY is being implemented through:

- Accelerated Irrigation Benefits Programme (AIBP);
- Command Area Development and Water Management (CAD & WM); and
- Surface Minor Irrigation (SMI) and Repair, Renovation and Restoration (RRR) of Water Bodies.

Further details are given in *Chapter-3*.

PRADHAN MANTRI KRISHI SINCHAYEE YOJANA (PMKSY) - ESTABLISHMENT OF MISSION FOR COMPLETION OF PRIORITIZED IRRIGATION PROJECTS AND FUNDING ARRANGEMENTS

During 2016-17, under the scheme 99 projects have been identified by the Committee headed by Minister (Water Resources) of Chhattisgarh for its completion upto 2019. The Cabinet on 27.07.2016 has approved establishment of the Mission to ensure completion of these projects. The arrangement of funds for Central share/ Assistance (CA) has been made by taking loan from National Bank for Agriculture and Rural Development (NABARD) as per year-wise requirements which could be paid back in 15 years time keeping a grace period of 3 years. Further, the State Governments, if required, may borrow funds from NABARD for the State Share.

A tripartite Memorandum of Agreement (MoA) was signed on 06 September 2016, amongst Govt. of India (through MoWR, RD & GR), NABARD and National Water Development Agency (NWDA) for funding of Central Assistance in respect of these 99 irrigation projects through Long Term Irrigation Fund (LTIF).

The further details i.r.o. Priority Projects, Status of Completion and their funding pattern are given in *Chapter-3*.

ACCELERATED IRRIGATION BENEFITS PROGRAMME (AIBP)

Under Accelerated Irrigation Benefits Programme, the State Governments have been provided an amount of Rs. 58,503.70 crore as CLA/Grant under AIBP (MMI) since its inception till March 2016-17. After commencement of this Programme, 297 Irrigation /Multi Purpose Projects have been included for funding under AIBP. Out of this, 143 major/medium irrigation projects have been completed and 5 projects were foreclosed. An irrigation potential of 24.39 lakh hectare has been created through major/ medium AIBP projects.

During 2017-18, Central Assistance (CA) of Rs. 3593.60 crore has been provided to various projects under AIBP.

Further, Sixteen Projects have been declared as national projects so far. These projects are taken up for execution after the concerned States obtain techno economic clearance, other statutory clearances and investment clearance. Out of these, five projects, namely Polavaram project of Andhra Pradesh, Saryu Nahar Pariyojana of Uttar Pradesh, Gosikhurd Irrigation Project of Maharashtra, Teesta Barrage Project of West Bengal and Shahpur Kandi Dam Project of Punjab have been taken up for execution. Gosikhurd and Saryu Nahar Pariyojna are included under 99 prioritized projects. Polavaram Project is also being funded under Long Term Irrigation Fund (LTIF). The progress of Teesta project has been affected due to land acquisition issue.

The State Government has constituted a High Level Task Force to suggest appropriate cause of action for execution of balance works. The works of Shahpur Kandi dam project was stopped in 2014 due to inter state issues between Punjab and Jammu & Kashmir. An agreement has been signed by Secretaries of Irrigation Department of both the States in this regard. Implementation of the projects is dependent upon ratification of agreement and approval of revised cost estimates.

POLAVARAM PROJECT AUTHORITY

Indira Sagar (Polavaram) project is located on river Godavari near Ramayyapet village Polavaram Mandal of West Godavari District, Andhra Pradesh. It is a multipurpose major terminal reservoir project on river Godavari for development of Irrigation, Hydropower and drinking water facilities to East Godavari, Visakhapatnam, West Godavari and Krishna district of Andhra Pradesh.

The project will provide irrigation to 2.91 Lakh Hectares (Culturable Command Area) and hydropower with installed capacity of 960 MW apart from 23.44 TMC (663.7 MCM) drinking and industrial water supply to Visakhapatnam township and steel plant and diversion of 80 TMC waters to river Krishna. The ultimate irrigation potential of the project is 4.368 lakh ha and annual power generation will be 2369.43 million units. In addition, 540 villages will also be provided with drinking water facilities in the command area.

The project was under construction with Central Assistance under Accelerated Irrigation Benefits Programme (AIBP). An expenditure of Rs.5135.87 crore has been incurred up to 31.03.2014 including Central Assistance of Rs.562.469 crore provided under AIBP. After declaration of National Project since 01.04.2014, additional expenditure of Rs.5364.16 crore have been incurred till March, 2017. So far CA of Rs.2000 crore has been provided during 2017-18 for this project. Further details are given in *Chapter-3.*

COMMAND AREA DEVELOPMENT AND WATER MANAGEMENT PROGRAMME (CAD&WM)

Under the CAD&WM programme, initially, 60 major and medium irrigation projects were taken up under the CAD Programme, covering a Culturable Command Area (CCA) of about 15 million hectares. After inclusion of new projects, deletion of completed projects and clubbing of some projects, about 150 projects were under implementation in the beginning of 12th Plan. The Programme was restructured and renamed as Command Area Development and Water Management (CAD&WM) Programme w.e.f. 1-4-2004. The Programme is being implemented as a State Sector Scheme from 2008-09 onwards and is being implemented *pari-passu* with Accelerated Irrigation Benefits Programme (AIBP) during the 12th Five Year Plan.

The core components of physical works under CAD&WM relates to construction of field channels. Since its inception in 1974-75 up to March, 2017, CCA of about 22.3 Mha has been covered. Central Assistance of about Rs.7950 crore has been released to States under the CAD Programme since its inception in 1974-75 up to March, 2017. During 2017-18, Central Assistance (CA) of Rs. 933.10 crore has been provided to various projects under PMKSY(CADWM). Details are in *Chapter- 3*.

PARTICIPATORY IRRIGATION MANAGEMENT (PIM)

National Water Policy emphasizes participatory approach in water resources management. It has been recognized that participation of beneficiaries will help greatly in the optimal upkeep of irrigation system and effective utilization of irrigation water. The participation of farmers in the management of irrigation would include transfer responsibility for operation & maintenance and also collection of water charges to the Water Users' Association in their respective jurisdiction with effect from 2008-09. One

time functional grant @Rs.1200/- per hectare to be shared by the Centre, State and Farmers in the ratio of 45:45:10 respectively are being paid to outlet level Water Users Associations' as incentive, the interest from which is to be used for maintenance. Other details of Water Users Association (WUA) are given in *Chapter- 3.*

REPAIR, RENOVATION & RESTORATION OF WATER BODIES (RRR)

Under the scheme, a total of 1877 water bodies have been taken up for restoration since XII Plan onwards, out of which 565 water bodies have been reported to be completed. Central Assistance of Rs. 344.315 crore has been released to the States for completion of works of these water bodies, out of which Rs. 79.65 crore was released during 2017-18.

SURFACE MINOR IRRIGATION (SMI) SCHEME

Since XII Plan, 4857 SMI schemes have been taken up under the programme out of which 2466 schemes have been reported to be completed. Central Assistance amounting to Rs. 5743.18 crore has been released for completion of these schemes out of which an amount of Rs. 665.35 crore was released during 2017-18.

FLOOD FORECASTING

In order to enable the local administration to take suitable measures like evacuation of people from flood affected areas to safe relocations during flood season and also to enable the project authorities in proper operation of reservoirs, the activity of flood forecasting in India is performed by Central Water Commission (CWC) on major rivers and their important tributaries. For this purpose, CWC issues flood forecasts at 226 stations (166 Level forecasting, 60 inflow forecasting) in the country. CWC has started three days advisory forecast in all 19 basins where flood forecasting activity is covered using rainfall-runoff modeling and rainfall forecast to give adequate lead time to the disaster managers for preparedness.

The forecasts issued by CWC proved to be very useful in saving life and public properties as a result of timely action by the authorities. CWC has been making continuous endeavour for modernization and expansion of its flood forecasting network in order to have desired automatic system of data collection and real time data transmission. So far, 510 data collection stations have been modernized, three Earth receiving Stations have been set up at New Delhi, Jaipur and Burla, 21 Modeling Centers have been equipped with latest computer systems for analysis of data, flood forecast formulation and its dissemination to concerned agencies expeditiously. For activities of flood forecasting, modernization and expansion in XII Plan, another 458 stations alongwith 5 more modelling centres are being modernized with automatic data acquisition system with Satellite based telemetry system in various basins in the country. Tenders have been awarded for the work during April, 2017 and around 180 stations have been installed and the remaining is in advanced stage of installation and is likely to be completed during monsoon 2018. For activities of flood forecasting, modernization and expansion in 14th Finance Commission period provision has been kept under DWRIS scheme under Part F Flood Forecasting amounting to Rs. 120.70 crore for continuing ongoing activities of Flood Forecasting at 275 locations and opening of new 50 FF stations and installation of 125 automatic data collection and transmission system during the period 2017-18 to 2019-20.

FLOOD MANAGEMENT PROGRAMME

During XI Plan, Government of India launched "Flood Management Programme" for providing Central assistance to the State Governments for undertaking the works related to river management, flood control, anti-erosion, drainage development, flood proofing, restoration of damaged flood

Inauguration of Ministry's pavilion at India International Trade Fair 2017.

management works and anti-sea erosion works. Under this Programme, a total of 522 works were approved during XI & XII Plan, out of which 298 works have been physically completed and the central assistance of Rs. 5023.07 crore has been released since XI Plan. The completed works have provided reasonable protection to 34.663 lakh ha area and 265.793 lakh population benefitted. The details of works approved, funds released so far and area protected are given in Annexure-XI & XII respectively.

A new scheme "Flood Management and Border Areas Programme (FMBAP)" has been proposed with merged components from the existing Flood Management Programme (FMP) and River Management Activities & Works related to Border Areas (RMBA) schemes. The approval of scheme is under progress for FY 2017-18 to 2019-20.

HYDROLOGY PROJECT

Phases of Hydrology Project (HP) were implemented only in 13 States. This has resulted in a sectoral divide amongst the HP and non-HP States in terms of equipment, technology, applications and capacity building which have a direct impact on water resources planning, development and management.

The National Hydrology Project (NHP) has been envisaged with pan-India coverage, including the Ganga and Brahmaputra Basin States which were not covered under previous phases of Hydrology Projects and as a follow-up and extension of Hydrology Project Phase-I and Phase-II. Total cost of the scheme as approved by the EFC held on 16.10.2015 is Rs. 3679.7674 crore [Rs. 3640 crore for National Hydrology Project (NHP) and Rs.39.7674 crore for creation of National Water Informatics Centre (NWIC)]. Details are in *Chapter 3.*

INFORMATION, EDUCATION AND COMMUNICATION

Ministry of Water Resources, River Development and Ganga Rejuvenation participated in the 37th India International Trade Fair (IIFT) organized by ITPO in Pragati Maidan from 14th to 27th November, 2017. The pavilion showcased achievements and works being done by various wings/ departments of the Ministry. Physical models of various projects/activities, banners, posters etc. depicting various activities, programmes and Projects undertaken by the organizations under MoWR, RD and GR was displayed and applauded by visitors.

This year for the Ministries & Departments Pavilion, the Pavilion of MoWR,RD&GR has been adjudged First for excellence in display and given special appreciation certificate by ITPO, which is a significant achievement for the efforts taken by Ministry and all the organizations involved in the display.

INFRASTRUCTURE DEVELOPMENT

Infrastructure Development (ID) Scheme has been approved by the Government by merging four continuing schemes viz. (i) Land & Building and Information Technology Plan of Central Ground Water Board (CGWB), (ii) Land & Building of Central Water Commission (CWC). (iii) Information Technology Development Plan of Ministry of Water Resources, River Development and Ganga Rejuvenation and (iv) e-Governance of the Ministry of Water Resources, River Development and Ganga Rejuvenation.

The Scheme aims at providing better working environment in the offices, creation of assets and savings on payment of monthly rent. To achieve this, construction of offices at various locations, provision for construction of staff quarters as well as modernization of existing offices of the Ministry (Proper), CWC and CGWB have been included under the ambit of the Scheme.

Competent Authority has approved the implementation/continuation of the Infrastructure Development Scheme for Ministry of Water Resources, River Development & Ganga Rejuvenation and its Attached and Subordinate Offices during the remaining period of 14th FC (i.e. 2017-20) with the total projects cost of Rs. 283.98 crore and an outlay of Rs. 198.23 crore. The proposed scheme of Infrastructure Development envisages provision of Rs. 198.23 crore out of which Rs. 181.83 crore is meant for Land and Building Component of the Scheme and Rs. 16.40 crore is for IT Component.

FARAKKA BARRAGE PROJECT

The Farakka Barrage Project (FBP) was commissioned in 1975 for preservation & maintenance of the Kolkata Port and for increasing the navigational depth of the Bhagirathi – Hooghly waterway. The Farakka Barrage Project comprises of a 2245 m long barrage across river Ganga at Farakka in Murshidabad District of West Bengal, a canal head regulator at Farakka for diverting water to Feeder Canal, a 38.38 km long Feeder Canal and Jangipur Barrage, besides the road-cum-rail bridge across Ganga at Farakka, Navigation Locks at Farakka, Jangipur and Kalindi (Nurpur/ Malda), a road-cum-rail bridge across the Feeder Canal, Townships at Farakka, Ahiron and Khejuriaghat having 4000 dwelling units. Its appurtenant structures include flood embankments, marginal bunds, afflux/guide bunds, etc.

NATIONAL WATER MISSION

The Government of India launched National Action Plan on Climate Change (NAPCC) which inter-alia identified the approach to be adopted to meet the challenges of impact of climate change through eight National Missions including National Water Mission with the main objective of "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management".

Highlights of 2017-18 are:

1. Development of State Water Budgeting Model Template under State Specific Action Plan on Water (SSAP-Water).
2. Expediting Baseline studies of 26 Major / Minor Irrigation Projects.
3. Regular review of Bench mark study of Thermal Power plants, Steel plants, Paper and Pulp and Textile and Jute Industry by TERI.

Farakka Barrage Project (FBP) at Farakka (Murshidabad)

DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)

Keeping in view dam safety issues being faced by ours ageing large dams and with an objective to address this issue in a holistic way in all respect, Govt. of India undertook a comprehensive Dam Safety Rehabilitation and Improvement Project (DRIP) with financial assistance from the World Bank at an estimated cost of Rs. 2100 Crore for a period of six years from 18th April, 2012 to June, 2018, which covers rehabilitation of 223 large dam projects spreads across seven States (Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Tamil Nadu, and Uttarakhand) along with institutional capacity building of all participating agencies and with a provision for enhancement of capacity in dam safety areas of selected academic and research institutions.

Three National Dam Safety Conferences and One International Dam Safety Conferences have been organized under the project so far. These conferences received the overwhelming response from the dam safety professionals, researchers, academicians, industries from the Country as well as overseas.

Dam Rehabilitation and Improvement Project (DRIP) has been taken up with the World Bank assistance at an estimated cost of Rs. 2100 Crore for a period of six years from 18th April, 2012 to June, 2018.

NATIONAL PROJECTS

The Union Cabinet in its meeting held on 7th February, 2008 gave its consent to the proposal of the Ministry of Water Resources for implementation of National Projects with Central Assistance of 90% of the cost of the project as grant.

Sixteen Projects have been declared as national projects so far. These projects are taken up for execution after the concerned States obtain techno economic clearance, other statutory clearances and investment clearance. Out of these, five projects, namely Polavaram project of Andhra Pradesh, Saryu Nahar Pariyojana of Uttar Pradesh, Gosikhurd Irrigation Project of Maharashtra, Teesta Barrage Project of West Bengal and Shahpur Kandi Dam Project of Punjab have been taken up for execution. Gosikhurd and Saryu Nahar Pariyojna are included under 99 prioritized projects. Polavaram Project is also being funded under LTIF. Details have been given in *chapter-3*.

ORGANISATIONS AND INSTITUTIONS

ATTACHED OFFICES

CENTRAL WATER COMMISSION (CWC)

The main activities of CWC may be summarized as follows:

- Flood Forecasting and Assistance to State Governments in Flood Management
- Collection and Analysis of Hydrological Data
- Techno-Economic Appraisal of Projects
- Monitoring of Selected Projects including those receiving Central Assistance
- Planning & Design of Projects
- Surveys, Investigations and Preparation of Detailed Project Report (DPR)
- Studies on Environmental and Socio-Economic issues
- Studies Related to Irrigation Planning and Water Management
- Basin Planning and Management
- National Water Resources Assessment
- Assistance in Resolution of Inter-State Water Disputes
- Construction Equipment Planning
- Studies on Dam Safety
- Research and Development
- Standardization of Engineering Practices
- Operation of Reservoirs
- Training and Capacity Building
- International Co-operation in Water Sector

Details of CWC are given in *Chapter-7*.

CENTRAL SOIL AND MATERIALS RESEARCH STATION (CSMRS)

Central Soil and Materials Research Station (CSMRS), New Delhi, is a premier organization in the country dealing with the field and laboratory investigations, and research in the areas of geotechnical engineering and civil engineering materials, particularly for construction of river valley projects and safety evaluation of existing dams. The Research Station is also involved in quality control of construction for various river valley projects. 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. The Research Station has some unique capabilities in the country in the field of geotechnical engineering and construction materials' characterization. The details of CSMRS are given in *Chapter-7.*

SUBORDINATE OFFICES

CENTRAL GROUND WATER BOARD

The Central Ground Water Board undertakes many scientific activities for finding groundwater sources, disposition of aquifers, assessment of groundwater resources, monitoring of water levels & quality and issues related to groundwater management through demand and supply side interventions. Main activities of the Board are as follows:

1. Aquifer Mapping Programme
2. Water Supply Investigations
3. Ground Water Regime Monitoring
4. Estimation of Ground Water Resources.
5. Training under National Ground Water Training and Research Institute.
6. Scrutiny of Major / Medium Irrigation Projects
7. IEC activities
8. Proposed Scheme of PMKSY- Har Khet ko Pani
9. 7th International Ground Water Conference 2017 (IGWC-2017)
10. Activities under taken by CGWB in the North Eastern Region
11. National Hydrology Project
12. Accreditation of CGWB Labs by NABL as per ISO/IEC 17025: 2005
13. Central Ground Water Authority

The details of CGWB are given in *Chapter-7.*

CENTRAL WATER AND POWER RESEARCH STATION (CWPRS)

The Central Water and Power Research Station (CWPRS), Pune an apex Research and Development institution in the field of hydraulics and allied research in the water and power sector has continued to serve the needs of the nation for about 100 years by catering

to the research and development needs for evolving safe and economical planning and design of water resources structures, river engineering, hydropower generation, and Ports and Water ways projects fulfilling the mandate of ***'Service to the Nation through Research'.*** CWPRS has offered its services to a number of projects in the neighbouring countries viz., Bangladesh, Bhutan, Afghanistan, Myanmar, Nepal, Singapore, etc., as well as countries in Middle East. The details of achievements are given in *Chapter-7.*

GANGA FLOOD CONTROL COMMISSION (GFCC)

The Commission has been assigned the following tasks:

- Preparation and Updation of comprehensive plans for flood management of the river systems in the Ganga basin.
- Phasing/sequencing of programme of implementation of works included in the basin-wise plans.
- Providing technical guidance to the Ganga Basin States, namely, West Bengal, Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, Chhatisgarh, Madhya Pradesh, Delhi, Haryana, Himachal Pradesh and Rajasthan on flood Management.
- According techno-economic appraisal and clearance to flood management schemes of the Ganga basin States with estimated cost of more than Rs. 12.5 crore and up to Rs. 25.0 crore except for schemes of the States of Haryana, Uttar Pradesh and Delhi on the river Yamuna in the reach from Tajewala to Okhla Barrage. The schemes with estimated cost of more than Rs. 25.0 crore are appraised by GFCC and their techno-economic clearance is accorded by TAC-MoWR
- Monitoring the execution of the important flood control schemes particularly those receiving Central Assistance under Flood Management Programme or being executed under Central Sector.
- Assessment of adequacy of the existing waterways under the road and rail bridges and additional waterways required to be provided for reducing the drainage congestion to reasonable limits.
- Performance evaluation of major flood management measures executed by the States including the Inter-State Flood Management Schemes.

The details of GFCC are given in *Chapter-7.*

SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE (SSCAC)

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 (TDWN) with a view to ensure efficient, economical and early execution of Unit-I (Dam and Appurtenant works) and Unit-III (Hydropower works) of the Sardar Sarovar Project.

Sardar Sarovar Dam (Gujarat)

The 85th meeting of the SSCAC was held on 15th January, 2018 at New Delhi. The details of achievements of SSCAC are given in *Chapter-7.*

BANSAGAR CONTROL BOARD

Bansagar Control Board was set up vide Government of India, Ministry of Agriculture and Irrigation Resolution No.8/17/74-DW-II dated 30th January, 1976. It was amended vide Resolution No.8/17/74-DW-II dated 28th March, 1978. This Resolution was

in accordance with an agreement reached between the Governments of Madhya Pradesh, Uttar Pradesh and Bihar on 16th September, 1973 for sharing the waters of River Sone and the cost of the Bansagar Dam. The details of amendments are listed in *Chapter-7.*

UPPER YAMUNA RIVER BOARD

"Upper Yamuna" refers to the reach of Yamuna from its origin at yamunotri to Okhla Barrage at Delhi. A Memorandum of Understanding (MoU) was signed on 12th May, 1994 amongst the basin States of Himachal Pradesh, Uttar Pradesh, Haryana, Rajasthan and National capital Territory of Delhi, for sharing the utilizable surface flows of river Yamuna up to Okhla. The MoU also provided for creation of "Upper Yamuna River Board" to implement the said agreement. Accordingly, the Central Government constituted the Upper yamuna River Board in1995 as a subordinate office under the Ministry of Water Resources. After creation of Uttaranchal State in 2000, the resolution was modified to include Uttaranchal (now Uttrakhand) also in the Board. The details are given in Chapter-7.

REGISTERED SOCIETIES

NATIONAL WATER DEVELOPMENT AGENCY (NWDA)

The National Water Development Agency (NWDA) was set up in July, 1982 by the Government of India as a Society under Societies Registration Act 1860 under the then Ministry of Irrigation (now Ministry of Water Resources, River Development and Ganga Rejuvenation) to study the feasibility of the links under Peninsular Component of National Perspective Plan. NWDA is fully funded by the Government of India. Subsequently in 1990, NWDA Society resolved to take up the studies of the Himalayan Component also. Further, on 28th June, 2006 preparation of Detailed Project Reports (DPRs) of link projects and pre-feasibility/ feasibility reports of intra-State links as proposed by States were also included in the functions of NWDA. Accordingly, the Ministry vide resolution dated 30.11.2006 has modified the functions of NWDA Society. The functions of NWDA were further modified vide the Ministry's resolution dated 19.05.2011 to undertake the work of preparation of DPRs of intra-State links also by NWDA, and the same has been published in the Gazette notification of Govt. of India dated 11th June, 2011. Further, two new functions in the mandate of NWDA were added vide Gazette notification dated 07.10.2016. The details are given in *Chapter-7.*

NATIONAL INSTITUTE OF HYDROLOGY (NIH)

The National Institute of Hydrology, a Govt. of India Society under the Ministry of Water Resources, River Development & Ganga Rejuvenation, established in December, 1978 at Roorkee, is conducting basic, applied and strategic research in the fields of hydrology and water resources development. The Institute is fully aided by the Ministry of Water Resources, Govt. of India. The objectives of NIH are as under:

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

The details of achievements are given in *Chapter-7.*

31st Annual General Meeting of National Water Development Agency Society

NORTH EASTERN REGIONAL INSTITUTE OF WATER AND LAND MANAGEMENT (NERIWALM)

North Eastern Regional Institute of Water and Land Management (NERIWALM) is a Registered Society under the administrative control of the Ministry of Water Resources, RD & GR, Government of India. This is only Water and Land Management Institute (WLMI) established and governed by Government of India and serving eight states of North East. The details of achievements of NERIWALM are given in *Chapter-7.*

STATUTORY BODIES

NARMADA CONTROL AUTHORITY

In pursuance of the decisions 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 details are given in *Chapter-7.*

BETWA RIVER BOARD

A decision to harness the available water resources of Betwa River was taken in a meeting held on 22nd July, 1972 between Chief Ministers of Uttar Pradesh and Madhya Pradesh. Further Uttar Pradesh and Madhya Pradesh in a meeting held on 9th December, 1973 agreed for setting up of a tripartite Control Board for the speedy, smooth and efficient execution of the various inter-state projects of both the States. Betwa River Board (BRB) was constituted in 1976 by an Act of parliament to execute the Rajghat Dam Project and Power House. The details of achievements of BRB are given in *Chapter-7.*

The Institute organised 40th Foundation Day held at Roorkee on December 16, 2017

TUNGABHADRA BOARD

The Tungabhadra Board was constituted by the President of India in exercise of the powers vested under sub section (4), Section 66 of Andhra State Act 1953 for completion of the Tungabhadra Project and for its operation and maintenance. The Board is regulating water for irrigation, Hydro power generation and other uses from the reservoir. The details of achievements of Tungabhadra Board are given in *Chapter-7.*

PUBLIC SECTOR ENTERPRISES

WAPCOS LIMITED

WAPCOS Limited is a "MINI RATNA-I" Public Sector Enterprise under the aegis of the Ministry of Water Resources, River Development & Ganga Rejuvenation. The Company was incorporated on June 26, 1969 under the Companies Act, 1956. The objects of the WAPCOS are:

- To perform the role of a premier agency for offering integrated package of services of scientific, technological and managerial quality for optimal planning and development of Projects;
- To adopt modern technology and systems to build in quality, reliability and accuracy thereby ensuring customer satisfaction;
- To continue the pace of growth of domestic and overseas business and to transfer know-how to Clients;
- To adopt international standards in surveys, investigations, designs, cost estimates, project planning including environmental studies and project management services for cost-effective and integrated development of Water resources, Power and Infrastructure Projects;
- To promote research and development through interaction with other national and international agencies;
- To maintain pre-eminence in the field of consultancy through diversification in allied fields;
- To secure a fair monetary return to the enterprise as a result of its operations through improved productivity;
- To play a dynamic role in use of state-of-the-art consultancy for innovative design alternatives;
- To attract the best available talent and promote a committed and motivated workforce;
- To strive to achieve client satisfaction; and
- To promote WAPCOS as a Brand Name.

The details of achievements of WAPCOS are

Afghan-India Friendship Dam (Salma Dam Project) executed by WAPCOS

given in *Chapter-8.*

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED

National Projects Construction Corporation Limited (NPCC) was established on 9th January, 1957 as a premier construction company to create necessary infrastructure for economic development of the country. NPCC Ltd. comply with Quality management requirements of ISO 9001-2008 for execution of Civil Works for Thermal & Hydro Electric Projects', River Valley Projects, Industrial Structures, Project Management Consultancy services for buildings, Housings, Roads, Bridges and Infrastructure Projects.

In its 61 years of existence the Corporation has successfully associated itself with completion of several National Projects from concept to commissioning stage. The details of achievements of NPCC are given in *Chapter-8.*

INDIA-WRIS WEBSITE

CWC & ISRO has jointly developed the Water Resources Information System (India-WRIS) during 11th Plan. The first full version of the website of India-WRIS (www.india-wris.nrsc.gov.in) was launched by Hon'ble Minister of Water Resources on 7th December, 2010. Subsequently, four more versions of the website of India-WRIS have been launched. The Ver. 4.1 was launched in July, 2015 and is available in public domain at 1:250000 scale. The details of achievements of the India-WRIS are given in *Chapter 3.*

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

2. National Water Policy

NATIONAL WATER POLICY

The National Water Policy (NWP), 2012 serves as a policy guideline for development and management of water resources in the country. The objective of the Policy is to take cognizance of the existing situation, to propose a framework for creation of a system of laws and institutions and a plan of action with a unified national perspective. In addition to prescribing policy recommendations, the Policy, lays stress on implementation through the National Water Board by preparing an action plan.

Copies of the National Water Policy, 2012 were forwarded to all States/UTs and concerned Central Ministries for necessary action. The MoWR, RD & GR also got a road map for implementation of the Policy prepared through an Expert Committee headed by Dr. S.R. Hashim. This report was also forwarded to all States/UTs for necessary action. Regular consultations take place with the State Governments for implementation of Policy and formulation of State Water Policies.

DRAFT NATIONAL WATER FRAMEWORK BILL

The National Water Policy, 2012, inter-alia, recommended that there is a need to evolve a National Framework Law as an umbrella statement of general principles governing legislative and/or executive (or devolved) powers by the Centre, the States and the local bodies. This should lead the way for essential legislation on water governance in every State and devolution of necessary authority to the lower tiers of government to deal with the local water situation. In pursuance thereof, the Ministry constituted an Expert Committee under the Chairmanship of Dr. Y.K. Alagh to draft a National Water Bill. The Committee submitted its report in May, 2013.

Later, a Committee was constituted under the Chairmanship of Dr. Mihir Shah on 28.12.2015 to examine the provisions of the draft National Water Framework Law and suggested changes/modifications therein taking into account inter-alia the emerging challenges in the water sector, reuse of waste water after treatment, the likely impact of climate change on water resources, importance of river restoration / rejuvenation, water contamination issue etc.

The Mihir Shah Committee submitted a Draft Report in May, 2016 that included a draft of National Water Framework Bill. The draft was circulated to States/UTs and the concerned Central Ministries for obtaining their comments. The draft was also placed on the website of the Ministry for inviting comments from general public. After receiving the comments from various quarters, the Committee submitted its final Report on 18th July, 2016.

The final report submitted by Dr. Mihir Shah Committee was circulated to all States/UTs and concerned Central Ministries for inviting their comments on the proposed National Water Framework Bill for taking further necessary action in the matter. The salient features of the proposed Bill are as under:

(1). To provide an overarching National Legal Framework based on principles for protection, conservation, regulation and management of water as a vital and stressed natural resource, under which legislation and executive action on water at all levels of governance can take place.

(2). That every individual should have a right to sufficient quantity of safe water for life within easy reach based on the principles of integrated river basin management. The States shall hold water resources as a Common Heritage and Public Trust.

(3). That the appropriate government shall strive towards rejuvenating river systems with community participation, ensuring:

(a) 'Aviral Dhara' – continuous flow in time and space including maintenance of connectivity of flow in each river system;

(b) 'Nirmal Dhara' – non- polluted flow so that the quality of river waters is not adversely affected by human activities; and

(c) 'Swachh Kinara' – clean and Aesthetic River banks with ecological integrity.

(4). It proposes that the appropriate government shall take all measures to protect the ecological integrity necessary to sustain eco-systems dependent on water. And also should adopt people-centred decentralized water management, for both surface and ground water, including local rainwater harvesting, watershed development and participatory irrigation management, while recognizing, encouraging and empowering local initiatives.

(5). It further proposes that the appropriate Government shall take into consideration the following:

(a) Water Use and Land Use;

(b) Appropriate Treatment and Use of Wastewater;

(c) Standards for Water Quality and Water Footprints; and

(d) Water Use Prioritization- Provided that these uses of water are consistent with the objective of sustaining aquifers and ecosystem indispensable to long term sustenance of the resource.

(6). The draft Bill proposes that high priority be given to Integrated River Basin Development and Management, wherein a river basin, including associated aquifers, shall be considered the basis hydrological unit for planning, development and management of water. Each State Government shall develop, manage and regulate basins of inter-State rivers through a River Basin Master Plan to be implemented by an appropriate institutional mechanism.

(7). It proposes establishment of a River Basin Authority for each inter-State river basin, or for a sub-basin or for sub inter-State river basin - wherever appropriate for optimum and sustainable development of the inter-State rivers and river valleys, with active participation and cooperation by all basin States to ensure equitable, sustainable and efficient utilisation of water resources with emphasis on demand management through conjunctive and integrated use of resources. Each River Basin Authority shall prepare a Master Plan for the River Basin.

(8). The Bill also proposes that the appropriate Government shall prepare and oversee the implementation of a Water Security Plan for:

(a) Attainment of sufficient quantity of safe water for life and sustainable livelihoods by every person; and

(b) Ensuring water security even in times of emergencies like droughts and floods.

The draft National Water Framework Bill, 2016 was circulated in September, 2016 to States/UTs and the concerned Central Ministries for obtaining their comments. MoWR, RD & GR is regularly pursuing

the State Governments for seeking their cooperation for early enactment of the National Water Framework Bill.

JAL KRANTI ABHIYAN

INTRODUCTION

Ministry of Water Resources, River Development & Gange Rejuvenation Jal Kranti Abhiyan was launched on 5th June, 2015 for a period from 2015-16 to 2017-18 in order to consolidate water conservation and management in the country through a holistic and integrated approach involving all stakeholders, making it a mass movement.

OBJECTIVES

The objectives of Jal Kranti Abhiyan are as under:

- Strengthening grass root involvement of all stakeholders including Panchayati Raj Institutions and local bodies in the water security and development schemes;
- Encouraging the adoption/utilization of traditional knowledge in water resources conservation and its management;
- To utilize sector level expertise from different levels in government, NGO's, citizens etc; and
- Enhancing livelihood security through water security in rural areas.

ACTIVITIES

Activities under 'Jal Kranti Abhiyan' include 'Jal Gram Yojana'; 'Development of Model Command Area'; 'Mass Awareness Programme'; and Other Activities.

Jal Gram Yojana is one of the main components of Jal Kranti Abhiyan under which two villages, in every district preferably being a part of dark block or facing acute water scarcity are being selected as "Jal Grams" across the country. So far 1115 Jal Grams have been selected and Water Security Plans for 269 Jal Grams have been prepared.

JAL MANTHAN

Jal Manthan is an initiative of the Ministry of Water Resources, River Development & Gange Rejuvenation for wider consultations among various stakeholders for churning out new ideas and tangible solutions to various water sector issues. The focus of Jal Manthan is to refine policies of the Ministry to make them more people friendly and responsive to the needs of the States. Jal Manthan provides various stakeholders an opportunity to highlight their concerns and impediments being faced by them in effective implementation of schemes related to water resources.

In this series, the Ministry has organized four Jal Manthans. The first, second and third Jal Manthans were held on 20th -22nd November, 2014, 22nd -23rd February, 2016 and 13th January, 2017 respectively. During these Jal Manthans, extensive consultations were held with different stakeholders on several important and critical areas in the water sector like PMKSY Priority Projects – Implementation Issues; Inter Linking of rivers – Progress and Challenges, River Basin Approach–Present Status and Future Indication, Ground Water and National Hydrology Project, Principles of Allocation of Water, Water Management, Use of innovative Technologies and Water Conservation, Participatory Irrigation Management, River Basin Management, River Rejuvenation and Flood Management, River Basin Approach for Sustainable Development, Ground Water Management, Water Security, Water Management, Coordination between Centre and States, water conservation, innovation in Water Governance etc.

Jal Manthan-4 was organized on 28th -29th July, 2017 for holding wider consultations among various stakeholders with a view to evolve strategies for better water resources development and management. During Jal Manthan-4, discussions/ consultations between various stakeholders were also held on issues pertaining to

PMKSY and difficulties being encountered in its implementation, Repair Renovation & Restoration of Water Bodies, Command Area Development, Interlinking of Rivers, etc. This was followed by a 'Chintan Baithak' wherein a detailed and in-depth review of the schemes being implemented by the Ministry and the future course of action thereon was undertaken.

SEDIMENT MANAGEMENT POLICY (SMP)

The issue of sediment management in rivers has wide range of implications for environment, river health, flooding, navigation etc. In India, this issue including its links with siltation and dredging, has been engaging attention of policy makers for quite some time and need for a comprehensive policy formulation has increasing been felt. Although considerable research has been done in India on siltation and sedimentation, considerable new challenges have come up with continued developments and have to be continually addressed through additional research and development. To address the issue of sediment management in Indian rivers, this Ministry has prepared a draft Policy on Sediment Management which has been circulated for comments to all States/ UTs and the concerned Central Ministries / Departments in August, 2017. The comments received so far are being examined.

HYDRO-METEOROLOGICAL DATA DISSEMINATION POLICY

A Committee for Finalization of Protocol for Data Sharing (CFPDS) amongst Central and State Government Organisations, for devising a protocol for data storage, exchange, sharing and dissemination amongst the Central and State agencies apart from linking it with National Water Informatics Centre (NWIC) and India-WRIS was constituted in October, 2015 under the Chairmanship of Joint Secretary (PP) with Joint Secretary (A & GW); CE (P&D), CE(EMO), CWC; Member (SAM), CGWB and Member Secretary (CPCB) as Members. The Committee convened four meetings on 06.11.2015, 02.12.2015, 18.12.2015 and on 12.01.2016 respectively.

Considering the increasing demand by the community, data collected with use of public funds should be made more readily available to all for facilitating rational debate, better decision making and in meeting society's needs; principle 10 of the United Nations Declaration on Environment & Development (1992) and Section 4 (2) of the Right to Information Act, 2005; the Government of India formulated a National Data Sharing and Accessibility Policy (NDSAP, 2012). The objective was to facilitate the access to Government of India owned shareable data and information in both human readable and machine readable forms.

Based on the above factors, Hydro-Meteorological Data Dissemination Policy, 2013 was formulated to deal with the issue of dissemination of hydro-meteorological data collected by CWC and CGWB, classification of Hydro-meteorological Data, Data User categories, custodian of Hydro-meteorological data and procedure for release of classified & unclassified hydro-meteorological data. In pursuance of the Hydro-Meteorological Data Dissemination Policy, 2013, a Classified Data Release Committee has been constituted which considers requests for release of classified data after due verification by the concerned Chief Engineer of CWC and receipt of Secrecy Undertaking. Release of classified data is to be for specific purpose/ study only and non-transferable.

Hydro-meteorological Data Dissemination Policy 2013 is under modification to facilitate sharing of Data amongst Implementing Agencies of National Hydrology Project. A draft Hydro-meteorological Data Dissemination Policy 2017 was prepared and circulated in September, 2017 to all stakeholders for their comments/views. The draft Policy 2017 has been modified on the basis of the comments received from

concerned stakeholders and is under process of approval.

RIVER DEVELOPMENT

The Government of India has taken a number of initiatives for river development/ rejuvenation. Recently, the Policy & Planning Wing under the Ministry of Water Resources, River Development & Ganga Rejuvenation has been renamed as "River Development & Public Policy" and Joint Secretary (Policy & Planning) has been re-designated as Joint Secretary (River Development & Public Policy). The work of development of River Ganga and its tributaries is being undertaken by Ministry of Water Resources, River Development and Ganga Rejuvenation under National Mission for Clean Ganga.

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

3. Major Programmes

Major Programmes

PRADHAN MANTRI KRISHI SINCHAYEE YOJANA (PMKSY)

During 2015-16, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) was launched by the Central Government with an overarching vision to ensure access to some means of protective irrigation for all agricultural farms in the country, and to produce 'per drop more crop', thus bringing much desired rural prosperity. Some of the broad objectives of the approved programme are as under:-

(a). Achieve convergence of investments in irrigation at the field level (preparation of district level and, if required, sub district level water use plans);

(b). Enhance the physical access of water on the farm and expand cultivable area under assured irrigation (Har Khet Ko Pani);

(c). Promote integration of water source, distribution and its efficient use, to make best use of water through appropriate technologies and practices;

(d). Improve on-farm water use efficiency to reduce wastage and increase availability both in duration and extent;

(e). Enhance the adoption of precision-irrigation and other water saving technologies (per drop more crop);

(f). Introduce sustainable water conservation practices;

(g). Ensure the integrated development of rain-fed areas using the watershed approach towards soil and water conservation, regeneration of ground water, arresting run-off, providing livelihood options and other NRM activities;

(h). Promote extension activities relating to water harvesting, water management and crop alignment for farmers and grass-root level field functionaries;

All these objectives are expected to lead to substantial increase in agricultural production and productivity thereby enhancing farm income.

ANTRI KRISHI SINCHAYEE PRADHAN MANTRI KRISHI SINCHAYEE YOJANA (PMKSY) COMPONENTS

The programme has four components i.e. (i) Accelerated Irrigation Benefits Programme (AIBP), [MoWR, RD & GR]; (ii) Har Khet Ko Pani (HKKP), [MoWR, RD & GR]; (iii) Per Drop More Crop, [MoAg& FW]; and (iv) Watershed Development [DoLR].

PHYSICAL TARGETS AND FINANCIAL OUTLAYS

The PMKSY was initially approved during 2015-16 for implementation across the country with an indicative outlay of Rs. 50,000 crore in five years.

Projected physical target and indicative outlay (GoI share)			
Component	Implementing Ministry	Physical Target (in lakh ha)	Financial outlay (in Rs. crore)
		2015-2020	
Accelerated Irrigation Benefits Programme (AIBP)	MoWR,RD&GR	7.50	11060
Har Khet Ko Pani	MoWR,RD&GR	21.00	9050
Per Drop, More Crop	DAC&FW	100.00	16300
Watershed Development	DoLR	11.50	13590
Total			**50000**

PRADHAN MANTRI KRISHI SINCHAYEE YOJANA - ACCELERATED IRRIGATION BENEFITS PROGRAMME (AIBP)

Central Government launched the Accelerated Irrigation Benefits Programme (AIBP) in the year 1996-97 to provide Central Assistance to major/medium irrigation projects in the country, with the objective to accelerate implementation of such projects which were beyond resource capability of the States or were in advanced stage of completion. Priority was given to those projects which were started prior to Fifth and Fifth Plan period and also to those which were benefiting Tribal and Drought Prone Areas. From the year 1999-2000, Central Loan Assistance under AIBP was also extended to Surface Minor Irrigation Projects (SMI) of special category States (N.E. States & Hilly States of Himachal Pradesh, Sikkim, J&K, Uttaranchal and projects benefiting KBK districts of Orissa).

Since its inception, 297 Irrigation / Multi Purpose Projects have been included for funding under AIBP. Out of this 143 projects could be completed and 5 projects were foreclosed. An irrigation potential of **24.39** lakh ha. had been created through these projects. The cumulative Central Loan Assistance / Grant provided to States under AIBP to all of above projects till 31.3.2015 was Rs. 52868.01 crore. Twenty five States got benefited from the programme. During 2015-16, Central Assistance of Rs. 2327.82 crore was released for projects under AIBP.

COMMAND AREA DEVELOPMENT AND WATER MANAGEMENT

The Centrally Sponsored Command Area Development (CAD) Programme was launched in 1974-75 for development of adequate delivery system of irrigation water up to farmers' field with an objective to enhance water use efficiency and production and productivity of crops per unit of land and water for improving socio-economic condition of farmers. The Programme envisages integration of all activities relating to irrigated agriculture in a coordinated manner with multi-disciplinary team under a Command Area Development Authority.

The Programme was restructured and renamed as Command Area Development and Water Management (CAD&WM) Programme w.e.f. 01-04-2004. The Programme is being implemented pari-passu with Accelerated Irrigation Benefits Programme (AIBP) during the XII Five Year Plan. The programme is under implementation as a sub-component of Har Khet Ko Pani (HKKP) component of Pradhan Mantri Krishi Sinchayee Yojna (PMKSY) - from 2015-16 onwards. The ongoing CADWM programme has now been restricted to implementation of CAD works of 99 prioritized AIBP projects during 2016-17 to December, 2019.

The activities covered under CAD

component of a Project are broadly categorized as 'Structural' and 'Non-Structural' interventions. Structural Intervention includes survey, planning, design and execution of: (i) On-Farm Development works (OFD); (ii) Construction of field, intermediate & link drains; (iii) Correction of system deficiencies; and (iv) Reclamation of waterlogged areas. Non-Structural Intervention includes activities directed at strengthening of Participatory Irrigation Management (PIM): (i) One time Functional Grant to the registered Water Users' Associations (WUAs); (ii) One time Infrastructure Grant to the registered WUAs; (iii) Trainings, demonstration, and adaptive trials with respect to water use efficiency, increased productivity, and sustainable irrigation participatory environment.

To promote water use efficiency in irrigation, financial assistance is provided to the States for development of infrastructure for micro-irrigation to facilitate use of sprinkler / drip irrigation as an alternative to construction of field channels. At least 10% CCA of each project is to be covered under micro-irrigation. Micro-irrigation infrastructure includes components of sump, pump, HDPE pipelines, and pertinent devices needed for bringing efficiency in water conveyance and field applications (through sprinklers, rain guns, pivots etc).

In case of micro-irrigation, other components such as land leveling, drainage works etc would be reduced, or entirely discarded; enabling certain cost savings which is expected to offset the higher cost of Micro-irrigation infrastructure. The devices – such as sprinkler/ rain gun/ Drip sets etc. – needed to be installed by individual farmers below farm outlets are not part of the micro-irrigation infrastructure. Farmers are expected to bear the cost of such devices or avail subsidies available in extant scheme of the Ministry of Agriculture.

Monitoring of CAD implementation is now planned to be carried out with the intent of continual improvement in three-tier Monitoring System:

All CAD works are planned, designed, tendered and executed by the State Governments through its pertinent Departments. Central Water Commission (CWC) through its CAD Cells in the Regional Offices of CWC and the Project Monitoring Organization (PMO) at it's headquarter provides the overall monitoring and coordination support. Moreover, for monitoring of PMKSY projects, a Project Monitoring Unit has been created by MoWR, RD & GR involving an Engineering and Management Consultant; and the monitoring visits are also undertaken by the Consultant. The Detailed Project Report (DPR) of the CAD component of prioritized Project prepared by the concerned State Government is submitted to CAD Cell of the pertinent Regional Office of CWC. CWC through its CAD Cell and the PMO appraises the DPR and forwards its recommendations to the CADWM Wing of the Ministry. CADWM Wing of Ministry processes the case for approval of competent level for inclusion of Project under CADWM Programme.

Funds under Pradhan Mantri Krishi Sinchayee Yojna (Har Khet Ko Pani) for the Command Area Development (CAD)

component will be provided to the State Governments as per Cost Sharing Ratios (which will be applied on the Ceiling Costs) indicated below:

Cost sharing for the CAD component

Activities Eligible for Funding	Cost Sharing Ratio
All activities of Structural interventions	50:50 (Centre : State)
All activities of Non-Structural interventions excluding Functional Grant to WUAs	60:40 (Centre : State)
Functional Grant to registered WUAs	45:45:10 (Centre: State: farmer)
Incremental Establishment Cost	50:50 (Centre : State)

For eight North Eastern States and three Himalayan States of Himachal Pradesh, Jammu & Kashmir and Uttarakhand, the cost sharing norms for 'All activities of Non-Structural interventions except Functional Grant to WUAs' will be 75:25 (Centre : State) in lieu of 60:40 norm applicable for other States.

Since the inception of the programme in 1974-75, 219 projects have been completed benefiting a Cultural Command Area (CCA) of about 15 Mha for which CA of about Rs.5028 crore have been given (up to March, 2012). During XII Plan period, a CCA of 7.6 Mha has been targeted with CA amount of Rs 15,000 crore which was subsequently reduced to 3.6 Mha during mid term appraisal. From 2015-16, the programme become HKKP component of PMKSY with a target of 1.5 Mha. Subsequently, from 2016-17 onwards, the role of programme has been restricted to 99 prioritised AIBP projects. The physical and financial achievement of the project during XI and XII Plan period are summarised below:

Physical and financial achievement of the PMKSY (HKKP) during XI & XII Plan

Plan	Physical (in Million hectare)		Financial (Central Assistance) (Rs in crore)	
	Target	Actual	Target	Actual
XI Plan	1.32	1.686	1833	1680.12
XII Plan				
(up to 2015-16)	7.6	1.419*	15000	1887.87
(from 2016-17 onwards)	7.2	0.480*		
(till March 2017)	14525	1816.77^		

**The achievement is as per Central Assistance released; ^Sanctioned for release till March, 2018*

The core components of physical works under CAD&WM relates to construction of field channels. Since its inception in 1974-75 up to March 2017, CCA of about 22.3 Mha has been covered. Central Assistance of about Rs.7950 crore has been released to States under the CAD Programme since its inception in 1974-75 up to March, 2017. During 2017-18, Central Assistance (CA) of Rs. 933.10 crore has been provided to various projects under PMKSY (CAD & WM).

PARTICIPATORY IRRIGATION MANAGEMENT (PIM)

National Water Policy emphasizes participatory approach in water resources management. It has been recognized that participation of beneficiaries will help greatly in the optimal upkeep of irrigation system and effective utilization of irrigation water. The participation of farmers in the management of irrigation would include transfer responsibility for operation & maintenance

and also collection of water charges to the Water Users' Association in their respective jurisdiction with effect from 2008-09. One time functional grant @Rs.1200/- per hectare to be shared by the Centre, State and Farmers in the ratio of 45:45:10 respectively are being paid to outlet level Water Users Associations' as incentive, the interest from which is to be used for maintenance. Apart from this, an amount of Rs. 3.00 lakh (60% - Central: 40% - State) is being provided to each WUA as one time infrastructure Grant. Overall 16 States viz. Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Nagaland, Odisha, Rajasthan, Sikkim, Tamil Nadu and Uttar Pradesh have either enacted exclusive legislation or amended their Irrigation Acts for involvement of farmers in irrigation management. Other States are also taking steps in this direction. So far 2015-16, 84,779 Water Users' Associations have been formed in various States covering an area of 17.84 million hectare under various commands of irrigation projects.

Since CADWM work is being implemented in 99 prioritized AIBP projects only under PMKSY (HKKP). As per information received, about 1232 WUAs have been formed during 2016-17 in State of Assam, Gujarat, J&K, Karnataka, Madhya Pradesh, Maharashtra, Odisha & Punjab and 1370 number WUAs during 2017-18 in State of Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Maharashtra, Manipur, Odisha, Punjab and Rajasthan. However, updated information on WUAs formation is awaited from other States.

Under the restructured "Command Area Development & Water Management" Programme, more emphasis is being given to participatory approach. Under this Programme, payment of Central Assistance to State is linked with the formation of WUAs.

SURFACE MINOR IRRIGATION (SMI) SCHEME

Since XII Plan onwards, 4857 SMI schemes have been taken up under the programme out of which 2466 schemes have been reported to be completed. Central Assistance amounting to Rs.5743.18 crore has been released for completion of these schemes out of which an amount of Rs. 665.35 crore was released during 2017-18.

REPAIR RENOVATION & RESTOTATION (RRR) OF WARER BODIES

Under the scheme, a total of 1877 water bodies have been taken up for restoration since XII Plan onwards, out of which 565 water bodies have been reported to be completed. Central Assistance amounting to Rs.344.315 crore has been released to the States for completion of works of these water bodies, out of which an amount of Rs. 79.648 crore was released during 2017-18.

PRADHAN MANTRI KRISHI SINCHAYEE YOJANA (PMKSY)- ESTABLISHMENT OF MISSION FOR COMPLETION OF PRIORITIZED IRRIGATION PROJECTS AND FUNDING ARRANGEMENTS

PRIORITIZATION OF PROJECTS DURING 2016-17

One of the major reasons for the projects to remain incomplete was inadequate provision of Central and State share funds. As a result, large amount of funds spent on these projects were locked up and the benefits envisaged at the time of formulation of the projects could not be achieved. This was a cause for concern and initiative was required at the national level to remedy the situation.

In view of the above, a Committee headed by Minister (Water Resources) of Chhattisgarh was constituted during 2016-17. The issues related to implementation of projects under PMKSY including prioritization of projects were deliberated in the Committee. As per the information supplied by concerned States to the Committee, 99 projects have been

identified by the Committee for completion by 2019.

In July, 2016, the proposal to complete 99 prioritized projects under AIBP including their CADWM works; by December, 2019 was approved by the Government. Total requirement of funds for completion of identified 99 projects is estimated at Rs. 77,595 crore (Rs. 48,546 crore for project works and Rs. 29,049 crore for CAD&WM works) with Central Assistance (CA) of Rs. 31,342 crore. Utilisation of 76.03 lakh ha. of potential is expected with the completion of these projects.

INNOVATION/INITIATIVES UNDER THE SCHEME

- The arrangement of funds for Central share/Assistance (CA) has been made through NABARD as per year-wise requirements which would be paid back in 15 years' time keeping a grace period of 3 years. Further, the State Governments, if required, may also borrow funds from NABARD for the State Share.
- In respect of State share, the Government has allowed NABARD to raise zero cost bonds, the interest of which shall be borne by the Central Government so that overall interest rate for State share comes to about 6% so as to make it attractive for the States and encourage them to raise requisite State share for early completion of projects.
- The progress of the projects in physical as well as financial terms is monitored through the field units of Central Water Commission. Further, One nodal officer for each of the 99 priority projects has been identified who would be updating the physical and financial progress of the project regularly in the MIS developed for this purpose.
- Monitoring through MIS system and third party is being carried out.
- Maximize use of pressurized pipe irrigation and micro irrigation wherever feasible would be adopted to increase efficiency. In Odisha & Maharashtra, land acquisition of 2970 ha. & 2060 ha. respectively has been avoided in distribution system by adopting underground Piped Distribution (PDN) and appx. cost saving is Rs. 1050 crore. Other States are also sensitised for adopting the same approach.
- *Pari-passu* implementation of Command area development works in the commands of these projects is envisaged to ensure that the Irrigation Potential Created could be utilized by the farmers. New Guidelines bringing focus on Participatory Irrigation Management (PIM) have been brought out. Further, transfer of control and management of irrigation system to the Water Users' Association (WUA) has been made necessary condition for the acceptance of CADWM completion.

COMPLETION OF PROJECTS

AIBP works of 18 prioritized projects in States of Andhra Pradesh, Chhattisgarh, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab and Telangana are completed/ almost completed. CAD works are at various stages of implementation. The cropped area in the command area of the completed works of the 99 projects was assessed through remote sensing as 32.5 L. Ha. during 2016.

During 2017-18, another 28 projects in the States of Andhra Pradesh, Assam, J&K, M.P., Maharashtra, Odisha, Rajasthan, Telangana and UP are likely to be completed as per information given by the States.

RELEASE OF FUNDS DURING 2016-17& 2017-18

Sr. No.	Item	Funds Released (Rs. in crore)	
		2016-17	2017-18
1	Accelerated Irrigation Benefits Programme (AIBP)	3308	3593.6
2	Command area Development (CAD)	854	933.1
3	Polavaram Project	2514	2000.0
4	State Share from LTIF	3334	4825.7
	Total	**10010**	**11352.4**

Further details about 99 Priority projects are given at Annexure-VII, VIII, IX & X.

MONITORING AND REVIEW OF THE PROGRESS OF PROJECTS UNDER PMKSY-AIBP (INCLUDING CADWM)

The progress of the projects is being reviewed extensively at the level of Secretary (WR, RD & GR), Hon'ble Minister (WR, RD & GR), PMKSY Council under Chairmanship of CEO, NITI Aayog and Principal Secretary to Hon'ble Prime Minister. Hon'ble Prime Minister also reviewed the progress of the works.

NATIONAL PROJECTS

The Union Cabinet in its meeting held on 7th February, 2008 gave its consent to the proposal of the Ministry of Water Resources for implementation of National Projects with Central Assistance of 90% of the cost of the project as grant falling in the following selection criteria:

- International project where usage of water in India is required by a treaty or where planning and early completion of the project is necessary in the interest of the country.
- Inter-State projects which are dragging on due to non-resolution in inter-state issues relating to sharing of costs, rehabilitation, aspects of power production, etc., including river inter-linking projects.
- Intra-State projects with additional potential of more than 2 lakh hectare and with no dispute regarding sharing of water and where hydrology is established.
- As per the modification in the guidelines of National Projects in September, 2012, Extension, Renovation and Modernization (ERM) projects, envisaging restoration of lost irrigation potential of 2.0 lakh hectare or more would now be eligible for inclusion as a National Project with certain conditions.

Sixteen Projects have been declared as national projects so far. These projects are taken up for execution after the concerned States obtain techno economic clearance, other statutory clearances and investment clearance. Out of these, five projects, namely Polavaram project of Andhra Pradesh, Saryu Nahar Pariyojana of Uttar Pradesh, Gosikhurd Irrigation Project of Maharashtra, Teesta Barrage Project of West Bengal and Shahpur Kandi Dam Project of Punjab have been taken up for execution. Gosikhurd and Saryu Nahar Pariyojna are included under 99 prioritized projects. Polavaram Project is also being funded under LTIF.

The progress of Teesta project has been affected due to land acquisition issue. The State Government has constituted a High Level Task Force to suggest appropriate cause of action for execution of balance works.

The works of Shahpur Kandi dam project was stopped in 2014 due to inter state issues between Punjab and Jammu & Kashmir. An agreement has been signed by Secretaries of Irrigation Department of both the States in this regard. Implementation of the projects is dependent upon ratification of agreement and

approval of revised cost estimates.

POLAVARAM MULTIPURPOSE PROJECT

(i) Project:

Polavaram Irrigation Project also known as Indira Sagar (Polavaram) Project is a multi-purpose project on the river Godavari in Andhra Pradesh. It shall provide irrigation to 7.2 lakh acres (2.91 lakh ha.) of Culturable Command Area (CCA) in East Godavari, Visakhapatnam, West Godavari and Krishna districts, help divert 80 TMC ft of Godavari waters for utilization in Krishna basin, 23.44 TMC of water supply to industries in Visakhapatnam, domestic water supply to 28.50 lakh population in 540 villages, generation of 960 MW power, etc.

(ii) Status as National Project:

The Polavaram Irrigation Project was declared a National Project on 1st March, 2014 vide section 90 of AP Reorganization Act, 2014. Central Government has created Polavaram Project Authority (PPA) with Governing Body to execute the Project and obtain all requisite clearances including environmental, forests and rehabilitation and settlement norms and all court cases. The Govt. of India will provide 100% of the remaining cost of the irrigation component only of the project for the period starting from 01.04.2014 to the extent of the cost of the irrigation component on that date.

(iii) Financial Progress:

Before declaration as a National Project, an expenditure of Rs. 5135.87 crore has been incurred up to 31.03.2014 including Central Assistance of Rs. 562.469 crore provided under AIBP. The CA released to Polavaram Project Authority from FY 2014-15 onwards is as under:

Financial Year	CA released to Polavaram Project Authority (Rs. crore)
2014-15	250.00
2015-16	600.00
2016-17	2514.16
2017-18	2000.00
Total	**5364.16**

(iv) Efforts made for completion of Project:

Dam Design Review Panel (DDRP) under the Chairmanship of Shri A.B. Pandya (former Chairman, CWC) have been constituted in June 2016 for technically sound and timely execution of the project. DDRP monitors the execution of the project related works and suggest measures for timely execution, quality control aspects and measures to maintain the time lines for the completion of the project. So far nine meetings of DDRP have been held.

A Joint Committee of MoWR, RD&GR and Water Resources Departments, Government of Andhra Pradesh, Chhattisgarh and Odisha has been constituted to resolve the inter state issues including Polavaram Project. One meeting of the Committee has been held and information sought by Government of Odisha and Chhattisgarh has been sent to them.

An Expert Committee has been constituted under the Chairmanship of Member (WP&P), CWC along with various Chief Engineers of CWC and officials from CSMRS, Polavaram Project Authority, Water Resources Department, Government of Andhra Pradesh and Experts as special invitees. The Objective of the Committee is to overview the implementation of Polavaram Project. The Committee has made three visits to the project site and had three meetings on 19th – 22nd April, 2017, 22nd – 24th October, 2017 and 15th -17th March, 2018.

As per GoAP, WRD G.O.Ms.No.18 dated 20.03.2017, GoAP authorised Member Secretary to enter into a MoU with Central Soil & Material Research Station (CSMRS),

New Delhi for Quality Audit and related works for a period of 2 (two) years initially. Quality Audit has been done by CSMRS, New Delhi during the period 19th -23rd July, 2017 and CSMRS has submitted its report. As per G.O/MoU, CSMRS has taken over the charge as Quality consultant for Quality Audit and related works of Polavaram Irrigation Project from 06.02.2018 up to a period of two years or till the completion of the Project.

A Monitoring Committee has been constituted by MoWR RD & GR, New Delhi on 12.09.2017 in order to strengthen the monitoring mechanism for Land Acquisition and Rehabilitation and Resettlement (R&R) process for Polavaram Project, Andhra Pradesh. The Chairperson of Monitoring Committee for Rehabilitation and Resettlement & Secretary, Ministry of Tribal Affairs, GoI Ms. Leena Nair and Member of the Committee & Secretary, Department of Social Justice & Empowerment, GoI Ms. G. Latha Krishna Rao along with other Members of Committee visited the Polavaram Irrigation Project from 20th to 22nd November, 2017.

Approval from Ministry of Finance have been obtained for NABARD funding to the project during 2016-17 keeping in view of limited budgetary resources.

FLOOD MANAGEMENT PROGRAMME (FMP)

The Flood Management Wing deals with matters concerning flood management, technical matters related to Ganga Flood Control Commission, Farakka Barrage Project and Upper Yamuna River Board. It has also been entrusted with International aspects of cooperation and development of Water Resources with Nepal and Bangladesh, including implementation of the Ganga Water Sharing Treaty (1996) with Bangladesh and Mahakali Treaty (1996) with Nepal. The wing also deals with the technical matters of Pancheswar Multi Purpose Project including matters of Pancheswar Development Authority (PDA). Steering the completion of balance works of North Koel Reservoir Project, Bihar and Jharkhand has also been entrusted to this wing.

FLOOD MANAGEMENT PROGRAMME

During XI Plan, Government of India launched "Flood Management Programme" for providing Central assistance to the State Governments for undertaking the works related to river management, flood control, anti-erosion, drainage development, flood proofing, restoration of damaged flood management works and anti-sea erosion works. Under this Programme, a total of 522 works were approved during XI & XII Plan, out of which 298 works have been physically completed and the Central assistance of Rs. 5023.07 crore has been released since XI Plan. The completed works have provided reasonable protection to 34.663 lakh ha area and 265.793 lakh population benefitted. The details of works approved, funds released so far and area protected are given in Annexure-XI & XII respectively.

A new scheme "Flood Management and Border Areas Programme (FMBAP)" has been proposed with merged components from the existing Flood Management Programme (FMP) and River Management Activities & Works related to Border Areas (RMBA) schemes. The approval of scheme is under progress for FY: 2017-18 to FY: 2019-20.

RIVER MANAGEMENT ACTIVITIES AND WORKS RELATED TO BORDER AREAS

The above Central sector scheme has been approved in December 2014 for Rs. 740 crore to cover the following works/ schemes during XII Plan. The scheme has following components:

(i) Hydrological observations and flood forecasting on common border rivers with neighboring countries:

(a) Flood forecasting on rivers common to India and Nepal:

Flood Forecasting on rivers common to India & Nepal has been in operation with currently 46 meteorological / hydro-meteorological sites in the Nepalese territory.

(b) Hydrological Observations on rivers originating in Bhutan:

A comprehensive scheme for establishment of Hydro-Meteorological and Flood Forecasting Network on rivers common to India and Bhutan is also in operation for transmission of real time data to control rooms in India. The cost of operation and maintenance of these sites in Bhutan is borne by India. Officers from both the sides meet twice a year alternatively in India and Bhutan to oversee its implementation.

(c) Joint observations on rivers common to India and Bangladesh and cooperation with neighbouring countries:

During lean season (January to May), the Ganga/ Ganges waters is being shared at Farakka with Bangladesh, as per the provisions of the Treaty signed between the two countries in 1996. The hydrological observations are being conducted jointly at Farakka (India) and Hardinge Bridge (Bangladesh) every year during the lean season.

Further, during every monsoon, hydrological data of three stations (Nugesha, Yangqen and Nuxia) on Brahmaputra and one station (Tsada) on Sutlej is provided by China to India as per existing MoUs and cost of maintenance of these stations is borne by India. The information provided by China is utilized by India in flood forecasting and advance warning.

(ii) Investigations of Water Resources projects in neighboring countries:

(a) Pancheshwar Multipurpose Project:

Pancheshwar Multipurpose Project is proposed along the India-Nepal border as per the provisions of the Mahakali Treaty signed in 1996 between India and Nepal for integrated development of river Mahakali (Sarada in India).

The Pancheshwar Development Authority (PDA) has already been set up jointly by the two Governments, and is functional since September 2014. Further, draft final DPR is ready, which has been examined by various agencies in India and Nepal. The issues raised by both the sides on the said DPR are being discussed jointly by the Team of Experts/ Officials (ToE) constituted by both the sides towards finalization of DPR.

(b) Surveys & Investigation of Sapta Kosi High Dam and Sun Kosi Storage cum Diversion Scheme:

As per the bilateral Agreement, the Joint Project Office-Sapta Kosi & Sun Kosi Investigation (JPO-SKSKI) is carrying out field investigations for Sapta Kosi High Dam and Sun Kosi Storage-cum-Diversion Scheme for preparation of a comprehensive DPR.

(iii). Grant-in-Aid to States/ UTs for flood management/ anti –sea erosion:

The scheme provides for 100% grant to select boarder States and UTs for river management works.

(iv). Pre-construction activities of Pancheshwar, PDA etc:

A provision for undertaking preconstruction activities by PDA has been kept under the scheme. The activities of collection of hydrological data, seismological observations, R&M of wireless stations, R&M of transit camps, EIA studies, installation and data processing for MEQs/ SMA, modernisation of snow gauge sites, and meetings of JGE/ JTG etc. are proposed.

FARAKKA BARRAGE PROJECT

The Farakka Barrage Project (FBP) was commissioned in 1975 for preservation & maintenance of the Kolkata Port and for increasing the navigational depth of the Bhagirathi – Hooghly waterway. The Farakka Barrage Project comprises of a 2245 m. long barrage across river Ganga at Farakka in

Murshidabad District of West Bengal, a canal head regulator at Farakka for diverting water to Feeder Canal, a 38.38 km long Feeder Canal and Jangipur Barrage, besides the road-cum-rail bridge across Ganga at Farakka, Navigation Locks at Farakka, Jangipur and Kalindri (Nurpur/ Malda), a road-cum-rail bridge across the Feeder Canal, Townships at Farakka, Ahiron and Khejuriaghat having 4000 dwelling units. Its appurtenant structures include flood embankments, marginal bunds, afflux/guide bunds, etc.

Farakka Barrage Project (FBP) at Farakka (Murshidabad)

Canal Head Regulator on Ganga at Farakka to divert water into Feeder Canal of FBP

FBP authority has been assigned following major responsibilities:

- Operation & Maintenance of Main Barrage:

  (a) 112 gates (in 109 bays) on main Barrage
  (b) 11 gates on Head-Regulator
  (c) 15 gates of Jangipur Barrage
  (d) Navigational lock Gate
  (e) Protective measures of apron and river bed in u/s and d/s of Barrage.

- Maintenance and protective measures of Feeder Canal (38.38 Km. in length), structures across Feeder Canal, Culverts, Inlets, Ferry Services, Inspection Roads (both banks), Syphon, Buildings etc.
- Maintenance & protective anti-erosion works in the original jurisdiction (12.5

km upstream and 6.9 km downstream of Barrage); alongwith its allied structures like marginal bund, afflux bund, inspection road, regulator, navigation locks, culverts, guide bund etc. for the safety of Barrage.

- Maintenance of Farakka Township, Khejuriaghat Township, Jangipur Barrage colony, colony at Kalindri lock including maintenance of all civil, mechanical and electrical structures.
- Operation & Maintenance of all equipments, vehicles, machineries etc.

Since the Gates of FBP have outlived their economic life and serviceability, phase wise replacement of all the gates of main barrage and Head Regulator, remote control system, etc. have been under taken by FBP. So far 42 gates of the Farakka Barrage have been replaced with new gates and the work of replacement of remaining gates has been taken up in phased manner.

Further, with the successful accomplishment of time specific anti-erosion and bank protection works in critical reaches on river Ganga, FBP authority has been able to ensure the safety of Farakka Barrage besides providing reasonable protection from floods to lives and livelihood of local people in the region. Apart from above, Farakka Barrage Project is facilitating implementation of India-Bangladesh Ganga Water Treaty -1996 on sharing of Ganga water between India and Bangladesh.

Achievement of works on Farakka Barrage Project during the financial year 2017-18 is listed below:

- Farakka Barrage Project has completed the anti - erosion works at 9th marginal embankment on left bank of river Ganga from Ch.1500.00 m. to Ch. 1876.00 m. (working length 430 m).
- Bank Protection measures for restoration at 9th marginal embankment (U/S of Farakka Barrage) of Left Bank or river Ganga from Ch. 1770.00 m. to Ch.1960.00 m., from Ch. 2020.00 m. to Ch.2177.00 m. (working length 301 m).
- Anti - erosion measures for restoration of bank slope and damaged portion of 9th marginal embankment on Left Bank of river Ganga in between Ch.2630.00 m to Ch. 3010.00 m. (working length 380 m).
- The work order for replacement of 35 gates was issued and works is in progress.
- The work of Construction of walk-way Bridge over piers of Farakka Barrage is near to be completed.
- Special repair of left bank inspection road of Feeder Canal including repair/ reconstruction of side and cross drainage systems from RD 9.00 to RD 30.00., from RD 90.00 to RD 110.00 (likely to be completed), from RD 110.00 to RD 124.00.
- Filling of scour pockets by sand filled HDPE bags in nylon crates and an armoured layer of crated boulders in Feeder Canal from RD 60.50 to RD 61.842 (Left Bank), from RD.100.20 to RD 100.85.
- Special protection work in the deep scoured bed of Feeder Canal by sand filled HDPE bags filled in nylon crates along with armored layer of crated boulders in Feeder Canal in between RD 26.90 to RD 27.23.
- Protection measures (by porcupine) on right bank of river Ganga/ padma in the downstream of Farakka Barrage at Boltala near village Mithipur and Bahura from Ch.4300 m to Ch. 4905 m = 605 m and Ch. 7100 m to Ch.7300 m = 200 m (working length 850 m).

UPPER YAMUNA RIVER BOARD

"Upper Yamuna" refers to the reach of Yamuna from its origin at yamunotri to

Okhla Barrage at Delhi. A Memorandum of Understanding (MOU) was signed on 12th May, 1994 amongst the basin States of Himachal Pradesh, Uttar Pradesh, Haryana, Rajasthan and National capital Territory of Delhi, for sharing the utilizable surface flows of river Yamuna up to Okhla. The MoU also provided for creation of "Upper Yamuna River Board" to implement the said agreement.

Accordingly, the Central Government constituted the Upper yamuna River Board in1995 as a subordinate office under the Ministry of Water Resources. After creation of Uttaranchal State in 2000, the resolution was modified to include Uttaranchal (now Uttrakhand) also in the Board. The resolution also provided for constitution of a Review Committee, to be known as the Upper Yamuna Review Committee (UYRC), comprising the Chief Ministers (Governor in case of President's rule) of the co-basin States as Members and Hon'ble Minister, MoWR, RD & GR, Govt. of India as Chairman, to supervise the working of the Upper Yamuna River Board (UYRB). The Board comprises of Member (Wp&p), Central Water Commission as the part time Chairman; one representative from each of the six basin States, Central Electricity Authority, Central Ground Water Board and Central pollution Control Board as its part-time Members and a full time Member Secretary. The expenditure on the Board is shared equally by the six basin States. The Board has sanctioned staff strength of 58.

The main function of Upper Yamuna River Board is to regulate the allocation of available flows amongst the beneficiary States and also monitoring the return flows; monitoring conserving and upgrading the quality of surface and ground water; maintaining hydro-meteorological data for the basin; over viewing plans for watershed management; monitoring and reviewing the progress of all projects upto and including Okhla barrage. The Board has been making tentative seasonal distribution of water to basin States at various distribution points. In continuation to above, Board has started the process of installation of telemetry system to observe discharge at 11 locations in the basin to ensure real-time dissemination of flow data amongst participating States. The above work was awarded to M/s Sutron Hydromet Systems Pvt. Ltd., New Delhi on 17.10.2017. Government of India has included the three proposed storage projects in the upper reaches of Yamuna and its tributaries known as Renukaji Dam, Kishau Dam and Lakhwar-Vyasi Projects as National Projects for which 90% of the cost of irrigation and drinking water supply component of the project shall be provided by the Government of India.

UYRB has continuously been engaged itself in resolving the inter- State issues amongst the basin States and signing of Agreements related to water distribution and related benefits and cost sharing from the proposed above three projects in Upper Yamuna Basin. In the 51st meeting of UYRB & 7th meeting of UYRC, various decisions were taken. The Board has continuously been engaged itself in resolving the issue in respect of division of water between UP & Uttarakhand. In continuation to it, a meeting of E-in-Cs of Irrigation Department, UP & Uttarakhand was held on 15.01.2018 under the Chairmanship of Chairman, UYRB in which the principle of division of Yamuna water between both the States has been decided.

UYRB has been working to resolve actively on various issues amongst the Basin States of Upper Yamuna reaches viz. Share of Yamuna Water to Rajasthan at Ex-Tajewala, Short supply of Yamuna water to Rajasthan from Okhla headwork, Interceptor Sewer Scheme for Yamuna River, Schemes for Gurgaon Feeder Canal and Agra Canal, Pollution of Yamuna raw water at Wazirabad, Division of Utilizable Water Resources of Yamuna River between Uttar Pradesh and Uttarakhand etc. In the 7th meeting of UYRC, concrete decisions were taken in order to resolve the above issues.

Board has organized 51 meetings and 7

meetings of the UYRC since its constitution to till date. In the year 2017-18, 51st meeting of UYRB was held on 14.09.2017 at Sewa Bhawan, New Delhi under the Chairmanship of Chairman, UYRB & Member(WP & P), CWC and 7th meeting of UYRC was held on 15.02.2018 at Vigyan Bhawan, New Delhi under the Chairmanship of Hon'ble Minister(WR, RD& GR), Govt. of India in which various important decisions were taken.

DEVELOPMENT OF WATER RESOURCES INFORMATION SYSTEM (DWRIS)

The scheme "Development of Water Resources Information System" is under implementation for creation of reliable and sound database for planning and policy formulation for Water Resources Projects, timely dissemination of flood forecast, etc. The scheme comprises of five main components namely:

1. Hydrological Observations including Flood Forecasting, Snow Hydrology, Water Quality and Monitoring of Glacial Lakes which has following main activities:-
   i. Running & Maintenance of Hydrological Stations continued during XII Plan (878 stations);
   ii. Running & Maintenance of Hydrological Stations (720 stations) opened during XII Plan Period;
   iii. Running and maintenance of Water Quality Laboratories for monitoring of water quality at existing stations;
   iv. Collection of storage data on the 66 major reservoirs;
   v. Coastal Management Information System (CMIS);
   vi. Flood Forecasting; and
   vii. Integrated Reservoir Operation.
2. Pilot Census of Major and Medium Irrigation Project
3. Strengthening of Monitoring Unit in CWC
4. Data bank and Information System:
   i. Reassessment of water availability in the country;
   ii. Up-gradation and modernization of Library Information Bureau; and
   iii. Software management in CWC
5. Integrated Water Resources Management Studies in 14 river basins

The DWRIS scheme was initiated during the XII Five Year Plan with an estimated cost of Rs. 1370 crore. It was decided to continue the scheme and the EFC in its meeting held on 28.11.2017 recommended the continuation of DWRIS scheme beyond the XII Five Year Plan for three years from 2017-18 to 2019-20, co-terminus with 14th Finance Commission period at an estimated cost of Rs. 682.42 crore.

RATIONALISATION OF MINOR IRRIGATION STATISTICS (RMIS) SCHEME

The scheme "Rationalization of Minor Irrigation Statistics (RMIS)" was launched in 1987-88 in the Ministry of Water Resources, RD&GR with 100% assistance to the States/UTs. During 11th Five Year Plan, the RMIS scheme was converted as one of the components of the Central Sector Scheme - Development of Water Resources Information System (DWRIS) of the Ministry of Water Resources, River Development & Ganga Rejuvenation. The main objective of the RMIS scheme is to build up a comprehensive and reliable database in the Minor Irrigation (MI) sector for effective planning and policy making. During 2017-18, the scheme was made as part of the Centrally Sponsored Scheme, "Pradhan Mantri Krishi Sinchai Yojana and other schemes" as a standalone component and named "Irrigation Census".

Under "Irrigation Census" scheme, each State/UT has identified a Nodal Department for compilation of minor irrigation statistics for the entire State/UT. A Statistical Cell consisting of requisite number of officers/ staff (6 for large State and 3 for small State) has been set up in the nodal department for taking up the Statistical work relating to the MI sector. These cells are responsible for collection, compilation and reporting of data on development of minor irrigation relating to their State/UT on a regular basis. For this purpose, they coordinate with Departments of Rural Development, Agriculture and Irrigation etc. at the State level. These cells are also responsible for conducting census of MI schemes on quinquennial basis with the help of staff of State/UT Governments posted at district/block/village levels.

Data base on Minor Irrigation schemes plays an important role in policy formation for water resources available in India. MI Censuses are a rich source of information on India's ground water sector. In the MI census, detailed information on irrigation sources, namely, Dug Well, Shallow Tube well, Medium Tube well, Deep Tube well, Surface Flow and Surface Lift schemes alongwith the irrigation potential created (IPC) and irrigation potential utilized (IPU) is collected and compiled on systematic basis throughout the country. Besides this, information on their ownership, the social class and holding size of the owner, number of electrical/diesel devices used for lifting water is also collected. Information in respect of adoption of water and energy conserving devices such as sprinkler and drip irrigation, use of non-conventional energy sources such as solar pumps, wind mills is also collected in the MI Census. The National Informatics Centre in the MoWR, RD&GR is associated in development of software, processing of data and generation of tables. Detailed data base on Minor Irrigation works in the country has been created through five censuses carried out under the scheme so far with reference years 1986-87, 1993-94, 2000-01, 2006-07 & 2013-14 respectively.

The 5th Minor Irrigation Census with reference year 2013-14 has been completed in 33 States/UTs. Online Data Entry, Validation and tabulation work was done for processing of data for the first time in the 5th MI Census. The Report of 5th MI Census has been placed on the website of the Ministry (www.mowr.gov.in).

Standing Finance Committee (SFC) has approved the scheme "Irrigation Census" for implementation with a total outlay of Rs. 257.78 crores during 2017-18 to 2019-20. Ministry has decided to widen the scope of " Irrigation Census" to include Census of Water Bodies along with 6th MI Census. Preparatory work for the 6th Minor Irrigation Census and Census of Water Bodies under "Irrigation Census" Scheme has already been initiated. An expenditure of Rs. 11.45 Crore has been incurred up to 31st December, 2017 against the total Budget Estimate (BE) of Rs. 29.55 Crore during the Financial Year 2017-18.

FLOOD FORECASTING

CWC has been making continuous endeavour for modernization and expansion of its flood forecasting network in order to have desired automatic system of data collection and real time data transmission. So far, 510 data collection stations have been modernized, three Earth receiving Stations have been set up at New Delhi, Jaipur and Burla, 21 Modeling Centers have been equipped with latest computer systems for analysis of data, flood forecast formulation and its dissemination to concerned agencies expeditiously. For activities of flood forecasting, modernization and expansion in XII Plan, another 458 stations alongwith 5 more modelling centres are being modernized with automatic data acquisition system with Satellite based telemetry system in various basins in the country. Tenders have been awarded for the work in April, 2017 and around 180 stations have been installed and the remaining is in advanced stage of

installation and is likely to be completed during monsoon 2018.

CWC is providing Flood Forecasting service at 226 stations, of which 166 are level forecasting stations on major rivers and 60 are inflow forecasting stations on major dams/ barrages. Out of this, Flood forecasting service at 27 stations have been started during 2017. It covers 19 major river systems in the country and 20 States viz., Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Telangana, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh & West Bengal and Union Territory viz., Dadra & Nagar Haveli and National Capital Territory of Delhi.

During the flood season, CWC operates Flood Control Room on 24X7 basis at Headquarter in New Delhi and 24 Division Offices spread throughout the country for monitoring the flood situation. On an average, about 6000 forecasts are being issued during flood season every year by the Central Water Commission. Normally, these forecasts are issued 6 to 48 hours in advance, depending upon the river terrain, the locations of the flood forecasting sites and base stations. In addition to conventional flood forecasting methodology, mathematical model forecasting based on rainfall-runoff methodology is also being used in some areas. This has enabled CWC to issue 3-day advance flood advisory.

During the flood season 2017, 6297 flood forecasts (5085 level forecast and 1212 inflow forecasts) were issued. Out of which 5901 (93.71%) forecasts were found within accuracy limit (± 0.15 m for level forecast and ± 20% for inflow forecast). Since 2014, CWC is using web-based software "e-SWIS" for entry of hydrological data on hourly basis, analysis of data and dissemination of flood forecasts is being entered by all divisions of CWC in since monsoon to monitor the current status of the river.

The CWC Flood Control Room at New Delhi keeps a close watch of flood situation likely to arise in the country on the basis of rainfall forecasts issued by the India Meteorological Department. Necessary analysis are carried out on the receipt of warning of heavy to very heavy rainfall with isolated extremely heavy rainfall received from IMD and suitable advisory are issued to appropriate authority for taking flood preparedness exercise.

FLOOD FORECASTING ACTIVITY OF CENTRAL WATER COMMISSION DURING 2017

Central Water Commission (CWC) through its field divisions collects hydrological and hydro meteorological data on real time basis during the flood season every year. Using these data flood/inflow forecasts are formulated for 226 locations and disseminated to various user agencies through Fax/e-mail/ SMS and Website. In addition to the data collected from the network of CWC stations, the meteorological data and Quantitative Precipitation Forecast (QPF) received from India Meteorological Department are also utilized in formulation of flood forecast.

PRE-MONSOON FLOOD FORECASTING ACTIVITY

The flood forecasting activity began from 3rd April, 2017. During the year 2017, due to continuous rain in Jhelum basin, River Jhelum crossed warning level from 5th April, 2017 and flowed in moderate flood situation for two days on 6th and 7th and fell below warning level on 8th April, 2017. The river Dhansiri (S) at Numaligarh, Kopili at Kampur, Barak at Badarpurghat, Kushiyara at Karimganj flowed above warning level from 3rd April to 8th April. River Brahmaputra at Dibrugarh and Neamatighat and River Jia-Bharali at N T Road Crossing flowed in low flood situation from 27th to 30th April, 2017.

REGULAR FLOOD FORECASTING ACTIVITY FROM 1ST MAY, 2017

Regular Flood Forecasting Activity commenced on 1st May, 2017 in Brahmaputra and Barak basins. During the period from 1st May to 17th September, 2017, rivers Raidak-I, Mundeswari (Damodar) in West Bengal, Kosi, Mahananda and Gandak in Bihar, Rapti in UP flowed in Unprecedented Flood Situation in various Flood Forecasting Stations. Rivers Katakhal, Kushiyara, Jia- Bharali, Brahmaputra, Dikhow, Beki, Gaurang, Sankosh (all in Assam), Torsa, Tista (in West Bengal), Bagmati, Kamlabalan and Ghaghra (all in Bihar), Ghagra, and Ganga (all in UP) flowed in High Flood Situation in various flood forecasting stations.

In CWC flood monitoring stations Rivers Lohit in Arunachal Pradesh, Sankosh in West Bengal, Sabarmati in Gujarat, Bagmati and Mahananda in Bihar, Rohin in UP, Arkavathy in Karnataka also flowed in Unprecedented Flood Situation. Similarly, Rivers Aie, Brahmaputra, Champamati in Assam, Kosi in Bihar, Sharda in UP, Brahmani-Baitarni in Odisha, Banas in Gujarat, and Moyar in Tamilnadu flowed in High Flood Situation during the period 1st May to 31st December, 2017. The summary of Flood Situation is given below:

8 Stations That Witnessed Unprecedented Flood Situation and 22 Stations that Witnessed High Flood Situation.

Sl. No.	State	District	River	Station	Period	
					From	To
Unprecedented Food Situation						
1.	West Bengal	Hooghly	Mundeswari	Harinkhola	28/07/2017 0300 hrs	28/07/2017 0900 hrs
2.		Coochbehar	Raidak-I	Tufanganj	12/08/2017 1500 hrs	13/08/2017 1800 hrs
3.	Bihar	Supaul	Kosi	Basua	13/08/2017 0500 hrs	13/08/2017 2000 hrs
4.		Purnia	Mahananda	Dhengraghat	14/08/2017 0300 hrs	14/08/2017 1300 hrs
5.		Katihar		Jhawa	14/08/2017 0300 hrs	14/08/2017 2000 hrs
6.		Gopalganj	Gandak	Dumariaghat	15/08/2017 0400 hrs	15/08/2017 2200 hrs
					16/08/2017 0900 hrs	18/08/2017 2100 hrs
7.	Uttar Pradesh	Balrampur	Rapti	Balrampur	15/08/2017 0900 hrs	16/08/2017 0900 hrs
8.		Siddhartha Nagar		Bansi	20/08/2017 0400 hrs	23/08/2017 0500 hrs

High Flood Situation						
1.	Assam	Hailakhandi	Katakhal	Matizuri	14/06/2017 1500 hrs	14/06/2017 2100 hrs
					15/06/2017 1500 hrs	15/06/2017 2300 hrs
2.		Karimganj	Kushiyara	Karimganj	28/06/2017 1400 hrs	28/06/2017 1600 hrs
3.		Sonitpur	Jia –Bharali	N T Road Crossing	02/07/2017 0500 hrs	02/07/2017 1200 hrs
					03/07/2017 0900 hrs	03/07/2017 1400 hrs
					04/07/2017 0600 hrs	04/07/2017 1400 hrs
					05/07/2017 0400 hrs	05/07/2017 1800 hrs
					09/07/2017 1100 hrs	10/07/2017 0700 hrs
4.		Dhubri	Sankosh	Golokganj	10/07/2017 0200 hrs	10/07/2017 1200 hrs
					12/08/2017 0900 hrs	14/08/2017 0700 hrs
5.		Barpeta	Beki	Road Bridge	11/07/2017 1200 hrs	12/07/2017 0200 hrs
					10/08/2017 1900 hrs	11/08/2017 1400 hrs
					12/08/2017 0000 hrs	12/08/2017 1400 hrs
6.		Dibrugarh	Brahmaputra	Dibrugarh	09/07/2017 1600 hrs	10/07/2017 0400 hrs
					10/08/2017 1800 hrs	12/08/2017 1100 hrs
7.		Jorhat		Neamatighat	11/08/2017 1200 hrs	13/08/2017 0600 hrs
8.		Sonitpur		Tezpur	12/08/2017 1200 hrs	14/08/2017 1000 hrs
9.		Sibsagar	Dikhow	Sibsagar	10/07/2017 0700 hrs	12/07/2017 0100 hrs
10.		Kokrajhar	Gaurang	Kokrajhar	11/08/2017 1600 hrs	12/08/2017 1600 hrs
11.		Dhubri	Brahmaputra	Dhubri	15/08/2017 1000 hrs	16/08/2017 1100 hrs
12.		Goalpara	Brahmaputra	Goalpara	14/08/2017 1500 hrs	16/8/2017 0600 hrs
13.	West Bengal	Coochbehar	Torsa	Ghugumari	12/08/2017 0700 hrs	13/08/2017 0600 hrs
14.		Jalpaiguri	Tista	Mekhliganj	13/08/2017 0500 hrs	13/08/2017 0600 hrs

15.	Bihar	Muzzafarpur	Bagmati	Benibad	14/08/2017 0300 hrs	15/08/2017 2200 hrs
16.		Khagaria	Kosi	Baltara	15/08/2017 1300 hrs	18/08/2017 0500 hrs
17.		Madhubani	Kamlabalan	Jhanjarpur	13/08/2017 1400 hrs	14/08/2017 2200 hrs
18.		Siwan	Ghagra	Gangpur Siswan	20/08/2017 0700 hrs	23/08/2017 0900 hrs
19.	Uttar Pradesh	Badaun	Ganga	Kachhla Bridge	16/07/2017 0200 hrs	16/07/2017 0900 hrs
					03/08/2017 0400 hrs	16/08/2017 0400 hrs
					04/09/2017 1700 hrs	06/09/2017 0400 hrs
20.		Faizabad	Ghagra	Ayodhya	16/08/2017 0500 hrs	20/08/2017 0900 hrs
21.		Barabanki	Ghagra	Elgin Bridge	15/08/2017 0600 hrs	18/08/2017 0600 hrs
22.		Gorakhpur	Rapti	Birdghat	19/08/2017 2200 hrs	23/08/2017 0900 hrs

42 Stations That Witnessed Moderate Flood Situation and 25 Stations That Witnessed Low Flood Situation during 2017

State	District	River	Station
Moderate Flood Situation			
Assam	Kamrup	Brahmaputra	Guwahati
	Lohit	Tinsukia	Dholabazar
	Dibrugarh	Buridehing	Chenimari (Khowang)
	Lakhimpur	Subansiri	Badatighat
	Sibsagar	Desang	Nanglamoraghat
	Lakhimpur	Ranganadi	N T Road Crossing
	Nagaon	Kopili	Kampur
	Golaghat	Dhansiri (S)	Golaghat
	Golaghat		Numaligarh
	Kamrup	Puthimari	N H Crossing
	Nalbari	Pagladiya	N T Road Crossing
	Barpeta	Manas	N H Crossing
	Karimganj	Barak	Badarpurghat
	Cachar	Barak	Annapurnaghat
	Morigaon	Kopili	Dharamtul
Arunachal Pradesh	East Siang	Siang	Passighat
West Bengal	Jalpaiguri	Tista	Domohani Road Bridge
	Coochbehar	Jaldhaka	Mathabanga
	Murshidabad	Ganga	Farakka Barrage

Bihar	Patna	Punpun	Sripalpur
	Darbhanga	Adhwara Group	Kamtaul
	Darbhanga		Ekmighat
	Darbhanga	Bagmati	Hayaghat
	Siwan	Ghaghra	Darauli
	Purba Champaran	Burhi Gandak	Ahirwalia
			Lalbeghiaghat
	Khagaria		Khagaria
	Samastipur		Rosera
			Samastipur
	Muzzafarpur		Sikandarpur (Muzzafar-pur)
	Katihar	Kosi	Kursela
Uttar Pradesh	Ballia	Ghaghra	Turtipar
	Kushinagar	Gandak	Khadda
Uttarakhand	Haridwar	Ganga	Haridwar
Jharkhand	Sahibganj	Ganga	Sahibganj
	Purba Singhbhum	Subarnarekha	Jamshedpur
Odisha	Gajapati	Vamsadhara	Kashinagar
	Bhadrak	Baitarni	Akhuapada
	Keonjar	Baitarni	Anandpur
	Balasore	Subarnarekha	Rajghat
Chhatisgarh	Bastar	Indravathi	Jagdalpur
Andhra Pradesh	Srikakulam	Nagavali	Srikakulam

Low Flood Situation			
Tripura	North Tripura	Manu	Kailashahar
West Bengal	Jalpaiguri	Jaldhaka	N H 31
Bihar	Muzzafarpur	Gandak	Rewaghat
	Patna	Ganga	Gandhighat
			Hathidah
			Dighaghat
	Bhagalpur		Kahalgaon
			Bhagalpur
	Motihari	Gandak	Chatia

Uttar Pradesh	Muzzafar-nagar	Yamuna	Mawi
	Mathura		Mathura
	Kannauj	Ganga	Kannauj
	Kanpur		Ankinghat
			Kanpur
	Farukkabad		Fathegarh
	Ghaziabad		Garhmuktheswar
	Moradabad	Ramganga	Moradabad
Uttarakhand	Dehradun	Ganga	Rishikesh
NCT Delhi	Delhi North	Yamuna	Delhi Railway Bridge
Odisha	Jajpur	Brahmani	Jenapur
	Rayagada	Vamsadhara	Gunupur
Gujarat	Ahmedabad	Sabarmati	Subash Bridge
Maharashtra	Ahmednagar	Godavari	Kopergaon
Karnataka	Kalaburagi	Bhima	Deongaon Bridge
Andhra Pradesh	Kurnool	Tungabhadra	Mantralayam

40 dams, reservoir and barrages had inflow exceeding the criteria during 2017

State	District	River	Station
Karnataka	Kodagu	Harangi	Harangi Dam
	Hassan	Hemavati	Hemavathy Dam
	Mysuru	Kabini	Kabini Dam
	Mandya	Cauvery	Krishnarajasagar Reservoir
	Ballari	Tungabhadra	T B Dam
	Shivamogga	Tunga	Upper Tunga Project
	Chikmagaluru	Bhadra	Bhadra Dam
	Vijayapura	Krishna	Almatti Dam
	Kalaburagi	Krishna	Narayanpur Dam
Jharkhand	Bokaro	Damodar	Tenughat Dam
	Santhal Parganas	Mayurakshi	Massanjore Dam
	Dhanbad	Damodar	Panchet Dam
	Dhanbad	Barakar	Maithon Dam
	Purbi Singhbum	Subarnarekha	Chandil Dam
West Bengal	Bardhamman	Damodar	Durgapur Barrage
	Birbhum	Mayurakshi	Tilpara Mihirlal Barrage
	Medhinipur	Kangsabati	Kangsabati Dam
Odisha	Sambalpur	Mahanadi	Hirakud Dam
Uttarakhand	Champawat	Sharda	Banbasa Barrage
UP	Bulandshahar	Ganga	Narora Barrage
	Chandauli	Rihand	Rihand Dam
MP	Shahdol	Sone	Bansagar Dam
	Mandsaur	Chambal	Gandhisagar Dam

Gujarat	Valsad	Damanganga	Madhuban Dam
	Banaskanta	Banas	Dantiwada Dam
	Mehsana	Sabarmati	Dharoi Dam
Maharashtra	Jalgaon	Tapi	Hathnur Dam
	Aurangabad	Godavari	Jaikwadi Dam
Andhra Pradesh	Srikakulam	Vamsadhara	Gotta Barrage
	Kurnool	Tungabhadra	Sunkesula Barrage
	Kurnool	Krishna	Srisailam Dam
	Nellore	Pennar	Somasila Dam
Telangana	Gadwal	Krishna	P D Jurala Project
Tamilnadu	Salem	Cauvery	Mettur Dam
	Erode	Bhavani	Bhavanisagar Dam
	Tiruchirapalli	Cauvery	Upper Anicut
	Thanjavur	Cauvery	Grand Anicut
	Theni	Vaigai	Vaigai Dam
	Thiruvallur	Kosasthaliyar	Poondi Satyamurthy Reservoir
	Thiruvannamalai	Ponnaiyar	Sathanur Dam

MODERNISATION OF FLOOD FORECASTING SERVICES

The Central Water Commission is making constant endeavour in updating and modernizing the forecasting services. The forecasting of flood involves a number of steps, namely, data observation, collection, transmission, compilation and analysis, formulation of forecasts and their dissemination. To make the flood forecasts more accurate, effective and timely, the modernization activities are being taken up on a continuous basis.

During 9th Plan, telemetry system was installed at 55 stations in Chambal and Upper Mahanadi basins for real time data collection and transmission to forecast formulation centres under the World Bank aided DSARP scheme. During 10th Plan, telemetry system was installed at 168 stations in six river basins namely, Godavari (63), Krishna (41), Brahmaputra (21), Damodar (20), Yamuna (15) and Mahanadi (8). Further, during 11th Plan, telemetry system was installed at 222 stations in seven river basins namely, Indus (4), Ganga (63), Yamuna (25), Narmada &Tapi (76), Mahanadi (36), Brahmaputra (14) and Godavari (4). During XII Plan, telemetry system has been installed at 65 stations. The activity for installation of telemetry system at 458 stations is in progress.

In order to receive and analyse data collected by the telemetry stations, Earth Receiving Station and Modeling Centres have been established in various parts of the country during different plan period. As on date, there are three Earth Receiving Stations in the country at New Delhi, Jaipur and Burla. A total of 22 Modeling Centre has been established in the country till the end of XI Plan. These Modeling Centres are located at Agra, Asansol, Bhubaneswar, Bhusaval, Burla, Dehradun, Dibrugarh, Gandhinagar, Guwahati, Hyderabad (two stations one each for Krishna and Godavari basins), Jaipur, Jalpaiguri, Kurnool, Lucknow, Maithon, New Delhi (one at Headquarter and one for Yamuna Basin), Patna, Shimla, Surat and Varanasi. The data reception from all the sites modernised is being monitored from CWC Headquarter at New Delhi. During XII Plan, one Modeling Centre has been established at Chennai. The activities for establishment of 4 Modeling Centres are in progress.

In order to improve the flood forecast activity in CWC, the methodology based on

mathematical model using windows based Mike-11 software is progressively being used. Advisory Flood Forecast using above model and WRF Rainfall Product inputs from IMD were issued in 2017 monsoon.

HYDROLOGY PROJECT

Previous phases of Hydrology Project (HP) were implemented only in 13 States. This has resulted in a sectoral divide amongst the HP and non-HP States in terms of equipment, technology, applications and capacity building which have a direct impact on water resources planning, development and management.

The National Hydrology Project (NHP) has been envisaged with pan-India coverage, including the Ganga and Brahmaputra Basin States which were not covered under previous phases of Hydrology Projects and as a follow-up and extension of Hydrology Project Phase-I and Phase-II. Total cost of the scheme as approved by the EFC held on 23.06.2016 is Rs. 3679.7674 crore [Rs. 3640 crore for National Hydrology Project (NHP) and Rs.39.7674 crore for creation of National Water Informatics Centre (NWIC)]. The components of NHP are summarized as follows:

Components of NHP

Component	Name	Objectives
A	In-Situ Hydro-met Monitoring Systems	expand and upgrade water resources monitoring systems
B	National Water Information System	develop centralized spatial data sets, including remotely sensed data and support National Water Informatics Centre (NWIC)
C	Water Resources Operation & Management Systems	develop Decision Support Systems (DSS) for selected river basin planning, assessments, flood forecasting etc.
D	Water Resources Institutions and Capacity Building	capacity building through trainings, providing, etc.

MoWR, RD & GR is coordinating the implementation of National Hydrology Project (NHP) with the World Bank Assistance. There are a total of 49 implementing agencies including 8 central agencies, 39 state level agencies and two River Basin Organisations (RBO) in National Hydrology Project.

Expected Outcomes from NHP and NWIC are as under:

- Data storage, exchange, analysis and dissemination through National Water Informatics Centre.
- Lead time in flood forecast from 1 day to at least 3 days.
- Mapping of flood inundation areas for use by the disaster management authorities.
- Assessment of surface and ground water resources in a river basin for better planning & allocation for PMKSY and other schemes of Govt. of India.
- Reservoir operations through seasonal yield forecast, drought management, Supervisory Control and Data Acquisition (SCADA) Systems, etc.
- Design of SW & GW structures, hydropower units, interlinking of rivers, smart cities.
- Fulfilling the objectives of Digital India.

The final outcome will be (i) reduction of flood and drought losses in the country, especially in the agricultural sector of the economy, and (ii) improved preparedness to reduce impacts and losses from hazardous events with respect to life, livelihood, and all sectors of national economy.

RESEARCH AND DEVELOPMENT

The programme seeks to promote research

activity to address the challenges in water sector. The scheme has four components:

1. **R&D in Apex Organisations:** It involves basic and applied research, creation & up-gradation of research facilities & training of personnel etc. and implemented through apex organizations of Ministry viz. Central Soil & Material Research Station (CSMRS), Central Water & Power Research Station (CWPRS), National Institute of Hydrology (NIH) and Central Water Commission (CWC).

2. **Sponsoring and Coordinating Research in Water Sector :** In order to encourage research activities, research related to particular region and specific project that cannot be addressed completely through the premier organizations, Ministry of Water Resources, RD&GR sponsors research schemes by providing financial assistance to IITs, Universities, Research Organizations etc. for taking up research in water sector through three Indian National Committees (INCs) constituted by the Ministry and Standing Advisory Committee headed by Secretary (MoWR, RD&GR).

   Indian National Committees (INCs) constituted by the Ministry are:

   - Indian National Committee on Surface Water (INCSW)
   - Indian National Committee on Ground Water (INCGW)
   - Indian National Committee on Climate Change (INCCC)

3. **Dissemination of Research Findings and Technology Transfer:** The above task is accomplished through publication of research papers, reports, organising and sponsoring seminars / workshops.

4. **Evaluation of R&D Activities and Consultancies :**

   a) Evaluation of R&D activities is conducted by engaging independent consultants.

   b) Besides, studies are also undertaken through consultancy in priority areas such as:

   - Water Use Efficiency;
   - Post Project Performance Evaluation ;
   - Environment Impact Assessment in respect of completed / upcoming irrigation projects and other areas ; and
   - Including impact of climate change on water resources and awareness thereof.

Targets & Achievements during Current FY: 2016-17 and 2017-18

Sl. No.	Particulars	Year			
		2016-17		2017-18	
		Target	Achieve-ment	Tar-get	Achieve-ment
1.	Technical Reports Submitted (Nos.)	248	196	200	182
2.	Research Papers Published(Nos.)	290	308	240	133
3.	Completion of physical/Numerical/mathematical model/desk studies/New Geotechnical investigation/ Evaluation of DPR/Compliance on DPR arch papers Published (Nos.)	15	53	115	237
4.	Training of Personnel(Nos.)	252	616	150	977
5.	Organisation of Workshop/Seminar/ Symposia/ Training (Nos.)	37	59	34	26

The research output are in terms of technical Report & Research papers having recommendations for improved techniques in the area of planning and design of water resources structure, water saving/ conserving techniques for agriculture, water use efficiency, integrated water resources management, hydraulic designs, climate change impact studies etc. will help in saving the public money and valuable resources. The output of the research is disseminated in public domain for utilization by the beneficiaries and stakeholders to make use of it.

Expenditure during F.Y. 2017-18 is Rs. 49.57 crore against allocation of Rs. 40 crore (BE) / Rs. 60 crore (RE).

Proposal for continuing the Scheme beyond XII Plan (2017-2020)

For the period beyond XII Plan (2017-2020), the Plan Scheme 'R&D in Water Sector' has been merged with another Plan Scheme of the MoWR, RD&GR namely 'Implementation of National Water Mission'. The scheme is now approved to be continued as "R&D in Water Sector & Implementation of National Water Mission" with a total outlay of Rs. 345.00 crore. Accordingly, SFC Memo has been prepared by R&D Division and approved for total outlay of Rs. 345.00 crore.

Components of the Proposed Scheme R&D in Water Sector & Implementation of National Water Mission beyond XII Plan (2017-2020) are:

Part A: R&D in Water Sector

1. R&D in apex organisation at national level
2. Sponsoring and coordinating research in water sector
3. Support for dissemination of research findings and technology transfer
4. Evaluation of R&D activities and consultancies
5. Establishment of Research Chair on Water Sector Conflicts and Governance at CPR

Part B: Implementation of National Water Mission

1. National Water Mission Directorate
2. Preparation of State Specific Action Plans for water sector
3. Human Resource Development and Capacity Building and mass awareness programme
4. Setting up of National Bureau of Water Use Efficiency (NBWUE)
5. Baseline studies
6. Demonstration / Benchmarking/Pilot projects

Details of Outlay: **(Rs. in crore)**

Description	2017-18	2018-19	2019-20	Total
1. R&D in apex organisation at national level				
Establishment	16.86	22.62	26.15	65.63
Infrastructure (including up-gradation of existing facilities as a follow up of benchmarking study)	8.63	20.2	18.31	47.14
Stores and equipments	3.89	22.22	20.23	46.34
Operational expenses	14.49	23.67	21.3	59.46
Sub Total:	43.87	88.71	85.99	218.57
2.Sponsoring and coordinating research in water sector	15.74	9.00	9.00	33.74
3.Support for dissemination of research findings and technology transfer	0.30	0.40	0.50	1.20

4.Evaluation of R&D Activities and consultancies	3.00	2.50	2.50	8.00
5.Establishment of Research chair on water sector conflicts and Governance	3.28	0.21	0.26	3.75
Sub Total:	66.19	100.82	98.25	265.26
6.Implementation of National Water Mission:				
(a) National Water Mission Directorate	1.50	3.00	4.00	8.50
(b) Preparation of State Specific Action Plans for water sector	4.00	5.00	6.00	15.00
(c) Human Resource Development and Capacity Building and mass awareness programme	1.00	8.00	10.00	19.00
(d) Setting up of National Bureau of Water Use Efficiency (NBWUE)	0.00	1.00	5.00	6.00
(e) Baseline studies	1.50	5.00	6.00	12.50
(f) Demonstration / Benchmarking/ Pilot projects	1.00	7.50	9.50	18.00
Sub Total of (6)	9.00	29.50	40.50	79.00
Grand Total	75.19	130.32	138.75	344.26

NATIONAL GROUND WATER TRAINING AND RESEARCH INSTITUTE (NGI)

During XII Plan, NGI under HRD and Capacity Building Scheme of Ministry of Water Resources, River Development and Ganga Rejuvenation implemented a three tier training programme keeping in view the requirements of the National Project on Aquifer Management.

This scheme continued beyond the XII Plan, since these trainings enable creation of a trained workforce for implementation of National Project on Aquifer Mapping & Management and overall sustainable development of the ground water resources. Besides the officers of the Board, NGI trains' officers from State Departments and candidates from abroad are also included in the training programme being organized by the Board. National Level training programmes are conducted at NGI, Raipur whereas State and Block Level training programmes are organized by the respective Region Offices of CGWB.

Details of the training programmes conducted till 31.03.2018

Training Programme	Annual Target	Total No. of Trainings Conducted	Total No. of Participants	Female participants
TIER – I (National Level)	35	46	883	197
TIER – II (State Level)	18	17	562	150
TIER – III (Block Level)	53	47	7282	2053
Total	106	110	8727	2400

A classroom session in progress for a Tier I Training 'Managed Aquifer Recharge'

A field demonstration in a training course on 'Applications of Geophysical Techniques in Ground Water Studies'

HUMAN RESOURCE DEVELOPMENT AND CAPACITY BUILDING

The Human Resource Development (HRD) and Capacity Building Scheme of the Ministry of Water Resources, River Development and Ganga Rejuvenation is a new scheme formed by merging three on-going publicity and training schemes, namely (i) Information, Education & Communication (IEC), (ii) National Water Academy (NWA), (iii) Rajiv Gandhi National Ground Water Training Institute (RGI) and introducing two new components, viz. (iv) Strengthening of North Eastern Regional Institute of Water and Land Management (NERIWALM) and (v) Implementation of Training policy of MoWR, RD & GR.

INFORMATION, EDUCATION & COMMUNICATION (IEC)

The following major activities were undertaken by IEC Section:

PARTICIPATION IN FAIRS / EXHIBITIONS

i) India International Trade Fair 2017:

Ministry of Water Resources, River Development and Ganga Rejuvenation participated in the 37th India International Trade Fair organized by ITPO in Pragati Maidan from 14th to 27th November, 2017. The pavilion showcased achievements and works being done by various wings/ departments of the Ministry. Physical models of various projects/activities, banners, posters etc. depicting various activities, programmes and Projects undertaken by the organizations under MoWR, RD and GR was displayed and applauded by visitors.

This year for the Ministries & Departments Pavilion, the Pavilion of MoWR, RD & GR has been adjudged First for excellence in display and given special appreciation certificate by ITPO, which is a significant achievement for the efforts taken by Ministry and all the organizations involved in the display.

ii) India International Science Festival – 2017:

The Ministry participated in India International Science Festival – 2017 organized by Ministry of Science and Technology and Earth Sciences through Central Water Commission at Chennai from 13th to 16th October, 2017.

iii) 1st Wellness India 2017 Expo:

The Ministry participated through Central Water Commission in the **1st Wellness India 2017 Expo** organized during 29th to 31st August, 2017 at Pragati Maidan, New Delhi.

ORGANISATION OF WORKSHOPS / SEMINARS / CONFERENCES

India Water Week 2017:

The fifth edition of India Water Week was observed from 10th to 14th October, 2017 at Vigyan Bhawan, New Delhi. It was inaugurated by Hon'ble President of India

Inauguration of Ministry's pavilion at IITF 2017

Shri Ram Nath Kovind. The theme for this year's India Water week was "Water and Energy for Inclusive Growth". There was also an exhibition running in parallel supporting the theme and showcasing the technologies, latest developments and solutions available for the areas in, water and energy.

About 1500 delegates from India and 13 other countries attended the five days international event. The major components of the event were viz: (a) Water, Food and Energy Security – Essential requirement for sustainable development, (b) Water for inclusive Growth, (c) Sustainable energy development – Key for all round economic growth, (d) Water and Society.

Other Events:

- A one day Conference on Jal Kranti Abhiyan was held on 07.3.2017 at Mavlankar Hall, Constitution Club, New Delhi.
- A workshop on "Arsenic Problem and its remediation in Ganga Basin" was organized through CGWB on 7th March, 2017 at Auditorium of SCOPE Complex, New Delhi.
- Water Conservation Programmes/ Workshops were organized in Bundelkhand on 28th April, 2017 in Sagar district of MP and Lalitpur district of UP.
- 'Ganga NirikshanYatra' during the visit of Hon'ble Minister (WR,RD&GR) in West Bengal was organised during 26th to 28th May, 2017.

PUBLICITY THROUGH PRINT MEDIA i.e. NEWS PAPERS/MAGAZINES

Two print media advertisements were published in connection with commencement ceremony of "Baliraja Jalsanjivani Yojana" on 12th December, 2017 and 24th December, 2017 respectively. An advertisement was also published on 16th February, 2018 in connection with the commencement of Bhujal Manthan-3 at Nagpur.

ORGANISATION OF TRAINING PROGRAMMES

Various Workshops and Training Programmes are being organized through Central Water Commission and Central Ground Water Board aimed at delivering knowledge regarding efficient Water Management especially through various techniques of artificial recharge to benefit various stakeholders including non government organisations and village Pradhans from across the States / UTs. The trainings are being imparted by the officers of Central Ground Water Board, State Governments as well as experts from other institutions.

Electronic media campaign: The Ministry has got produced two Radio Jingles and one Radio Spot through National Film Development Corporation. These Radio Jingles on Water Conservation have been broad caste on All India Radio and Private FM Channels across the country for a period of 60 days.

Painting Competition on Water Conservation: A three tier Painting Competition has been organised since 2010 across the country for 6th, 7th and 8th standard students in three stages, namely, School, State and National Level to spread awareness on water conservation. This year, the School and State Level Painting Competition have been successfully conducted across all States/UTs. The 8th National Level Painting Competition was conducted in the FY 2017-18.

Essay Competition on Water Conservation: First Essay Competition has been successfully organized in FY 2015-16 through Central Ground Water Board, on the similar lines. Third National Essay Competition was organized in the FY 2017-18.

Quiz Competition for children on water conservation: A new initiative of organising Quiz Competition has been undertaken by the Ministry. The advertisement has already been released in the leading newspapers for inviting nominations / participation from Schools across the country.

Mass Awareness activities under Tribal Sub Plan: The Ministry organised various Awareness Programmes on Water Conservation in, Arunachal Pradesh, Mizoram, Nagaland, Meghalaya, Lakshadweep and Dadra and Nagar Haveli under Tribal Sub Plan in the FY 2017-18.

Production of Celebrity Endorsed TV Commercials: Ministry is in the process of producing some TV Commercials on water conservation by Celebrity endorsement. Once produced, these TVCs will be broadcast on National TV Channels, Theatres etc. to create awareness on water conservation among the masses.

Outdoor Media Campaign: Ministry is in the process of creating mass awareness on water conservation related issues by displaying some messages / advertisements on Delhi Metro Trains.

JAL KRANTI ABHIYAN

Jal Kranti Abhiyan was organized by MoWR, RD & GR on 5th June, 2015 for a period from 2015-16 to 2017-18 in order to consolidate water conservation and management in the country through a holistic and integrated approach involving all stakeholders, making it a mass movement. The objectives of Jal Kranti Abhiyan are as under:

- Strengthening grass root involvement of all stakeholders including Panchayati Raj Institutions and local bodies in the water security and development schemes;
- Encouraging the adoption / utilization of traditional knowledge in water resources conservation and its management;
- To utilize sector level expertise from different levels in government, NGO's, citizens etc;

- Enhancing livelihood security through water security in rural areas; and
- Activities under 'Jal Kranti Abhiyan' include 'Jal Gram Yojana'; 'Development of Model Command Area'; 'Mass Awareness Programme'; and Other Activities.

Jal Gram Yojana is one of the main components of Jal Kranti Abhiyan under which two villages, in every district preferably being a part of dark block or facing acute water scarcity are being selected as "Jal Grams" across the country. So far 1115 Jal Grams have been selected and Water Security Plans for 269 Jal Grams have been prepared.

JAL MANTHAN

Jal Manthan is an initiative of the MoWR, RD & GR for wider consultations among various stakeholders for churning out new ideas and tangible solutions to various water sector issues. The focus of Jal Manthan is to refine policies of the Ministry to make them more people friendly and responsive to the needs of the States. Jal Manthan provides various stakeholders an opportunity to highlight their concerns and impediments being faced by them in effective implementation of schemes related to water resources.

In this series, the Ministry has organized four Jal Manthans. The first, second and third Jal Manthans were held on 20th -22nd November, 2014, 22nd -23rd February, 2016 and 13th January, 2017 respectively. During these Jal Manthans, extensive consultations were held with different stakeholders on several important and critical areas in the water sector like PMKSY Priority Projects – Implementation Issues; Inter Linking of rivers – Progress and Challenges, River Basin Approach–Present Status and Future Indication, Ground Water and National Hydrology Project, Principles of Allocation of Water, Water Management, Use of innovative Technologies and Water Conservation, Participatory Irrigation Management, River Basin Management, River Rejuvenation and Flood Management, River Basin Approach for Sustainable Development, Ground Water Management, Water Security, Water Management, Coordination between Centre and States, water conservation, innovation in Water Governance etc.

Jal Manthan-4 was organized on 28th – 29th July, 2017 at Vigyan Bhawan, New Delhi for holding wider consultations among various stakeholders with a view to evolve strategies for better water resources development and management. During Jal Manthan-4, discussions / consultations between various stakeholders were also held on issues pertaining to PMKSY and difficulties being encountered in its implementation, Repair Renovation & Restoration of Water Bodies, Command Area Development, Interlinking of Rivers, etc. This was followed by a 'Chintan Baithak' wherein a detailed and in depth review of the schemes being implemented by the Ministry and the future course of action thereon was undertaken.

BHUJAL MANTHAN

Ministry of Water Resources, River Development and Ganga Rejuvenation organized two day event Bhujal Manthan-3 on the themes "Participatory Ground Water Management" and "Low Cost Artificial Recharge measures for ground water augmentation" from 16th to 17th February, 2018 at Kavivarya Suresh Bhatt Sabhagruha, Reshimbag, Nagpur. The two day event was inaugurated by Hon'ble Minister, Ministry of Water Resources, RD & GR.

The event was attended by around 2000

participants including Hon'ble Ministers, Hon'ble Chief Ministers, Hon'ble MPs, Hon'ble MLAs, subject experts, delegates, stakeholders & officers from various Ministries, Govt. Organizations (Central as well as State Governments), Non-Government organizations' Academicians, scientists from Research Institutes working in the ground water domain including Farmers, Village Headmen, Industrialists, Students and common men from across the country.

INFRASTRUCTURE DEVELOPMENT

Infrastructure Development (ID) Scheme has been approved by the Government by merging four continuing schemes viz. (i) Land & Building and Information Technology Plan of Central Ground Water Board (CGWB), (ii) Land & Building of Central Water Commission (CWC). (iii) Information Technology Development Plan of Ministry of Water Resources, River Development and Ganga Rejuvenation and (iv) e-Governance of the Ministry of Water Resources, River Development and Ganga Rejuvenation.

The Scheme aims at providing better working environment in the offices, creation of assets and savings on payment of monthly rent. To achieve this, construction of offices at various locations, provision for construction of staff quarters as well as modernization of existing offices of the Ministry (Proper), CWC and CGWB have been included under the ambit of the Scheme.

Competent Authority has approved the implementation/continuation of the Infrastructure Development Scheme for Ministry of Water Resources, River Development & Ganga Rejuvenation and its Attached and Subordinate Offices during the remaining period of 14th FC (i.e. 2017-20) with the total projects cost of Rs. 283.98 crore and an outlay of Rs. 198.23 crore. The proposed scheme of Infrastructure Development envisages provision of Rs. 198.23 crore out of which Rs. 181.83 crore is meant for Land and Building Component of the Scheme and Rs. 16.40 crore is for IT Component.

CWC – Land & Building: Modernisation of **CWC (Hqrs)** and construction works

of residential quarters at **Guwahati**, office building of Sub Division at **Balasore** are in progress. Revised Administrative Approval for the construction of G+3 Floor office building of CWC/GFCC at Patna has been issued to CWC. Approval of the competent authority for the procurement of 0.020 ha land of Govt. of Uttarakhand for construction of hutment at Mana/Badrinath site under Chamoli Distt. of Uttarakhand has been issued to CWC.

CGWB – Land & Building : Expenditure Sanction towards the construction of National Ground Water Training & Research Institute (NGWT&RI) building at **Naya Raipur** has been issued to CGWB. Works for the Construction of office building of CGWB in **Guwahati** are in progress. Administrative Approval for the Construction of Regional and Divisional office at **Ahmedabad** has been issued to CGWB. Administrative Approval for the Construction of office building, Workshop & Store at **Ambala** and **Jammu** has been issued to CGWB. Administrative Approval and Expenditure Sanction for the Construction of boundary wall, workshop & store etc at **Jodhpur** has been issued to CGWB. Approval for the Construction of temporary shed, godowns, workshop office etc at Kendri, Raipur has been issued to CGWB and works are in progress.

CGWB-IT: During 2017-18, Manav Sampada – e-HRMS has been implemented in all the offices of CGWB, 200 numbers of Personal Computers & Peripherals have been installed in Regional Offices, Divisional Offices, State Unit Offices and Central Head Quarters Office for e-Governance activities in Central Ground Water Board (CGWB). IPv6 compliant LAN will be established at CHQ, Faridabad. Establishment of Video Conferencing facility has been proposed to be implemented in 22 Offices of CGWB. Design & Development of Web based Applications for e-Governance applications in association with NIC would be initiated.

Ministry (proper) - e-Governance:

The Ministry has taken following new initiatives for strengthening e-Governance:

i. Ministry of Water Resources, RD & GR has completely operationalized e-office. This Ministry has more than 90% electronic files usage in e-office and the percentage of physical files being used is less than 10% only. Moreover, the Ministry has even linked its e-office instance with Department of Expenditure, Department of Personnel & Training, Central Water Commission and Department of Legal Affairs enabling inter- departmental transfer of e-Files amongst the above Departments.

ii. Further, the Ministry has sanctioned requisite funds to NIC for operationalizing e-office in Central Water Commission, Central Soil & Materials Research Station, Central Water & Power Research Station, Ganga Flood Control Commission. E-office is expected to be implemented completely in above Attached Offices/ Subordinate Organizations under the Ministry by the end of this financial year.

iii. The new Website of the Ministry fully compliant with Guidelines for Indian Government Websites (GIGW) prescribed by Department of Administrative Reforms & Public Grievances is in finalization stage of development and scheduled to be launched shortly.

iv. The MIS / Dashboard for monitoring the Physical and Financial achievement of 99 projects under PMKSY has been developed and launched in public domain.

v. The development of e-Human Resources Management System (e-HRMS) for 6 Organizations viz. Central Water Commission, Central Soil & Material Research Station, Central Water & Power

Research Station, National Institute of Hydrology, Central Ground Water Board & National Water Development Agency taken up in Phase-I has reached the final stage which would facilitate the proper Human Resources Management at a single access point and shall include efficient manpower planning, recruitments, Postings, Promotion, Transfer APAR submission and review etc.

vi. A Web-based Intra-MoWR portal has been developed by NIC Cell which incorporates login Based Software system for effective online monitoring of VIP References, Circulars uploading system by SMDs themselves.

Ministry (proper) – Land & Building:

Renovation of Four Rooms and Two toilets has been undertaken in Shram Shakti Bhawan. The works for the other rooms & toilets are in process.

RIVER MANAGEMENT ACTIVITIES AND WORKS RELATED TO BORDER AREAS

The above Central Sector Scheme was approved in December, 2014 for Rs. 740 crore to cover the following works/ schemes during XII Plan. The scheme has following components:

1. Hydrological observations and flood forecasting on common border rivers with neighboring countries:

(a). Flood Forecasting on rivers common to India and Nepal: Flood Forecasting on rivers common to India & Nepal has been in operation with currently 46 meteorological / hydro-meteorological sites in the Nepalese territory.

(b). Hydrological Observations on rivers originating in Bhutan: A comprehensive scheme for establishment of Hydro-Meteorological and Flood Forecasting Network on rivers common to India and Bhutan is also in operation for transmission of real time data to control rooms in India. The cost of operation and maintenance of these sites in Bhutan is borne by India. Officers from both the sides meet twice a year alternatively in India and Bhutan to oversee its implementation.

(c). Joint observations on rivers common to India and Bangladesh and cooperation with neighbouring countries: During lean season (January to May), the Ganga/ Ganges waters is being shared at Farakka with Bangladesh, as per the provisions of the Treaty signed between the two countries in 1996. The hydrological observations are being conducted jointly at Farakka (India) and Harding Bridge (Bangladesh) every year during the lean season. Further, during every monsoon, hydrological data of three stations (Nugesha, Yangqen and Nuxia) on Brahmaputra and one station (Tsada) on Sutlej is provided by China to India as per existing MoUs and cost of maintenance of these stations is borne by India. The information provided by China is utilized by India in flood forecasting and advance warning.

2. Investigations of Water Resources projects in neighboring countries:

(a). Pancheshwar Multipurpose Project: Pancheshwar Multipurpose Project is proposed along the India-Nepal border as per the provisions of the Mahakali Treaty signed in 1996 between India and Nepal for integrated development of river Mahakali (Sarada in India). The Pancheshwar Development Authority (PDA) has already been set up jointly by the two Governments, and is functional since September 2014. Further, draft final DPR is ready, which has been examined by various agencies in India and Nepal. The issues raised by both the sides on the said DPR are being discussed jointly by the Team of Experts/Officials (ToE) constituted by both the sides towards finalization of DPR.

(b). Surveys & Investigation of Sapta

Kosi High Dam and Sun Kosi Storage cum Diversion Scheme: As per the bilateral Agreement, the Joint Project Office-Sapta Kosi & Sun Kosi Investigation (JPO-SKSKI) is carrying out field investigations for Sapta Kosi High Dam and Sun Kosi Storage-cum-Diversion Scheme for preparation of a comprehensive DPR.

3. Grant-in-Aid to States/ UTs for flood management/ anti –sea erosion: The scheme provides for 100% grant to select boarder States and UTs for river management works.

4. Pre-construction activities of Pancheshwar, Pancheshwar Development Authority (PDA) etc.: A provision for undertaking preconstruction activities by PDA has been kept under the scheme. The activities of collection of hydrological data, seismological observations, R&M of wireless stations, R&M of transit camps, EIA studies, installation and data processing for MEQs/ SMA, modernization of snow gauge sites, and meetings of JGE/ JTG etc. are proposed.

NATIONAL WATER MISSION

The Government of India launched National Action Plan on Climate Change (NAPCC) which inter-alia identified the approach to be adopted to meet the challenges of impact of climate change through eight National Missions including National Water Mission with the main objective of "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management".

Highlights of 2017-18 are:

- Development of State Water Budgeting Model Template under State Specific Action Plan on Water (SSAP-Water).
- Expediting Baseline studies of 26 Major / Minor Irrigation Projects.
- Regular review of Bench mark study of Thermal Power plants, Steel plants, Paper and Pulp and Textile and Jute Industry by TERI.

State Water Budgeting: 2017-18 initiative of National Water Mission:

One of the major reasons for steep decline in per capita availability of Water in India from 5177 m^3 in 1951 to 1545m^3 in 2011 is lack of effective control on annual water consumption (demand) exceeding the annual water availability (supply). In other words, the annual water consumption (demand) by various sectors should be ensured to be within the limits of water availability (supply) for any water security and sustainability. The current scenario can at best be described as laissez faire where water consuming (demand) sectors are not concerned about water availability nor are there any state level single agency which oversees and coordinates to hold any sector or entity accountable for over exploitation and excessive use (demand). It is this governance deficit that is majorly responsible for the steep fall in per capita availability. National Water Mission has taken up an initiative to bridge this critical water governance gap through an institutional mechanism of State Water Budgeting in the already continuing scheme of State Specific Action Plan on Water, on the lines similar to that of financial budgeting.

Under National Water Mission, 11 State Governments - Andhra Pradesh, Arunachal Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Telangana, Uttarakhand and West Bengal are being supported to formulate State Water Budgeting for Water Security, Safety and Sustainability as an innovative strategic intervention to check over-exploitation, water deficit and contamination by building a convergence and synergy model aimed at performance based water governance. The initiative is being expanded across all the States and UTs. It is expected that the model gets matured in 3-5 years. Like financial budget, the water budget too is expected to be undertaken on an annual basis.

The State Water Budgeting template has been finalised in a National Consultation held on 23rd October, 2017 and templates have already been circulated to all the 11 State Governments and also hosted in NWM website. The national consultation was addressed by Shri Amarjeet Singh, Secretary, MoWR RD & GR, Dr. Ramesh Chand, Member, NITI Aayog, Dr. M.Ariz Ahammed, Mission Director, NWM, past chairpersons of CWC, CGWB, State Government officials, Central Ministries and Expert Institutions.

State Water Budgeting empowers the State Government in achieving Water Security, Safety and Sustainability through 5 strategic interventions viz.

a. Water Governance- improvement

b. Supply Management

c. Demand Management

d. Technology for improved Water Use Efficiency

e. Water Quality management

Likely benefits of the State Water Budgeting:

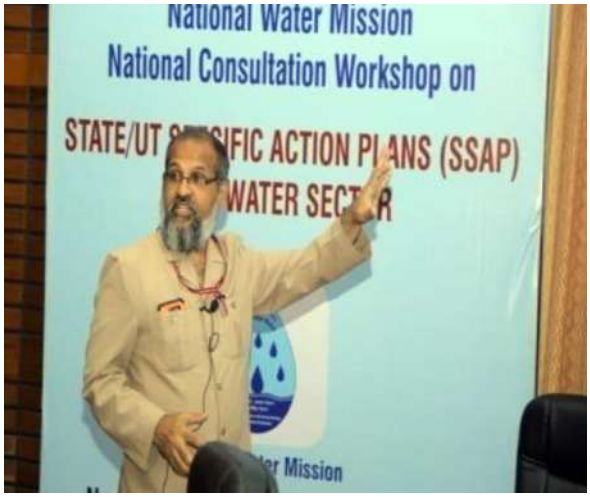
1. Hitherto water is seen compartmentally by the Government ministries/ departments/ bodies and also by the user citizens. There is no institutional mechanism or a platform in State or UT Governments to bring in all stakeholders of Water reflecting all its dimensions- supply, demand, quality, technology etc. In essence, the natures' Hydrological cycle was not appreciated in water governance. Consumption was never related with availability of water resulting in over-exploitation and deficits. There are no allocations to both water development and consumption allowing laissez faire for one and all for over exploitation. Most importantly there was no motivation for establishing measurement system at supply and demand side, which is very critical for any management. Above all there is no transparency in annual water availability and consumption for the general public-citizens.

2. With State Water Budgeting there will be a paradigm shift in the approach.

   a) **Holistic approach:** Both government ministries/ departments and non-government stakeholders are made to look at water as a multi-disciplinary activity holistically and appreciate in hydrological cycle approach. The State Governments are constituting Steering Committees under the chairmanship of Chief Secretary comprising all the Departments related to Water, Users including Industry, Knowledge institutions and Civil Society under one platform.

   b) **Check deficits by balancing consumption with availability:** Under the exercise the states are expected to prepare State Water budgets by balancing annual water expenditure to annual water availability comprising estimates of availability and demand allocations to different departments/sectors for controlling water use like that of financial budget. In case of any escalated demand for any sector, it is expected that the concerned department should engage in negotiation with Water Resource Department for revised allocation but cannot extract water either from ground or surface source, on its own as per earlier laisse faire approach.

   c) Culture of measurement and accountability: The exercise not only encourage as is reporting of current status of measurement systems both at supply and demand side and on water quality; but also aimed to drive for wider arrangement and installation of measurement system at all providers and users both for proper management and accountability.



d) **Introduction of the concept of value for resource:** All the states are enabled to assess financing and economics of water for different uses and its rate of return to inject a sense of responsibility among political representatives, public servants and the general public.

e) **Democratisation and transparency:** The exercise requires all the data to be made public, by hosting in website with regular updates. This will empower citizens to make governments and other bodies accountable. Thus it will deepen democracy in the use of nation's most precious Resource-Water as a common property in wider public interest with transparency in water availability, supply, demand and consumption by various sectors and their water productivity in comparison to the comparable efficient units / bench marking.

2. Base Line Studies for Improving WUE in Irrigation Sector: National Water Mission, MoWR, RD&GR have awarded 26 baseline studies for improving water use efficiency for irrigation projects in Major/Medium Irrigation projects located in six states viz. Assam, Manipur, Telangana, Andhra Pradesh, Maharashtra and Kerala. Draft inception reports of 24 projects were discussed in 4th Core-group meetings held in January, 2018 and inception reports are in final stages of submission.

3. Bench marking studies for Improving WUE in Industrial Sector: National Water Mission, MoWR, RD&GR has awarded a bench marking Study to "The Energy & Resources Institute (TERI)" New Delhi to ascertain the bench marks in water use efficiency in industrial sector. The study would focus on two industrial sectors viz. Thermal power plants & textile industries in phase-I and scoping exercise, preliminary baseline assessment & comprehensive water audit in Pulp & Paper and Steel Industries in the phase-II.

DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)

Keeping in view dam safety issues being faced by ours ageing large dams and with an objective to address this issue in a holistic way in all respect, Govt. of India undertook a comprehensive Dam Safety Rehabilitation and Improvement Project (DRIP) with financial assistance from the World Bank at an estimated cost of Rs. 2100 crore for a period of six years from 18th April, 2012 to June, 2018, which covers rehabilitation of 223 large dam projects spreads across seven States (Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Tamil Nadu, and Uttarakhand) along with institutional capacity building of all participating agencies and with a provision for enhancement of capacity in dam safety areas of selected academic and

research institutions.

Dam Rehabilitation and Improvement Project (DRIP) has been taken up with the World Bank assistance at an estimated cost of Rs. 2100 Crore for a period of six years from 18th April, 2012 to June, 2018.

- The funding pattern of the project is as follows:
  - 80% from World Bank loan (50% IDA credit and 50% IBRD loan)
  - 20% from State / Central Government budgetary support
- Out of the total estimated cost of Rs. 2100 crore, the share is as follows:
  - World Bank Rs. 1680 crore,
  - DRIP States Rs. 393.60 crore
  - Centre Rs. 26.40 crore

The objective of the DRIP:

- Rehabilitation and Improvement of Dams and associated appurtenances;
- Dam Safety Institutional Strengthening in participating States and CWC; and
- Project Management.

- About 223 Dams in seven States (namely Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Tamil Nadu and Uttarakhand) and Institutional Strengthening of Central Water Commission (CWC) and other Implementing Agencies are covered under DRIP.
- DRIP is being implemented and coordinated by CWC through a Project Director (CPMU) with the assistance of Engineering and Management Consultant viz. M/s EGIS EAU (France) in JV with M/s Egis India Consulting Engineers Pvt. Limited. The overall progress of DRIP is being monitored by National Level Steering Committee (NLSC) headed by the Secretary (MoWR, RD&GR) as its Chairman.
- Six meetings of the National Level Steering Committee for Dam Rehabilitation and Improvement Project (DRIP) have been conducted as on date to review implementation of DRIP progress.
- The Ministry has given in-principle approval to CWC's proposal for extension of implementation period of two years beyond 2018 to 2020. The Project has a revised cost estimate of Rs. 3466.00 crore as per details given below at Statement-I.

DRIP-II

Additionally, in order to cover all States of India under the umbrella of DRIP, CWC has submitted a proposal for new DRIP (DRIP-II), which is under consideration of the Ministry.

- Under DRIP-II, 14 States and two Central Agencies have submitted proposals to cover 634 Dams and more States are likely to join DRIP-II.
- The overall cost of DRIP-II is expected to be between Rs. 8000 crore to Rs. 9000 crore as per details given below at Statements I & II respectively:

Statement - I

Implementing Agency	Revised Total Project Cost				(Rs. in crore)
	No. of Project Dams	Rehabilitation & Improvement	Institutional Strengthening	Project Management	**Total**
Madhya Pradesh (WRD)	25	157	5	6	**169**
Odisha (WRD)	26	728	12	11	**751**
TamilNadu (WRD)	69	468	50	26	**543**
TANGEDCO (Tamil Nadu)	20	238	0	22	**260**
Kerala (WRD)	16	300	53	7	**360**
KSEB (Kerala)	12	123	21	10	**154**
CWC (HQ)		0	55	215	**270**
Karnataka (WRD)	22	544	24	13	**581**
UJVNL (Uttarakhand)	5	223	10	2	**235**
DVC (Jharkhand)	3	139	2	2	**143**
Total	**198**	**2921**	**233**	**313**	**3466**

Statement-II

S.No.	State / Agency	No. of Dams	Estimated cost (Rs. in crore)
1	Karnataka	28	386.14
2	Uttar Pradesh	41	1618.14
3	Rajasthan	207	1205.81
4	Telangana	29	645.13
5	Maharashtra	173	1170.75
6	Goa	2	58.00
7	Manipur	2	19.99
8	Meghalaya	6	108.75
9	Andhra Pradesh	65	1200.00
10	Bhakhra Beas Management Board / Min. of Power, Govt. of India	3	2300.00
11	Kerala WRD	19	165.902
12	Gujarat	8	157.00
13	West Bengal	9	126.47
14	Madhya Pradesh	27	103.693
15	Bihar	10	63.516
16	Chhattisgarh	5	91.52
17	Central Water Commission		570.00
	Total	**634**	**7920.81**

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

4. Inter-State River Issues

INTER-STATE RIVER WATER DISPUTES ACT, 1956

The Parliament enacted Inter-State River Water Disputes (ISRWD) Act, 1956 under Article 262 of the Constitution, for adjudication of disputes relating to waters of inter-State rivers and river valley thereof. As per the recommendations of 'Sarkaria Commission' on Centre State relations, the Act was last amended in August, 2002.

In order to further streamlining the adjudication of inter-State river water disputes, the Inter-State River Water Disputes (Amendment) Bill, 2017 was introduced in Lok Sabha by Minister for WR, RD & GR on 14.03.2017 during the Budget Session, 2017. The Bill envisages to establish a standalone Tribunal with permanent establishment, permanent office space and infrastructure so as to obviate with the need to set up a separate tribunal for each water dispute which is invariably a time-consuming process. The Bill was further referred by the Speaker, Lok Sabha to Parliamentary Standing Committee on Water Resources for examination on 25.05.2017. The Standing Committee held three meetings on 16.06.2017, 30.06.2017 and 10.07.2017 and submitted its recommendations on the Bill in the form of 'Nineteenth Report of Standing Committee on Water Resources on 'The Inter-State River Water Disputes (Amendment) Bill, 2017' dated 11.08.2017. On the basis of these recommendations, draft Cabinet Note on Officials Amendments to be made in the Bill has been prepared by the Ministry and referred to Department of Legal Affairs and Legislative Department for examination and vetting.

INTER-STATE WATER DISPUTES TRIBUNALS

MAHANADI WATER DISPUTES TRIBUNAL

The Government of Odisha had filed a complaint dated 19.11.2016 with the Ministry of Water Resources, River Development and Ganga Rejuvenation under Section 3 of the Inter-State River Water Disputes (ISRWD) Act, 1956 read with Inter-State River Water Dispute Rules, 1959. Odisha requested Union Government for Constitution of a Tribunal under Section 4 (1) of the ISRWD Act, 1956 for adjudication of the water disputes in respect of the Inter-state River Mahanadi and its basin between the riparian States of Odisha and Chhattisgarh and refer the complaint to the Tribunal under Section 5 (1) of the ISRWD Act, 1956.

In this connection, the Central Government has constituted Mahanadi Water Disputes Tribunal vide Notification No. 1114 (E) dated 12.03.2018 with the following composition-

1. Mr. Justice A.M. Khanwilkar, Judge of the Supreme Court of India : Chairman
2. Dr. Justice Ravi Ranjan, Judge of the Patna High Court : Member
3. Mrs. Justice Indermeet Kaur Kochhar, Judge of the Delhi High Court : Member

The Tribunal is taking up further action for adjudication of the dispute.

CAUVERY WATER DISPUTES TRIBUNAL (CWDT)

The Cauvery Water Disputes Tribunal (CWDT) constituted by the Government of India on 2nd June, 1990 to adjudicate the water dispute regarding inter-state river Cauvery and the river valleys thereof.

The Cauvery Water Dispute Tribunal submitted its report and decision under section 5 (2) of Inter-State River Water Dispute Act, 1956 to Government on 5th February, 2007. Under Section 5(3) of the said Act, the Central Government as well as party States sought further clarification/guidance in this regard.

The Tribunal took up the petitions of the party States for consideration on 10th July, 2007. In its order, the Tribunal, inter-alia, observed as under:-

"It appears that the State of Karnataka, the State of Tamil Nadu and the State of Kerala filed Special Leave Petitions against the aforesaid decision of this Tribunal dated 5th February, 2007 before the Supreme Court. The Supreme Court has granted Special Leave. The appeals are pending. According to us, in this background, these applications under Section 5(3) of the said Act should be listed for orders after disposal of the appeals by the Supreme Court".

The Supreme Court converted the SLPs filed by the party States into Civil Appeals titled Civil Appeal No. 2453 of 2007 (State of Karnataka Vs. State of Tamil Nadu & Ors.) with Civil Appeal No. 2454 of 2007 (State of Kerala Vs. State of Tamil Nadu & Ors.) and Civil Appeal No.2456 of 2007 (State of Tamil Nadu Vs. State of Karnataka & Ors.). On 09.12.2016, the Supreme Court upheld the maintainability of these Civil Appeals filed by the party State and as such, hearings were held on a regular basis. The Hon'ble Supreme Court vide its orders dated the 16th February, 2018 and the 18th May, 2018 has delivered final judgement in the Civil Appeals No. 2453 of 2007, 2454 of 2007, 2456 of 2007 filed by States of Tamil Nadu, Karnataka and Kerala against the award of the said Tribunal on the allocation of water to them, and the Award of the said Tribunal has now merged with the Judgement dated the 16th February, 2018 of the Hon'ble Supreme court. Final allocation of the Cauvery river water to four basin States as modified by Supreme Court Order is as under:

Karnataka	:	284.75 TMC (270 + 14.75)
Tamil Nadu	:	404.25 TMC(419 – 14.75)
Kerala	:	30 TMC
UT of Pondicherry	:	7 TMC
Environmental Protection	:	10 TMC
Inevitable escape into sea	:	4 TMC
Total	**:**	**740 TMC**

Expenditure incurred by the Tribunal upto 31.03.2018

Sl. No.	Specifications	Rs. in lakh
1	Budget Allocation for 2017-18	214.00
2	Expenditure from 4/17 to 03/18	186.49
3	Cumulative Expenditure upto 31/03/18	2999.49

KRISHNA WATER DISPUTES TRIBUNAL (KWDT)

The Krishna Water Disputes Tribunal was constituted on 2nd April, 2004 for adjudication of the dispute relating to sharing of waters of Inter-State river Krishna and river valleys thereof. In the Writ Petition No. 408 of 2008, Hon'ble Supreme Court has ordered that the effective date of constitution of the Tribunal will be 01.02.2006. Consequently, the term of the Tribunal was extended up to 31.12.2010 as per provisions of ISRWD Act, 1956. The report and the decision by the Tribunal under Section 5(2) of the Act were forwarded to the Ministry of Water Resources on 30th

December, 2010. Further, the tenure of the Tribunal has been extended from time to time.

The Report and Decision was pronounced on 30.12.2010 by the KWDT-II under Section 5(2) of the Act. Thereafter the Party States i.e. Andhra Pradesh, Karnataka, Maharashtra and also the Central Government had filed their Reference Applications u/s 5(3) of the Act to the Tribunal. Subsequently, replies and rejoinders were filed by the Party States and the Central Govt. Arguments were advanced on behalf of the Party States and Central Govt. on the dates of hearing before the Hon'ble Tribunal. The Tribunal concluded the hearing of the arguments vide order dated 30.08.2013. The order on References was pronounced by the Tribunal on 29.11.2013 by way of Further Report and same was forwarded to the Central Govt. and the respective Party States under Sec. 5(3) of the Act for their information and implementation.

Meanwhile, as per Andhra Pradesh Re-organization Act, 2014 the term of the Tribunal has been extended for two years w.e.f. 1st August, 2014 for submission of further report by the Tribunal so as to address the terms of reference specified in clauses (a) and (b) of the Section 89 of the Andhra Pradesh Re-organization Act, 2014 (6 of 2014).

The Tribunal has framed preliminary issues on the above reference and the hearings on same are continuing. The proceedings in the references are going on and after exchange of routine replies and rejoinders, the arguments on behalf of the Party States have already begun. The Party States have adduced their witnesses by filing affidavit of their witnesses and the cross examination of the witnesses whose affidavits have been adduced is going on. The witnesses put forward by the Party States are being examined and the hearings are taking place every month in the Tribunal. **The term of the Tribunal has been extended for a further period of one year w.e.f. 01.08.2018**.

Expenditure incurred by the Tribunal

Sl. No.	Specifications	Rs. in lakhs
1.	Budget Allocation for 2018-19	358.00
2.	Expenditure from 4/17 to 03/18	293.00
3.	Cumulative Expenditure up to 31/03/2018	2166.00

VANSADHARA WATER DISPUTE TRIBUNAL (VWDT)

The Supreme Court had directed Central Government to constitute the Vansadhara Tribunal before February, 2010. The Tribunal was notified on 24.02.2010 under the Chairmanship of Mr. Justice B.N. Agrawal with Justice Nirmal Singh and Justice B.N. Chaturvedi as its Members. However, Hon'ble Justice B.N. Agrawal resigned from the post of Chairman on 9th December, 2010 and Justice Nirmal Singh, Member, resigned from the post of Member with effect from 02.01.12. The Central Government has since nominated Hon'ble Dr. Justice Mukundakam Sharma as Chairman of the Tribunal who took over charge of the post on 17.09.2011 and Justice Shri Ghulam Mohammad as Member of the Tribunal who took over charge of the post on 08.04.12.

Further, the Hon'ble Supreme Court vide its order dated 13.12.2013 in I.A. No.7 in Writ Petition (Civil) No.443/2006 has observed as under:

"It is common ground that Vansadhara Water Disputes Tribunal started functioning with effect from 17.9.2012. We are of the view that this date be considered as the effective date of the Constitution of the said Tribunal for the purpose of calculating the period of three years as provided under Section 5(2) of the Inter State River Water Disputes Act, 1956."

In pursuance of the order of the Hon'ble Supreme Court dated 13th December, 2013, the Central Government vide S.O.

778(E) dated 14th March, 2014 has decided that the effective date of constitution of said Tribunal shall be 17th September, 2012, and accordingly, under the provisions of sub-section (2) of section 5 of the said act, the period of three years of submission of report and decision by the Vansadhara Water Disputes Tribunal shall commence from the 17th September, 2012.

The Tribunal delivered its order in I.A.No.1/2010 on 17th December, 2013 allowing the Government of Andhra Pradesh to construct a side weir along with the ancillary works as proposed and has, inter alia, directed for constitution of a three member Supervisory Flow Management and Regulation Committee of river Vansadhara. The State of Odisha has filed a Special Leave Petition against the said order before the Hon'ble Supreme Court and the same is pending for hearing.

The Tribunal has submitted its Report (03 Volumes) with the decision on the issues referred to it within the stipulated time on 13.09.2017. The State of Odisha and also the Central Government have filed explanatory/ guidance applications on 11th December, 2017 and 12th December, 2017 respectively under Section 5(3) of the ISRWD Act, 1956. As per the proviso to Section 5(3) of the ISRWD Act, 1956, the Tribunal may forward to the Central Government a further report within one year from date of such reference i.e. from 11.12.2017.

Further, Mr. Justice Ghulam Mohammad, Member VWDT passed away on 23.11.2017 in Hyderabad. The Chief Justice of India was requested by the Minister (WR, RD & GR) to nominate a sitting judge of High Court/ Supreme Court as a Member, VWDT.

Now, as per Gazette Notification no. S.O. 3923(E) dated 7th August, 2018, the Central Government appoints Ms. Justice Pratibha Rani, Judge of Delhi High Court as Member of the Vansadhara Water Disputes Tribunal. The Tribunal shall examine the explanatory/guidance applications as filed and pending before it, once the Ms. Justice Pratibha Rani joins the Tribunal.

Expenditure incurred by the Tribunal

Sl. No.	Specifications	Rs. in lakh
1.	Budget Allocation for 2017-18	486.11
2.	Expenditure upto 31st March, 2018	457.39
3.	Cumulative Expenditure upto 31/03/18	2241.73

MAHADAYI /MANDOVI WATER DISPUTES TRIBUNAL

The Central Government issued a Notification No. S.O. 2786 (E) dated 16th November, 2010 consisting a Tribunal called as the "Mahadayi Water Disputes Tribunal" for adjudication of water disputes relating to Inter-State river Mahadayi and the river valley thereof, consisting of (1) Hon'ble Justice J.M. Panchal, Judge, Supreme Court of India as Chairman, (2) Hon'ble Justice Viney Mittal, Judge, High Court of Madhya Pradesh as Member and (3) Hon'ble Justice P.S. Narayana, former Judge, High Court of Andhra Pradesh as Member.

The office accommodation for MWDT has been allotted at 5th Floor, A-Wing, Janpath Bhavan, New Delhi. The Tribunal held its first sitting in its own office premises on 21st August, 2013 and having regard to the pleadings by the parties, framed 44 issues for determination and directed the parties to submit list of witnesses to be examined.

The Central Government vide Notification dated 13th November, 2014 decided that the effective date of constitution of MWDT shall be 21st August, 2013 instead of 16th November, 2010. Accordingly the Tribunal shall forward its report under Sub-Section (2) of Section 5 of the said Act to the Central Government within a period of 3 years there from, i.e. on or before 20th August, 2016. Further, as per proviso to Section 5(2) of the said Act, the Tribunal has been given two extensions of one

year each viz. extension given for period of one year w.e.f. 21.08.2016 vide Notification dated 11.08.2016 and extension given for period of one year w.e.f. 21.08.2017 vide Notification dated 24.07.2017.

In the sitting of the Tribunal held on 03.09.2014, the Tribunal while observing that many of the information provided by the States through various documents are inconsistent and/or incomplete hence, gave a number of directions to the party States to produce data, undertake detailed analysis, produce reports, inspect documents etc., on or before 02.12.2014. The Tribunal also directed the Central Water Commission to furnish all available data / information relating to planning and development of water resources of Mahadayi River Basin and to undertake a detailed analysis with a view to checking consistency of data and file report on or before 02.12.2014. The matter was thereafter listed on 09.12.2014; many hearings of Tribunal have taken place since. The Tribunal has disposed of many applications of the contesting parties.

The Tribunal vide its separate order dated 17th July, 2015 directed the party States to file affidavit of evidence of witness/ witnesses dealing with Hydrology. The party States have filed the affidavit of evidence of witness/witnesses which are to be treated as examination in chief of the witnesses concerned. Thereafter the matter was listed from time to time.

During the cross examination of witnesses, the state of Karnataka has moved IA No. 60 of 2015 to permit it at its own cost, to lift or pump 7 TMC of water annually from Mahadayi basin to Malaprabha basin during the months of monsoon. This application has been disposed off by the Tribunal vide its order dated 27.07.2016.

The Tribunal passed the following order on 21.2.2018:

(i). "The final hearing/advancement of final arguments of the learned counsels for the three party-States commenced on 6.2.2018 and lasted upto 21.2.2018.

(ii). During the course of arguments, the learned counsels for the three party-States have produced Notes of arguments-written submissions in support of their respective cases. They are taken on the record of the case as Volume Nos. 217 to 221 and 225 to 238.

(iii). Thus, the final hearing has concluded and the report as contemplated by Section 5(2), as well as the decision of the Tribunal within the meaning of Section 6(1) of the Inter-State River Water Disputes Act, 1956, is reserved.

EXPENDITURE INCURRED BY THE TRIBUNAL

Sl. No.	Specifications	Rs. in lakh
1	Budget Allocation for 2017-18	407.00
2	Expenditure for 2017-18	396.35
3	Cumulative Expenditure upto 31.03.2018	1441.35

RAVI & BEAS WATERS TRIBUNAL

The Ravi and Beas Waters Tribunal which was constituted on 2nd April, 1986 submitted its report on 30th January, 1987. The report was circulated in May, 1987. A reference was made to the Tribunal in August, 1987 comprising reference received from the Central Government and references received from Governments of Punjab, Haryana, and Rajasthan, seeking explanation/guidance on certain points in the report.

However, the Punjab Government was not satisfied with the Award and in the year 2004, the Punjab Legislative Assembly passed the Punjab Termination of Agreement Act, 2004. A Presidential Reference related to Punjab Termination of Agreement Act, 2004 was made to the Supreme Court. The Presidential reference No.1 of 2004 U/A 143(1) of the Constitution of India has since been disposed

off by the Supreme Court vide its judgment dated 10.11.2016. The period for forwarding of further report by the Tribunal has been extended upto 5th August 2019.

Expenditure incurred by the Tribunal

Sl. No.	Specifications	Rs. in Lakh
1	Budget Allocation for 2017-18	**203.10**
2	Expenditure for 2017-18	**110.88**
3	Cumulative Expenditure upto 31.03.2018	**1297.71**

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

5. International Cooperation

BILATERAL COOPERATION

The year 2017 has been quite productive in terms of developing bilateral cooperation in water sector as Ministry of Water Resources, River Development and Ganga Rejuvenation has signed agreement with the Netherlands. It will strengthen mutual cooperation between India and the Netherlands and its agencies to derive maximum benefits in the field of Water and Delta management and water technology, recycling/reuse of waste water etc. to name a few. A brief on the Memorandum of Understanding (MoU) signed during 2017 and Implementation of previously signed Memorandum of Understandings (MoUs) is as follows:

Memorandum of understanding between India and the Netherlands:

- A memorandum of understanding between India and the Netherlands was signed on 27th June, 2017 on cooperation in the field of Water Management by collaborating and sharing of experience and expertise in the areas mutually agreed upon, including technique in river basin management planning/ integrated water resources management, pollution abatement for river including river Ganga, decision support systems (data gathering, application of remote sensing & GIS in hydrology and water resources), delta management-water safety including flood management along rivers, delta and coasts, promoting water management, water quality issues and waste water recycling, and re-use through innovative concession arrangement. A Joint Working Group has been formed on 04.10.2017 for implementing activities envisaged in the Memorandum of Understanding (MoU).

Memorandum of understanding between India-Morocco:

- A memorandum of understanding (MoU) was signed between India and Morocco on 14.12.2017 in New Delhi for Cooperation in the field of water resources on areas of conception, realization and maintenance of the hydraulic infrastructure, notably big dams and water transfer projects, Integrated water resources management (conjunctive use of surface and ground water resources, enhancement of water use efficiency, resilience and adaptation to climate change, artificial recharge of aquifers, organizational, institutional and regulation aspects), flood and drought management, sustainable development and management of ground water resources including recharge augmentation, harvesting and valuation of rainfall water, resilience and adaptation to climate change.

Memorandum of understanding between India-Israel:

- A memorandum of understanding was signed between India and Israel on 11th November, 2016 on “cooperation at the regional, national and international levels in the field of water resources development and management by collaborating and sharing of experience

and expertise in the areas mutually agreed upon, including techniques in the efficient use of water resources, recycling/reuse of waste water, desalination, aquifer recharge and in-situ water conservation techniques", for a period of five years. A Joint Working Group has been formed in September, 2017 for implementing activities envisaged in the Memorandum of Understanding (MoU).

- A team of 20 CWES officers has been deputed to Israel for one week exposure training program as a part of enhancing capacity building and sharing expertise in the field of water sector.

Memorandum of understanding between India-Hungary:

- A Memorandum of Understanding (MoU) was signed between India and Hungary on 16th October, 2016 for "cooperation in the areas of River Basin Management Planning, Integrated Water Resources Management; Water and Waste Water Management; Water related education, research & development; Management of Ground Water", for a period of five years. Article IV of the MoU has been amended and the amended Article has been annexed with the signed MoU. Ministry of External Affairs has been requested to take up the amendments with Hungarian side for their concurrence.

Memorandum of understanding between India-European Union:

- A Memorandum of Understanding (MoU) was signed between India and European Union on 07th October, 2016 under Indo-European Water Partnership (IEWP) with a view to bring together representatives and relevant stakeholders, including interested EU Member States and Indian States, European and Indian Institutions, business and civil society to strengthen, promote and develop cooperation in the field of water management on the basis of equality, reciprocity and mutual benefit. A Joint Working Group has been formed and three JWG meeting has been held so far for implementing Memorandum of Understanding (MoU). All priority areas have been identified and the same has been intimated to group members for implementation of MoU.

INDIA – NEPAL COOPERATION

Sapta Kosi High Dam Multipurpose Project & Sun Kosi Storage cum Diversion Scheme (including Kamala Diversion): Approval for setting up of the Indo Nepal Joint Project Office (JPO) was accorded in March 2003 and JPO started functioning in August 2004 with the mandate of jointly carrying out field investigations and preparation of DPR for Sapta Kosi High Dam Multipurpose Project (SKHDMP) and Sun Kosi Storage cum Diversion Scheme (SSDS). Investigation of Kamla Multipurpose Project (KMP), which is now a component of SSDS, and Preliminary study of the Bagmati Multipurpose Project (BMP) were added to its mandate in October, 2004.

Though the work of Sun Kosi project has progressed well, the work of Sapta Kosi High Dam project has been disrupted on several occasions for reasons, beyond the control of JPO. In view of disruption of work, time extension to JPO was granted from time to time, the last being up to February, 2017.

India- Nepal Joint Team of Experts (JTE): Fifteenth meeting of JTE held in Kathmandu in July, 2017, wherein the progress of the works was reviewed. The Indian side requested the Nepal side to facilitate early resumption of drilling/drifting in Sapta Kosi area. Team Leader, JTE-Nepal agreed to take up the matter and facilitate such support. JTE has 'in principle' agreed for extension of JPO for a period of 30 months w.e.f 1st March, 2017 subject to periodic review of the progress of works.

Pancheshwar Multipurpose Project

(PMP): Pancheshwar Multipurpose Project (PMP) is primarily aimed at energy production and augmenting irrigation in India and Nepal.

A treaty known as "Mahakali Treaty" concerning the integrated development of the Mahakali River, was signed between the Government of Nepal and the Government of India on 12th February, 1996. During the year 2009, an independent autonomous body the Pancheshwar Development Authority (PDA) was set up for development, execution and operation of the Pancheshwar Multipurpose Project as also to finalize its Detailed Project Report. Office of PDA started functioning in the year 2014 in Nepal, with the headquarters at Mahendranagar, Nepal.

Pancheshwar Main Dam is proposed on river Mahakali (known as river Sharda in India), where the river forms the international boundary between Nepal and State of Uttrakhand in India at 2.5 km downstream of the confluence of river Sarju with river Mahakali. The project would comprise of a rock-fill dam with central clay core of 311 m height. Two underground power houses, one on each bank of Mahakali River, with the total installed capacity of nearly 4800 MW are proposed to be constructed at Pancheshwar dam site.

A re-regulating dam on Mahakali River at Rupaligad is proposed at about 27 km downstream of the main dam to even out peaking flows released from Pancheshwar power houses and for meeting downstream irrigation water requirement. Two underground powerhouses on both sides of river with total installed capacity of 240 MW (2 x 60 MW on either bank) are also envisaged at Ruplaigad.

The project aims at producing hydro power and to enhance the food grains production in both the countries by providing additional irrigation resulting from the augmentation of dry season flows. Power generated will be shared equally between both the nations as per Mahakali Treaty. Irrigation benefits in form of annual irrigation will be about 0.43 Mha, with 0.17 Mha in Nepal and remaining 0.26 Mha in India. In addition, due to moderation of flood peak at reservoir(s), incidental flood control benefits for both the countries are also envisaged from the project.

The work of preparation of Detailed Project Report (DPR) was entrusted to Water and Power Consultancy Services Limited (WAPCOS) by PDA. WAPCOS have submitted the draft final DPR in November, 2016. At present the finalization of draft DPR of the project is underway, for which a Team of Experts/Officials has been formed by both the countries. Two meetings of joint team of Experts/officials have taken place, first was held in August, 2017 at Kathmandu, Nepal and Second meeting was held in September, 2017 at New Delhi and most of the issues have been resolved.

After finalization of DPR by PDA, PDA shall undertake the execution, operation and maintenance of the Project, including the work of re-regulating dam at Rupaligad site in an integrated manner.

India- Nepal Joint Committee on Inundation and Flood Management (JCIFM): Eleventh meeting of Joint Committee on Inundation and Flood Management (JCIFM) was held in April, 2017 in Nepal in which progress of the ongoing works and other flood management issues between two countries were discussed.

INDO-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 efforts in maximizing the benefits from common river systems. It is headed by Water Resources Ministers of both the countries. So far, 37 meetings have been held. The last meeting was held in March, 2010 in New Delhi.

(i) Treaty on Sharing of Ganga/Ganges Waters at Farakka:

A Treaty was signed by the Prime

Ministers of India and Bangladesh on 12th December, 1996 for the sharing of Ganga/ Ganges waters at Farakka during the lean season. As per the Treaty, the Ganga/Ganges waters is being shared at Farakka (which is the last control structure on river Ganga in India) during lean period, from 1st January to 31st May every year, on 10-daily basis as per the formula provided in the Treaty. The sharing of water as per the Treaty is being monitored by a Joint Committee headed by Members, JRC from both sides. The 66th and 67th meeting of Joint Committee were held at Dhaka (May, 2017) and New Delhi (October, 2017), respectively. The "Ganga Water Treaty of 1996" with Bangladesh is being implemented to the satisfaction of both the countries since 1997.

(ii) Proposed "Ganga/Padma Barrage Project" in Bangladesh:

Government of Bangladesh has proposed to construct "Ganga/Padma Barrage Project" at Pangsha in Bangladesh. In this context, an Indian Team visited the project site in October, 2016 and held a meeting with Bangladesh officials at Dhaka, thereafter. Further, a "Joint Technical Sub-Group" comprising of Indian and Bangladesh officials has been formed to jointly study the different aspects of this Project.

INDUS WATERS TREATY 1960

Under the Indus Waters Treaty 1960, lndia and Pakistan each have created a permanent post of Commissioner for Indus Waters. Each Commissioner is the representative of his Government and serves as a regular channel of communication on all matters relating to implementation of the Treaty. The two Commissioners together form the Permanent Indus Commission (PIC).

During the year 2017-18, two meetings of Water Resources Secretaries of both the countries were held at World Bank headquarters in Washington DC, USA to discuss the issues on Kishanganga and Ratle Hydroelectric plants.

In fulfilment of the provisions of Indus Waters Treaty, the daily G&D data of 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.

Irrigated Cropped Area statistics for the crop year 2016-17 for the Indus, the Jhelum & the Chenab basin had been compiled and sent to Pakistan as per the provisions of Indus Waters Treaty.

Flood flow data for agreed sites on the

Signing of Record of Discussion of 66th Joint Committee meeting on 18th May, 2017 at Dhaka, Bangladesh

rivers Ravi, Sutlej, Tawi and Chenab was also communicated by lndia to Pakistan as a gesture of goodwill and friendship for their benefit through telephone during 4th July to 7th October, 2017 to undertake advance flood relief measures.

Clearance of Projects from Indus Waters Treaty Angle issued / to be issued for:

Nakthan HE Project (460 MW) Stage-I, on Prabati River and Tosh Stream in H.P. has been cleared from Treaty angle.

Shahpur Kandi Dam Project:

The mediation efforts of this Ministry have helped the States of J&K and Punjab to reach an agreement under its aegis to resume works of Shahpur Kandi Dam project in Punjab/ J&K. The dam will help in providing irrigation facility to 5000 hectares in Punjab & 32173 hectares in J&K besides generation of 206 MW power. This will help towards optimum utilization of lndia's rights on Eastern Rivers of Indus basin. It is a National project and eligible Central Assistance will be provided by this Ministry.

Ujh Multipurpose Project:

To fast track utilization of India's rights under lndus Waters Treaty, the detailed Project Report of Ujh Project was submitted to Government of J&K. This project will store around 0.65 MAF of waters of river Ujh (a tributary of river Ravi) to irrigate 30,000 ha. and produce more than 200 MW of hydropower. The DPR is being examined by Govt. of J&K. It is a National project and eligible Central Assistance will be provided by this Ministry.

Pong Dam Oustees:

Four meetings of High Powered Committee set up by Hon'ble Supreme Court under the chairmanship of Secretary (WR, RD & GR) were held. In these meetings, the Committee has sorted out various related issues between the two States and has been reviewing the progress of resettlement from time to time. Several decisions have been taken in these meetings to expedite the resettlement process.

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

6. External Assistance in Water Resources Sector

The Ministry of Water Resources, River Development and Ganga Rejuvenation assists the State Governments in availing external assistance from different funding agencies to fill up the resource gap and state of the art technology for water resources development and management in the country. There are 12 ongoing externally aided projects in various States with the assistance from different funding agencies, viz. World Bank (4), Asian Development Bank (5) and Japan International Cooperation Agency (JICA) (3).

Brief of the World Bank, Asian Development Bank and Japan International Cooperation Agency (JICA) assisted ongoing externally aided projects in water sector is given in the table below:

Status of Ongoing Externally Aided Project in Water Sector

No	Funding Agency	Name of State	Name of Project	Agreement effective/ Closing date	Project cost US$ in mill	Loan amount US$/ XDR in mill	State Govt share US$ mill	Cumulative Disbursement amt US$/ XDR in mill
1	WB	Andhra Pradesh & Telangana	7897-IN (IBRD): Water Sector Improvement Project	14.8.2010/ 28.7.2018	988.97	450.60 (USD)	529.06	322.35
2	WB	Madhya Pradesh, Odisha, Kerala & Tamil Nadu	7943-IN (IBRD): Dam Rehabilitation and Improvement Project	18.4.2012/ 30.6.2020	437.50	139.65 (USD)	72.73	0.44
			4787-IN (IDA): Dam Rehabilitation and Improvement Project			93.02 (XDR)		82.79
3	WB	West Bengal	8090-IN (IBRD): West Bengal Accelerated Development of Minor Irrigation Project	19.3.2012/ 20.12.2019	205	30 (USD)	50	1.22
			5014-IN (IDA): West Bengal Accelerated Development of Minor Irrigation Project			78.20 (XDR)		50.88
4	WB	Uttar Pradesh	5298 IN (IDA): Uttar Pradesh Water Sector Restructuring Project, Phase-2	24.10.2013/ 31.10.2020	515	239.40 (XDR)	155	84.21
5	ADB	Maharashtra & Karnataka	2679-IND: Sustainable Coastal Protection and Management Investment Program-I	17.8.2011/ 30.6.2018	58.50	47.37	11.10	32.13

6	ADB	Assam	2684-IND: Assam Integrated Flood and River-bank Erosion Risk Management Investment Program-I	10.5.2011/ 31.7.2017	60.62	48.50	12.12	37.62
7	ADB	Karnataka	3172-IND: Karnataka Integrated & Sustainable Water Resources Management Investment Program-1	7.5.2015/ 31.3.2019	48	31	17	7.89
8	ADB	Odisha	3265-IND: Orissa Integrated Irrigated Agriculture and Water Management Investment Program Tranche-2	7.6.2016/ 17.9.2018	171.56	120	47.78	26.55
9	ADB	Tamil Nadu	3394-IND: Climate Adaptation in Vennar Sub-basin in Cauvery Delta Project	14.7.2016/ 30.6.2021	144	100	44	11.76
10	JICA	Andhra Pradesh & Telangana	IDP-181: Andhra Pradesh Irrigation & Livelihood Improvement Project Phase-1	30.3.2007/ 10.7.2017	1137.77 cr (INR)	15129.95 million (JPY)	186 cr (INR)	15129.95 million (JPY)
11	JICA	Odisha	IDP-244: Rengali Irrigation Project Phase -2	30.3.2015/ 30.3.2026	2255 cr (INR)	32378 million (JPY)	473 cr (INR)	1003.19 million (JPY)
			IDP-244A: Rengali IrrigationProject Phase-2			1581 million (JPY)		165.32 million (JPY)
12	JICA	Rajasthan	IDP-259: Rajasthan Water Sector Livelihood Improvement Project-I	26.10.2017/ 26.10.2024	2606.20 cr (INR)	13145 million (JPY)	-	0
			IDP-259A: Rajasthan Water Sector Livelihood Improvement Project-I			580 million (JPY)		0

1. Water Sector Improvement Project in Andhra Pradesh and Telangana:

Achievements in Andhra Pradesh:

- Increased irrigation area by bridging gap ayacut to an extent of 90,000 acres after carrying out modernization works.
- Increase in crop yields (15% to 25%) of five major crops (Paddy, Cotton, Maize, Groundnut and pulses).
- Productivity is increased in paddy from 35 bags (75 kgs/bag) per acre to 45 bags per acre due to availability of adequate water, inputs and handholding support by the department.

The farmers have been motivated to use groundwater by digging new wells and promote conjunctive use of surface and groundwater. 184 farmers have sought technical advice from GWD, 124 wells constructed. 16 of farmers were fitted with solar pump sets.

Achievements in Telangana State:

- Total area irrigated under the project is increased, reducing about 80% of the gap ayacut.
- Water is reaching the tail end areas to the satisfaction of the farmers due improved conveyance efficiency.
- Demonstrations on improved agricultural and water management practices like mechanised transplantation, drum seeder technology, alternate wetting and drying, integrated crop management, introduction of new verities in all the major crops etc.,

have prompted large scale adoption by the farmers in the command.

- Adoption of improved agricultural and water management practices resulted in increased yield of the five major crops (paddy, maize, chillies, cotton and groundnut) by more than 25%.
- About 5% of the cropped area under the project has been diversified into high value crops such as vegetables, chillies, cotton and maize from paddy.

2. Dam Rehabilitation and Improvement Project:

Rehabilitation Progress:

- ❖ Design Flood Review completed for all dam projects to check the adequacy of Flood handling capabilities.
- ❖ Formation of Dam Safety Review Panels consisting of independent experts by each States. DSRP inspected all the DRIP dams.
- ❖ Geophysical investigation for 5 dams.
- ❖ De-siltation study for 3 dams.
- ❖ Idukky Arch Dam – Study of unusual dam Behavior and distress completed.
- ❖ Rehabilitation works completed for 20 dams.

Institutional Strengthening:

- ❖ 78 National training programmes have been conducted for over 2,700 officials.
- ❖ 4 International Training on Dam Safety held at Deltares, Netherlands and USBR, USA.
- ❖ 6 technical exposure visits have been organised to Japan involving 40 participants for seismic, desiltation, and instrumentation.
- ❖ Collaboration with Japan Water Agency to develop the O&M Manual for Seismic Events.
- ❖ Organization of four National Dam Safety conferences in Chennai (March, 2015), Bengaluru (January, 2016), Roorkee (February, 2017), and Kerala (January, 2018).

3. West Bengal Accelerated Development of Minor Irrigation Project:

Achievement/Change Process:

- **Focus Area -** From Northern districts to Western districts;
- **Intensive Approach -** from entire state to selected polygon and now micro-watershed based;
- **Allocation -** Redefining and Redistribution of staff and Support Organizations team accordingly;
- **GIS & remote sensing -** Use of GIS in planning, monitoring and impact assessment;
- **Department Engineers -** All Executive Engineers with their Assistant Engineers/ Sub Assistant Engineers are involved in Project implementation in western districts;
- More focus on **Community involvement in** Planning, implementation & ownership;
- **Involvement of good NGOs** as output based service providers;
- **Schemes -** Priority shifted from Ground water to Surface flow scheme;
- **Type of schemes -** Dug well (PDW), Water Detention Structure (WDS), Check Dam, *hapa* Lift Irrigation (LI) and Tube Well (TW);
- **Design & Specifications-**Improvised and modernized. Resulted in more effective, efficient and significant reduction in cost;
- **Bill of quantities (BOQ)** and **Schedule of rates (SoR) updated and** revised;
- **Scaling up-** All the GIS;
- **Energization -** Improvised and more effective Energization, time taken for energization significantly reduced;
- Solar & Solar hybrid schemes pilot tested, Solar schemes promoted;
- **Use of Technology-**
- Resistivity test, GPS, Water Meter, DWLR, water budgeting etc. ; and
- Promoting & facilitating use of technologies in agriculture, horticulture and fishery practices.

4. Uttar Pradesh Water Sector Restructuring Project Phase-2:

Development of River Basins Assessments & Plans for all major rivers:

- Agreement signed on 10.12.2015, and work started on March, 2016;
- Inception report delivered on 23.6.2016, SWARA has approved on 28.6.2016;
- Report on Knowledge Based Design approved on 9.12.2016;
- Status of the work completed is 45%.

Assessment of Impact of Climate Change on Water Resources of State:

- 3 nos proposals received, technical and financial evaluation completed;
- Competent Authority advised to sign the agreement after availability of funds.

Flood Management Information System Implementation (FMIS):

- GIS software and communication equipments have been procured;
- GIS specialists, analysts, web master, system managers, IT specialists, embankment and flood management experts are positioned.

5. Sustainable Coastal Protection and Management Investment Programme:

Achievements in Assam:

- Achievement in Maharashtra:
- Mirya Bay Geotextile Reef construction is completed;
- Mirya Bay Beach Nourishment work is completed;
- Mumbai Maritime Board (MMB) home page is operation;
- Geographic Information System is operational;
- Raw Coastal Data is available for download;
- Maharashtra Shoreline Management Plan 2017 is completed.

Achievements in Karnataka:

- Shoreline Management Plan (SMP) for two districts i.e. Dakshina Kannada and Udupi prepared and approved, whereas SMP for Uttara Kannada is waiting Govt. approval;
- Construction of 6 Inshore Berms at Ullal are completed;
- Work of rehabilitation of north & south Breakwater of Ullal are completed;
- Construction of 2 Offshore Reefs at Ullal is completed.

6. Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program Phase-1:

Under Palasbari-Gumi sub-project: Palashbari erosion protection works (Package 1&2)	98% of work is completed
Gumi erosion protection works (Package 1&2)	Work is completed
Construction of Palashbari embankment with blacktopped road & slope protection works above LWL	95% of work is completed
Under Dibrugarh sub-project: Construction of revetments, water geo-bag apron for Matholla – Oakland bank protection work	Work is completed
Raising and strengthening of Dibrugarh Town Protection Embankment, 9.5 km at Dibrugarh	Work is completed
Emergency work for protection of Dibrugarh Town Area & Motholla Oakland	Work is completed

7. Karnataka Integrated and Sustainable Water Resources Management Investment Program Phase-1:

Achievements by Water Resources Department through **Karnatka Neeravari Nigam Limited (KNNL):**

- The Advanced Centre for Integrated Water Resources Management (AC-IWRM) is completely operational with all the specialists recruited.
- The Gondi Canal contract is awarded on 26.2.2016. Canal lining work is started in the June closure period. As on March, 2018, 92.51 km of main canal and distributaries are lined and 604 out of 678 structures are constructed. Extension is given to the contractor upto 31st December, 2018 for completion of the work.
- The contract for installation of 100 flow measurement & telemetry systems in Gondi, Bhadra, Upper Tunga Project, Singatalur LIS, Vijayanagara Channels, Tungabhadra Left Bank Canals is awarded on 23.11.2015. As of March, 2018 end 82 numbers of flow measurement & telemetry systems are installed in Bhadra Project, Upper Tunga Project, Singatalur LIS and Tungabhadra Left Bank Canal system. Balance telemetry system are to be installed in Gondi and Vijaynagar Channels for which completion of modernization is awaited.
- Command Area Development (CAD) works-124 CAD works are awarded as community participation packages in 11 Water Users Cooperative Societies (WUCS). The original 124 CAD works are scheduled to be completed by 31-08-2018. Additionally 104 CAD packages are awarded to these 11 WUCS and action is being taken to award 6 CAD packages. These additional 110 CAD packages are scheduled to be completed by 31-12-2018.

8. Orissa Integrated Irrigated Agriculture and Water Management Investment Program Tranche-2:

Progress of civil works in Orissa

Sl. No.	Name of the Project	Total No. of Packages		Packages Awarded		Expr. incurred Rs. in cr. (as on 31.03.2018)	% Expenditure
		Nos.	Cost in Crore	Nos.	Cost		
1	2	3	4	5	6	7	8
1	Machhagaon Canal	21	81.14	21	81.14	54.27	67%
2	Pattamundai Canal	31	156.57	31	156.57	112.41	72%
3	HLC Range-1 Canal	14	59.30	14	59.3	36.63	62%
4	MCII	17	106.9	8	60.06	11.58	11%
5	Ramial	9	32.38	9	32.38	28.35	88%
6	Kanjhari	7	32.06	7	32.06	32.15	78%
7	Kansbahal	7	22.65	7	22.65	12.18	54%
8	Saline Embank	12	93.38	10	82.77	73.99	79%
	G. Total	118	584.38	107	526.93	354.56	61%

9. Climate adaptation in Vennar Sub-basin in Cauvery Delta Project:

Progress of construction of civil works:

Sl. No.	Work	Value in Rs. crore	Year of completion	Physical progress (%) (as on 31.03.2018)	Financial progress (%)
1	Vellaiyar	178.17	2019	30	25
2	Pandavaiyar	100.80	2019	70	
3	Harichandranathi	257.74	2019	30	
4	Adappar	168.35	2019	30	
5	Valavanar Drain	44.62	2019	35	
6	Vedaranyam Canal	32.18	2019	45	
7	Pumping schemes	14.59	2018	75	
8	Other activities	164.21	-	30	

10. Andhra Pradesh Irrigation and Livelihood Improvement Project Phase-1:

Impact assessment and evaluation:

- The project has developed integrated water conservation and management systems which harness all the water resources to improve land productivity and water use efficiency;
- Involvement of primary stakeholders is very much evident in management of water resources;
- Agriculture growth and increase in rural income have been achieved through increase land, water and labour productivity masked by sustainable agriculture diversification; crop diversification with emphasis on enhancement of non-paddy area for improvement of cropping intensity, economic returns and productivity is observable;
- Utilization of ground water in the vicinity of project ayacut contributed to enhancement of cropping intensity;
- **Andhra Pradesh Irrigation and Livelihood Improvement Project (APILIP)– Japan International Cooperation Agency(JICA)** have strengthened institution development through capacity building in the project area; and
- Rise in farm income, ultimately the enhancement of livelihoods of direct and indirect stakeholders of these irrigation projects has been achieved.

11. Rengali Irrigation Project Phase-2:

Status of physical progress as on date 18.08.2018:

Pkg. A1 - Out of 13 Nos. of Structures 12 nos. are going to be completed only one H.R at Sitalabasa Minor is on progress.

Pkg. A2 - All the 13 Nos. of Structures are going to be completed.

Pkg. A3 (A) - Agreement drawn on dt. 12.03.2018 on the work is in progress.

Pkg. A3 (B) - The Financial Bid is to be approved by DoWR.

Pkg. B1 - Out of 88 nos. of structures 73 nos. of structures are completed.

Pkg. B2- Agreement drawn on dt. 02.08.2018 and mobilization of Machineries started for construction.

Pkg. C1 - Financial Bid is to be approved by the DoWR.

Pkg. C2 - Financial Bid is to be approved by the DoWR.

Pkg. C3 - Financial Bid is to be approved by the DoWR.

Pkg. C4 - Technical Evaluation submitted to the Govt. for approval.

Pkg. D1 - Rehabilitation Action Plan is in progress.

Pkg. E1 - P-Q documents for ICB received and opened on 18.08.2018 for further action.

12. Rajasthan Water Sector Livelihood Improvement Project Phase-1:

The project envisage to increase the productivity of irrigated agriculture through improved surface irrigation systems performance, introduction of micro irrigation system, and improving water management and strengthen agriculture support services, involving greater participation of users in service delivery. The project has recently been implemented.

DESIGN CONSULTANCY TO INTERNATIONAL PROJECTS

The Central Water Commission is actively associated with the designs of the Mega Water Resources project in the neighbouring countries v/s Indo-Nepal (2 projects), Bhutan (4 projects), Afghanistan (1 project) by way of design consultancy.

INTERNATIONAL PROJECTS

1. Punatsangchhu-I H.E. Project, Bhutan
2. Punatsangchhu-II H.E. Project, Bhutan
3. Sapta-Kosi & Sun-Kosi Multi Purpose Project, Indo-Nepal
4. Pancheshwar Multi Purpose Project, Indo-Nepal
5. Arun-III H.E Project, Nepal
6. Tala H.E. Project, Bhutan(Projects with Special Problems)
7. Chukha H.E.Project, Bhutan (Projects with Special Problems)

1. Punatsangchhu-I H.E. Project, Bhutan:

Punatsangchhu-I H.E. Project which intercepting total catchment area of 6390 sq. km. envisages construction of a concrete gravity type dam, 130 m. high above the deepest foundation and 240.0 m long at the top. The overall length of the spillway section of the dam is 120.0 m comprising of seven nos. of sluice spillway bays, each of 8 m width with crest elevation at 8El.1166.0 m. to pass simultaneously Probable Maximum Flood of 11500 cumec + GLOF of 4300 cumec. The length of the concrete non-overflow section on both sides of dam would be about 120.0 m. The dam would provide a gross pondage of 24.92 MCM and live pondage of 12.38 MCM between MDDL 1195 m and FRL 1202 m to enable the power station envisaged under the project, to cater to dilurnal variations in power requirements. The project has an installed capacity of 1200 MW and construction of the project is underway.

2. Punatsangchhu-II H.E. Project, Bhutan:

The Punatsangchhu-II H.E. Project envisages construction of 86 m. high concrete gravity dam with an installed capacity of 1020 MW. The dam is located 29 km. downstream of the Wangdue Bridge and 3 km downstream of TRT outfall of PHEP-I on Wangdue Tshirang National Highway. The dam comprises of seven sluice blocks and five non-overflow blocks. The length of the dam is 213 m. The top of dam is at El.846 m. with FRL at El. 843 m. and MDDL at El.825 m. Seven sluices of gate size 8m. (w) x 13.2 m (H) have been provided at EL.797 m. for discharging simultaneously PMF 11723 cumec and GLOF of 4300 cumec. The project has a catchment area of 6835 sq. km. The gross storage capacity of the reservoir formed by dam construction is 7.0 MCM and the live storage capacity is 4.64 MCM.

3. Sapta Kosi & Sun Kosi Multipurpose Project, Indo-Nepal:

The Sapta Kosi High Dam Multipurpose Project, as per the preliminary studies carried out, envisages construction of a 269 m. high dam to divert river waters through a dam toe power house with an installed capacity of 3000 MW (at 50% load factor) and irrigation of 15.22 lakh ha. Gross command area through construction of a barrage one km downstream of the dam. A joint project office has already been set up in Nepal for investigation of the project. Field investigation studies and

preparation of DPR for Sapta Kosi High Dam Multipurpose project & Sun Kosi Storage cum Diversion Scheme are to be taken up jointly by Govt. of India and HMG Nepal.

Status: DPR stage design engineering for this project is being carried out by Central Water Commission. Investigations to be carried out have been identified which are under progress by CWC (Indo-Nepal joint group). Design and drawings works would be prepared after receipt of the data from project authority.

4. Pancheshwar Multipurpose Project (Indo – Nepal):

An MoU has been signed between CWC and WAPCOS (I) Ltd for Pancheshwar multipurpose project (PMP) and Rupaligad H.E. Project (Indo – Nepal for providing consultancy services for Preparation/ updation of Detailed Project Report (DPR). Design (N&W) unit is providing consultancy to WAPCOS in preparation of design/ drawings for preparation of the updated DPR of the project in respect of Pancheshwar main Rockfill dam, upstream and downstream cofferdams. Total 11 Nos. (6 original + 5 Revision) of drawings related to Pancheshwar Main Rock fill dam, U/S Coffer dam and D/S Coffer dam were issued to WAPCOS for inclusion in the updated DPR. The Final Draft DPR received from WAPCOS Ltd. has been technically examined in Designs (N&W) unit and combined comments have been issued to WAPCOS Ltd. Subsequently, Minutes of the meeting held in the chamber of CE, Design (N&W) on 30/01/2017 between officers of Design (N&W) unit and WAPCOS officers, to discuss the design related comments on final Draft DPR of Pancheshwar Multipurpose Project, were communicated to WAPCOS. Member (WP&P) convened a meeting on 21.03.2017 with Commissioner (FM) and the finalized comments were sent to MoWR for onward transmission to PDA, Nepal.

The PDA prepared a synthesized document listing therein the comments of both from the Govt. of India and the Govt. of Nepal. A team of experts (TOE) was subsequently constituted for resolving outstanding issues by both the governments. First meeting of the team held at Nepal during 21st -23rd August, 2017 during which some of the technical observations were resolved and the second meeting was held at Delhi during 5th-6th September, 2017 during which almost all technical comments were resolved.

5. Arun-3 HE Project (4 x 225 MW), Nepal:

MoU between CWC & SJVN for providing design consultancy services for 900 MW Arun-3 HEP in Nepal **as Retainer Consultant** signed on 10th August, 2017.

Arun-3 HEP (4 x 225 MW) is a run-of the river project located on Arun River a tributary of Koshi in the district of Sankhuwasabha (Eastern Nepal) with a catchment area of 26747 sq.km. The project will use 344.68 cumecs of design discharge and will generate about 3924.03 GWh energy per annum at 90% dependable year. The project comprising of 70 m high diversion dam, intake structure with four bell mouth opening leading to four no. of intake tunnels of 6 m diameter, restricted orifice type Surge Shaft of 24 m diameter, two vertical steel lined underground pressure shafts each of 5.5 m dia. with bifurcation into four of diameter 3.2 m to feed the four 225 MW capacity Francis turbines placed in underground Power House of size 179.49 m (L) x 22.5 m. (W) x 49.5 m. (H). Water after generation has been proposed to be discharged into the river through 10 m modified horse-shoe shaped concrete lined TRT tunnel.

Transient analysis of water conductor system of Arun 3 HEP has been carried out in this directorate and the comments / observations of the same were communicated to SJVN. The proposal for the removal of Desilting Chamber has been submitted by SJVN and same has been broadly examined and comments/observations were communicated to project authority.

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

7. Organisations and Institutions

ATTACHED OFFICES

CENTRAL WATER COMMISSION (CWC)

Central Water Commission (CWC) with its headquarters at New Delhi is a premier technical organisation in the field of Water Resources in the country since 1945. The Commission has been 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 Irrigation, Flood Control, Drinking Water Supply and Water Power Development.

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

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

MAJOR ACTIVITIES of CWC:

(i) Hydrological Observations:

Central Water Commission is operating a network of 954 hydro- meteorological observation stations (including 76 exclusive meteorological stations) throughout the country on all major river basins to observe (i) water level (gauge), (ii) discharge, (iii) water quality, and (iv) silt besides selected meteorological parameters including snow observations at key stations. The hydrological data collected from sites is scrutinized, validated and published in the form of Water Year Book, Water Quality and Year Book and Sediment Year Book, etc. The data so collected is utilized for planning and development of water resources projects, climate change studies, water availability studies, flood / inflow forecasting, examination of international & inter-State issues, river morphological studies, inland waterway development, Reservoir Siltation studies and research related activities, etc.4

In addition to this, Central Water Commission has opened 722 new sites. However, measurement of few parameters with reduced frequency is being done at these sites due to paucity of required manpower.

(ii) Water Quality Monitoring:

Central Water Commission is monitoring water quality at 429 key locations covering all the major river basins of India. At present the water quality network covers 67 main rivers, 138 tributaries and 64 sub-tributaries.

The water quality data generated is computerized in Data Base system and disseminated in the form of Water Quality Year Books, Status Reports and Bulletins. The water quality data is used by different agencies for planning of water resources project, research purposes and sewerage treatment plant etc.

CWC is operating online Water Quality

Monitoring System at three sites, namely, Agra (Jawahar Bridge) on river Yamuna, Lucknow on river Gomti and Moradabad on river Ramganga for measurement of pH, conductivity, temperature, dissolved oxygen, bio- chemical oxygen demand (BOD), Chemical Oxygen Demand (COD).

(iii) Survey and Investigation:

CWC is carrying out surveys and investigations for preparation of Detailed Project Reports (DPRs) in the NE region, Sikkim, Bihar, Jharkhand and J&K on the request of the respective States for development of water resources potential for irrigation, hydropower and other uses.

The investigations for various projects were continued during 2017-18 namely, Kalez Khola HE Project (Sikkim), Rukni Irrigation Project (Assam), Sonai Irrigation Project (Assam), Tarumchu HEP (Sikkim), and Land Kali Khola HEP (Sikkim).

A Joint Project Office for Sapta Kosi, Sun Kosi Investigations (JPO-SKSKI) based in Biratnagar (Nepal) is carrying out surveys and investigations for preparation of DPR of Sapta Kosi High Dam and Sun Kosi Storage-cum-Diversion Project jointly with Nepal for mutual benefit of both the countries.

(iv) Project Appraisal:

During the year 2017-18, technical examinations of 13 water resources projects (8 irrigation and 5 flood management) were completed and accepted by the Advisory Committee of Ministry of Water Resources. The irrigation projects accepted by the Advisory Committee would provide irrigation to 14,07,870 hectare area land and flood management projects will provide protection to 4,53,894 persons and 1,48,331 hectare area land. A total of 45 irrigation projects were appraised during the year 2017-18. As of now, 18 Major projects as well as 4 revised cost estimates (all Major) are under different stages of appraisal.

Apart from the appraisal of Irrigation and Flood Control projects, civil components of hydroelectric projects are also appraised by Central Water Commission. The appraisal of Civil aspects including appraisal of cost estimates for 11 hydroelectric projects have been completed during the current year.

A web enabled Project Appraisal Management System (e-PAMS) is under development. A Dashboard has already been made operational for monitoring the status of appraisal of ongoing Major & Medium Irrigation and flood management projects. The basic version of the e-PAMS application has been created for the irrigation and multipurpose projects.

(v) Project Monitoring:

A three tier system of monitoring at Centre, State and Project level was introduced in 1975. At Central level, this work was entrusted to CWC. The main objective of monitoring is to ensure the achievement of physical and financial targets and achieve the targets of creation of irrigation potential. Monitoring system is also expected to contribute in identification of the inputs required, analysis of the reasons for any shortfalls/bottlenecks and suggest remedial measures etc., with a view to complete the projects in a time bound manner.

During 2017-18, a total of 47 (20 Major and 27 Medium) projects under General Monitoring and 149 (73 Major, 55 Medium and 21 ERM) on-going projects under PMKSY-AIBP are targeted by CWC field units. During 2017-18, 7 monitoring visits were undertaken and 6 status reports were issued in respect of projects under General Monitoring. Similarly, 141 visits were undertaken and 111 status reports were issued for projects under PMKSY-AIBP.

During 2015-16, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) has been conceived by the Central Government. The programmes as being implemented by the Govt. of India, viz; Accelerated Irrigation Benefits Programmes (AIBP);

Repair, Renovation and Restoration (RRR) and Command Area Development and Water Management (CADWM) have been subsumed in PMKSY. Out of 149 ongoing projects under AIBP, 99 projects have been identified as priority projects under PMKSY-AIBP with a dedicated funding mechanism to complete these projects in a time bound manner by December, 2019.

(vi) Morphological Studies:

The study of river morphology and implementation of suitable river training works as appropriate have become imperative for our nation as large areas of the country are affected by floods every year causing severe damage to life and property in spite of existing flood control measures taken both by Central and State Governments. Problems are aggregating mainly due to large quantity of silt/ sediment being carried and deposited in its downstream reaches. The special behaviour of the river needs to be thoroughly understood for evolving effective strategies to overcome the problem posed by it.

During the 12th Plan period, consultancy works for morphological studies of 15 rivers (Ganga, Sharda, Rapti, Kosi, Bagmati, Yamuna, Bramhaputra, Subansiri, Pagladiya, Krishna, Tungbhadra, Mahananda, Mahanadi, Hoogli, & Tapti) by using Remote Sensing technology have been awarded to IITs /NITs under the Plan Scheme "R&D Programme in Water Sector".

The remaining part of the above studies have been included in the EFC of Plan scheme "Research and Development programme in water sector and implementation of National Water Mission" during the remaining period of 14th Finance Commission i.e. 2019-20.

(vii) National Water Mission and Climate Change Issues:

The "National Water Mission" was formulated by Ministry of Water Resources with main objective of "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management". The Mission, duly approved by the Government, has set five goals to achieve the above objective, which are:

1. Comprehensive water data base in public domain and assessment of the impact of climate change on water resource.
2. Promotion of citizen and state actions for water conservation, augmentation and preservation.
3. Focused attention on vulnerable areas including over-exploited areas.
4. Increasing water use efficiency by 20%.
5. Promotion of basin level integrated water resources management.

Climate Change Cell was created in CWC in August, 2007 to deal with all the studies, works and reports on the subject regarding impact of climate change on water resources being referred to CWC. CWC provides inputs and assistance to National Water Mission (NWM) Secretariat in examining the research proposals related to climate change received in NWM Secretariat.

(viii) Hydrological Studies:

Hydrological studies form the backbone of a water resources project. The success of a project is largely governed by the hydrological inputs. The inputs in Detailed Project Report (DPR) or Pre- Feasibility (PFR) stage are made available in the form of:

(i) Water availability/Yield Studies

(ii) Design flood estimation

(iii) Sedimentation studies

(iv) Diversion flood studies

In addition to above, special studies in respect of review of flood hydrology for existing projects as per dam safety guidelines is also carried out.

So far, flood estimation reports covering 24 sub- zones have been published. The periodic revisions/updating of earlier reports are carried out whenever additional data are received.

During the year 2017-18, Technical examination of hydrological aspects of DPRs in respect of 80 projects have been carried out in CWC. Out of this, 46 projects have been cleared and observations/comments were issued in 21 of the projects. 13 projects are still under examination. In addition to above, HSO unit is also carrying out other specialized studies related to hydrology.

CWC also provides support in the field of Hydrology related to capacity building and training, modernization, BIS standardization, development of computer software as well as technical coordination with National and International organizations.

(ix) Design Consultancy:

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

At present CWC is providing design consultancy to 64 projects. Out of this, 29 projects (including 3 from North Eastern Region and 3 from neighboring countries) are at construction stage; 13 projects (including 3 from North Eastern region and 3 from neighbouring countries) are at DPR stage and 22 projects (including 02 from North Eastern region and 02 from neighboring countries) involve special problems.

In addition to above, technical examinations of DPRs of 66 nos. of Hydro-electric/ Irrigation/ Flood Management/ Multi-Purpose Projects were also carried out during the year (till Dec 2017). These include 7 projects from neighbouring countries, namely, Indo-Nepal (2), Nepal (2), Afghanistan (2) and Bhutan (1). Out of these, DPRs of 22 nos. of projects have been cleared. Remaining 44 Nos. of projects are at various level of appraisal.

(x) Environmental Management and Rehabilitation & Resettlement:

CWC is compiling data relating to salient features of Rehabilitation & Resettlement aspects of Major/Medium, existing /on-going water resources projects based on the information received from various State Governments. Till now, the information received from State Governments related to 490 Major and Medium Irrigation Projects have been compiled. CWC is also compiling data relating to Submergence, R&R Issues of Major & Medium Projects monitored by field units of CWC and various State Governments. Till now, 92 Major and Medium Irrigation Projects have been compiled.

The draft Rehabilitation & Resettlement Plan for Siang Single Storage Project prepared by CWC in August, 2015 was modified to include best provisions of various existing R&R Plans and provisions in "Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement Rules–2015. A tentative estimate for Rehabilitation & Resettlement Plan for Upper Siang Basin Project, Arunachal Pradesh has also been prepared.

A National Environmental Monitoring Committee for River Valley Projects (NEMCRVP) has been set up by the Ministry of Water Resources to monitor implementation of Environment Management Plan and observance of environmental clearance. Member (Water Planning & Projects) is the Chairman of this inter-ministerial multi-

disciplinary Committee. NEMCRVP has representatives of Ministries of Environment & Forests, Agriculture & Co-operation, Tribal Affairs and Water Resources, besides NITI Aayog.

The latest status of the implementation of the environmental safeguards of the projects have been sought from the Chairmen of the State Level Environmental Monitoring Committees for consideration of National Environmental Monitoring Committee for appropriate action in the matter. The information received in respect of 12 projects has been compiled.

(xi) Environmental Impact Assessment:

Central Water Commission (CWC) has taken up Environmental Evaluation/Impact Assessment Study of selected river valley projects in the country. The studies in respect of 7 projects namely, Jayakawadi Stage-I (Maharashtra), Barna Project (Madhya Pradesh), Salandi Project, Mahi Bajaj Sagar Project (Rajasthan), Mahanadi Delta Project (Odisha), Ramganga Project (Uttar Pradesh) and Singur Project(Andhra Pradesh) has been completed so far.

During 2017-20, It is proposed to carry out the Environmental Evaluation/Impact Assessment Study in respect of 6 irrigation projects, namely, Ukai Project, Durgawati Irrigation Project, Eastern Koshi Canal Project, Paralkot Dam Project, Sutiyapat Project and Tawa Project. The Expression of Interest for conducting the studies was published and the Consultants for the studies were shortlisted. Later, the Project Management Committee under the chairmanship of Chief Engineer (EMO), CWC has now decided to study three projects namely, (i) Ukai Project (ii) Eastern Koshi Canal Project and (iii) Tawa Project.

(xii) Application of Remote Sensing Techniques in Water Resources Sector:

The important studies undertaken during the year is as under:

(i) It is proposed to carry out Sedimentation Assessment Study in respect of 40 reservoirs using Remote Sensing Technique during 2017-20 through consultancy. The RFP for awarding the study of these reservoirs is under preparation.

(ii) CWC also conducts in house Sedimentation Assessment Study of reservoirs using Remote Sensing Technique. During the period 2017-20, the study in respect of 10 reservoirs is proposed. A study of Tandula Reservoir (Chhattisgarh) has been undertaken and is in progress.

(xiii) Development of Water Resource Information System:

CWC & ISRO jointly developed the Water Resources Information System (India-WRIS) during 11th Plan. The first full version of the website of India-WRIS (www.india-wris.nrsc.gov.in) was launched by Hon'ble Minister of Water Resources on 7th December, 2010. Subsequently, four more versions of the website of India-WRIS have been launched. The Version 4.1 was launched in July, 2015 and is available in public domain at 1:250000 scale.

The information system contains 105 GIS layers grouped in five heads: 1) Watershed Atlas, 2) Administrative Layers, 3) Water Resources Projects, 4) Thematic Layers and 5) Environmental Data. The major GIS layer generated are basin/sub- basin/watershed, river network, canal network, water body, major and medium irrigation project (dam, barrage etc), road network, town and village extent, CWC HO network and CGWB well data. As per provision of Hydro-Meteorological Data Dissemination Policy 2013 (MoWR), all unclassified data of CWC G&D stations has been made available on India-WRIS website.

The Centre for maintenance and further development of the India-WRIS portal was functioning at Central Water Commission Headquarter with support from ISRO at New Delhi since February 2015. The support

from ISRO for maintenance and further development of the portal ended w.e.f. 31st December, 2017. Later, the updation of portal has again been restarted by CWC since 1st February, 2018 through hiring of individual consultants. Refinement and updation of rivers, watershed and water bodies are under progress.

The National Water Information Centre in being setup by MoWR, RD &GR for further maintenance and development of India-WRIS.

(xiv) Performance Overview of Irrigation Projects:

Large investment has been made for creating irrigation facilities in the country which has contributed in achieving the food security of the country. Evaluation of performance of completed irrigation projects periodically provides an opportunity to assess the actual performance of projects vis-a-vis envisaged objectives and targeted benefits, identify problematic area and corrective measures to address them.

Keeping in view these aspects, Central Water Commission is carrying out various studies and dealing with other related issues of completed major/ medium irrigation projects in the country. The details are given below:

(a) Performance Evaluation of Completed Irrigation Projects:

Central Water Commission is carrying out Post Project Performance Evaluation Studies of completed major/medium irrigation projects in the country. Studies include evaluation of system performance and agro-economic, socio-economic and environmental impacts of project including economic analysis identifying deficiencies and recommending corrective measures for improving the performance of project for achieving the envisaged objectives and targeted benefits. A Technical Advisory Committee (TAC) under the Chairmanship of Member (WP&P), CWC has been constituted for guiding, supervising and approving above studies.

During 2017-18, five Post Project Performance Evaluation Studies (PES) were completed. Major/medium Irrigation Projects were completed through consultancy and the Final Report was approved by the TAC in its 26th meeting held on 16.02.2017

(b) Water Use Efficiency Studies of Completed Major/Medium Irrigation Projects:

Irrigation sector is the biggest consumer of developed water resources and its share in the overall demand of water is about 80%. However, water use efficiency in irrigation sector is relatively low. Central Water Commission has been undertaking water use efficiency studies of completed major/ medium irrigation projects in the country. The studies cover the following aspects of irrigation projects:

(i). Reservoir Filling Efficiencies (inflow and release pattern)

(ii). Delivery System/Conveyance Efficiency

(iii). On Farm Application efficiency

(iv). Drainage Efficiency

(v). Irrigation Potential Created and Utilized

A Technical Advisory Committee under the Chairmanship of Member (WP&P), CWC has been constituted for guiding, supervising and approving the studies.

(xv) Capacity Survey of Important Reservoirs in the Country:

Capacity survey of reservoirs, hitherto known as hydrographical survey of major reservoirs, was initiated by CWC in the VIII Plan. Till date, the capacity survey of 36 reservoirs has been completed. During XII Plan, The capacity survey work of 25 reservoirs has been targeted. Process for awarding work for capacity survey of 8 reservoirs is under progress.

(xvi) Indian National Committee on Surface Water (INCSW):

The Indian National Committee on Surface Water (INCSW) has been constituted by MoWR, RD&GR with an objective to promote research work in the field of Water Resources Engineering (Surface Water aspect) by providing financial assistance by way of grants to academicians/experts in the Universities, IITs, recognized R&D laboratories, Water Resources/ Irrigation departments of the Central and State Governments and NGOs under R&D Programme of the Ministry. INCSW is headed by Chairman, CWC and comprises of members representing MoWR,RD & GR, CWC, CSMRS, CWPRS, NIH, DST, Ministry of Agriculture, Water and Land Management Institutes (WALMIs), IIT, NGO's etc. Director, WS&RS Directorate, CWC is the Member Secretary of the Committee.

The important activities conducted under the aegis of INCSW during the year 2017-18 are given below:

- Presently, 92 research schemes are under progress in various organisations in the country with funding from the MoWR,RD&GR under the R&D Programme. A master database of all these R&D Schemes that are currently handled by INCSW has been created and updated on regular basis. In this regard, amount totalling to about Rs. 78.00 Lakhs has been released to various research institutes for above research scheme.
- INCSW is organising the ICID's 9th International Micro Irrigation Conference (IMIC) 2019 in Aurangabad, Maharashtra during 16th–18th January, 2019. INCSW is co-ordinating and engaging the eminent stakeholders for seminars, exhibitions and sessions to build public awareness for use of micro irrigation on large scale and to get support to implement key strategies for conservation, preservation. The event will focus on the theme of "Micro Irrigation for Modern Agriculture".

(xvii) Training & Capacity Building:

Central Water Commission offers training to water sector professionals every year. These training are organised at National Water Academy (NWA), CWC Headquarter and field offices of CWC.

The National Water Academy, CWC is a center of excellence for imparting training on all facets of Water Resources Development and Management covering the different areas of planning, design, evaluation, construction, operation and monitoring of water resources projects as well as application of high- end technology in water sector. In addition to the programmes on technical subjects, programmes on non technical topics such as Water Law, Water Policy, Strategic issues, Environmental, Economic and Social Issues are also being organized. The programmes at NWA are open to all stakeholders of water sector including those from NGOs, Media, Private Sector Organisations, academic institutions, PSUs, individuals and foreign nationals. During 2017-18 (up to 15th March, 2018), NWA conducted 40 training programmes in which 1140 officers participated.

The outstanding achievements of NWA are multidimensional, which includes demand driven programmes; capacity building under Hydrology Project; collaborative efforts with other expert Organisations; programmes under National Water Mission; programmes under Pradhan Mantri Krishi Sinchai Yojana; customized programmes for foreign nationals and other programmes for all other stakeholders viz. School teachers; Panchayati Raj Institutions (PRIs); Media Personnel and NGOs etc.

In the recent past, many new areas have been added to the NWAs portfolio like e-SWIS; e-Water; preparation of PMP Atlas; Monitoring of Irrigation Projects using Bhuvan Software; Modernization and Capacity Enhancement of Hydropower

Projects etc.

HYDROLOGICAL STUDIES ORGANIZATION (HSO)

The Hydrological Studies Organization (HSO), a specialized unit under D&R Wing of Central Water Commission, carries out hydrological studies in the projects in the country. The success of the projects is largely governed by the hydrological inputs. The inputs at Detailed Project Reports (DPR), Feasibility Project Reports (FPR) or Pre-Feasibility Reports (PFR) stages are made available in the form of:

1. Water Availability / Yield studies
2. Design Flood studies
3. Sedimentation studies
4. Diversion Flood studies

The consultancy services in the field of hydrology are also offered to the State Water Resources Departments, State & Central Agencies at various stages of the project implementation.

(i) Technical Examination of DPRs/ PFRs:

During the year 2017-18 (up to December, 2017), 69 projects were appraised for technical examination in HSO Unit out of which 34 projects were cleared and observations/ comments were issued in 19 of the projects. 16 Projects are still under examination.

(ii) Development of flood estimation model for un-gauged catchments:

To compute the design flood in un-gauged catchments, country has been divided into seven zones and further into 26 hydro - meteorologically homogeneous sub-zones and flood estimation models have been developed for each subzone. So far flood estimation reports covering 24 sub-zones have been published. The periodic revisions / updating of earlier reports are carried out whenever additional data are received.

(iii) Design flood review studies in Dam Rehabilitation and Improvement Project (DRIP):

Advances in computing the magnitude and characteristic of extreme flood events and revision of the Indian Engineering standards for large dams require re-evaluation of spillway capacities of many existing structures. Under the proposed Dam Rehabilitation and Improvement Project (DRIP), the design flood review studies of 250 Projects are to be vetted by HSO. In addition, similar studies are done by states on their own for some projects are also to be examined in HSO. State Governments have been requested to conduct design flood review of all large dams in their respective states/jurisdiction and submit the reports for vetting. Design Flood Review Studies of the following 9 projects were carried out during the year 2017-18 namely, (1)Asan Dam Project, Uttarakhand, (2) Virbhadra Barrage, Uttarakhand (3) Dakpather Barrage, Uttarakhand (4) Maithon Dam, Jharkhand (5) Panchet Dam, Jharkhand (6) Mala Prabha Dam Project, Karnataka (7) Bennithora Dam, Karnataka (8) Bhadra Dam, Karnataka and (9) Mettur Dam, Tamil Nadu.

(iv) Plan Schemes:

The programme and work on National Hydrology Project is under progress. two TORs were under preparation during Year 2017-18, viz; (1) Physical based Mathematical Modelling for Sediment rate estimation and Sediment transport in the five River basins and (2) Development of Regional model for water availability.

(v) Consultancy Work/Special Study:

The consultancy work for carrying out Hydrological studies and preparation of relevant chapters for DPR in respect of following projects are in progress:

- Preparation of Chapter on Hydrological studies of Sapta Kosi, Sun Kosi and Kamala dams, Nepal.
- Karnali Multipurpose Project:

In addition to the regular work of appraising the hydrological studies of DPRs, following special studies have been performed at HSO.

- A total of 41 BIS codes have been reviewed and comments/ observation have been sent to Head, Water Resources, BIS, Manak Bhawan, New Delhi.
- Review of 6 Water Balance Study reports and Technical feasibility on Godavari-Cauvery link of NWDA.
- Design flood study of Phinasingh Medium Irrigation Project, Himachal Pradesh.
- Design flood study of Garada Dam Project.
- Water availability study of Upper Maha Nanda Irrigation Project.
- Post project performance evaluation study of Jayakawadi Project, Maharashtra.
- Design Flood Study of Banas river with crossing of Narmada Main Canal, Gujarat.

(vi) Japan International Cooperation Agency (JICA):

20 Projects were received under Andhra Pradesh Irrigation and Livelihood Improvement Programme Phase-II (APILIP) for JICA Funding. Hydrological Studies of all these projects have been cleared.

(vii) Technical Assistance/ Advice:

The following two reports in respect of Committees set up by MoWR, RD & GR were finalized by HSO during 2017-18:

- Finalization of the report on "Problems of Salination of land in Coastal Areas of India and suitable Protection measures".
- Finalization of the "Report of the Expert Committee on Erosion & Siltation in Rivers".

(viii) Association with NIH:

This Organization is involved in various activities of NIH in respect of following committees:

- NIH Society: NIH Society is the apex body of the institute, presided by Union Minister for MoWR, RD&GR, Govt. of India. Chairman, CWC; Member (D&R) and Chief Engineer (HSO), CWC are the members of NIH Society.
- Governing Body: The governing body is the executive body of the institute. It exercises all executive and financial powers of the society. Chairman, CWC is the member of the governing body of NIH.
- Technical Advisory Committee: the research programmes and other technical activities of NIH are monitored and guided by Technical Advisory Committee (TAC) of NIH headed by Chairman, CWC. Member (D&R) and Chief Engineer (HSO) are the members of TAC.

Working Group: Working Group of NIH consider and recommend to TAC the programme of studies to be taken up by different scientific divisions. Director, Hydrology (DSR) is the member of working group of NIH. Generally two meetings are held in a year to review the work of NIH.

(ix) Trainings/Workshop/ Seminar:

The technical expertise available/ developed in HSO is disseminated to other State and Central agencies associated with water resource planning through workshops and training programmes where the faculty is drawn from HSO and other concerned organisation. Necessary resource persons are also deputed to National Water Academy, Pune for organizing the workshops/training programmes. This year, two training programs were conducted on the topic "Project Hydrology - Hydrological Aspects in Project Planning and Preparation of DPR" and "Project Hydrology – Use of Statistics in Hydrology" for practicing Engineers/ Officers of Central and State Government.

(x) Paper Submitted/Presented:

Following technical papers were submitted for the International Dam Safety Conference, 2018, held at Thiruvananthapuram, Kerala:

- Design storm and Design flood study of Kadam Dam.
- Back water study for Polavaram Irrigation Project.
- Scale issues of GIUH.
- A comparative evaluation of PMP estimates for small catchments by physical & statistical methods in Narmada basin.
- Impact of loss rate on Design Flood studies of Mettur Dam.

(xi) Technical Co-ordination:

CWC is represented on a large number of committees under many organizations relating to Hydrology. Hydrological Studies Organisation (HSO) interacts with organizations such as NIH, INCOH, BIS, INCID, IMD, WMO/UNESCO etc. The following committees are related to Hydrology:

- National Institute of Hydrology Society.
- Governing body of National Institute of Hydrology (NIH).
- Technical Advisory Committee (TAC) of National Institute of Hydrology (NIH).
- Working group of NIH (Surface Water).
- Expert Appraisal Committee (EAC) for River Valley and Hydroelectric Projects set up in MoEF.
- Indian National Committee on Hydrology (INCOH).
- Research Committee of INCOH.
- National Committee on Dam Safety (NCDS).
- Indian Association of Hydrologist.
- World Meteorological Organisation (WMO).
- Indian Meteorological Department (IMD).
- Yamuna Standing Committee.
- Committee to examine the safety of Tilaiya Dam.
- Bureau of Indian Standards (BIS), WRD-1, WRD-2, WRD-21 and WRD-10.
- Inter-Ministerial Group on issues related to river Ganga.
- Expert Committee on Erosion and Siltation in rivers.
- Committee for reviewing existing jurisdiction & functions of field Units/ Organizations of CWC.

DAM SAFETY ORGANIZATION (DSO)

Dam Safety Organization is looking after issues related to Dam Safety aspects which can be broadly categorized as under:

- Monitoring and Rehabilitation of Large dams.
- Instrumentation in Dams and Power House Caverns, besides other hydraulic structures.
- Special Analysis like Dam Break Modelling and foundation problems.
- Computer Aided Designs.
- Rehabilitation of aged & distressed dams.

Dam Rehabilitation & Improvement Project (DRIP):

Government of India with financial assistance from the World Bank has undertaken the Dam Rehabilitation and Improvement Project (DRIP) for rehabilitation of about 223 dam projects initially in 4 States (namely Kerala, Madhya Pradesh, Orissa and Tamil Nadu) and in Central Water Commission (CWC) and with a provision of unallocated resources (about Rs. 480.30 crore) for funding the new States/Dam owning entities joining the project at a later date. Later on, Karnataka

Water Resources Department joined the DRIP scheme in November, 2014 (for rehabilitation of 27 dams) followed by the joining of Damodar Valley Corporation (for rehabilitation of 3 dams) and UJVN Limited (for rehabilitation of 5 dams/ barrages) in July, 2015. DRIP presently envisages rehabilitation of about 198 large dam projects, involving eight Implementing agencies in six States and two central implementing agencies (Central Water Commission and Damodar Valley Corporation Ltd). In addition, DRIP also involves institutional strengthening (for dam safety) of all participating states as well as at central level in CWC.

The project is progressing well. Design flood reviews of all the DRIP dams have been completed for checking the hydrological adequacy of the dams. Main rehabilitation works have been awarded at 195 dam projects and rehabilitation works are under various stages of implementation. As per award of work till December, 2017, the committed amount for various works stand at Rs. 2010.00 crore. As per the current action plan, all the planned works are expected to be awarded by March, 2018. So far, rehabilitation works for 30 dams have been completed.

Training programmes with focus on DRIP implementation were initiated well in advance for building up in-house technical capabilities of participating states. So far, 83 training programmes have been organized for the benefit of officials of various Implementing agencies under DRIP in which over 3000 personnel have been trained in various aspects of dam safety and rehabilitation. Four international training programmes were also organized in 2016 and 2017 as part of capacity building under this project. The CWC has collaborated with worlds two leading and renowned organizations (Bureau of Reclamation, USA and Deltares, Netherlands) benefiting 78 officials. With the assistance of the World Bank and cooperation of Japan Water Agency, knowledge sharing visits have been organized to Japan. 50 participants from Central as well as State agencies had the exposure on seismic, de-siltation, instrumentation and other dam safety related issues during the 6 exposure visits organized to Japan.

Three National Dam Safety Conferences and One International Dam Safety Conferences have been organized under the project so far. These conferences received the overwhelming response from the dam safety professionals, researchers, academicians, industries from the Country as well as overseas.

Works of the development of 'Dam Health and Rehabilitation Monitoring Application (DHARMA)' software has been completed and launched. DHARMA programme will enable collection and compilation of basic as well as engineering information for all dams and allow the systematic presentation and interpretation of data for effective monitoring of the health of dams.

Many new initiatives are being taken under the project. Emergency Action Plan/ Disaster Management Plan for all the DRIP dams is being prepared to handle any emergency situation, so that losses of life and property damages can be minimized. So far, Dam Break Analysis and Inundation mapping have been prepared for about 114 no. of DRIP dams. Studies of Seismic Hazard Mapping for Peninsular India are being prepared by the IIT Roorkee. CWC has also signed MoU with Central Water & Power Research Station (CWPRS) to take up the study for Seismic Hazard Mapping for rest part of the country and proposal of CWPRS. Study of unusual dam Behavior and distress of Idukki Arch Dam has been completed. FEM Studies for Crack analysis of Konar Dam of DVC is completed. De-siltation Works of two dams of TANGEDCO have been awarded. Major intervention for Hydro-Mechanical works of very old dams like Krishna Raja Sagar dam in Karnataka initiated. People-inclusive approach for Dam Safety for additional

spillway work of Hirakud dam has been finalized.

DAM SAFETY LEGISLATION

Owing to India's sizeable number of dams – of which substantial proportions are ageing – legislation on the dam safety has been desired by various forums to ensure the safety of the dams in the country.

Seeing the limitation of the Dam Safety Bill (2010) in terms of its initial applicability to the two states of Andhra Pradesh and West Bengal and the Union Territories only, CWC in June 2014 had submitted a new draft of the Dam Safety Bill to the Ministry seeking national level applicability of the Bill. Accordingly, Dam Safety Bill 2017 has been prepared with all India applicability under Entry 56 and 97 of list I on the basis of opinion obtained from Solicitor General of India. Draft Dam Safety Bill 2017 was also shared with the concerned line Ministries /Departments. The comments have been received from Ministries. As per suggestions of NITI Aayog, the draft Bill was circulated to State Governments on 9.8.2016. Comments were received from 19 States and 4 dam owning organizations. The comments of the States were deliberated in the meeting of National Committee on Dam Safety (NCDS) held under the Chairmanship of Secretary (MoWR, RD & GR) for finalization of draft Bill. States except a few have largely supported the bill. The National Dam Safety Bill 2017 has been put up for approval of the Cabinet.

NATIONAL COMMITTEE OF DAM SAFETY (NCDS)

Ministry of Irrigation, Government of India constituted a Standing Committee in 1982 to review the existing practices and to evolve unified procedures of dam safety for all dams in India, under the Chairmanship of Chairman, Central Water Commission. Subsequently, Government of India, and Ministry of water Resources reconstituted the Standing Committee in 1987 as the National Committee on Dam Safety to:

- Monitor the follow-up action on the report on dam safety procedures both at the Centre and at the State level.
- Oversee dam safety activities in various states and suggest improvements to bring dam safety practices in line with state-of the art practices consistent with Indian conditions.
- Act as a forum of exchange of views on techniques adopted for remedial measures to relieve distress in dams.

The National Committee was reconstituted in October, 2015 and consists of 31 members from 18 states and 5 DSO's and various other organizations. The 38th meeting of NCDS was held on 22nd January, 2018 at Thiruvananthapuram, Kerala.

NATIONAL REGISTER OF LARGE DAMS (NRLD)

The National Register of Large Dams (NRLD) is maintained by CWC. As per the latest information compiled there are 5701 nos. large dams in Country. Out of which, 5254 nos. are completed Large Dams and there are 447 large Dams are under construction. The regular updation of NRLD with added features is being carried out from time to time as per information received from the States/ Dam owners. NRLD is now available at CWC Website. The compilation of NRLD is expected to prove useful/ handy to all engineers, planners and policy makers associated with Water resources sectors. Dam Health and Rehabilitation Monitoring Application (DHARMA) is being developed under DRIP and all data related to NRLD is being migrated to DHARMA.

TECHNICAL EXAMINATION OF PROJECTS FOR SEISMIC AND FOUNDATION ASPECTS\

Detailed Project Reports of 16 nos. of river valley projects in various states namely, State of West Bengal, Madhya Pradesh, Odisha, Himachal Pradesh, Arunachal Pradesh, Uttarakhand,Meghalaya,Gujarat,Maharashtra

and Afghanistan have been examined with respect to geological investigations related to foundation engineering & seismic aspects; and observations issued. Out of 16 projects, 9 projects have been cleared and compliance of comments from project authorities is awaited in respect of the remaining projects.

NATIONAL COMMITTEE ON SEISMIC DESIGN PARAMETERS

The National Committee on Seismic Design Parameters (NCSDP) was constituted through MoWR Order dated 21st October, 1991 with the objective to recommend the Seismic Design Parameters for the proposals received from the dam owners. The Member (D&R), CWC is the chairman of the Committee with 11 other experts from various engineering disciplines from different technical institutions and Govt. organizations as its Members. Director FE&SA, CWC is the Member Secretary of the NCSDP. During 2017-18, 32nd meeting of NCSDP was held on 12th July, 2017, wherein the site specific seismic study reports of 13 projects were discussed and cleared by the Committee.

DAM BREAK AND GLACIAL LAKE OUTBURST FLOOD (GLOF) STUDIES

Dam break analysis is carried out to prepare the inundation map and disaster management plan in the unlikely event of dam failure. It estimates the maximum water level at the downstream locations of the dam in the event of a hypothetical failure of the dam. GLOF Studies are carried out to account for the flood, resulting from the breach of moraine dams, in the design of the projects. During the year, the GLOF study report of Goriganga IIIA HEP, Uttarakhand has been examined and cleared.

CONSULTANCY SERVICES ON INSTRUMENTATION IN HYDRAULIC STRUCTURES

Detailed Project Report / Compliance Report of fourteen river valley projects in various country / states namely Afghanistan, Arunachal Pradesh, Assam Himachal Pradesh, Jammu & Kashmir, Meghalaya, Madhya Pradesh, Odisha and Uttarakhand have been examined; out of which ten projects have been cleared with respect to instrumentation aspect and observation for four projects have been sent.

During the year, consultancy services towards planning and preparation of instrumentation specification / construction drawings / vetting of drawings/ preparation of instrumentation chapter for DPR purpose were provided.

DWRIS: DATA BANK & INFORMATION SYSTEM UPGRADATION AND MODERNIZATION OF I.T. IN CWC

SMD is entrusted with the work of management of IT hardware/ software at Head CWC (HQ) and extending IT services to CWC officers which is continual activity. The existing IT resources in CWC need regular up-gradation and upkeep to match with the technological development in the field of Information technology. Maintenance and strengthening of the IT hardware/ software/ network resources is a continuing activity. Further, to promote e-governance activities in CWC, several IT applications are being developed/ implemented in coordination with various stakeholders.

Overall responsibility of SMD is for Implementation of Plan schemes (DWRIS), monitoring all functions of software management directorate which includes support/maintenance of IT infrastructure/ inventory in Central Water Commission, procurement of IT consumables, procurement of computers, printers, UPS, scanners etc. as per requirement in CWC, implementation of e-Office software in CWC (HQ) & field offices, development of Web Based Application Software for Inventory Management, Development of ePAMS application software, Design and development of New CWC website, Spill over work of e-Bhagirath software, Implementation

of eHRMS software, Implementation of eOffice software in CWC. Procurement of engineering and general software for use in various directorates as per requirement, and Conducting training programmes on various software used in CWC.

DESIGN ORGANIZATION

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

(i) Design Consultancy of Projects:

During the year 2017-18 Design Consultancy to various State Governments has been/being provided by Design Units of D&R Wing, CWC in respect of 51 nos. of Projects from 23 States and 08 nos. of Projects from Bhutan(4), Indo-Nepal (3) and Nepal(1).

(a) Technical Examination of Detailed Project Reports (DPRs) of Hydro-electric / Irrigation/FMP/ Multi Purpose Projects:

During 2017-18, out of 59 nos. (66-7), DPRs of Hydro-electric / Irrigation / FMP/ Multi Purpose Projects from 18 nos. States and 07 Nos. of Projects from Afghanistan (02), Bhutan (01), Nepal (02) and Indo-Nepal (02), 22 nos. DPRs of Projects have been cleared. For remaining 44 nos. Projects, CWC observations / comments on DPRs for 38 nos. of Projects have been sent to Project Authorities and Compliance on the same are awaited from Project Authorities and **06** nos. of Project is under technical examination.

(b) Technical Examination of Hydrological Studies of DPRs:

During 2017-18, out of 68 nos. of Projects from 23 States and 01 no. of Project from Afghanistan, 34 nos. of Projects have been cleared. For remaining 35 nos. Projects, CWC observations / comments on Hydrological Studies for 19 nos. of Projects have been sent to Project Authorities and Compliance on same are awaited from Project Authorities and rest 16 nos. Hydrological Studies of Projects are under examination.

CENTRAL SOIL AND MATERIALS RESEARCH STATION (CSMRS)

Central Soil and Materials Research Station (CSMRS), New Delhi, is a premier organization in the country dealing with the field and laboratory investigations, and research in the areas of geotechnical engineering and civil engineering materials, particularly for construction of river valley projects and safety evaluation of existing dams. The Research Station is also involved in quality control of construction for various river valley projects. 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. The Research Station has some unique capabilities in the country in the field of geotechnical engineering and construction materials' characterization.

The sphere of activities of the Research Station is covered under the following main areas:

- Soil Mechanics Discipline includes Soil Mechanics, Geosynthetics, Soil Dynamics and Rockfill. This discipline deals with the foundation and borrow area investigations, studies on problematic soils (expansive soils, dispersive soils, organic soils, collapsible soils, soft soils etc.), fly ash characterisation, rockfill material characterization, hydraulic fracturing of core materials, Numerical Modeling and quality control of embankments and earth and rockfill dam.

- Rock Mechanics Discipline includes Rock Mechanics, Engineering Geophysics and Geotechnical Instrumentation. This discipline deals with the foundation rock characterisation, in- situ measurements such as stress & deformability, laboratory assessment of rocks, geophysical investigations, geotechnical instrumentation and numerical modelling.
- Concrete Technology Discipline includes Concrete Technology, Concrete Diagnostics, Concrete Special Studies and Chemistry. This discipline deals with the construction materials survey and characterization, design of concrete mixes, roller compacted concrete, substitution of sand with bottom ash, thermal studies, diagnostic investigation/ health monitoring, material for repair and rehabilitation, petrography, chemical investigation, durability of concrete, chemistry and mineralogy, water quality, alkali aggregate reaction, new material such as polymer, grout etc. SSC/SFRC/ HPC/HSC/CFRD and quality control of concrete structures.

INVESTIGATIONS FOR PROJECTS

Thirty seven projects, including two abroad and four in North- East region of India, were investigated. The investigations comprised field and laboratory investigations in the areas of Soil, Rock, and Concrete (including its constituents).

The investigated projects are as under:

(i) International Projects:

1. Pancheshwar Multipurpose Project, Nepal
2. Punatsangchhu –II H.E. Project, Bhutan

(ii). Indian Projects:

Projects in North-East India

1. Kalej Khola H.E.P, Sikkim
2. Mawphu-II H.E. Project, Meghalaya
3. Sonai Irrigation Project, Assam
4. Tlawng Hydroelectric Project, Aizwal, Mizoram

Projects in other part of India:

1. Bagaha Town Protection Phase-III, Bihar
2. Baglihar Project, J&K
3. Bina Complex Irrigation Project, Madhya Pradesh
4. Chandpatha dam project, Madhya Pradesh
5. Delhi Earth Station, ISRO, New Delhi
6. Gararda Dam Project, Rajasthan
7. Harduaganj Thermal Power Project, Harduaganj, Aligarh, Uttar Pradesh
8. Jawharpur Thermal Power Project, Harduaganj, Etah, Uttar Pradesh
9. Kanhar Irrigation Project, Uttar Pradesh
10. Kharkai Barrage Project, Jharkhand
11. Konar Dam Project, Jharkhand
12. Luhri H.E. Project, Himachal Pradesh
13. Madhya Maheshwer SHP (3x5 MW), Uttarakhand
14. Parichha Dam, Uttar Pradesh
15. Polavaram Project, Andhra Pradesh
16. Project Division, Water Resources, Bundi, Rajasthan
17. Renukaji Project, Himachal Pradesh
18. Rihand Super Thermal Power Project, Uttar Pradesh
19. Sardar Sarovar Project, Uttar Pradesh
20. Sharavathy Pumped Storage Project, Karnataka
21. Shongtong Karchham H.E. Project, Himachal Pradesh
22. Singareni Collieries Company Limited, Telangana
23. Sirkari Bhiyol Rupsiabagar H.E. Project, Uttrakhand
24. Tanda Thermal Power Plant, Uttar Pradesh
25. Tehri PSP (4x250 MW), Uttarakhand
26. Turga Pumped Storage Project, West Bengal
27. Upper Indravati Pumped Storage Project, Odisha

28. Vishnugad Pipalkoti H. E. Project, Uttrakhand
29. Vyasi H E Project (120 MW), Uttarakhand
30. Wainganga-Nalganga Link Canal Project, NWDA, Maharashtra
31. Yamuna Basin Authority, NRWQL, New Delhi

NEW INITIATIVES TAKEN DURING 2017-18

Following new initiatives were taken during 2017-18:

- Acquired ISO 9001 : 2008
- MoU signed
  - WAPCOS Ltd.
  - Polavaram Project Authority, Hyderabad
  - PSP Tehri H E Project, Uttarakhand
  - Vishnugad Pipalkoti H E Project, Uttarakhand
  - Vyasi HE Project, Uttarakhand
- Quality Control/ Assurance in respect of the following project is under progress
  - Punatsangchhu Hydroelectric Project (PHEP-II), Bhutan
- Solutions provided to problem in Water Resources Projects
  - Sardar Sarovar Project, Gujarat (raising height)
  - Hirakud Dam, Odisha (extending spillway)
  - Pandoh Dam, HP (Sulphate issue)
  - Bhakra Dam, Punjab (safety)
  - Polavaram Project, AP (all aspects)
  - Punatsangchhu –II H.E. Project, Bhutan (Anisotropy of rock, u/g structures)
  - Farakka Barrage Project, West Bengal (Geosynthetics)
  - Sawalkote HEP, J&K (Dolomite, ACR)
- Diagnostic Investigation of Dams
  - Hirakud Dam, Odisha (Underwater scanning)
  - Konar Project, Jharkhand (Evaluation of concrete)
  - Chandpatha Dam, Madhya Pradesh
- Instrumentation
  - Hirakud Dam Project, Odisha
  - Sardar Sarovar Project, Gujarat
- Association with Interlinking of Rivers with particular reference to geotechnical investigation
  - Ken-Betwa Link Project, Madhya Pradesh
  - Burhi Gandak-None-Baya-Ganga Link canal project, Patna, Bihar
  - Kosi–Metchi Link canal project, Patna, Bihar
  - Daman Ganga–Pinjal Link Project, Gujarat/ Maharashtra
  - Ponnaiyar– Palar Intra State Link Canal Project, Tamil Nadu
  - Wain Ganga- Nal Ganga Intra State Link Canal Project, Maharashtra
- Institutional strengthening and up gradation of CSMRS
- Advice Plan for Rehabilitation
- Dam Safety / Health Checking / Monitoring
- Numerical Modeling
- Risk and Reliability Studies

SUIBORDINATE OFFICES

CENTRAL GROUND WATER BOARD (CGWB)

Central Ground Water Board (CGWB), a subordinate office of the Ministry of Water Resources, Government of India, is the National Apex Agency entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring,

assessment, augmentation and regulation of ground water resources of the country. The data generated from various studies taken up by CGWB provide a scientific base for water resource planning by stakeholders.

The Board is headed by the Chairman and has five Members namely, (i) Member (CGWB) (ii) Member (CGWA), (iii) Member (North & West), (iv) Member (East), & (v) Member (South). The administrative & financial matters of the CGWB are dealt by the Director (Administration) and Member (Finance) respectively. The Board has 18 Regional offices, each headed by a Regional Director, supported by 17 Engineering Divisions and 11 State Unit Offices for undertaking various field activities.

MAIN ACTIVITIES OF CENTRAL GROUND WATER BOARD

The Central Ground Water Board undertakes many scientific activities for finding groundwater sources, disposition of aquifers, assessment of groundwater resources, monitoring of water levels and quality and issues related to groundwater management through demand and supply side interventions. Main activities of the Board are following:

- Aquifer Mapping Programme
- Water Supply Investigations
- Ground Water Regime Monitoring
- Estimation of Ground Water Resources
- Training under National Ground Water Training and Research Institute.
- IEC activities
- Activities under taken by CGWB in the North Eastern Region
- National Hydrology Project
- Accreditation of CGWB Labs by NABL as per ISO/IEC 17025: 2005
- Central Ground Water Authority

ACHIEVEMENTS OF CGWB DURING THE YEAR 2017-18

(i) Aquifer Mapping (NAQUIM) Programme:

Aquifer Mapping and Management Programme (NAQUIM) was initiated in 2012 with an objectives to delineate and characterize the aquifers and develop management plans to ensure sustainability of ground water resources. Out of ~32 lakh km^2 of the entire country, an area of ~25 lakh km^2 has been identified to be covered under aquifer mapping in phases. Four major sets of activities being undertaken are (i) Data Compilation & Data Gap Analysis (ii) Generation and integration of data (iii) Preparation of aquifer maps and (iv) Formulation of aquifer management plans.

(ii) Data generation for Aquifer Mapping:

Various Data Generation activities *viz*., exploratory drilling, geophysical surveys, chemical quality studies and other hydro geological surveys are taken up during the year 2017-18 for value addition to aquifer maps. The individual achievements of data generation activities are as follows:

- **Ground Water Exploration:**

  During financial year 2017-18 (up to 31.03.2018), Central Ground Water Board has constructed 771 wells (EW- 528, OW-191, PZ- 52) tto assess the ground water potential in different hydrogeological set up. In addition to these, around 1155 wells have been constructed through outsourcing in the states of Gujarat, Haryana, Rajasthan, West Bengal, Bihar & Jharkhand, Karnataka, Tamil Nadu and Telangana.

- **Geophysical Studies:**

  Geophysical studies are undertaken as an integral part of aquifer mapping and short-term water supply investigations. During 2017-18 up to 31st March, 2018, the Board has carried out 2019 Vertical Electrical Soundings, 92.03 line kilometer

Autoflow Well at Shekhon ka Tala, Jaisalmer district, Rajasthan

High Yielding Wells Jamb EW, Patur Taluka, Akola District, Maharashtra

resistively profiling and geophysical logging of 87 bore holes in various parts of the country.

- **<u>Water Quality Analysis:</u>**

  Around 34,458 no's of water samples were analyzed for the basic constituents, heavy metals (such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc.), organic and specific constituents during the year 2017-18 up to March, 2018.

(iii) Aquifer Maps and Management Plans:

By the end of March, 2017, aquifer maps and management plans were developed for an area of ~6.3 lakh km^2. An additional area of ~1.3 lakh km^2 has been covered under aquifer mapping and management plan making the total coverage ~8.66 lakh km^2 till March, 2018. Aqufier maps and management plans are subject to a three tier review including review by a National Level Expert Committee (NLEC) before finalization. The NLEC comprises domain experts from CGWB; IIT, Roorkee; IIT, Delhi; JNU; IWMI etc. The maps and management plans developed are shared with the concerned state governments through the State Ground Water Coordination Committees (SGWCC).

(iv) Collaborative Studies: For value addition to the Aquifer Mapping Programme, Central Ground Water Board has embarked upon collaborative studies with some of the leading research/academic institutions of National importance and other related Central departments. The brief of the progress made during the year 2017-18 is outlined as under:

a. ***CGWB*** *has undertaken collaborative study with* ***Indian Institute of Remote Sensing, Dehradun on "Mapping, Modelling and Impact assessment of Land Subsidence in North India"****.*

b. ***CGWB*** *has undertaken collaborative study with* ***National Remote Sensing Centre, Hyderabad on "Joint use of Geospatial Technology in Aquifer Mapping and Management":*** The objective of the collaborative study includes Satellite data interpretation and capacity building of officers from CGWB and MDWS on application of space technology in groundwater management, use of geospatial and other data.

c. ***CGWB*** *has undertaken* ***collaborative study with Bhabha Atomic Research Centre, Mumbai on "Isotope Hydrogeological Investigations in Probable Paleochannel in parts of Punjab, Haryana, Rajastahn, Gujarat & U.P."*** with an objective to determine the isotopic signature of

groundwater in the paleochannels and in the surrounding environment to trace the source and mechanism of recharge, determine the age of groundwater in the paleochannels and overall chemical quality of ground water from the paleochannels and from the surrounding area. The study has been completed and its draft report has been prepared.

d. ***CGWB*** *has undertaken collaboration with* ***Geological Survey of India, Ministry of Mines, Government of India on Sharing of 1:50,000 Scale Geological Map Data, Hydrogeological Maps for National Project on Aquifer Management".***

e. ***CGWB and CSIR-NGRI*** *entered into* ***an agreement for carrying out Data generation for Aquifer Mapping with focus on palaeo-channels in parts of Ganga-Yamuna Doab, Allahabad and Kaushambi districts, Uttar Pradesh*** with the aim to decipher aquifer geometry, aquifer characteristics, identify major paleo-channels in the inter-stream region around Allahabad and Kaushambi region.

f. ***Collaborative study with IIT, Kanpur and IISc, Bangalore for ground water modeling:***

- CGWB has entered into an MoA with Indian Institute of Technology (IIT), Kanpur for development of groundwater flow models and preparation of aquifer management plans for parts of Haryana and Punjab and for the entire Bundelkhand region covering parts of Madhya Pradesh and Uttar Pradesh.
- CGWB has also entered into an MoA with Indian Instittue of Science (IISc), Bangalore for development of groundwater flow models and preparation of aquifer management plans for parts of Karnataka.

g. ***MoU with Geological Survey of India*** *for Study on* ***'Sustainability of Springs in parts of Almora district, Uttarakhand':*** The study would focus on preparation of spring development and rejuvenation plan through investigations on characterization of the springs, studying the geological, geomorphological and other controls on spring recharge and discharge characteristics, identification of the recharge areas, spring water quality and preparation of the spring shed maps.

(v) Fifth and Sixth Meetings of National Inter-departmental Steering Committee (NISC):

The fifth and sixth meetings of NISC were held on 23rd March 2017 and 29th August 2017 respectively. In the sixth meeting of NISC, a presentation on the independent evaluation of the "Ground water management and regulation" Plan Scheme was made and the scheme was rated as four out of five by Department of Civil Engineering, IISc, Bangalore which carried out the independent evaluation.

(vi) Major outcomes of NAQUIM:

The NAQUIM investigations provided new insights into groundwater dynamics in various parts of India. NAQUIM outcomes have helped in providing practical solutions to variety of ground water issues in the country like conceptualization of the largest ever artificial recharge plan, sustainability of hot springs, arsenic contamination etc. Some of the notable outcomes are listed below:

- Project on Tapi Mega Recharge has been initiated as an outcome of Aquifer mapping study. This project envisages to recharge ground water to the tune of 358.92 million m3/ year benefiting an area of 2.3 lakh hectares.
- Plan of revival of Rajgir springs was prepared and action points identified upon which the Government of Bihar has initiated the implementation.
- Multilayered aquifers identified in intensely irrigated water stressed areas of Kurukshetra Haryana.
- Successful wells (18 nos) were drilled

in water scarce villages in Tikamgarh district for State PHED.

- On the basis of study, improvised well design was proposed to deal with groundwater contamination in Rosanabad area of Haridwar city, which was discussed and accepted by the State Government.
- Tamil Nadu Water Supply and Drainage Board (TWAD) has constructed wells tapping Fluoride safe aquifers in upper Ponnaiyar Aquifer system based on the findings of Aquifer Mapping
- Arsenic safe alternate aquifers were delineated in Bairiya Block of Ballia District and Karanda Block of Ghazipur District in Uttar Pradesh. Wells tapping arsenic safe aquifers in 30 villages in Bairiya Block and 15 villages in Karanda Block were constructed by CGWB
- The issue of rising water levels in parts of Mehrauli Block in Delhi-NCR has been investigated through Aquifer Mapping and the findings were highly appreciated by the Hon'ble Delhi High Court in its judgment.
- Based on Aquifer mapping recommendations Govt of Tamil Nadu has initiated actions to control withdrawal of ground water in the coastal areas of Cuddalore District.
- As a part of Aquifer mapping programme in Ribhoi district, Meghalaya, CGWB has drilled 18 successful bore wells. Based on the study the State Government is initiating ground water based irrigation for the first time in the State

(vii) Water Supply Investigations:

The Board provides assistance to defense and government agencies to solve their immediate water supply problems by selecting suitable sites for construction of ground water abstraction structures. The Board has carried out a total of 252 investigations during this year up to 31st March, 2018.

(viii) Ground Water Regime Monitoring:

Ground water levels in the country are monitored through a network of about 23125 Ground Water Observation Wells for months of April/May, 2017, August, 2017, November and January, 2018.

(ix) Estimation of Ground Water Resources of the Country:

Dynamic Ground Water Resources of the country have been assessed jointly by CGWB and respective State ground water departments using Ground Water Estimation Methodology. Dynamic Ground Water Resources Assessment with reference to the base year 2013 has been computed. The Progress of GWRA for the year 2017-18:

- Revised Ground Water Estimation methodology- 2015 was approved on 29th May, 2017
- The Central Level Expert Group for overall reassessment of GWRA 2017 was constituted on 18th May, 2017.
- The State Level committees for Ground water resources estimation has been constituted for 33 states and 6 UT's.

(x) National Ground Water Training and Research Institute (NGWTRI/NGI):

During XII Plan, NGI under HRD and Capacity Building Scheme of Ministry of Water Resources, River Development and Ganga Rejuvenation implemented a three tier training programme keeping in view the requirements of the National Project on Aquifer Management.

This scheme continued beyond the XII Plan, since these trainings enable creation of a trained workforce for implementation of National Project on Aquifer Mapping & Management and overall sustainable development of the ground water resources. Besides the officers of the Board, NGI trains' officers from State Departments and candidates from abroad are also included in the training programme being organized by the

Board. National Level training programmes are conducted at NGI, Raipur whereas State and Block Level training programmes are organized by the respective Region Offices of CGWB.

Details of the training programmes conducted till 31.03.2018

Training Programme	Annual Target	Total No. of Trainings Conducted	Total No. of Participants	Female participants
TIER – I (National Level)	35	46	883	197
TIER – II (State Level)	18	17	562	150
TIER – III (Block Level)	53	47	7282	2053
Total	**106**	**110**	**8727**	**2400**

(xi) IEC Activity such as Essay Competition, Bhujal Manthan, Painting Competition etc.:

- CGWB isorganizing 3rd National Essay Competition with the theme- "Swachh Jal Swachh Bharat" in phase - I and phase- II. Phase- I have been completed on 31.12.2017 and Phase- II theme on "Drop of water holds wealth of life" is under progress. CGWB will also be organizing 8th National Painting Competition with the theme "Use water with more care-save our future generation."
- Two day **Bhujal Manthan-3** organized by CGWB at Nagpur during second week of February, 2018.
- **5 workshops** are proposed to be organized at Lucknow, Raipur, Chandigarh, Hyderabad and Ahmedabad. Out of these five workshops, workshops have been completed successfully at Ahmedabad, Lucknow and Hyderabad. Under Tribal Sub Plan eight Mass Awareness Programme are proposed to be held at Hyderabad, Guwahati, Ahmadabad, Patna, Bhopal, Nagpur, Bhubneshwar & Chennai. Out of these, Mass Awareness Programme, two have already been completed successfully at Hyderabad and Nagpur.
- CGWB participated in 37th India International Trade Fair (IITF)- 2017 organized at Pragati Maidan, New Delhi from 14th – 28th November, 2017.
- **"Mission Bundelkhand"** was **launched** by Hon'ble Minister (MoWR, RD & GR) Sushri Uma Bharti at Lalitpur on Water Conservation. During the program **reports** on ***"Aquifer Mapping and Management Plan of Lalitpur District"*** and ***"Aquifer Mapping and Management Plan of Jhansi district"*** were **released** by Hon'ble Minister.
- Hon'ble Minister (MoWR, RD & GR) Sushri Uma Bharti undertook **Ganga Nirikshan Yatra**, under NMCG, along Ganga River in the State of Uttar Pradesh to spread awareness about the Project **'Namami Gange'**. Hon'ble Minister was accompanied by Chairman CGWB and other officers from CGWB. Hon'ble Minister (MoWR, RD & GR) initiated her yatra in West Bengal from Ganga-Sagar to Gangotri. During the yatra,

(xii) 7th International Ground Water Conference 2017 (IGWC-2017):

The 7th International Ground Water Conference 2017 (IGWC-2017) entitled "Groundwater Vision 2030: Water Security, Challenges & Climate Change Adaptation", under the aegis of National Hydrology Project (NHP) has been organised by NIH in partnership with CGWB, Association of Global Groundwater Scientists (AGGS)

Hon'ble Minister (WR, RD & GR) inaugurating the pavilion of MoWR at 37th IITF-2017, Pragati Maidan, New Delhi

Release of 'Mission Bundelkhand' Report on Aquifer Management Plan of Jhansi district by Hon'ble Union Minister, MoWR, RD & GR, Shushri Uma Bharti

& Texas A&M University (ATM), on 11th -13th December, 2017 at New Delhi. The groundwater professionals working in the country and abroad attended the deliberations.

(xiii) Activities under taken by CGWB in the North Eastern Region (NER):

The Central Ground Water Board (CGWB) is conducting scientific and technical studies for ground water assessment, development and management in the North Eastern Region. Major achievements of the North Eastern Region in the year 2017-18 up to March, 2018 are given in Chapter 9: Initiatives in the North East.

xvi) National Hydrology Project (NHP):

CGWB has Project Implementation Plan for Rs 85.00 crore, in respect of NHP, which is spread over a period of 8 years. CGWB proposes to take up following activities under NHP:

- **Real time monitoring of water quality in coastal aquifers in Tamil Nadu**

& Puducherry: Construction of 60 piezometers & installation of Digital Water Level Recorder with telemetry (includes, supply, installation & maintenance for 5 years after 1 year of warranty)

- **Establishment of Center of Excellence for groundwater modeling:** It will support the modeling studies of Purpose Driven Studies, Joint study of CGWB & CWC in River Basin Modeling and also, assist State ground water agencies & Regional Offices of CGWB to take up modeling studies.
- **eGEMS:** Consultancy for Design, development and Implementation of Additional Modules, including procurement of additional licenses and hosting; data integration and training for Pan India expansion.
- **PDS:** A purpose driven study proposed to be taken up in sub-basin above Ramganga confluence of Ganga Basin, for stream aquifer relationship, delineation of aquifer contamination through solute transport model & pilot study for aquifer remediation.
- **River Basin Studies:** A joint collaborative study with CWC for River Basin Studies.
- Institutions Capacity Enhancement.
- **Technical Guidance & Support to States in the implementation of NHP:**

  3 Nos of Domain specific training and 5 Awareness raising Campaigns have been completed. Minor procurements such as procurement of printers (2 Nos), laptops (5 Nos) & Hiring of vehicle (1 No) have been made. A proposal of Purpose Driven Study on River-Aquifer Relationship was submitted to PDS evaluation committee of NIH for approval. One officer from CGWB was trained at Delft Netherlands on surface water modelling in HEC-RAS software. In addition, 3 Officers had attended training on WB procurement procedures at NWA Pune, on Open source data & analysis at IIT, Roorkee & Water Quality Modeling at NIH, Roorkee. Coordinated training of Ground Water Modelling with IHE-Delft, The Netherlands for 25 Officers from State & Central Implementing Agencies, which was completed in April 2018.

(xv) Accreditation of CGWB labs by NABL as per ISO/IEC 17025: 2005:

Eight Regional Chemical Laboratories of CGWB have been accredited by NABL as per ISO/IEC 17025: 2005 for analysis of Chemical Parameters confirming International standards. These labs are located at Lucknow, Guwahati, Chandigarh, Bhopal, Nagpur, Hyderabad, Bhubaneswar and Jaipur.

CENTRAL GROUND WATER AUTHORITY

Central Ground Water Authority (CGWA) has been entrusted with the responsibility of regulating and controlling ground water development and management in the country and issuing necessary directives for the purpose. The Authority performs the following functions:

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

The 40th and 41st meetings of Central Ground Water Authority was held on 03.04.2017 and 10.08.2017 under the chairmanship of Shri K. B. Biswas, Chairman, CGWA and Shri Akhil Kumar, Chairman, CGWA respectively at New Delhi. The Guidelines of Central Ground Water Authority has been revised by the Committee constituted by the Ministry of Water Resources, River Development & Ganga Rejuvenation. The revised guidelines have been hosted on the website of Ministry, CGWB and NOCAP for inviting comments and suggestions. As per the directives of Secretary (WR, RD & GR) on-site inspections were carried out by the Regional Offices of CGWB to check the compliance of NOC accorded by CGWA. Necessary show-cause notices were issued to the project proponents who have not complied with the conditions of the NOC issued by CGWA.

CENTRAL WATER AND POWER RESEARCH STATION

The Central Water and Power Research Station (CWPRS), Pune an apex Research and Development institution in the field of hydraulics and allied research in the water and power sector has continued to serve the needs of the nation for 100 years by catering to the research and development needs for evolving safe and economical planning and design of water resources structures, river engineering, hydropower generation, and Ports and Water ways projects fulfilling the mandate of '***Service to the Nation through Research***'. CWPRS has offered its services to a number of projects in the neighbouring countries viz., Bangladesh, Bhutan, Afghanistan, Myanmar, Nepal, Singapore, etc., as well as countries in Middle East.

SIGNIFICANT ACHIEVEMENTS

(a) River Engineering: Major studies related to river training and bank protection works, hydraulic design of barrages and bridges, measuring water & sediment discharge etc., carried out are as follows:

- Flood Management Works for River Jhelum.
- Protection and restoration of Eastern Kosi Embankment.
- Proposed road and railway bridges across River Yamuna.
- Bank protection of River Ganga near Bhagalpur, Bihar.

(b) River and Reservoir Systems Modeling: A few important studies related to flood estimation & forecast, reservoir sedimentation & water quality studies carried out using mathematical models are as follows:

- Morphological and flood routing studies of River Narmada from Sardar Sarovar to Bharuch, Gujarat.
- Estimation of design discharges of River Alaknanda at Govindghat, Uttarakhand
- Assessment of water quality of Sardar Sarovar and Khadakwasla Dams.
- River Rejuvenation of Mutha River flowing through Pune City.

(c) Reservoir and Appurtenant Structures: Almost all the Infrastructure development projects of the country in the fields of Power Projects viz., Salma Dam, Afghanistan, Polavaram Project, Andhra Pradesh, Punatsangchu-I and II, Bhutan, Mangdechhu Project, Bhutan, Ratle Project, J & K, Arun-III, Nepal, Mullaperiyar Dam, Kerala, Teesta IV, Sikkim, Indira Sagar, M P, & Kiru Project, J & K, have the imprints of CWPRS. Hydraulic design for spillway profile and energy dissipation systems for Mangdechuu, Punatsangchuu and Kholangchuu in Bhutan, Teesta Stage IV & V Project, Salma Dam, Afghanistan, Lower Siang H.E. Project, Etalin H.E. Project, Arunanchal Pradesh, Polavaram Dam in Andhra Pradesh are the significant projects carried out in the recent past.

(d) Coastal and Offshore Engineering: Major significant projects related to optimization of location, length and alignment of breakwaters, jetties, berths, approach channel, turning circle etc. for development of ports and harbours, carried out in the recent past include viz. Project VARSHA, Mumbai Port, JNPT, New Mangalore Port, Kamarajar Port, Ennore, Visakhapatnam Port, Paradeep Port, Mormugoa Port, , Kandla Port, Chennai Port, Cochin Port, Kolkata port, Chidambarnar Port, Tuticorin, Fisheries Harbours and Kudankulam**.**

(e) Foundation and Structures: Laboratory and field tests are carried out to determine soil, rock and concrete properties. Some of the major studies include:

- Strength and Elastic Properties on Cylindrical Concrete Core - Hirakud Dam, Odisha.
- Dam Instrumentation Data - Indira Sagar Dam, MP.
- Strain Measurement – Penstocks - Kalinadi H.E. Project, Karnataka.
- Geotechnical stability - Karwar Port, New Mangalore Port, Jigaon Earthen Dam, Maharashtra and Kakinada Port, Andhra Pradesh.

(f) Applied Earth Sciences: Important studies related to seismic surveillance of river-valley projects, controlled blasting studies for civil engineering construction sites, detection of seepage and engineering properties structures using Nuclear logging & Geophysical methods are:

- Determination of in-situ material strength, Dynamic response analysis and Non destructive testing for Mulla Periyar Dam, Kerala.
- Microearthquake study - Sawalkote J&K and Tlawng H.E.P. Mizoram.
- Seismological studies – Punatsangchhu - I H.E.P. Bhutan.
- Analysis & interpretation of seismological data - Indira Sagar Power Station
- Seepage studies - Omkareshwar Dam, MP
- Nuclear density logging and tracer studies - Almatti Dam and Manikdoh Dam

AWARDS

- CBIP Award "Best R&D Institute in Water Resources Sector" - 2017
- Vasundhara Mitra Award - 2017 at Pune for contribution towards Environmental Protection.

A Brief Summary of Achievements of CWPRS

Indicators	2016-17	2017-18
Studies Awarded (Nos.)	111	147
Amount (Rs. crore)	25.90	33.97
Reports Submitted (Nos.)	95	105
Paper Published (Nos.)	90	58
Participation in Seminars/Symposia/ Conference (Nos.)	114	64
Lectures Delivered (Nos.)	97	38
Technical Committee Meetings (Nos.)	23	38
Training of Personnel (Nos.)	315	823
Training Programmes/Conferences/Organized (Nos.)	17	18

GANGA FLOOD CONTROL COMMISSION

Ganga Flood Control Commission was established in 1972 with its Headquarters at Patna. 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 Ganga basin States are part time Members/permanent invites.

ACHIEVEMENT DURING 2017-18

(i) Maintenance of Flood Protection Works of Kosi and Gandak Projects:

The flood protection works on river Kosi and Gandak are being carried out based on site inspection after every flood season and on the recommendations of Kosi High Level Committee (KHLC) and Gandak High level Standing Committee (GHLSC) respectively. The reimbursement of expenditure incurred on maintenance of the flood protection works executed in Nepal portion is being made by Government of India after utilization certificate of the same is received from the State Government of Bihar for Kosi and Government of Uttar Pradesh for Gandak respectively.

Like previous years, this year also, the KHLC/GHLSC inspected the flood protection works on river Kosi and Gandak during 20th October – 23rd October, 2017 and 14th -17th October, 2017 respectively, held meetings and finalized the recommendations for flood protection works on these rivers to be taken up and completed in time bound manner.

(ii) Updating of comprehensive Plan for Flood Management:

Comprehensive plans for flood management for all the 23 river systems of the Ganga basin were prepared between 1975 & 1990. The work of updating these comprehensive plans was taken up due to changes, additional information/ data on hydro-meteorology and morphology in the basin in the subsequent years. All comprehensive plans except comprehensive plan for Flood Management for Kosi river system have been updated once. Second updating of 6 plans have also been completed. Second updation of Rupnarayan-Handi-Rasulpur is completed in July, 2017. During the year the first up-dation of the comprehensive plan of Kosiriver System is under progress.

(iii) Assessment of the adequacy of existing waterways under road and rail bridges:

Assessment of the adequacy of existing waterways activity commenced during the later half of the eighties has been completed except for some stretches of the Ganga main stem. Main stem Ganga was divided in to 5 reaches (a) Outfall to Sahebganj, (b) Sahebganj to Buxar, (c) Buxar to Haridwar, (d) Haridwar to Rudrapryag and (e) Rudraprayag to Badrinath & Rudrapryag to Kedarnath.

Out of 5 reaches the assessment study has been completed for 4 reaches. Rudraprayag to Badrinatrh was completed in the FY 2017-18. The last reach i.e. Rudrapyag to Kedarnath will be taken up in FY 2018-19.

(iv) Monitoring of Important Flood Management Schemes:

GFCC is monitoring about 137 flood management schemes which, inter-alia, include:

(a) 113 flood management schemes supported under "Flood Management Programme" of Ministry of Water Resources River Development and Ganga rejuvenation;

(b) 2 schemes of maintenance of flood protection works of Kosi and Gandak Projects in Nepal;

(c) 3 schemes viz; extension of embankment along Lalbakey, Kamla and Bagmati rivers in Nepal; and

(d) 19 schemes on common/border rivers in west Bengal along India-Bangladesh border under the Central Sector Schemes

"River Management Activities and Works related to Border Areas".

(v) Techno-economic Appraisal of Flood Management Schemes:

Techno-economic appraisal of flood management schemes of Ganga basin States is a continuing activity of GFCC. 62 number of Flood management schemes were received in GFCC from Ganga Basin States during 2017 including spill over projects from previous years, out of which 19 schemes received in current financial year. 17 schemes were accorded techno-economic clearance and on 15 schemes compliance were issued, 05 schemes were dropped and 25 schemes are under examination in GFCC.

SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE (SSCAC)

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 (Hydropower works) of the Sardar Sarovar Project. The Secretary, Ministry of Water Resources, is the Chairman of the SSCAC. The officers of the departments like Water Resources, Irrigation, Power, Finance and Revenue etc. concerned with the construction of the project, of the four party states viz Gujarat, Maharashtra, Rajasthan and Madhya Pradesh along with concerned officers from the Government of India and the Narmada Control Authority are members of the committee. The secretariat of the Committee is located at Vadodara and it has a full time secretary of the rank of Joint Secretary belonging to the Central Water Engineering (Group – A) service. SSCAC is a very small organization working under MoWR, RD & GR; hence there is no direct recruitment.

SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE (SSCAC)

The 85th meeting of the SSCAC was held on 15th January, 2018 at New Delhi. The major issues discussed are as follows:

- Insurance Coverage for Sardar Sarovar Power Houses.
- Foreclosure of contract awarded to M/s INTRAX for work package IV of Energy Management Centre of Narmada Control Authority.
- Annual Development Plan 2017-18 for Unit-I and Unit-III works of Sardar Sarovar Project.
- Construction of new structures of Bridges/Culverts in existing land width and side of existing structure on Kevadia to Akteshwar road from ch. 8/0 to 14/4 Taluka Garudeshwar, Distt. Narmada.
- Meeting of Dam Safety Panel for Sardar Sarovar Project.
- Review of the progress of Unit-I and Unit-III works of Sardar Sarovar Project: (I) Raising the height of Sardar Sarovar Dam above Crest level (i.e. 121.92m) - Refurbishing and restoring of Radial Gates &its appurtenant parts along with its handling for SSP.
- Construction of Garudeshwar Weir.
- Supply Installation and Commissioning of Isolated Phase Bus Ducts, Static Frequency Convertor and Phase reversal Switches along with all required accessories (i.e. balance items) for pumping mode operation of 6x200MW T.G. Sets of River Bed Power House (RBPH)at Sardar Sarovar Hydro Electric Project (SSHEP) at Kevadia Colony.
- Payment of share cost of SSP by the party States.

PHYSICALACHIEVEMENTS (SARDAR SAROVAR PROJECT)

SSCAC, as recommendatory and advisory

Committee, recommended the proposal; "Refurbishing and restoring of Radial Gates & its appurtenant parts along with its handling for Sardar Sarovar Project" as discussed in the 83rd meeting of the SSCAC held on 26th June, 2015 at New Delhi. The work has been completed now.

FINANCIAL ACHIEVEMENTS

SSCAC has continuously made efforts to minimize the outstanding share cost of SSP payable by the party States. As per the statement of SSNNL, the total undisputed share of expenditure to be reimbursed by party States of Madhya Pradesh, Maharashtra and Rajasthan, as on November, 2017 is Rs. 5869.07 crore out of which Rs 5096.96 crore has been resolved amongst the party States. The balance share cost of Rs. 772.11 crore is remaining for reimbursement.

BANSAGAR CONTROL BOARD

Bansagar Control Board was set up vide Government of India, Ministry of Agriculture and Irrigation Resolution No.8/17/74-DW-II dated 30th January, 1976. It was amended vide Resolution No.8/17/74-DW-II dated 28th March, 1978. This Resolution was in accordance with an agreement reached between the Governments of Madhya Pradesh, Uttar Pradesh and Bihar on 16th September, 1973 for sharing the waters of River Sone and the cost of the Bansagar Dam. The Union Minister of Water Resources, River Development and Ganga Rejuvenation are the Chairman of the Board and 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 met out of budge grant of Union Ministry of Water Resources and subsequently reimbursed by the three States of Madhya Pradesh, Uttar Pradesh and Bihar.

Bansagar dam was raised to its full height along with erection of 18 nos. Radial Crest Gates in June, 2006. In 2017-18 the reservoir got filled up to Reservoir Level (FRL) i.e. RL 338.97m on 26.9.2017.

BANSAGAR DAM PROJECT

Bansagar is a multipurpose river valley project on river Sone in Madhya Pradesh envisaging both irrigation and hydroelectric

power generation. The Bansagar Project is being executed by the Water Resource Department, Government of Madhya Pradesh under direction of Bansagar Control Board. The party States are carrying out the execution of the canals and power system independently under their jurisdiction.

STATUS OF RELEASE OF WATER TO THE BENEFICIARY STATES FROM BANSAGAR DAMS (2017-18)

The total water released to the Sates of Madhya Pradesh, Uttar Pradesh and Bihar from April, 2017 to Match, 2018 is 717.273 M.Cum, 65.067 M.Cum and nil M.Cum respectively.

UPPER YAMUNA RIVER BOARD (UYRB)

Upper Yamuna River Board is a subordinate office under Ministry of Water Resources, River Development & Ganga Rejuvenation, Government of India. A memorandum of Understanding (MoU) was signed by the Chief Ministers of Himachal Pradesh, Haryana, Utter Pradesh, Rajasthan and National Capital Territory of Delhi on 12thMay, 1994 regarding allocation of utilizable surface flow of River Yamuna upto Okhla Barrage (Upper Yamuna) among the co-basin States.

The Board consists of Member, Central Water Commission as part time Chairman and one nominee each from the States of Utter Pradesh, Uttarakhand, Haryana, Rajasthan, Himachal Pradesh, and National Capital Territory of Delhi not below the rank of the Chief Engineer, a Chief Engineer from Central Electricity Authority and representatives of Central Ground Water Board and Central Pollution Control Board as part time Members. The Board has a full time Member-Secretary who does not belong to beneficiary states.

The expenditure on the Board is shared equally by the six basin States. The Board has sanctioned staff strength of 58 and all the posts of Board Secretariat are filled on deputation basis from Staff/Officers of Central / State Government.

UPPER YAMUNA REVIEW COMMITTEE

As per Resolution dated 11th March, 1995, there shall be a "Upper Yamuna Review Committee(UYRC)" comprising of the Chief Ministers (Governor in case of President's Rule) of the States of Himachal Pradesh, Haryana, Rajasthan, Utter Pradesh, Uttarakhand, and National Capital Territory of Delhi under the Chairmanship of the Hon'ble Minister, MoWR, RD & GR, Govt. of India for assessment of working of the UYRB and ensure implementation of MoU dated 12.05.1994 regarding allocation of surface flow of Yamuna and issue directions as may be necessary for the proper development and management of the upper reaches of the Yamuna River Basin uptoand including Okhla Barrage.

ACTIVITIES OF UYRB

The Board has been making tentative seasonal distribution of water to basin States at various distribution points. In continuation to above, Board has started the process of installation of telemetry system to observe discharge at 11 locations in the basin to ensure real-time dissemination of flow data amongst participating States. The above work was awarded to M/s Sutron Hydromet Systems Pvt. Ltd., New Delhi on 17.10.2017.

Government of India has included the three proposed storage projects in the upper reaches of Yamuna and its tributaries known as Renukaji Dam, Kishau Dam and Lakhwar-Vyasi Projects as National Projects for which 90% of the cost of irrigation and drinking water supply component of the project shall be provided by the Government of India.

UYRB has continuously been engaged itself in resolving the inter- State issues amongst the basin States and signing of Agreements related to water distribution and related to benefits and cost sharing from

Foundation on Stone Laying Photo

Sh. Arjun Ram Meghwal, Hon'ble Minister of State, MoWR, RD & GR, GoI laid the foundation stone of UYRB office building at NOIDA on 10.02.2018

the proposed above three projects in Upper Yamuna Basin. In the 51st meeting of UYRB & 7th meeting of UYRC, various decisions were taken. In continuation to it, a meeting of E-in-Cs of Irrigation Department, UP & Uttarakhand was held on 15.01.2018 under the Chairmanship of Chairman, UYRB in which the principle of division of Yamuna water between both the States has been decided.

UYRB has been working to resolve actively on various issues amongst the Basin States of Upper Yamuna reaches viz. Share of Yamuna Water to Rajasthan at Ex-Tajewala, Short supply of Yamuna water to Rajasthan from Okhla headwork, Interceptor Sewer Scheme for Yamuna River, Schemes for Gurgaon Feeder Canal and Agra Canal, Pollution of Yamuna raw water at Wazirabad, Division of Utilizable Water Resources of Yamuna River between Uttar Pradesh and Uttarakhand etc. The 7th meeting of UYRC was held under the Chairmanship of Hon'ble Minister, WR, RD & GR to discuss / resolve the various issues regarding water sharing among various basin States.

Board has organized 51 meetings of UYRB and 7 meetings of the UYRC since its constitution to till date. In the year 2017-18, 51st meeting of UYRB was held on 14.09.2017 at Sewa Bhawan, New Delhi under the Chairmanship of Chairman, UYRB & Member (WP & P), CWC and 7th meeting of UYRC was held on 15.02.2018 at Vigyan Bhawan, New Delhi under the Chairmanship of Hon'ble Minister (WR, RD& GR), GoI in which various important decisions were taken.

COMPLETION OF BALANCE WORKS OF NORTH KOEL RESERVOIR PROJECT, BIHAR AND JHARKHAND

North Koel Reservoir project on North Koel river is situated in the most backward tribal area of Palamu and Garhwa districts of Jharkhand. The major components of project include Mandal dam, Mohammadganj Barrage (located 96 km downstream of Mandal dam) and two canals, originating from the left and right bank of Mohammadganj Barrage, with network of distribution system for irrigating the 111,521 hectares drought prone areas in the States of Jharkhand and Bihar.

The Union Cabinet has approved the proposal at an estimated cost of Rs 1622.27 crore during three financial years from the start of the project. The Cabinet also approved execution of balance works of the

project on turnkey basis by M/s WAPCOS Ltd., a CPSU under MoWR, RD & GR as Project Management Consultant (PMC). M/s WAPCOS Ltd has awarded the tender for execution of balance works on the dam and barrage. Works on the barrage has been started.

REGISTERED SOCIETIES

NATIONAL WATER DEVELOPMENT AGENCY (NWDA)

The National Water Development Agency (NWDA) was set up in July, 1982 by the Government of India as a Society under Societies Registration Act 1860 under the then Ministry of Irrigation (now Ministry of Water Resources, River Development and Ganga Rejuvenation) to study the feasibility of the links under Peninsular Component of National Perspective Plan. NWDA is fully funded by the Government of India. Subsequently in 1990, NWDA Society resolved to take up the studies of the Himalayan Component also. Further, on 28th June, 2006 preparation of Detailed Project Reports (DPRs) of link projects and pre-feasibility/ feasibility reports of intra-State links as proposed by States were also included in the functions of NWDA. Accordingly, the Ministry vide resolution dated 30.11.2006 has modified the functions of NWDA Society. The functions of NWDA were further modified vide the Ministry's resolution dated 19.05.2011 to undertake the work of preparation of DPRs of intra-State links also by NWDA, and the same has been published in the Gazette notification of Govt. of India dated 11th June, 2011. Further, two new Functions in the mandate of NWDA were added vide Gazette notification dated 07.10.2016.

Hon'ble Union Minister of WR, RD and GR is the President of the Society. The President exercises such powers for the conduct of the business of the Society as may be vested in him/her by the Society.

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

MAJOR ACTIVITIES INTER BASIN WATER TRANSFER PROPOSALS:

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

(i) Peninsular Rivers Development Component:

NWDA has collected data and water balance studies of all 137 basins/sub-basins and 52 identified diversion points (including 3 additional studies), 58 reservoir studies, Toposheet studies of 18 links including 1 additional study and all 18 pre-feasibility reports. Based on these studies, NWDA has identified 16 water transfer links under Peninsular Component for Surveys and Investigations and preparation of Feasibility Reports. So far FRs of 14 links under Peninsular Component has been completed.

DPR of Ken-Betwa Link Project Phase-I, and Ken-Betwa Link Project Phase-II, Damanganga – Pinjal Link Project and Par-Tapi-Narmada Link Project have been completed by NWDA.

Alternative studies of Mahanadi-Godavari link without Manibhadra Dam are being carried out. The Minister (WR, RD & GR) have directed that an alternative plan to transfer water from Godavari basin without Ichampalli Dam is to be explored and a technical feasibility note be prepared. The studies are in progress by NWDA.

(ii) Himalayan Rivers Development Component:

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

NWDA has completed water balance studies of all the 19 diversion points, Toposheet studies of 16 storage reservoirs & 19 water transfer links and pre-feasibility report of 14 links. Based on these studies, NWDA has identified 14 water transfer links under Himalayan Component for Surveys and Investigations and preparation of Feasibility Reports (FRs). So far FRs of two links (Indian portion) in the Himalayan Component has been completed. The surveys and investigations and preparation of draft feasibility reports of seven more links in Indian portion have been completed. Field surveys & investigations for the remaining links under Himalayan Component are under progress except one link which lies entirely in Nepal.

PREPARATION OF DETAILED PROJECT REPORT (DPR)

(i) Ken-Betwa Link Project:

A tripartite Memorandum of Understanding (MoU) for the preparation of Detailed Project Report (DPR) of Ken-Betwa Link Project was signed amongst the Union of India, Governments of Madhya Pradesh and Uttar Pradesh on 25.8.2005.

Ken-Betwa Project has been declared as a National Project by the Government of India in the year 2008 and subsequently been included as a part of Prime Minister's package for development of drought prone Bundelkhand region. The DPR for the Phase-I of Project was completed by NWDA and sent to the concerned States in April, 2010.

GRANTS RELEASE AND EXPENDITURE INCURRED BY NWDA

The total grant-in-aid released to NWDA up to 31st March, 2018 was Rs. 720.90 crore.

CONSTITUTION OF SPECIAL COMMITTEE ON "INTERLINKING OF RIVERS

The Hon'ble Supreme Court in the matter of Writ Petition (Civil) No.512 of 2002 on Networking of Rivers along with Writ Petition No.668 of 2002 delivered a judgment dated 27.2.2012. The Hon'ble Supreme Court has directed that an appropriate body should be created to plan, construct and implement the inter linking of rivers program for the benefit of the nation as a whole.

Further, Hon'ble Apex Court vide their judgment in a Writ Petition (Civil) on Networking of Rivers (Inter-linking of Rivers) had directed that the Ken-Betwa inter-linking project be taken up for implementation at the first instance and the progress be placed bi-annually before the Cabinet. The Hon'ble Apex Court had also directed constitution of a Special Committee under the Chairmanship of Hon'ble Minister for Water Resources, River Development and Ganga Rejuvenation for carrying forward the inter-linking of rivers programme.

In compliance MoWR, RD and GR has constituted a Committee called Special Committee on Interlinking of Rivers under the Chairpersonship of Hon'ble Minister for WR, RD & GR vide Gazette Notification dated 23rd September, 2014.

The Special Committee for Interlinking of Rivers has been convened 14 meetings and last meeting was held on 14.01.2018. State Irrigation /Water Resources Ministers and Principal Secretaries/Secretaries of various States and other members attended the

meetings.

The Special Committee for Interlinking of Rivers has constituted four specific sub-committees comprising; (i) Sub-committee for comprehensive evaluation of various studies/reports (ii) Sub- Committee for system studies for identification of most appropriate alternate plan (iii) Sub-Committee for restructuring of National Water Development Agency and (iv) Sub-Committee for consensus building through negotiations and arriving at agreement between concerned States. The three Sub-Committees (i-iii) were constituted vide MoWR, RD & GR O.M. dated 13.02.2015. Eight meetings of the Sub-Committee–I have been held and last meeting was held on 28.12.2017. Ten meetings of the Sub-Committee –II have been held and last meeting was held on 03.03.2017.

The Sub-Committee-III for Restructuring of National Water Development Agency had completed the assigned work and submitted its Report to Hon'ble Minister (WR, RD & GR) and Chairperson, Special Committee on 21.09.2015.

A Consensus Group has been constituted by Ministry of Water Resources in June, 2002, under the Chairmanship of Chairman, Central Water Commission with DG, NWDA as Member Secretary. 11 meetings of the Group were held. This group has been renamed as 'Sub-Committee for consensus building through negotiations and arriving at agreements between the concerned states'. This Sub-Committee-IV has held two meetings on 17.04.2015 and 30.10.2015.

Cabinet in its meeting held on 15.11.2016 had reviewed the status-cum-progress report of ILR projects.

CONSTITUTION OF TASK FORCE FOR INTERLINKING OF RIVERS (ILR)

Ministry of Water Resources, River Development & Ganga Rejuvenation vide O.M. No. 2/5/2015-BM/630-645 dated 13.04.2015 has constituted a Task Force for Interlinking of River to look into the issues relating to Interlinking of Rivers. Eight meetings of the Task Force has been held on 23rd April, 2015, 5th November, 2015, 28th April, 2016, 15th June, 2016, 25th October, 2016, 13th February, 2017, 11th May, 2017 and 15th September, 2017 respectively.

CONSTITUTION OF GROUP ON LEGAL ASPECTS UNDER TASK FORCE FOR INTERLINKING OF RIVERS (TF-ILR)

In pursuance of the decision of the Task Force for Interlinking of Rivers taken in its 4th meeting held on 15th June, 2016, a Group has been constituted vide Office Memorandum dated 18.07.2016 to look into legal aspects and required enabling Provisions for implementation of Interlinking of Rivers and other related issues. The Group has submitted its report to the Chairman, TF-ILR during March, 2017. The report was independently examined by CWC. The Task Force discussed the Report of the Group on legal aspects. In its 9th meeting and decided to obtain legal opinion on the recommendations of the Group. Based on request, Prof. Madhava Menon, Director (Retd), Bangalore Law University has submitted his opinion on 11.08.2017 which was considered by the Task Force in its meeting held on 15.09.2017.

CONSTITUTION OF THE FINANCIAL GROUP UNDER TASK FORCE FOR INTERLINKING OF RIVERS

MoWR, RD & GR vide OM dated 12.09.2017 has constituted a Group on Financial Aspects under the Chairmanship of Dr. Prodipto Ghosh, former Secretary to the Government of India and Member of the Task Force. As per ToR of the Group, the Group would look into the financial aspects of various inter-basin water transfer links identified by NWDA and suggest funding pattern for implementation of these links. The Group has held four meetings so far on 24.10.2017, 17.11.2017, 08.12.2017 and 09.01.2018 respectively.

NABARD FUNDING UNDER PMKSY-AIBP

NWDA has been identified to act as an agency for borrowing resources from LTIF and release Central Assistance to the State Governments towards the prioritized PMKSY-AIBP (Major & Medium Irrigation) Projects and their CADWM works, for their completion in time bound manner. Memorandum of Agreement for borrowing from NABARD to fund Central share in these projects was signed by this Ministry of Water Resources, RD & GR, NWDA and NABARD on 6th September, 2016.

NWDA has signed a contract agreement with WAPCOS Limited for "Establishment of Project Monitoring Unit for Monitoring and Management of Pradhan Mantri Krishi Sinchayee Yojna" in October, 2017. A Project Monitoring Unit has been set by WAPCOS Limited in the CSMRS campus, New Delhi.

FIFTH INDIA WATER WEEK-2017

Fifth India Water Week-2017 with the theme **"Water and Energy for inclusive growth"** was organized during 10th - 14th October, 2017 at New Delhi comprising of an International Conference and Exhibition. European Union was associated as foreign partner and Netherland was associated as foreign sponsor in the organization of IWW-2017. The Hon'ble President of India was the Chief Guest for the Inaugural function of the Conference on 10th October, 2017.

NATIONAL INSTITUTE OF HYDROLOGY (NIH)

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

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

The studies and research in the Institute are carried out under five scientific themes at the Headquarters, two Centers for Flood Management Studies and four regional centers. The five scientific themes at the Headquarters are: (1) Environmental Hydrology, (2) Ground Water Hydrology, (3) Hydrological Investigations, (4) Surface Water Hydrology, and (5) Water Resources Systems. The Institute has a Research Management and Outreach Division (RMOD), which provides the interface with various research and academic institutions.

The Institute has set up six regional centers in order to deal with the area specific hydrological issues of different regions in the country and for providing effective interaction with the States in the region. These Centres are: (1) Hard Rock Regional Centre (Belgaum), (2) Western Himalayan Regional Centre (Jammu), (3) Deltaic Regional Centre (Kakinada); (4) Central India Hydrology Regional Centre (Bhopal), (5) Centre for Flood Management Studies for Brahmaputra basin (Guwahati), and (6) Centre for Flood Management Studies for Ganga basin (Patna).

MAJOR RESEARCH AREAS (XII PLAN)

The major research areas identified under 12th Plan are:

- Hydrology of extremes
- Regional Hydrology
- Environmental Hydrology
- Integrated Water Resources Management
- Hydrology for Watershed Management
- R&D under National Water Mission
- Technology transfer and outreach activities

STUDIES AND RESEARCH

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

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

SPONSORED RESEARCH ACTIVITIES

The Institute has been undertaking research studies for providing solutions to the real life hydrological problems in the field using advanced techniques. Some of the significant contributions of NIH include studies for solution of real-life problems related to augmentation of water supply and water management in cities, glacier contribution in stream flow of Himalayan rivers for hydro-electric power projects, watershed development, water quality management plan for lakes, storm water drainage network in cities, flood inundation mapping and flood risk zoning, and water quality assessment in major cities.

CONSULTANCY CAPABILITIES

The Institute has excellent capabilities in the areas of hydrology and water resources to take up national and international consultancy. The Institute is taking up consultancy projects, which provide a good opportunity for the scientists of NIH to implement the results of their research for solving need-based problems.

TECHNICAL PUBLICATION

The research output of the Institute is published in the form of reports and peer reviewed scientific papers. During the year 2017-18, the Institute has published 59 papers in reputed international and national journals and proceedings of international and national conferences and symposia. During the year, 46 technical and 49 sponsored studies were going on.

TECHNOLOGY TRANSFER

One of the main objectives of the Institute is to transfer the developed technology to the target users. Besides wide dissemination of reports and research papers, organization of workshops, training courses, seminars, symposia, conferences, brain storming sessions, etc. have been major activities under the Technology Transfer Programme. The Institute has organized 18 training programmes for field engineers, scientists, researchers, etc.

CAPACITY BUILDING ACTIVITIES

NIH organized a number of training courses covering various topics of interest. The objective of the training courses was to upgrade the knowledge, skills and attitudes of the field engineers, NGO representatives, research students and other stakeholders operating in different states. Eighteen Scientists and scientific staff of the Institute were trained at various places in the country.

IMPORTANT EVENTS

The Institute participated in the 37th India International Trade Fair (IITF-2017), held at New Delhi during 14th -27th November, 2017, by putting up a stall in the pavilion

The Institute participated in the 37th India International Trade Fair (11 -2017 at Pragati Maidan organised by MoWR by November 14-27, 2017 showing working Model of sewage treatment band on constructed metland technology

The Institute participated in the 5th India Water Week-2017 on the theme: Water and Energy for inclusive Growth at Pragati Maidan organised by MOWR during October 11-14, 2017

of Ministry of Water Resources showcasing activities of the Institute - Working Model of Sewage Treatment based on constructed Wetland Technology during the exhibition.

7TH INTERNATIONAL GROUND WATER CONFERENCE (IGWC-2017)

Organized 7th International Ground Water Conference **(IGWC-2017)** on **"Groundwater Vision 2030: Water Security, Challenges and Climate Change Adaptation"** in association with CGWB, AGGS and Texas A&M University, USA during 11th -13th December, 2017 at New Delhi along with an add-on post-Conference workshop on "Groundwater Modelling using iMOD for the Ganga basin" on 14th December, 2017.

VIGILANCE AWARENESS WEEK (30TH OCTOBER - 4TH NOVEMBER, 2017)

In compliance of the directive from Central Vigilance Commission vide no. 017/VGL/023 dated 17.08.2017, Vigilance Awareness Week was observed in the Institute at Roorkee and its Regional Centres at Belgaum (Karnataka), Jammu (J&K), Kakinada (Andhra Pradesh), and Bhopal (Madhya Pradesh), and Centres for Flood Management Studies at Patna (Bihar) and Guwahati (Assam) from 30th October to 04th November, 2017.

NORTH EASTERN REGIONAL INSTITUTE OF WATER AND LAND MANAGEMENT (NERIWALM)

North Eastern Regional Institute of Water and Land Management (NERIWALM) is a Registered Society under the administrative control of the Ministry of Water Resources, RD & GR, Government of India. This is only Water and Land Management Institute (WALMI) established and governed by Government of India and serving eight states of North East. It was established by North Eastern Council (NEC), Shillong, Ministry of Home Affairs during December, 1989. It was

transferred to Ministry of Water Resources, RD & GR by the NEC, Ministry of Development of North Eastern Region (DoNER) w.e.f. 1st April, 2012. NERIWALM has been functioning under a two tier administration i.e. **'Governing Body (GB)',** presided over by Hon'ble Minister, MoWR, RD & GR and **'Executive Council (EC)'** which is chaired by the Secretary, MoWR, RD & GR**.**

ACHIEVEMENT OF ACTIVITIES:

The Institute has been conducting different technical activities based on an approved **Annual Action Plan.** The capacity building activities include training programmes, conferences, workshop and seminars covering various subjects and issues related to water and land resources management and fulfilling objectives of National Water Policy and National Water Mission, Government of India. In addition to organizing regular training, seminar, and workshops etc., some new initiatives have been taken up like documentation of "Dong System" a traditional Irrigation system prevails in Assam, Self-finance In-Plant Training for Students of NE Region and a proposal for registration also submitted to the Agriculture Skill Council, Govt. of India.

Physical and Financial achievement and new initiatives of activities during 2017-18

Activity	Achievement from 1st April, 2017 to 31st December, 2017		Anticipated achievement during 1st January to 31st March, 2018	
	Physical (Nos.)	Financial (Rs. in lakh)	Physical (Nos.)	Financial (Rs. in lakh)
Capacity building activities (training/ workshop/conferences)	37	9.23	14	1.30
Collaborative Training programmes				
a) with Assam Agricultural University for training on "Water Management in different Crops"	02	0.40	02	0.40
b) with ICAR NE Hills Centre, Umium, Meghalaya for training on "Rain water Harvesting"	0	0.00	02	0.50
Programmes sponsored by National Water Mission				
R&D on Base line study on Water Use Efficiency of five irrigation projects	04	29.03	04 (Inception Report submitted, continued)	28.87
As Nodal Agency of NWM for preparation of State Specific Action Plan (SSAP) of Water Sector: 19 states	11 States	208.08	08 State	*106.08 (*subject to release by NWM)

New Initiatives (Sponsored)				
International Seminar on Land and Water Issues in South East Asia: Status, Opportunities and Challenges	0	0	01	8.0 (sponsored by NEC, Shillong)
Regional Seminars on different issues of water sector	0	0	06	21.70 (Sponsored by NEC, Shillong)
Display and demonstration of micro-irrigation in the Research Farm being	01	--	--	Sponsored by Jain Irrigation System Ltd

NATIONAL GANGA RIVER BASIN AUTHORITY (NGRBA) AND SUBSEQUENT CONSTITUTION OF NATIONAL MISSION FOR CLEAN GANGA (NMGC) AS AN AUTHORITY

NATIONAL MISSION FOR CLEAN GANGA (NMCG)

National Mission for Clean Ganga (NMCG) was registered as a society on 12.8.2011 under the Societies Registration Act, 1860. It acted as implementation arm of National Ganga River Basin Authority (NGRBA) which was constituted under the provisions of the Environment (Protection) Act (EPA), 1986. NGRBA has since been dissolved with effect from the 7.10.2016, consequent to constitution of National Council for Rejuvenation, Protection and Management of River Ganga (referred as National Ganga Council) vide notification no. S.O. 3187(E) dated 7-10-2016 under EPA, 1986.

Financial achievements/releases during the FY: 2017-18 (Rs. in crore):

During the FY 2017-18 against Budget allocation of Rs. 2550.00 crore MoWR, RD & GR has released an amount of Rs. 1423.22 crore to National Mission for Clean Ganga. NMCG released an amount of Rs. 1625.11 crore to State Programme Management Groups and other implementing agencies for the implementation of project under Namami Gange.

A. POLLUTION MANAGEMENT

Cleaning of river Ganga is being carried out through various activities focusing on point and non-point sources for abatement of pollution, including treatment of municipal sewage, treatment of industrial effluent, river surface cleaning, rural sanitation, afforestation & bio-diversity etc. The details are given in following paras:

I. Municipal Pollution:

The municipal sewage being generated in cities on banks of Ganga is being managed by a mix of Interception & Diversion projects, Sewerage Network and Sewage Treatment Plant (STP) projects. As on 25.05.2018 aggregate of 276 MLD capacity created and 62 MLD rehabilitated and sewerage network of 1879.5 km. has been completed and made operational under NGRBA/ Namami Gange. Further, STP projects with additional treatment capacity of 2382 MLD new capacity and 867 MLD rehabilitation Capacity sewerage network projects of 4858 km. have been sanctioned and are in various stages of implementation. NMCG has so far sanctioned 104 Sewerage Infrastructure projects in 97 towns in Ganga River Basin at Rs. 17,366 crore under Namami Gange Programme including Externally Aided projects (EAP) component with the assistance of Japan International Agency (JICA) and the World Bank.

Sewerage infrastructure Components under Namame Gange

State	No. of towns	No. of Projects	Total Sanctioned Cost (Rs. crore)	Total Expenditure (Rs. crore)	No. of projects completed
Uttarakhand	14	31	1024.50	185.17	14
Uttar Pradesh	18	31	6845.40	1563.70	8
Bihar	10	20	4629.10	174.50	0
Jharkhand	2	2	156.00	37.01	0
West Bengal	15	16	2675.00	690.30	2
Haryana	2	2	217.87	217.94	1
Delhi	1	2	1818.40	33.69	0
Total	**62**	**104**	**17366.27**	**2902.30**	**25**

Hybrid annuity based PPP model

Financial model for execution of infrastructure projects under Namami Gange Programme on Hybrid Annuity based Public Private Partnership (PPP) model has been developed. The purpose is to implement infrastructure projects under 'Namami Gange' in a financially sustainable, outcome oriented and accountable manner.

Accordingly, development of 82 MLD STPs at Haridwar (68 MLD at Jagjeetpur, 14 MLD at Sarai) and 50 MLD STP at Ramana, Varanasi on hybrid annuity based PPP mode have been taken up on priority and notice inviting bids issued on 31.12.2016. Similarly development of sewage treatment project at Mathura through Hybrid Annuity based PPP mode has been approved. 3 Market Conferences with the prospective bidders and technology providers have been organized to assess receptiveness of market towards new hybrid annuity based PPP mode of implementation. Last Consultative meeting with prospective bidders and technology providers was conducted on 18.1.2017 at New Delhi. Standard Draft Concessionaire agreement and bid document have been prepared. 16 Transaction advisors have been empanelled. International Finance Corporation (IFC), a sister concern of World Bank, is the Transaction Advisor for the projects.

Pre-feasibility studies (PFR) and condition assessment in identified 118 towns has been entrusted to 5 Central Public Sector Undertakings (CPSUs). Pre-feasibility studies (PFR) and condition assessment reports of 90 towns have been prepared by CPSUs out of which 80 Reports have been examined.

II. Industrial Pollution:

In context of industrial pollution, besides others, tannery, textile, sugar, paper & pulp and distillery have been identified as polluting industries. There are total 48 distillers in main Ganga stem of GPI. Out of 48 distilleries 42 are molasses based, 6 units (2 bottling unit & 4 non-molasses units) are exempted from implementing ZLD status. Out of 43 units, 5 are self-closed, out of 37 units, 32 units have installed system for ZLD comprising of Reverse Osmosis (RO), Multiple Effect Evaporation (MEE) and composting/ Incineration. Remaining 5 distilleries have been issued closure directions. Majority of distilleries are opting Bio-methanation followed by MEE and Bio-composting route only few distilleries are going for MEE / Incineration. Further, out of 90 pulp and paper industries, 81% are complying and all the operational units have installed and connected their OCEMS to CPCB server. Additionally, 13 units in pulp & paper sector have achieved ZLD status. In Sugar sector compliance with notified effluent discharge quality norms and effluent generation norms notified in January, 2016. Sugar mills have achieved reduction in wastewater discharge

from 200 litres to average of 137 litres per tonne of cane crushed in compliance of the newly notified standards. Out of 76 operational sugar, 51 mills have installed the flow meters at the inlet of the ETP which is helpful to find out the waste water generation from the mills, 74 mills are having upgraded Effluent Treatment Plant (ETP) system up to the tertiary treatment level to improve the quality of treated effluent discharge. Out of 76 operational sugar mills, all mills have submitted their ETP adequacy assessments reports and 21 sugars mills have submitted the revalidated adequacy assessment reports from the third party (National Sugar Institute (NSI), Kanpur/Vasantdada Sugar Institute (VSI), Pune /IITs). Out of 76 operational sugar mills, 35 sugar mills have submitted their irrigation management plan from the reputed institute, 60 sugar mills have constructed the lagoon for the storage of the treated effluent in the low demand period.

III. MONITORING OF POLLUTION:

Towards monitoring of industrial pollution, online continuous effluent monitoring stations (OCEMS) have been installed and connected with CPCB server in 775 out of 1109 GPIs. However, number of GPIs has been updated by SPCBs to 938.

Water quality monitoring is being carried out by manual monitoring at 94 locations. Networks with 84 real time water quality monitoring station (RTWQMS) have been planned. Out of that 44 Real Time Water Quality Monitoring Stations (RTWQMS) installed and operational on main stem of river Ganga and its major tributaries. Data from these stations is collated and displayed at different locations of significance. The data generated is centrally complied at CPCB. Besides, existing locations, 40 new sites have been identified for installation of Real Time Water Quality Monitoring Stations (RTWQMS) for which receiving of No Objection Certificate from the Competent Authority is ongoing.

IV. ENTRY LEVEL ACTIVITIES:

The entry level activities have been initiated through Central Public Sector Units (CPSUs) for providing visible impact in short term. The entry level activities include river surface cleaning, repair / modernization / development of ghats and crematoria.

(i) River Surface Cleaning

River surface cleaning services through trash skimmers have been hired for 11 towns. These trash skimmers are operational in Delhi, Haridwar, Garhmukteshwar, Kanpur, Allahabad, Varanasi, Patna, Sahibganj, Howrah, Mathura-Vrindavan, Nabadwip.

River Surface Cleaning Trash skimmer

(ii) Ghat Cleaning

IL & FS Environmental Infrastructure and Services Ltd. (IEISL) has been engaged for cleaning of 84 ghats in Varanasi for 3 years at a cost or Rs. 5 crore per year. Similar ghat Cleaning activities are being taken up for other major towns such as Haridwar, Kanpur-Bithoor, Allahabad, Mathura-Vrindavan.

(iii) Ghats/ Crematoria

Details of Ghats/ Crematoria taken up in states are as under:

State	No. of Projects	Total Sanctioned Cost (Rs. crore)	No. of Ghats to be created	No. of crematoria to be created
Uttarakhand	9	175.08	22	22
Uttar Pradesh	11	397.7	87	25
Bihar	5	40.86	14	1
Jharkhand	4	62.07	12	2
West Bengal	7	44.24	15	4
Total	**37**	**721.94**	**151**	**54**

V. RURAL SANITATION AND GANGA GRAM:

Ganga Gram:

Ganga Gram initiative has been conceptualized to promote rural sanitation in the villages located on the banks of river Ganga with an aim to reduce the pollution load on river Ganga from such villages. The lead role in implementing the scheme has since been taken over by Ministry of Drinking Water & Sanitation. They would be developing 25 villages from across the 5 states as Ganga Grams on pilot basis. NMCG has released an amount of Rs. 100 crore to MoDWS in the month of November, 2017, for these activities.

Rural Sanitation:

The task of rural sanitation in villages along the bank of river Ganga has been assigned to Ministry of Drinking Water and Sanitation (MoDWS) for making villages sanitized. The key activities include IEC, construction of Individual House Hold Latrines (IHHLs) and Solid Liquid Waste Management (SLWM) in villages. Under this project a total of 4465 villages are marked on the banks of River

Ganga States viz. Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal.

All the marked villages (4465) situated along the bank of river Ganga have been declared Open Defecation Free (ODF) by Ministry of Drinking Water & Sanitation.

National Mission for Clean Gang (NMCG) has released an amount of Rs.578 crore during 2015-17 and Rs. 125 crores during 2017-18 to MoDWS.

VI. SYNERGY WITH CENTRAL MINISTRIES:

Signing of Memorandum of Undertakings (MoUs) with Central Ministries has been carried out for effective coordination and establishing synergy with various government ministries. These ministries are Shipping, Human Resource Development, Rural Development, Railways, Tourism, AYUSH, Petroleum (Indian Oil Corporation Limited for Mathura Refinery), Department of Youth Affairs, Drinking Water & Sanitation, Agriculture.

VII. ECO TASK FORCE/ GANGA TASK FORCE:

A company of Composite Ecological Task force (CETF), Territorial Army battalion of 111 infantry battalion was deployed during the July, 2015 to February, 2017 at Allahabad with an objective to create awareness, monitoring the river, Ghat Cleaning, afforestation and supporting NMCG's Outreach work. After the satisfactory completion of the given work, it was decided to continue the services of CETF battalion in the name of Ganga Task Force (GTF). The approval for rasing of one GTF battalion was given to the TA Directorate, MoD duringAugust 2017 for four years at an estimated cost of Rs. 167 crore with following scope of work:

a) Plantation of trees to check soil erosion.

b) Management of public awareness/ participation campaign.

c) Patrolling of sensitive river areas for biodiversity protection.

d) Patrolling of Ghats.

e) Monitoring of river pollution

f) Assist during floods/natural calamity in the region.

The raising process of GTF battalion is underway at Kanpur, Allahabad & Varanasi.

VIII. INTERNATIONAL COOPERATION:

NMCG endeavors to deploy best available knowledge and resources across the world for Ganga rejuvenation. Clean Ganga has been a perennial attraction for many international countries that have expertise in river rejuvenation. Countries such as Australia, United Kingdom, Germany, Finland, Israel etc. have shown interest in collaborating with India for Ganga rejuvenation. Germany has signed an implementation agreement with National Mission for Clean Ganga for technical cooperation worth of 3 million Euros. The main focus of this cooperation is on Indo-German knowledge exchange, information & data management, and public outreach both at national level and Uttarakhand State level. KfW, the German Development Bank, has offered a financial cooperation for Euro 120 million for the State of Uttarakhand. Ganga rejuvenation has also attracted funding from multilateral agencies such as World Bank (Us $ 1 billion) and Japan International Cooperation Agency (Rs.496.90 crore).

IX. COMMUNICATION AND PUBLIC OUTREACH (2017-18):

In view of the foregoing communication activities, a variety of Information, Education and Communication (I.E.C) activities for Namami Gange programme have been taken by NMCG to raise the level of awareness and participation. Following are the major events organised by NMCG pertaining to communication, public outreach, consultation and monitoring:

- **Ganga Saptami Sankalp Diwas (2nd May, 2017):** In a bid to not lose the unprecedented momentum generated by Ganga Swachhta Pakhwada, NMCG celebrated 'Ganga Saptami Sankalp Diwas' on 2nd May, 2017 during which interactive programmes were organised at more than 30 locations on the banks of the river. Scores of people took pledge to not pollute river Ganga. Thousands more joined the clean Ganga campaign.
- **Ganga Nirikshan Yatra (26th May to 12th June, 2017):** Ganga Nirikshan Yatra was conducted from Ganga Sagar in West Bengal to Gangotri in Uttarakhand during which Hon'ble Minister for Water Resources, River Development and Ganga Rejuvenation addressed Ganga Chaupals at about 28 locations. The mammoth Yatra to maximize people's involvement in clean Ganga movement saw participation from all stakeholders including state governments, local bodies, Gram Panchayats etc. Hon'ble Minister urged thousands of people to not pollute Ganga and become a part of Namami Gange programme. She also exhorted people to plant more trees and informed them about the rich bio-diversity of river Ganga.
- **Ganga Dusshera (3rd - 4th June, 2017):** On the auspicious occasion of Ganga Dusshera, Nehru Yuva Kendra Sangathan was tasked by NMCG to hold interactive sessions at village/block level with youth on river conservation.
- **Ganga Vriksharopan Saptah (25th July to 31st July, 2017):** Afforestation is one of the most important components of Namami Gange programme. In acknowledgement of this fact, a week-long plantation drive – 'Ganga Vriksharopan Saptah' (Ganga Plant-athon) was observed in the last week of July (from 25th to 31st July) during which several lakhs saplings were planted across five main stem Ganga basin states – Uttarakhand, Uttar Pradesh, Jharkhand, Bihar and West Bengal. Aimed at restoring the forest cover along river Ganga to fulfil the larger goal of rejuvenating the Ganga basin, people from all walks of life were exhorted to "Adopt a Plant" and participated in the mammoth afforestation drive. The alacrity with which people took part in the drive was inspiring. In a bid to mobilise the local communities and maximize public participation, administrations of each Ganga river bank districts were sensitized to issue directions to schools, colleges, civil society organisations and gram panchyats.

- **Awareness activities during Char Dham Yatra in Uttarakhand (July 2017**

to October 2017): NMCG organised several awareness activities during Char Dham Yatra 2017. Executed by State Programme Management Group (SPMG) Uttarakhand, the implementing arm of NMCG in states, several awareness activities like painting competition, hoardings, Unipole hoardings, street plays, mobile vans etc. were organised during Char Dham Yatra 2017. The winners of the painting competition were felicitated by the Hon'ble Governor of Uttarakhand Shri K.K. Paul. One of the main attractions of the programme was Ganga Trek (Gangotri-Gaumukh-Tapovan) which was organised in association with Nehru Institute of Mountaineering. NMCG was able to spread the clean Ganga message to more people during the religious season of Char Dham Yatra 2017.

- **Swachhta Hi Sewa (15th September, 2017 to 2nd October, 2017)**

  As part of the 'Swachhta Hi Sewa' campaign aimed to generate unprecedented awareness to keep surroundings clean, National Mission for Clean Ganga (NMCG) organised several public outreach activities in five main stem Ganga basin States and National Capital Territory of Delhi.

Observed over 15 days at several locations near river Ganga, activities like shram daan, plantation drives, cleaning of ghats, Ganga Swachhta Sandesh rallies, nukkadnataks, cultural programmes, workshops and various competitions were organised. Through these activities, people were sensitized about ails of river pollution and were urged to play their part in preserving the pristinity of the Ganges by not throwing any garbage in the river, by not washing clothes in the river, by stop defecating in open etc. The message of clean Ganga could be disseminated appropriately, and people fervently offered their participation in Namami Gange programme. The "Swachhta Hi Sewa" campaign proved to be an excellent platform to engage with the people. The commitment of Hon'ble Prime Minister, political leaders, religious leaders and celebrities (like Indian Cricket team) for "Swachhta Hi Sewa" campaign augured well to popularize clean Ganga message. The campaign culminated on 2nd October, 2017.

- **Foundation stone laying ceremony of Ramana STP by Hon'ble PM in Varanasi (22nd September, 2017):** Hon'ble Prime Minister Shri Narendra Modi laid the foundation stone of a 50 MLD Sewage Treatment Plant (STP) based on Hybrid Annuity-PPP model in Ramana in Varanasi on 22nd September, 2017. This is the first time ever that Hybrid Annuity-PPP model is adopted in sewage sector. It was a major step forward in realising the dream of Nirmal Ganga under Namami Gange programme.
- **Ceremony of signing of tripartite concession agreement for two Hybrid Annuity based PPP model (11th October, 2017):** Union Minister for Water Resources, River Development and Ganga Rejuvenation Shri Nitin

Jairam Gadkari presided over the ceremony of signing of tripartite concession Agreement with private sector concessionaries for two Hybrid Annuity-based PPP mode projects in two major cities in the Ganga river basin - Haridwar and Varanasi. A website to enable the corporates to undertake CSR activities was also launched. The first quarterly newsletter titled Namami Gange was also released by the Hon'ble Minister. The ceremony was followed by a press conference by the Hon'ble Minister.

- **India Water Week (10th to 14th October, 2017)":** After last year's good response at India Water Week, NMCG took part in the annual event this year as well. The whole-hearted participation of NMCG yielded positive results. Many new ideas were shared by experts in water sector and the visitors took keen interest in the activities being done under Namami Gange programme.

- **Patna projects foundation stone laying by Hon'ble PM (14th October, 2017):** Prime Minister Shri Narendra Modi laid the foundation stone for four awarded sewerage projects costing Rs 738.04 crore for the city of Patna.The ceremony took place at Mokama on 14th October, 2017. These four projects together will create new STP capacity of 120 MLD and upgrade the existing 20 MLD for Beur, Karmalichak and Saidpur sewerage zones. This will also lay down sewer network of 234.84 km in Beur and Saidpur zones. The event was extensively advertised by NMCG.

- **Chhat Puja (26th to 27th October, 2017):**

To reach to masses, NMCG participated in the Chhat Puja festival that is celebrated with much fervour in Delhi, Bihar and other areas along river Ganga. Namami Gange stall was set-up at Chhatghat at ITO, Delhi to popularize Namami Gange programme which also includes cleaning of Ganga's tributaries. River Yamuna is one of them. Apart from hoardings, calendar cards, caps and T-shirts, the USP of this event remained Namami Gange hot air balloon which was installed just outside the venue to create widespread awareness about clean Ganga mission. Activities like Shram Daan were also organised at the ghat in the morning of Chhat Puja. A team from NMCG offered Shram Daan at the ghat.

- **Ek Shaam Ganga Ke Naam (4th November, 2017):** A cultural evening – Ek Shaam Ganga Ke Naam – was organised by NMCG at NCUI Auditorium on 4th November, 2017 as part of Namami Gange programme's I.E.C. activities. Intended to evoke Ganga consciousness, the event was attended by hundreds of people from all walks of life including bureaucrats, academicians, researchers, artists, students, teachers, water and river experts, engineers, media, and other stakeholders.

- **India International Trade Fair-2017 (14th November to 27th November, 2017):** NMCG pavilion at India International Trade Fair 2017 at New Delhi was a hit. NMCG pavilion was given the award of Special Appreciation Certificate. Inaugurated by Hon'ble Union Minister for Water Resources Shri Nitin Gadkari on 15th November, 2017, NMCG pavilion showcased the achievements under Namami Gange programme.

- **Namami Gange road show in London (29th November, 2017):** In an attempt to appeal the corporates in United Kingdom to participate clean Ganga mission, a Namami Gange road show was organised in London during which Hon'ble Minister interacted with business tycoons. NRIs and PIOs in UK committed more than 5 billion dollars for the development of amenities like ghats, river fronts, crematoria and parks as part of the Namami Gange Mission. The road show was organized by the National Mission for Clean Ganga and the Indian High Commission in UK. The important MoUs were signed with Vedanta group for Patna, Foresight group for Kanpur, Hinduja group for Haridwar etc.

- **Namami Gange road show in Mumbai (7th December, 2017):** The road show in London, which was a success, was organised followed by a similar road show in Mumbai wherein Hon'ble Union Minister for Water Resources, River Development and Ganga Rejuvenation Shri Nitin Gadkari interacted with the captains of the Indian trade and industry, who made commitments to development amenities like ghats, river fronts, crematoria and parks along river Ganga. The Minister urged the need of the people's movement to make clean Ganga mission success.

- **Namami Gange Interventions in Magh Mela 2018:** Apart from setting up an exhibition at Magh Mela 2018 to spread awareness about Ganga cleaning, National Mission for Clean Ganga (NMCG) financed setting up of bio-toilets at several locations on the banks of the river, which are used extensively by the pilgrims and visitors. Other engaging activities like street plays and laser light shows were also organised at the Mela.

- **Ganga Swachhta Pakhwada (16th March to 31st March, 2018):** Continuing the momentum generated in 2017 during Swachhta Pakhwada, lakhs of people participated in the 15 days event organised across 28 cities. Apart from SPMGs, District Administration, PRIs, Forest Department, this year participation of Central Reserve Police Forces for Shram Daan has been very forthcoming.

The event saw massive involvement of school children. Activities like cultural evening, shram daan, painting competitions, signature and selfie campaigns, street plays, exhibitions, plantation drives, distribution of resource material etc.

The event was inaugurated in Haridwar by Drinking Water and Sanitation, Uttarakhand and Hon'ble Minister for State for Water Resources presided the concluding ceremony of Pakhwada in Allahabad.

- NMCG staff also organised shram daan twice at Kalindi Kunj Ghat on River Yamuna during the Pakhwada. All stakeholders were taken on board for successful completion of the Pakhwada.
- **Social Media Platforms:** NMCG/ Namami Gange has been active on social media platforms like facebook, twitter, youTube, instagram etc. Time and again,

e-contests and campaigns were run to engage as many people as could with the Namami Gange programme.

STATUTORY BODIES

BRAHMAPUTRA BOARD

Brahmaputra Board was constituted in the year 1980 by an Act of Parliament (No. 46 of 1980 called "The Brahmaputra Board Act") under List 56 of Schedule 7 of article 246 of the Constitution of India with the objective of planning and integrated implementation of measures for control of floods and bank erosion in Brahmaputra and for matters connected therewith. It started functioning since 11th January, 1982 with headquarters at Guwahati, Assam. The jurisdiction of the Board includes the states of Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, Sikkim and West Bengal (Jalpaiguri, Coochbehar, Alipurduar, Darjeeling and Kalimpong districts falling in Brahmaputra Basin).

COMPOSITION OF BRAHMAPUTRA BOARD

The Board consists of the Chairman, Vice-Chairman, General Manager and Financial Adviser as Ex-officio members and 17 part time Members representing 7 States of the North Eastern Region; North Eastern Council; concerned Ministries of Government of India, namely, Water Resources, Finance, Agriculture, Power, Road Transport & Highways; Organizations of Government of India, namely, Central Water Commission, Central Electricity Authority, India Meteorological Department and Geological Survey of India.

THE NORTH EASTERN HYDRAULIC & ALLIED RESEARCH INSTITUTE (NEHARI)

The institute was established near Guwahati with facilities of Hydraulic Modelling, Soil Testing, Concrete and Rock Mechanics Laboratory in association with CSMRS, CWPRS. The Board has successfully carried out sample testing as requested by various organizations like NEEPCO, CWC, NEC, NHPC and State Governments of Assam, Manipur, Meghalaya and Mizoram for their on-going projects. So far, NEHARI has completed physical model studies of (i) Jiadhal River, (ii) River Brahmaputra from Porvita to South Salmara, (iii) Majuli Island and (iv) Kameng River (Jia Bharali in Assam). *An Advisory Committee under the Chairmanship of Chairman, Brahmaputra Board with members from CWPRS, CSMRS, CGWB, IITG, WAPCOS, NERIWALAM & NWA-Pune governs the functions of NEHARI.*

MAJOR FUNCTIONS

The main function of the Board as per the Act is 'Survey and Investigation' and preparation of Master Plans for the control of flood and bank erosion and improvement of drainage giving due importance to the development and utilization of Water Resources of the Brahmaputra Valley for irrigation, hydropower, navigation and other beneficial purposes within the jurisdiction of the Board. Other important functions are preparation of Detailed Project Reports (DPRs) and estimates of projects proposed in the Master Plans, approved by Ministry of Water Resources and construction of Multipurpose Dams and other works in the field of management and development of water resources under its jurisdiction proposed in the Master Plans.

ACHIEVEMENTS OF THE YEAR

The important activities of Brahmaputra Board under its jurisdiction are as below:

(i) Master Plans:

Brahmaputra Board had taken up preparation of Master Plans of the main stem of the Brahmaputra and Barak along with 68 major tributaries of Brahmaputra including Majuli Island, River Dhaleswari and rivers of Meghalaya, Mizoram, Manipur and Tripura in three parts.

All 57 Master Plans identified up-to XI Plan have been completed by Brahmaputra Board. Out of above, 49 Master Plans have been approved by Government of India. During the year 2017-18: Eight Master Plans approved by the Board were submitted for approval of MoWR, RD & GR. These Master Plans are further modified incorporating some additional data collected utilizing tools of latest technology and 5 submitted to Ministry of WR, RD & GR and 3 are under modification. Master Plan of Imphal River in Manipur, Feni River in Tripura and 2 Master Plans in the State of Mizoram, namely, Tuichang and Kaladan (Kolodyne) are identified for preparation of Master Plans.

(ii) 'Survey & Investigation' and Preparation of Detailed Project Reports of Multipurpose Projects:

Brahmaputra Board took up 'Survey & Investigation' of 14 of Multipurpose Projects in Brahmaputra and Barak Basin and in the south flowing rivers of Meghalaya.

ANTI-EROSION AND FLOOD MANAGEMENT SCHEMES

(i) Protection of Majuli Island from Flood and Erosion:

Majuli is the largest inhabited fresh water River Island in the world. The Island has constantly been subjected to erosion by the mighty Brahmaputra. Responsibility for undertaking anti-erosion works for protection of certain spots in Majuli Island was given to Brahmaputra Board in the year 1999. Physical activities on the ground started in the year 2004. The total area of the land mass of Majuli Main Island was 502.21 sq. km. in the year 2004. Since the year 2004, with regular implementation of ant-erosion / bank protection measures by Brahmaputra Board, the total area of Majuli Island has increased to 524.29 sq. km. till the year 2016. Currently, works under Phase-II & III are almost completed. A new scheme for protection of Majuli Island from flood and erosion of river Brahmaputra for Rs. 233.57 crore has been approved by MoWR, RD & GR and Ministry of DoNER allocated Rs. 207.00 crore for the same. Execution of the scheme is in progress and targeted to be completed in next two year. Board also has it in mind to create a permanent office campus alongwith a recreation centre at Majuli and in this regard district administration has provided land.

DRAINAGE DEVELOPMENT SCHEMES (DDS)

Brahmaputra Board identified 41 drainage congested areas for preparation of Detailed Project Report (DPR) based upon the studies carried out under 49 approved Master Plans. During 2017-18, observations of CWC on the DPRs of Pota Kolong, Deroi, Larsing and Dharmanagar DDSs are being attended and DPRs are under modification.

Regarding Demow DDS, CWC requested to get the design of the DPR of Demow DDS to be vetted from CWC headquarters.

MONITORING OF SCHEMES UNDER FLOOD MANAGEMENT PROGRAMME - A STATE SECTOR SCHEME UNDER CENTRAL PLAN - IN BRAHMAPUTRA AND BARAK VALLEY

Brahmaputra Board is entrusted with monitoring of schemes under Flood Management Programme in respect of entire North Eastern Region including Sikkim and part of West Bengal falling under Brahmaputra Basin since 10th Five Year Plan.

NARMADA CONTROL AUTHORITY

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

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

The Authority is headed by the Secretary, Ministry of Water Resources,RD&GR, Govt. of India, as its Chairman, with Secretaries of the Union Ministries of Power, Environment & Forests, Social Justice & Empowerment and Tribal Welfare, Chief Secretaries of the four party States, viz. Madhya Pradesh, Maharashtra, Gujarat & Rajasthan, one full time Executive Member and three full time Members appointed by the Central Government and four part time Members one each nominated by each party States.

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

The Narmada Control Authority has its Head Quarter at Indore (MP), Regional Offices at Indore, Bhopal & Vadodara, Liaison Unit in New Delhi and Field Offices at Mandla, Hoshangabad, Kevadia and Indore.

MEETING OF NARMADA CONTROL ATHORITY, SUB-COMMITTEES / SUB-GROUPS

During the year (1.4.2017 to 28.02.2018) three Meetings of Narmada Control Authority, five Meetings of the Sardar Sarovar Reservoir Regulation Committee (SSRRC), one Meeting each of Narmada Main Canal (NMC) Sub- Committee, Hydro met Sub-Group, R&R Sub-Group of NCA, Environment Sub-Group, three Meetings of Task Force of NCA and two meetings of Power Sub–Committee were held.

PROGRESS OF SARDAR SAROVAR PROJECT

(i). Sardar Sarovar Dam:

NCA in its 89th (Emergency) Meeting held on 16th June, 2017 has given permission for the Phase-II construction comprising raising of further height of Sardar Sarovar Dam by lowering down of the Gates and impounding of water in the reservoir to FRL of EL 138.68 m. Subsequently, SSNNL, GoG has completed the work and reservoir permission schedule to fill the SSP reservoir up to FRL EL 138.68 m. was finalized by the SSRRC in its 51st Meeting. Due to lesser rains in the current year leading to deficit in utilizable flow in the order of 45%, the SSP reservoir was filled up only upto EL 130.75 m. in the month of September, 2017.

Sardar Sarovar Project was dedicated to the Nation by the Hon'ble Prime Minister on 17th September, 2017. An expenditure of Rs.58935.28 crore has been incurred on Sardar Sarovar Project upto November, 2017.

(ii). Narmada Canal:

Works on Narmada Main Canal (NMC) from Head Regulator to Gujarat Rajasthan border (Ch. 0 to 458.318 km) is almost completed. Works of 74.0 km. Narmada Main Canal in Rajasthan is also completed.

In Gujarat the works on all branch canals of NMC from 0 to 458.318 km have almost

Swachh Bharat Abhiyan in Narmada Control Authority

Sardar Sarovar Project-Dedicated to Nation by Hon'ble Prime Minister of India.

been completed except Kachh Branch Canal. 95% of distribution systems in NMC from 0 KM to 144.5 km up to minor level have been completed and balance work is scheduled to be completed in the year 2017-18. In Rajasthan portion, works pertains to Distributaries (Flow & Lift) including Sub- distributaries, minors & sub-minors were almost completed to 99%.

REAL TIME DATA ACQUISITION SYSTEM IN NARMADA BASIN

NCA was entrusted with the works of establishment of Real Time Data Acquisition System comprising of 26 remote stations and 1 Master Control Centre at Indore in Narmada Basin under Phase-I. Due to deterioration of satellite KALPANA-I and ageing and obsoleteness of the equipment leading to failure of stations beyond their revival and as per decision taken in 19th Hydromet Meeting to upgrade the existing 4 Project Station namely Bargi, Tawa , ISP and SSP, NCA has initiated for the action for up gradation by installing Cell Net Modem/ E Tracker with necessary accessories after completing necessary codal formalities. At present, 4 Project Stations and MCC are operational and hourly hydrometeorological data from the sensors are being received with varied degree of performance and stored at MCC, Indore. Based on these information and also analyzing manually collected data from other 14 Remote Stations, NCA issues the daily hydrological status report containing important hydrological parameters like water level, live storage, inflow / discharge for the major reservoirs operation table for monsoon period and Non monsoon period and 10 daily releases etc. in the Narmada Basin.

Consequent upon the decision taken in the 88th NCA meeting held at New Delhi on 17th May, 2017, the Central Water Commission was asked to take up the work of implementation of Real Time Data Acquisition System in Narmada basin for inflow forecast and Annual Water Accounting. The data thus obtained will be shared to NCA as well as party States on real time basis seamlessly. In pursuance CWC had constituted a Committee under the Chairmanship of Executive Member, NCA to finalise RFP so that Chief Engineer (NBO), CWC, Bhopal can take necessary actions for implementation of RTDAS. The first meeting of the said Committee was held on 29.01.2018 in New Delhi.

SSRRC Secretariat is monitoring the integrated reservoir operation of Narmada basin on daily basis as well as ten daily basis by issuing appropriate mechanism like DSR (Daily Status Report), OM on Ten Daily and comparison of Projected and actual releases. Dynamic interactive communications were also taking place with the respective project authorities for efficient monitoring.

WATER ACCOUNTING

NCA prepares Annual Water Account (AWA) of Narmada Basin and the AWA for the year 2015-16 has been prepared and circulated to the party States. NCA allocates the water among the party States on the basis of utilizable flow assessed by the end of October each year at ex SSP. On the basis of storage in the major and medium reservoirs in Narmada basin, release for various purposes and change in storages, utilization by Party States during monsoon, the utilizable flow for the year 2017-18, was assessed as 17.07 MAF which was 39% lesser than 28.00 MAF at 75% dependability. Water allocation to the party States are being done as per the provision made in the NWDT Award, NCA effectively monitors the regulation and uses of Narmada water on 10-daily basis by issuing the O.M. on the basis of approved Reservoir Operation Table and actual status of reservoirs and key G&D stations on Narmada River.

BETWA RIVER BOARD

A decision to harness the available water resources of Betwa River was taken in a meeting held on 22nd July, 1972 between Chief Ministers of Uttar Pradesh and Madhya Pradesh. Further Uttar Pradesh and Madhya Pradesh in a meeting held on 9th December,

1973 agreed for setting up of a tripartite Control Board for the speedy, smooth and efficient execution of the various inter-state projects of both the States. Betwa River Board (BRB) was constituted in 1976 by an Act of parliament to execute the Rajghat Dam Project and Power House. The project authority started construction of the project under the overall guidance of Betwa River Board after promulgation of Betwa River Board Act 1976. The benefits and cost of the above projects are being shared equally by both the State Governments.

The Union Minister of Water Resources is the Chairman of the Board. Union Minister of Power, Union Minister of Water Resources, Chief Ministers and Ministers-in-charge of Finance, Irrigation and Power of the two States are its members. An Executive Committee of the Board headed by Chairman, Central Water Commission manages the activities of the Board.

RAJGHAT DAM PROJECT

The Rajghat Dam with appurtenant structures has been constructed across River Betwa to provide Irrigation facilities to 1.38 lakh ha. In Uttar Pradesh and 1.21 lakh ha. In Madhya Pradesh with power generation of 45 MW through Rajghat Hydro Electric Project at the toe of dam on left flank. The cost as well as benefits of the project are to be shared equally by both the States. Construction work of Dam and Power House have been completed.

TUNGABHADRA BOARD

AWARD

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

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

PHYSICAL AND FINANCIAL ACHIEVEMENTS AND NEW INITIATIVES (FROM 1ST APRIL 2017 TO 31ST MARCH, 2018)

(i). Irrigation Wing:

(1) The Tungabhadra Reservoir filled up to the level 496.891m (1630.22 ft.) in this year. The inflow in to the reservoir from April, 2017 to March, 2018 was 3502.69 Million Cubic Meters (Mcum) (123.70 TMC). The utilization by the Karnataka State, Andhra Pradesh & Telangana till end of March, 2018 was 3194.21 MCum (112.806 TMC), 2107.84 MCum (74.440 TMC), 1018.13 MCum (35.956 TMC) and 68.242 Mcum (2.410 TMC) respectively as against the likely abstraction of 3228.02 MCum (114.00 TMC) for the water year 2017-18. Evaporation losses from April, 2017 to March, 2018 were 156.530 MCum (5.528 TMC) to be shared equally by the State of Karnataka on left side and the half share of the right side in the Reservoir evaporation loss shall be shared by the State of Karnataka and Andhra Pradesh in the ratio of 3.5 : 5.5. There is no surplus through spillway

during this water year 2017-18.

(2) Transparency in Water Management (Accounting and Measurement):

- Canal flow measurement with modern acoustic Doppler techniques is implemented. Installation of Telemetry system is commissioned.
- Daily live data of water level, velocity and discharge in the canals is displayed in the website of www.tbboard.gov.in for information to member states, publics and farmers community.
- This is propagating awareness among the farmers community about the over usage and misuse of water.
- Now the TB Canals are habituated to be closed during good rainy spells and adopting optimum usage of water as a mark of water accountability.
- Such events did not happen in the past one decade.

(3) Water management became more effective and judicious by introducing private security and labourer on the canal.

(4) The occurrence of canal breaches is nil.

(5) Due to partial completion of modernization works, velocity of flow improved and water is reaching the Board limit at 2000 Cusecs when compared to earlier 1200 Cusecs with more efficiency, when compared to the earlier years.

(6) Plugging of 800 to 1000 unauthorized pipes under canal banks was innovatively taken up with pressure shotcreting and 400 siphon wells are filled with earth. More discharges is realized at the Board limit by reducing unauthorized drawls.

(ii). Hydro Electric Scheme:

Two Power Houses are maintained by the Tungabhadra Board, with a total installed capacity of 72 MW and a target of 175 million units of power generation is envisaged during the water year 2017-18. Against this, the power generated till end of March, 2018 was 87.324 million units. The power generated is shared between the States of Karnataka and Andhra Pradesh in the ratio of 20:80 respectively.

(iii). Mini Hydel Power Plant:

1. A Mini Hydel Plant at the head of Right Bank High Level Canal of the Tungabhadra Project under Build, Operate, Own and Transfer (BOOT) system through an independent power producer viz., M/s NCL Energy Ltd., Hyderabad has been commissioned on 27-10-2004. The Mini Hydel Plant comprised 3 units of 2.75 MW each and generated 12.972 million unit's upto March, 2018. The power generated is purchased by the Transmission Corporations of Karnataka and Andhra Pradesh in the agreed ratio of 20:80.
2. One more new Mini Hydel plant was implemented at the head of Rayabasavanna canal of Tungabhadra Project under Build, Operate, Own and Transfer (BOOT) system through an independent power producer viz., M/s Khandaleru Power Company Limited, Hyderabad. The project construction was started in September, 2012 and commissioned in record time of 11 months i.e., 31.8.2013. The total project capital cost is Rs.11.5 crores. The Mini Hydel plant comprising single unit of 1.4 MW has generated 3.793 million units upto March, 2018. The power generated is purchased by the GESCOM, Gulbarga (Karnataka) and rate of power purchase is Rs.2.80 per unit.

(iv). Fisheries Wing:

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 produced and reared in the Board's Fish Farm to meet

the demand of the public and for stocking in the reservoir to increase the biomass of fish wealth. The fishing rights of the reservoir wasrenewed for the year 2017-18 to a local Fishermen's Cooperative Society for Rs.96.51 lakhs. In order to facilitate preservation of fish catch, the Board is running an ice-cum-cold storage plant. The gross earnings from the Ice Plant upto March, 2018 is 28.00 lakhs.

Board Meeting

In between April, 2017 to March, 2018 Tungabhadra Board held one meeting.

Award

The Board was conferred with CBIP Award for "Best Maintained Project" on 29.12.2016.

POLAVARAM PROJECT AUTHORITY

Indira Sagar (Polavaram) project is located on river Godavari near Ramayyapet village Polavaram Mandal of West Godavari district in Andhra Pradesh. The project is multipurpose major terminal reservoir project on river Godavari for development of Irrigation, Hydropower and drinking water facilities to East Godavari, Visakhapatnam, West Godavari and Krishna district of Andhra Pradesh. The project will provide irrigation to 2.91 Lakh Hectares (CCA) and hydropower with installed capacity of 960 MW apart from 23.44 TMC (663.7 MCM) drinking and industrial water supply to Visakhapatnam township and steel plant and diversion of 80 TMC waters to river Krishna. The ultimate irrigation potential of the project is 4.368 lakh ha and annual power generation will be 2369.43 million units. In addition, 540 villages will also be provided with drinking water facilities in the command area.

The Polavaram Irrigation Project was declared a National Project on dated 01.03.2014 vide section 90 of AP Reorganization Act, 2014 with Union Government to take under its control the regulation and development of the Polavaram Project. Central Government has created Polavaram Project Authority (PPA) with Governing Body to execute the Project and obtain all requisite clearances.

The Project was accorded investment clearance by the erstwhile Planning Commission for Rs. 10151.04 crore (at 2005-06 price level) in 2009. The estimated cost at 2010-11 level is Rs.16010.45 crore. The project was under construction with Central Assistance under Accelerated Irrigation Benefits Programme (AIBP). An expenditure of Rs.5135.87 crore has been incurred up to 31.03.2014 including Central Assistance of Rs.562.469 crore provided under AIBP. After declaration of National Project, additional Rs.5364.16 crore have been incurred till March, 2017.

AUTONOMOUS BODIES

KRISHNA AND GODAVARI RIVER MANAGEMENT BOARDS

APEX COUNCIL

In exercise of the powers conferred by sub-section (1) of Section 84 of the Andhra Pradesh Reorganisation Act, 2014 (Act 6 of 2014), the Central Government has constituted vide Gazette Notification dated 29th May, 2014, the Apex Council consisting of:

(a) Minister of Water Resources, River Development and Ganga Rejuvenation, Government of India —Chairman;

(b) Chief Minister of the State of Andhra Pradesh —Member; and

(c) Chief Minister of the State of Telangana —Member.

ACTIVITIES UNDERTAKEN:

KRISHNA RIVER MANAGEMENT BOARD (KRMB)

Subsequent to formation of the Board, various issues related with the functioning of the Board as mandated in the Andhra Pradesh Reorganisation Act, 2014 (6 of 2014)

were discussed through meetings with the senior officers of the States of Telangana and Andhra Pradesh. To sort out the issues raised by the State Governments, regular meetings were held at technical level as well as Board level. Besides various technical meetings, two urgent and important Board meetings on 10.7.2014 and 30.10.2014 were held so far to sort out drinking water requirements and issue of power generation as well as irrigation through Nagarjuna Sagar Project and Srisailam Hydroelectric Project and orders were passed. Three other Board meetings on 16.12.2015, 27.05.2016, 26.8.2016 and one special Board meeting on 08.02.2017 were also held. 6th and 7th Board meetings were held on 22.08.2017 and 04.11.2017 respectively.

GODAVARY RIVER MANAGEMENT BOARD (GRMB)

The first Meeting GRMB was held under the Chairmanship of Shri A. Mahendran on 6.8.2014 at Hyderabad. In pursuance of the decisions taken therein, few engineers and supporting staff have been posted on informal basis by Irrigation & CAD Department of the States of Andhra Pradesh and Telangana to assist the Chairman and Members of the Board in the day to day activities. The "Draft Godavari River Management Board Regulations, 2014" and "Draft Working Manual" have been prepared by the Board Secretariat and sent to both the State Governments in September, 2014 for concurrence/views.

The second meeting of GRMB was held under the Chairmanship of Shri M. S. Agrawal on 30.12.2014 at Hyderabad wherein significant decisions were taken for making the Board fully functional administratively and financially at the earliest. Both the State Governments have assured their full cooperation for technical strengthening of the Board by providing all technical inputs sought by the Board at the earliest. The third, fourth and fifth Board meetings were held on 21.01.2016, 16.11.2016 and 21.07.2017. 6th Meeting of Godavari River Management Board was held on 12th December, 2017.

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

8. Public Sector Enterprises

WAPCOS LIMITED

WAPCOS Limited is a "MINI RATNA-I" Public Sector Enterprise under the aegis of the Ministry of Water Resources, River Development & Ganga Rejuvenation. The Company was incorporated on 26th June, 1969 under the Companies Act, 1956. WAPCOS is a technology driven Consultancy and Engineering, Procurement and Construction (EPC) Organization with strong global presence in the fields of Water Resources, Power and Infrastructure Sectors. WAPCOS comply with the Quality Assurance requirements of ISO 9001:2015 for Consultancy Services in Water Resources, Power and Infrastructure Development Projects and Quality Assurance requirements of ISO 9001:2008 for Engineering, Procurement & Construction Projects related to Residential, Office Buildings, Civil Works, Roads & Highways, Irrigation, Agriculture and Water Projects, Electrical Power Projects for Generation, Substation, Transmission, Distribution Networks, Rural Electrification and Renewable Energy, Industrial, IT, Telecommunications etc.

OBJECTIVES

- Objectives offering integrated package of services of scientific, technological and managerial quality for optimal planning and development of Projects.
- To adopt modern technology and systems to build in quality, reliability and accuracy thereby ensuring customer satisfaction.
- To continue the pace of growth of domestic and overseas business and to transfer know-how to Clients.
- To adopt international standards in surveys, investigations, designs, cost estimates, project planning including environmental studies and project management services for cost-effective and integrated development of Water resources, Power and Infrastructure Projects.
- To promote research and development through interaction with other national and international agencies.
- To secure a fair monetary return to the enterprise as a result of its operations through improved productivity.
- To play a dynamic role in use of state-of-the-art consultancy for innovative design alternatives.
- To attract the best available talent and promote a committed and motivated workforce.

FIELDS OF SPECIALIZATION

Main Fields of specialization of the Company cover Irrigation, Drainage and Water Management, Ground Water Exploration and Minor Irrigation, Flood Control and River Morphology, River Management, Dams and Reservoir Engineering, Water Bodies and Land Conservation, Agriculture, Watershed Management, Natural Resources Management, Hydropower, Thermal Power, Pumped Storage Project, Transmission and Distribution, Rural Electrification, Non-

conventional Sources of Energy, Water Supply, Sanitation and Drainage, Environment, Ports and Harbours and Inland Waterways, Urban and Rural Areas development, Roads and Highway Engineering, and Buildings & Townships. The Company provides concept to commissioning services for developmental projects in India and Abroad.

WAPCOS' spectrum of services covers a wide range of activities:

• Preliminary Investigations/ Reconnaissance • Feasibility Studies/ Planning/ Project Formulation • Baseline and Socio-Economic Surveys	• Field Surveys & Investigations and Testing • Institutional/ Human Resource Development • Project Management and Construction Supervision	• Operation & Maintenance • EPC/ Turnkey & Deposit Works

The USPs of WAPCOS include Survey & Investigation/Pre-Feasibility/DPRs for more than 550 Projects in Irrigation, Water Resources & Agricultural etc. contributing to development of over 15 Million ha Irrigation Potential; more than 200 Projects in Ports & Inland Navigation; over 500 Projects in Water Supply & Sanitation, Rural & Urban Development, Roads & Highway Engineering; EIAs for over 250 Projects in the fields of Irrigation, Hydro/Thermal Power, Ports & Harbours in India and Abroad. Similarly, in Hydro-Power Sector; WAPCOS has completed almost 52 Hydro-Power Projects in 19 Countries with an installed capacity of more than 20,500 MW; over 105 Hydro Power Projects in India with an installed capacity of more than 9,000 MW. In Thermal Power; the Company has successfully completed 12 overseas Projects with installed capacity of more than 2,900 MW and 37 Projects in India with an installed capacity of more than 12,000 MW. In Transmission & Distribution WAPCOS has accomplished more than 14 Projects in India and Abroad.

REGISTRATION WITH INTERNATIONAL ORGANIZATIONS

- WAPCOS is registered with various international funding agencies for participating in the funded projects like
- World Bank
- Asian Development Bank
- African Development Bank
- Japan Bank for International Cooperation
- United Nations Office for Project Services
- French Development Agency
- German Development Bank

Operations Abroad: In the year 2008-2009, WAPCOS had presence in 8 countries that has expanded to 45 countries by year 2017-2018. Apart from India, WAPCOS has successfully completed/on-going consultancy assignments in about 60 countries covering Asia, Africa, Middle East, South America and is currently engaged in providing consultancy services in:

• Angola • Afghanistan • Bangladesh • Benin • Bhutan • Burkina Faso • Burundi • Cambodia • Central African Republic • Chad	• DR Congo • Ethiopia • Fiji • Georgia • Ghana • Guinea Conakry • Kazakhstan • Kenya • Lao PDR • Lesotho • Liberia • Malawi • Maldives	• Mali • Mongolia • Mozambique • Myanmar • Nepal • Niger • Nigeria • Philippines • Rwanda • Senegal • Sierra Leone	• South Sudan • Sri Lanka • Swaziland • Tanzania • Tajikistan • Togo • Uganda • Uzbekistan • Vietnam • Yemen • Zimbabwe

In India, the Company is providing Consultancy services for developmental projects in all the states and is involved in key Government of India schemes such as Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Namami Gange, Smart City, Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY), Pradhan Mantri Awas Yojana (PMAY), Integrated Power Development Scheme (IPDS), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Pradhan Mantri Gram Sadak Yojana (PMGSY) etc.

DIVIDEND

In view of the excellent performance of the company for the year 2016-17, Dividend of Rs. 35 crore, which is highest-ever in the history of the company and is 53.85% of the paid-up capital of Rs. 65 crore, was paid in September, 2017.

MoU SCORE FOR THE YEAR 2016-17

WAPCOS achieved MoU Composite Score of 100 with MoU rating as "Excellent" for the year 2016-17 on the basis of audited data, which was conveyed by the DPE vide their Score and Rating of MOU evaluation 2016-17 as on 24.01.2018. The Board in its 224th meeting held on 22th February, 2018 placed on record its appreciation for CMD and his team for this achievement.

AWARDS / RECOGNITION

Hon'ble President of India presented Award for Excellence and Outstanding Contribution to the Public Sector Management-Institutional instituted by Standing Conference of Public Enterprises, an apex body of Central Government owned Public Enterprises to recognize the contribution of Public Enterprises to WAPCOS. The Company has received several prestigious National/International Awards such as "Meritorious Award-Corporate Governance" instituted by Standing Conference of Public Enterprises, an apex body of Central Government owned Public Enterprises; "Top Performing CPSEs' "MoU Excellence Award" instituted by Department of Public Enterprises, Government of India; "Best Consultancy Organisation" - Instituted by Central Board of Irrigation and Power, a premier Institution setup by the Government of India; Company of the Year - PSE Excellence Award instituted by Department of Public Enterprises, Ministry of Heavy Industry and Public Enterprises, Government of India and Indian Chamber of Commerce to recognize the contribution of Public Sector to the Indian Economy Water Awards - Best Consultancy Company, Best Indian Water Company to Work and Made in India – Best Water Company (Public Sector) supported by UNESCO and ASSOCHAM; PSE Excellence Award – Corporate Governance and Corporate Social Responsibility & Sustainability Award, instituted by Indian Chamber of Commerce; PSE Excellence Awards- Corporate Governance- Department of Public Enterprises, Government of India; PSE Excellence Award - Best Human Resource Management- Department of Public Enterprises, Government of India, Corporate Governance & Sustainability Award, instituted by Indian Chamber of Commerce and World Water Leadership Congress Awards - Most Promising Brand endorsed by Asian Confederation of Businesses; India Africa Champion in Biz & SME Awards 2017 under Achievement in Power & Renewable Energy, Exemplary services in Agriculture & Dedicated Leadership in Infrastructure supported by ASSOCHAM.

INNOVATION AND CHANGE ORIENTATION

Over the last few years, WAPCOS has successfully diversified into Construction sector and involved in construction of projects in various sectors such as dams, buildings, STP's, Protection of Archaeology sites etc. WAPCOS now has the requisite experience & expertise to undertake EPC projects of any scale and complexity in the sectors of its operation.

WAPCOS has made significant

breakthrough in various flagships schemes of Government of India and has been able to secure projects under the following Schemes:

(i) Namami Gange, Integrated Ganga Conservation Mission: The Government of India approved the flagship "Namami Gange" Programme which integrates the efforts to clean and rejuvenate the Ganga river in a comprehensive manner. WAPCOS has prepared the DPR for more than 250 ghats and Crematoria in the states of Uttarakhand and Uttar Pradesh. In addition, Condition Assessment and Feasibility Report have been prepared for about 30 towns in the states of Uttarakhand and Uttar Pradesh. Currently WAPCOS is involved in Construction of 23 Ghats and Crematoria in Uttarakhand for the following:

- Chandi Ghat at Haridwar
- Stretch from Rishikesh to Devprayag
- Stretch from Devprayag to Rudraprayag
- Stretch from Haridwar to Uttarakhand Border

(ii) Atal Mission for Rejuvenation and Urban Transformation (AMRUT): WAPCOS is the Project Development and Management Consultant (PDMC) for this Scheme in Madhya Pradesh, Haryana and Meghalaya. WAPCOS has also been appointed for the preparation of DPRs for AMRUT projects in Rajasthan.

(iii) Smart City Mission: WAPCOS prepared the Smart City Proposal for Guwahati City and was ranked 17th in the 1st Round. In the second round WAPCOS prepared the Smart City Proposal for Shimla, which has also been selected.

(iv) Pradhan Mantri Krishi Sinchayee Yojana (PMKSY): An Agreement has been signed on 4.10.2017 between National Water Development Agency (NWDA), Ministry of Water Resources, River Development & Ganga Rejuvenation and WAPCOS Ltd. wherein WAPCOS has been appointed Project Monitoring and Management Agency for Projects under PMKSY. Scope of Work includes Examination of Pre sanction appraisal of CA to 99 Projects; Project wise quantification of work executed & balance works; Realistic revised work plan for completion of balance works as projected; Arrangement of the State Govt. for Gap Funding, if any; Inter face/ co-ordination work for funding with NWDA and NABARD; Site visits for monitoring of progress of works; Development & management of MIS; Co-ordination with State Government, MoA&FW, MoRD for timely updation of physical & financial progress and convergence of data base in the MIS; and Assist in organising workshops/ seminars/awareness campaigns on behalf of Ministry.

(v) Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY): WAPCOS is the REC Quality Monitor on behalf of Rural Electrification Corporation and Project Management Agency (PMA) and Third Party Inspecting Agency (TPIA) for the utilities of respective states of Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal, Assam, Tripura, Jharkhand, Haryana, Manipur, Nagaland, Himachal Pradesh, Jammu & Kashmir, Rajasthan, Madhya Pradesh Andaman & Nicobar Island and Pondicherry.

(vi) Integrated Power Development Scheme (IPDS): WAPCOS is acting as the Third Party Independent Evaluation Agency – Energy Accounting (TPIEA-EA) Third Party Concurrent Evaluation Agency (TPCEA) on behalf of Power Finance Corporation and Project Management Agency (PMA) under DISCOM for the states of Uttar Pradesh, Kerala, Madhya Pradesh, Assam, Tripura, Nagaland, Meghalaya, Punjab & Chandigarh, Haryana, Arunachal Pradesh, Manipur, Mizoram, Rajasthan Tamil Nadu, Andhra

Pradesh, Telangana, Chhattisgarh, Odisha and Maharashtra.

CORPORATE SOCIAL RESPONSIBILITY & SUSTAINABILITY

WAPCOS has a two tier Corporate Social Responsibility Structure, First Tier being of Senior Officials of the Company and Second Tier of Board Level committee. Activities have been undertaken in different States of India and in diverse fields, which include Empowerment of Women through Skill Development activities, Environmental sustainability, Promotion of Renewable sources , Safe drinking water activities, Development of pond structures and water conservation awareness programmes in backward areas, Swachh Bharat activities including construction of toilets, School Sanitation, Hygiene and Healthcare Programme for underprivileged people, Upliftment of deprived society, Promotion of sports/ training and Development of infrastructure etc.

The monitoring of Corporate Social Responsibility (CSR) Activities was done regularly by independent agencies as well as internal monitoring committee.

Beneficiaries at training center in Aurangabad, District of Maharashtra

Installed street light in one of the village in Alwar District, Rajasthan

CORPORATE GOVERNANCE

WAPCOS is committed to adoption of and adherence to best Corporate Governance practices. It has been complying with the guidelines on Corporate Governance issued by the Department of Public Enterprises (DPE), Government of India. The company is having Audit and Remuneration committee in place and has received "Nil" comments from CAG for the last 12 years.

FINANCIAL PERFORMANCE

Increase in income from Rs.452.70 crore to Rs.1105 crore in 2017-18 (144.09% Growth).

- New Business Procured increased from Rs.252.46 crore to Rs.1,983.64 crore in 2016-17 (685.72% Growth).
- Increase in Net worth from Rs.207.74 crore to Rs.539.80 crore (159.85% Growth).
- Authorized / Paid-up Capital increased from INR 16.00 crore (2013) to INR 100.00 crore (2018) (6.25 times in the last 4 years).
- The company's operations expanded from 20 nos. countries (2013) to 45 countries (2017-2018).
- The company secured "Excellent" Rating with MoU Composite Score of 100 for the last 4 years in succession.

This is the highest achievable score as per the performance evaluation criteria of the Department of Public Enterprises, Govt. of India.

FOREIGN PROJECTS

ASIAN REGION

(i). Afghan-India Friendship Dam (Salma Dam Project)

Salma Dam Project is a multipurpose project planned for generating 42 MW of power, irrigating 75000 ha. area of land, water supply and other benefits to the People of Afghanistan. It is funded by Ministry of External Affairs. WAPCOS is implementing the project on behalf of Ministry of External Affairs.

The Salma Dam is across Harirud river and is located in the Chist-e-Sharif district of Herat province in Afghanistan. The Project comprises construction of 107.5 meters high, 550 meter long earth & rock fill dam having 633 million cum gross capacity of reservoir. Other components of the project are: (i) surface powerhouse of installed capacity of 42 MW with three power units of 14 MW each (ii) concrete spillway 36 m. wide & 63 m. high, 2100 cumec capacity controlled by the 3 nos. radial gates (iii) diversion tunnel 8.5 m. dia. & 630 m. long on right flank (iv) Irrigation sluice of 15 cumec discharge capacity (v) 4.25 m. dia. & 523 m. long steel penstock and (vi) 157 km. long, 110 Kv transmission line for evacuation of power to Herat city. Work also includes supply of all hydro-mechanical and electro-mechanical equipment from India.

Afghan-India Friendship Dam (Salma Dam Project) - Front View of the Project

(ii). Bangladesh

- Techno Economic Feasibility Study for Setting up of an Inland Container Depot at Ishurdi.
- Review of Detailed Project Report for establishment of inland river port at Ashuganj at Bangladesh High Commission of India, Dhaka.

(iii). Bhutan

- Detailed Design Engineering for Punatsangchhu-I Hydro Electric Project.
- Detailed Design Engineering for Punatsangchhu-II Hydro Electric Project.
- Technical Services on Design & Construction of 400 kV Transmission lines Mangdechhu Hydro-Electric Project.
- Kuri Gongri H.E. Project.

(iv). Cambodia

- Project Implementation Consultancy for Construction of 230 kV Double

Afghan-India Friendship Dam (Salma Dam Project) - Interior View of Power House

Circuit Transmission Line Tower with Twin ACSR "Bittern" Conductor with Stringing of Single Circuit between Stung Treng and Kratie Project.

- Study of Ground Water Resources in Kampong Spue Province.
- Supply and Installation of Hand Pumps for Augmentation of Rural Water Supply.
- Stung Tasal Water Resources Project (Phase-I and Phase-II).

(v). Lao PDR

- Project Management Consultancy Services for Engineering, Procurement and Construction of 230 kV Double Circuit & 115 kV Multi Circuit Transmission Lines and Associated Substation Projects.
- Project Management Consultancy Services for Extension of Thabok and Nabong Substation at 230 kV rating, Extension of one no. 115 kV line bay at Nam Gnuang (Thasala) 115/22 kV Substation, 115 kV Single Circuit Transmission Line from Nam Gnuang (Thasala) to Laksao, 115/22 kV Substation at Laksao.
- Construction of storage dams & development of irrigation systems.

vi). Mongolia

- Project Management Consultancy for Construction and Establishment of Atal Bihari Vajpayee Center of Excellence in Information Technology, Communication and Outsourcing Center.

(vii). Myanmar

- Development of Irrigation and Land Consolidation Schemes.
- Feasibility Study and Detailed Project Report along with Tender Documents for Myitkyinar-Putao Road in Kachin State.

(viii). Nepal

- DPR and CEIA Study of Pancheshwar Multipurpose Project (4800MW).
- Construction Supervision and Construction Management for Kulekhani-III HEP (MW).
- Project Management Consultancy for Strengthening of India - Nepal Power Transmission line Interconnection at 132 kV Level.
- Project Management Consultancy Services for Koshi Corridor 220 kV Double Circuit Transmission lines and associated Substations.
- EIA studies for Arun-3 HEP, Khanbari.

AFRICAN REGION

(i). Burundi

- Project Management Consultancy for the execution of Kabu 16 (20 MW) Hydro Electric Project, and associated Substation and Transmission Lines.

(ii). DR Congo

- Project Management Consultancy Service for Grand Katende Hydro Electric Project.

(iii). Fiji

- Clients Representative for Design and Build Contract – Upgrading Water and Waste Water Pipe Network – Central/ Eastern and Western Urban Centers.

(iv). Ghana

- Feasibility Studies and Supervise the Completion of the Kpong Left Bank Irrigation Project, (Phase-I) Construction Supervision for Fisheries Project.

(v). Mozambique

- Irrigation service provider for Horticulture in Mozambique- PROIRRI.
- Towers Erection in Bl-2 High Voltage Line (Influene – Ressano Garcia) to elevate the sag at N4 & Maputo Circular Road's Crossing Places.
- Design for Project of Improving the Quality of Power Supply-Distribution (Lot-1).
- Tender Engineering, Design Review and Construction Supervision for Emergency Project – Overhead Transmission Lines and Cables.

(vi). Niger

- Drilling and Construction of 500 Nos. Boreholes including geophysical, survey, drilling, testing, installation of hand pump fitting with DG sets in various regions of Niger and Construction of Storage Tanks Pump Houses and Supply of Geophysical and Laboratory Equipments.

(vii). Republic of Togo

- Project Management and Construction Supervision Consultancy Services for 161kV Line Kara – Mango – Dapaong Transmission Line and Associated Substation.
- Engineering Studies, Supervision and Control of Work of Electrification of 150 Rural Communities.

(viii). Rwanda

- Supervise engineering-procurement-construction of the 15 MW peat-to-power plant.
- Export Targeted Modern Irrigated Agriculture Projects.

(ix). Swaziland

- Project Management Consultant for Turnkey Project for ensuring Food Security through increased Maize production by Soil Conditioning, Farm Mechanization and Granular Fertilizer Application.

(x). Tanzania

- Project Management Consultancy Services for Augmentation of Water Supply Scheme in Dar Es Salaam and Chalinze (Design & Construction Supervision Phase).
- Extension of Lake Victoria Pipeline to Tabora, Igunga and Nzega Towns (Design Phase).

(xi). Uganda

- Project Management and Construction Supervision of 1392 Km of Medium Voltage Lines and 1482 Km of Low Voltage Network.

(xii). Zimbabwe

- Skill support for Operation and Maintenance of Hwange Thermal Power Station (920 Mw) for Zimbabwe Power Company.
- Up-gradation of Deka Pumping Station and River Water Intake System at Hwange Thermal Power Station.
- Specialist Consultancy Services for Hwange Stages I & II Plant Improvement at Hwange Thermal Power Station.
- Repowering of Small Thermal Power Stations at Harare (2X30 MW), Munyati (2X50 MW) & Bulawayo (2X60 MW)

for Zimbabwe Power Company.

- Supply of Custom Built Simulator for 220 MW and 120 MW units similar to Hwange Power Station and to train the trainers the skill development of Zimbabwe Engineers and Operators.
- Project Management Consultancy Services for Gairezi Hydro Electric Project (30MW).

INDIAN PROJECTS

(i). Andhra Pradesh

- Detailed Route Survey for Slurry Pipeline from Kirandul (Chhattisgarh) to Vizag and Water Pipeline from Sukma to Kirandul.
- DPR providing Water Supply for drinking, Industrial and Irrigation needs of Rayalaseema, Prakasam and Nellore Districts by diverting flood waters from Godavari River to Penna River.
- APPDCL-2X800 MW-SDSTPS-Sea Water Intake & Outfall System.
- APPDCL-2X800 MW-SDSTPS-Sea Water Intake & Outfall System - Consultancy Studies for Filed Monitoring of Shoreline Changes and Intake Basin for SWIO System
- APGENCO-SRIKAKULAM Thermal Power Project (4 x 1000 MW).
- Protection of Shorline from Soil Erosion at Odalarevu, East Godavari District.
- APTDC-Engg. - Detailed Project Report on "Development of Passenger/Cargo Jetty & Allied Infrastructure at various locations".
- Project Management Consultancy for Additional Water Storage Reservoir for Visakhapatnam Steel Plant, Visakhapatnam.

(ii).Arunachal Pradesh

- Model Studies for Etalin H.E. Project (3097 MW).

(iii). Assam

- PMGSY State Quality Monitoring Consultancy.
- Feasibility Study for MUM availability on continuous basis for Bongaigaon thermal Power Project (3x250MW).
- EIA Study for Lower Kopili HEP.

(iv). Bihar

- North Koel Reservoir Project.

(v). Chhattisgarh

- Project Management Consultant for Development of Ring Road No. 4, Road Network System, Water Supply System, Sewerage, Electrical Networks, Storm Water Drains and Reuse System including Defect Liability for Kamal Vihar, Raipur.

(vi). Gujarat

- DPR for Bhadbhut Barrage and Diversion Works.
- Dredging of Mangrol Fishery Harbour, Porbandar Fishery Harbour and Madhwad Fish Landing Centres.
- Technical Consultant for setting up of Truck Parking Terminal at Kandla.
- Third party survey for carrying out/ witnessing the tripartite hydrographic survey work for dredging works of Kandla Port Trust.
- Technical Consultancy Services for supervision of Refurbishing, Restoring and installation of radial gate parts and other appurtenant parts to its full performance for main dam of Sardar Sarovar Project along with other associated hydro mechanical works.

(vii). Haryana

- Survey and preparation of DPR/ Tender Documents for 9 ULBs under AMRUT

Mission.

- Project Management Agency for Implementation of Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY).
- Survey and preparation of DPR / Tender Documents for 18 ULBs (including additional 9 ULBs) of Haryana State under AMRUT Mission, Directorate of Urban Local bodies, Punchkula.

(viii). Himachal Pradesh

- Pre-feasibility Report and DPR for the Project providing irrigation Reclaimed Area under Swan River Channelization Management Programme including adjoining Irrigable Area in District Una.
- Assisting Municipal Corporation, Shimla to participate in the Smart Cities challenge.
- Assessment of Non- Revenue Water and Developing Strategy and Implementation Action Plan for Reduction Plan for reduction of Non -Revenue Water in Select Smart City, Municipal Corporation of Shimla.

(ix). Jammu & Kashmir: Detailed Project Reports of :

- Water Supply & Sewerage.
- Solid Waste Management.
- Improvement of Road & Traffic Management in District Kargil.
- Construction of 6.5 MLD Sewerage Treatment Plant and Allied Structure under the Project "Deposit Works for Sewage Treatment Plant under UIDSSMT in Leh.
- Construction of In-vessel Compost Plant including Development of Solid Waste Management System in Leh town under UIDSSMT in Leh.
- Project Management Consultant for Improvement of Road Networks in Leh
- EIA studies for Reoli Dugli HEP, Lahol Spiti.

(x). Jharkhand

- North Koel Reservoir Project.

(xi). Kerala

- Project Management Consultancy works for Operation & Maintenance for various facilities of Kochi SEZ.
- Project management Consultancy for Operation & Maintenance of various facilities in Cochin Special Economic Zone.

(xii). Madhya Pradesh

- Project Development and Management Consultant for AMRUT including Project Management of other Notified Schemes in Project Area.
- Feasibility Report and Detailed Project Report on Sewerage and Sewage Treatment for Bhopal City.
- EIA study for Lower Orr irrigation Project, Sagar.
- EIA study for Bina Complex irrigation Project, Sagar.
- EIA study for Parsahdoh irrigation Project, Multai.

(xiii). Maharashtra

- 500MW Ultra Mega Solar Power Project.
- Study analysis and necessary clearances for creation of new navigational channel.
- Techno-economic feasibility study for coastal cargo in Maharashtra and development of Vasai, Jaigad and Rajpuri Creeks for integrated transport.
- Development of Hill Station in Sahyadri near Ambone Village, Mulshi- Preparation of Geotechnical and Summary Report.
- Detailed Project Report with pre-

requisite Survey work & Design Component for Mega Recharge Scheme of Ground Water in Tapi Alluvial Basin, (Task - II).

- Design Consultancy of Purna Barrage-2 (ner Dhamna) Distt. Akola.
- Design consultancy of Kwatha Barrage, Distt. Akola.
- Design Consultancy of Pedhi Barrage Distt. Amravti.
- Concurrent Evaluation of Gosikhurd National Project.
- Detailed Survey and Investigation for Preparation of Detailed Project Report for Nar-Par-Auranga-Ambika-Girna Valley Link Project.
- Detailed Project Report by appointing agency for Proposed Gargai Dam Project.
- Design Consultancy of Kati Pati Barrage Lift Irrigation Project, Akola.
- EIA study for Nandgaon Port.
- EIA study for extension and deepening of navigation channel at Mazgaon Dock Limited, Mumbai.

(xiv). Mizoram

- Detailed Project Report of Turini H.E. Project for the Power & Electricity Department.

(xv). Odisha

- Detailed Project Report for Upper Indravati Pumped Storage Project (600 MW).
- Project Management Consultancy for Implementation of Mega lift Projects in Cluster No.III.
- Proof Engineering Consultants for Implementation of Mega Lift Projects In Cluster No. III.
- Owner's Engineer for Construction of Ash Pipe Line & Ash Pond for 2 X 660 MW– IB Valley Thermal Power Project Under Phase II.
- Renovation and Modernization of Unit # 3 of Chiplima Hydro Electric Project, Chiplima
- Comprehensive Contract Management Services for Renovation & Modernization of Hirakud H.E. Project, Burla, Unit No. 5 & 6 (2x43.6 MW).
- Comprehensive Contract Management Services for Implementation of Renovation & Modernization of Balimela H.E. Project, Unit No. 1 to 6 (6x60 MW).
- Proof Engineering Consultancy for Execution of Upper Indravati Irrigation Project.
- Project Management Consultancy for construction of 241 Nos. 33/11kv substations & associated lines under phase-I, phase-II and phase-III of Odisha Distribution System Strengthening Project in NESCO & WESCO area.
- Survey and Investigation for setting up a riverine port on river Mahanadi near Paradip.
- Wave Modelling/Tranquility Study in PICT facility, at Paradip Port for Paradip International Cargo Terminal.
- Detailed Project Report for laying of pipe line from Tarapur to Paradip.
- Project Management Consultant for Engineering, Supply, Erection and Commissioning of dedicated 11 kV Trunk Lines and Spur Lines from existing 33/11 kV Sub-stations works within the jurisdiction of DISCOMs under ODAFFP-Fishery Feeders (Phase-I).

(xvi). Punjab

- Electro-Mechanical works of Shahpurkandi H.E. Project (206MW), Gurdaspur.

(xvii). Rajasthan

- Detailed Project Report of Eastern Rajasthan Canal Project.
- Establishment of ground control network, conducting survey/resurvey and updation of the survey & settlement (records) operations for the Jaipur Zone.
- Pre-feasibility study report for development of inland port in Jalore and Barmer Districts.
- Online survey of Street Vendors and preparation of Street Vending Plan under National Urban Livelihood Mission for Bharatpur and Alwar cities.

(xviii). Sikkim

- Lender's Engineer of 400kV Teesta III H.E. Project to Kishanganj Transmission Line Project.
- Detailed Design, Construction Supervision for balance works of 1,200 MW Teesta III HE Project.
- Investigation, Design and preparation of Detailed Project Report for construction of alternate Highway from Melli to Singtam.
- Review & Re-casting of DPR and Project Management Agency (PMA) services for Deen Dayal Upadhyaya Gram Jyoti Yojana under Energy & Power Department, Government of Sikkim in four districts.
- Review & Re-casting of DPR and Project Management Agency services for Integrated Power Development Scheme under Energy & Power Department, Government of Sikkim.

(xix).Tamil Nadu

- Kundah pumped Storage Hydro-Electric Project (4x125MW) in Nilgiri Hills.
- Coastal Disaster Risk Reduction Project assisted by World Bank - Detailed Project Report (Residual Work) for the Reconstruction and Modernization Fishing Harbour at Mallipattinam in Thanjavur District.
- Techno-economic Feasibility Report for the Project Development of Shallow Draught Berth to Handing General Cargo Berth (Excluding Coal and Construction materials).
- Project Management Agency for Implementation of Integrated Power Development Scheme and Deendayal Upadhyaya Gram Jyoti Yojana.
- Project Management Consultancy for Water Supply Scheme at Tiruchirappalli City Corporation.

(xx). Uttrakhand

- Lender's Engineer for THDC Pumped Storage H.E. Project (4X250MW).
- Design Supervision Consultancy-Bhimtal; Infrastructure Development Investment Program for Tourism.
- Concurrent Monitoring, Quality Monitoring, Mid-term and Final Evaluation of Accelerated Irrigation Benefit Programme.
- External Hydrological Monitoring Consultancy for Uttarakhand Decentralized Watershed Development Project.
- Construction of Chandi Ghat at Haridwar.
- Construction of Ghats and Crematoria in the Stretch from Rishikesh to Devprayag.
- Construction of Ghats and Crematoria in the Stretch from Devprayag to Rudraprayag.

(xxi). Uttar Pradesh

- Monitoring Management Information System and Evaluation of UPWSRP, Phase-II.
- Project Management Consultancy for

Implementation of R-APDRP Part-B Scheme of Govt. of India.

- Condition Assessment & Feasibility Study of sewerage system network of various towns in Kali West and Gomti Basin – under Namami Gange Programme.

(xxii). West Bengal

- Engineering Services for Phase I & Phase II for Turga Pumped Storage Project (1000 MW).
- Detailed Analysis & Preparation of Reports pertaining to delayed completion of Hydro Power Project at TLDP-III, NHPC and providing technical support, WBSEDCL.
- Technical Auditing by Independent 3rd Party for the maintenance dredging in Hugli Estuary.
- Pre Feasibility Report of Lugu Pahar Pumped Storage Project Scheme of Damodar Valley Corporation (DVC), Kolkata.
- Cumulative Impact Assessment and carrying capacity study for Teesta Basin.
- EIA study for setting up mini bulk carrier handling facilities at Haldia Dock Complex.

(xxiii). Delhi

- Project Design & Management Agency for Implementation of SMART grid. infrastructure including Enhancing of Existing Network in NDMC Power Distribution Area.
- Annual Repair and Maintenance works including Civil and Electrical works of EPFO Office building and Staff Quarters.

(xxiv). Puducherry

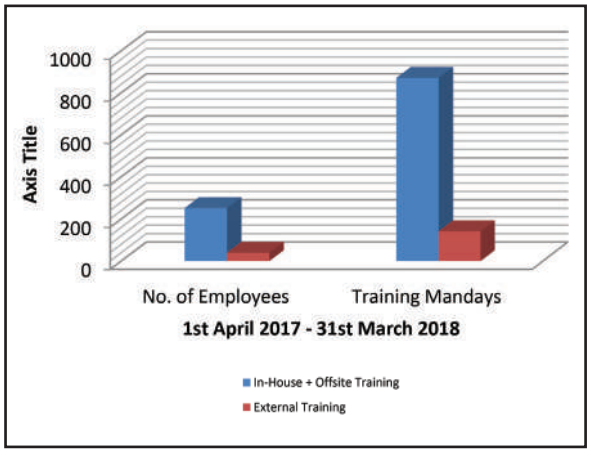
- PIA-Fisheries-Hiring of Consultancy Services for redesign & revising the associated documents & drawings for Slipway at the Fishing Harbours of Puducherry & Karaikal.

(xxv). ALL OVER INDIA

- Extension of breakwater with additional wharf at MUS in Car Nicobar - Conducting model studies for mooring studies in the proposed wharf at MUS Bay.
- REC Quality Monitors for Rural Electrification works under DDUGJY XI Plan Phase-II and XII Plan in the States of Uttar Pradesh, Bihar, Maharashtra, Kerala, Karnataka, Tamil Nadu, West Bengal, Assam and Tripura.
- Delineation of aquifers for mega artificial re charge in parts of Tapi basin, Maharashtra & Madhya Pradesh.

EXTERNAL TRAINING PROGRAMMES

Skill Development is a continuous process and therefore at WAPCOS employees are also nominated to attend external training programmes, workshops and seminars to overcome the gaps in their skill and knowledge requirements. About 31 employees attend various training programmes covering a total of 100 training man-days. During the period 1st April , 2017 to 31stMarch, 2018, a total of 292 officers were trained out of a total of 923 regular employees, covering a total of 1013 training man-days.



Shri Nitin Gadkari, Hon'ble Minister (Road Transport & Highways, Shipping and Water Resources, River Development and Ganga Rejuvenation); in the presence of Shri Arjun Ram Meghwal, Hon'ble Minister of State; Dr. Satya Pal Singh, Hon'ble Minister of State; and Dr. Amarjit Singh, Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India, receiving Dividend of Rs. 42.13 crore (inclusive of Dividend Tax) for the year 2016-2017 from Shri R.K. Gupta, CMD, WAPCOS.

Shri Nitin Gadkari, Hon'ble Union Minister (Road Transport & Highways, Shipping and Water Resources, River Development and Ganga Rejuvenation), in the presence of Shri Arjun Ram Meghwal, Hon'ble Minister of State (Parliamentary Affairs and Water Resources, River Development and Ganga Rejuvenation); Dr. Satya Pal Singh, Hon'ble Minister of State (Human Resources Development and Water Resources, River Development and Ganga Rejuvenation) and Dr. Amarjit Singh, Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation releasing In-house Technical Journal "WAPTECH-2017"

NATIONAL PROJECTS CONSTRUCTION CORPORATION LIMITED (NPCC)

National Projects Construction Corporation Limited (NPCC) was established on 9th January, 1957 as a premier construction company to create necessary infrastructure for economic development of the country. NPCC Ltd comply with Quality management requirements of **ISO 9001-2008** for execution

Water Treatment Clarifier at Mlandizi for Dar es Salaam & Chalinze Water Supply Scheme

of Civil Works for Thermal & Hydro Electric Projects, River Valley Projects, Industrial Structures, Project Management Consultancy services for buildings, Housings, Roads, Bridges and Infrastructure Projects. In its 61 years of existence, the Corporation has successfully associated itself with completion of several National Projects from concept to commissioning stage. Some of them are in remote and hazardous location over the country. The corporation is making profit for the last seven years and now has a positive net worth.

FIELDS OF SPECIALIZATION

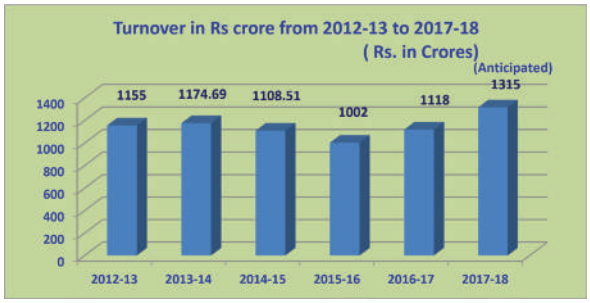
The field of specialization includes Townships & Other Residential Buildings, Institutional Buildings, Office Complexes, Roads, Bridges & Fly-Overs, Hospitals & Health Sector Projects, Industrial Structures, Surface Transport Projects, Environmental Projects, Thermal Power Projects, Hydro-Electric Power Projects, Dams, Barrages & Canals, Tunnels & Underground Projects and Real Estate Works.

FINANCIAL STATUS

The authorized capital of the corporation is Rs. 700 crors and its Paid up Capital is Rs. 94.53 crore. The Corporation achieved a turnover (total income) of Rs. 1167 crore during 2016-17 compared to previous year's turnover (total income) of Rs. 1002 crore. The turnover during the year 2017-18 is anticipated amount to Rs. 1315 crore, whereas the turnover of Rs. 826 crore is achieved up to January, 2018. The net worth of corporation is Rs. 146 crore with profit of Rs. 28.84 crore as on 31.3.2017.

The turnover from 2012-13 to 2017-18 has been indicated in table below. The order book position up to January, 2018 stands at Rs. 6179 crore.

NPCC is executing projects for various Ministries / Govt. Departments/ Organizations as their "Extended engineering Arm" like MoRD, MHA, MoWR, MoH, MoFPI, Banks, MoES, Ministry of AYUSH, Assam Rifle, Ministry of Youth Affairs & Sports, IGNTU, SC & ST Development Department, Govt. of Odisha, RAU, Central Agricultural Universities as well as State Governments. NPCC had added new clients like West Bengal State Rural Development Agency, Central Excise at Dwarka, Vishveshwaraiah Jala Nigam Limited, Guru Ghasidas Vishwa vidyalaya, Hydro Engineering College, Navodaya Vidyalaya Samiti, Karnataka Slum Development Board etc. for its value addition for infrastructure development of country.



MAJOR WORKS SECURED DURING 2017-18

- Construction and maintenance of West Bengal State Rural Roads at West Bengal.
- Construction of various buildings for Assam Rifle in NE Region.
- Construction of Eklavya Modal residential school at various places of Odisha.
- Construction of Residential Complex for Central Excise Department at Dwarka New Delhi.
- Construction of GGL corporate of Building at Lucknow.
- Construction of Navodaya Vidyalaya Samiti Schools in all over India.
- Construction of 1188 (GF) dwelling units including infrastructure at 07 selected slums (in-situ) in Bellary City under PMAY-HFA.
- Conceptual layout and Architectural plan, pre-construction activities including preparation of detailed design specification drawing and const of office bldg of Upper Yamuna River Board (UYRB) at Noida.
- Construction of Chitradurga Branch Canal including Earthwork Excavation, Embankment, CC Lining using Mechanical Paver, Cross Drainage Works at Karnataka.
- Construction of BoP elements for BSF (Jawan Barrack Admn. Block, CH cum DH, KSM & toilet Block) Jammu, Amritsar & Gurdaspur of Frontier Punjab & Rajasthan.
- Construction of various Buildings for NSEZ, Noida.
- Construction of New Academic Building & extension of Canteen building at Indian Statistical Institute Bengaluru centre.
- Expansion/Augmentation of Builtup Space of STPI Patna.
- Establishment of NIH Kolkata-Phase-II.
- Construction of Office Complex and development of Infrastructure for Brahmaputra board at Majuli Island Assam.
- Construction of Campus of Hydro Engineering College at Bandla Bilaspur (HP).
- PMC with architectural services for Construction, Project Monitoring for works at GGV Campus at Bilaspur.

STATUS OF MAJOR WORKS UNDER EXECUTION

At present, the corporation is working at more than 140 projects spread all over the country. These includes Indo Bangladesh Border Fencing works in Tripura, Mizoram, Assam & Meghalaya, Assam Rifle works in different States of North Eastern, Irrigation & River Valley Projects (Dolaithabi Barrage in Manipur), Hydroelectric Projects (Haithiari Power house in Uttrakhand) & other miscellaneous projects. Some of the major projects are summarised below:

(i). Building Works:

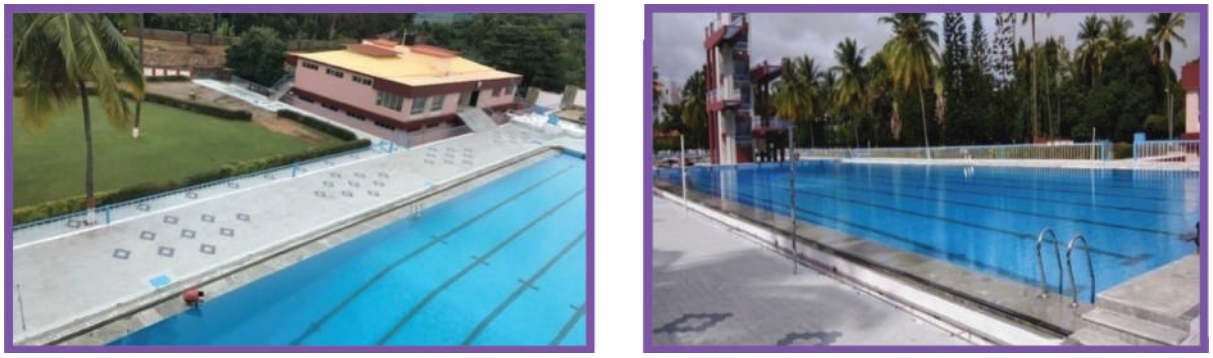
The Corporation has under-taken several construction assignments relating to Buildings, Roads, Hospitals, Bridges, and Flyovers etc.

- Construction of new building at Kolkata for NRIADD, Ministry of AYUSH.

- Renovation and modernization of CWC (HQ) Sewa Bhawan, New Delhi.
- Various works of construction/up gradation/ renovation & maintenance of IARI, Pusa Campus, New Delhi.
- Construction of Academic Block, Girls and Boys Hostels at Udhampur Campus of Jammu University.
- Works of construction/up-gradation/ renovation & Maintenance of Sports Authority of India, New Delhi.
- Construction of quarters for Container Corporation of India Ltd. (CCIL) at New Delhi and Jaipur (Rajasthan).
- Construction of Office building for Punjab and Sind Bank, Ranjeet Nagar, New Delhi.
- Construction of Buildings for Rajiv Gandhi National Ground Water Training & Research Institute(RGI), Raipur (Chhattisgarh).
- Construction of 3 Bed Room flats at Muthi (3 blocks of G+11 of 24 Units each) for Jammu Development Authority.
- Construction of buildings for Indira Gandhi National Tribal University Campus at Amarkanthak (M.P.).
- Assam Rifles Quarters at different locations in the state of Nagaland, Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Tripura, Sikkim & Assam.
- Construction of Silver Jubilee Hall & Academic Block at NERIST, Itanagar.
- Construction of five College of Central Agricultural University (CAU), Imphal at Nagaland, Mizoram and Tripura.
- Development of infrastructure facilities for National Institute of Pharmaceutical Education and Research (NIPER), Hyderabad.
- Construction of three Nos. Ekalabya Model Residential School Building for ST&SC Development Department, Odisha.
- Construction of godowns and up-gradation of internal roads of CWC works at UP, Kolkata and Chhattisgarh.
- Construction work of 2nd phase for work of Central Research Institutes (CRI) of CCRYN at Village Devarkhana- Distt Jhajhhar, Haryana and Nagamangala - Distt Mandya, Karnataka.
- Permanent Administrative Building for NERIST at Nirjuli, Itanagar.
- Construction of Bank Building at Plot No.C-1, Vedvyas Puri, Meerut (U.P.).

OBC Boys Hostel for IGNTU, Amarkantak

Type –II (G+III) For ASSAM RIFLES AT PHUNDREI (MANIPUR)



Renovated Swimming Pool Complex at SAI, Bengaluru

Dolaithabi Barrage at Manipur

- Work relating to development of Sports Infrastructure Facilities in Jammu & Kashmir For Ministry of Youth Affairs & Sports.
- Construction & Maintenance of University for Rajendra Agricultural University (RAU), PUSA District, Samastipur, Bihar.
- Development of Spiritual Circuit-II in Uttar Pradesh (U.P.) under Swadesh Darshan Scheme.
- Renovation and expansion of laboratories of chemical engineering department at IIT Kharagpur (Phase-I).
- Construction of Clinical Research Unit (Homeopathy) at Mouza Chhotopathuram, Siliguri, Darjeeling (W.B.).
- Construction of P/I coy level building of

Synthetic Athletic Track at DAVV, Indore

ITBP at Kukung Keh, J&K.

- Integrated Development of tourist facilities at Mantalai Sudhmahade Patnitop in J&K (Ministry of Toursim Deptt.).
- STPI Buildings at Noida, Meerut & Agra of Software Technology Park of India.

(ii). Road Works & Other Projects:

- Indo Bangladesh Border fencing, road works and Border out post at Assam, Tripura, Mizoram, West Bengal and Meghalaya.
- Flood lighting works of Indo Bangladesh Border Fencing in the States of Assam, Meghalaya and Tripura.
- Assam Rifles Building works in North Eastern States- Assam, Tripura, Manipur and Nagaland.
- PMGSY Roads works in Bihar, Jharkhand, Uttar Pradesh and West Bengal.
- Road and Drain Improvement works at Shimoga District, Karnataka.
- Road and Drain Improvement works at Bagalkote District, Karnataka.
- New Hathiari Hydro Electric Project in Uttrakhand.

INITIATIVE IN NORTH EASTERN STATES DEVELOPMENT

NPCC is working in eight North Eastern States for the last 35 years for developing the infrastructure and other social amenities for the upliftment of socio-economy of the peoples of north eastern states. It is creating further national integrity as Govt. has taken all the pain for security, safety and peaceful life of the people of these States. The details of such initiatives are covered under *Chapter 9*: Initiatives in the North East.

Road Works for Sports Authority of India, Bengaluru

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

9. Initiatives in North East

NATIONAL INSTITUTE OF HYDROLOGY

The North Eastern Regional Centre (NERC), Guwahati catering for the seven NE States, Sikkim and parts of West Bengal (Teestha Basin) was established in August 1988 and has been working for various water resources problems of the region. Considering flood as the major problem in the region, Ministry of Water Resources, Govt. of India decided to rededicate the Regional Centre towards service of the region and renamed it as NIH Centre for Flood Management Studies for the Brahmaputra Basin (NIH-CFMS).

During 11th Plan period, the Centre had worked in the thrust areas of: (i) Flood estimation and routing; (ii) Structural / non structural measures for flood management; (iii) Integrated watershed management for flood control; (iv) Hydrological data base management system; (v) Drainage congestion and erosion problems; (vi) Water quality problems; (vii) Socio-economic aspect of flood disaster; and (viii) Technology transfer activities. Keeping in view the importance of the above thrust area, the Centre proposed to continue the work in the above thrust area during the 12th Plan period with more emphasis on pilot basin studies. During the year under report, the Centre has been working on the following studies:

- Application of USLE Model for Estimation of Soil Loss in Kulsi River Basin using Remote Sensing and Geographic Information System;
- Evaluation of Ground Water Quality with more Emphasis on Arsenic Contamination in Barpeta District of Assam;
- Evaluation of Ground Water Quality in Shillong – the Capital City of Meghalaya;
- Distribution and Risk Assessment of Heavy Metal Pollution in Surface Soils of Guwahati (Assam);
- Estimation of Runoff for Kulsi River Basin using NRCS Curve Number and Geographic Information System; and
- Morphometric Analysis of Kulsi Basin using different Digital Elevation Models (DEMs).

CENTRAL SOIL AND MATERIAL RESEARCH STATION

CSMRS, in association with Water Resources Department (WR/MWRDA) of Meghalaya, conducted a mass awareness programme on "Jal Kranti Abhiyan" on 22.12.2015 in the water scarce remote area of Mendipathar, Resubelpara, North Garo Hills District, Meghalaya. The programme was organized to sensitize the people to protect water bodies and water sources and to stop disposal of waste into rivers and streams thereby making the water fit for human use and consumption. Other projects include: Doimukh HE Project, Arunachal Pradesh, KalejKhola H.E.P, Sikkim, Lower Kopili HE Project, Assam, Mawphu HE Project, Meghalaya, Rukni Irrigation Project, Assam, Subansiri Downstream Works Guwahati, Assam and Tlawng Hydroelectric Project, Aizwal, Mizoram.

During 2017-18, two Senior Officers of CSMRS participated in the "Leadership development training for senior officials of MoWR" at Indian Institute of Management, Ahmadabad. Four officers participated in the training for implementation of GeM at National Institute of Finance Management, Faridabad and twenty five officers and staff participated in the training for implementation of E-office and e-HRMS.

CENTRE WATER COMMISSION

CWC has a dedicated design unit for North-Eastern region, undertakes design and consultancy for Multipurpose including Hydro Electric Projects in the region comprising of Sikkim, Assam, West Bengal, Meghalaya, Manipur, Mizoram, Tripura, Arunachal Pradesh and also for the States of Andaman & Nicobar Islands, Orissa, Bihar (Technical Appraisal), Bhutan and part of Nepal. In addition, it also prepares the design chapters & drawings for preparation of pre-feasibility report & detailed project report of Multipurpose and Hydro-Electric Projects investigated by Field Circles of CWC located at Shillong, Gangtok and Faridabad. It also under takes design of Multipurpose and Hydro Electric Projects that are undertaken by the Brahmaputra Board. It also carries out technical appraisal of projects received from the State Governments and Public Sector undertakings.

At present, following projects of North - Eastern Region are being provided design consultancy for construction of Hydro electric /river valley development projects and for preparation of Project reports to projects under investigation.

Manipur: Dholaithabi Barrage Project

Meghalaya:

1. New Umtru H.E Project
2. Ganol H.E Project

Arunachal Pradesh:

1. Subansiri Lower H.E Project, Arunachal Pradesh(cleared)
2. Dibang M.P.Project, Arunachal Pradesh(cleared)
3. Pauk H.E Project, Arunachal Pradesh:

Preparation of Detailed Project Reports

The work of preparation of DPR of the following projects in North Eastern region is under progress:

Sikkim: Kalez khola H.E.Project

Technical Examination of Project Reports:

The DPRs of following Projects submitted by different State Governments are under investigation during the year 2017-18:

1. Noa-Dehing M.P. Project, Arunachal Pradesh(cleared)
2. Umngot H.E Project, Meghalaya
3. Mawphu(Stage-II) H.E Project, Meghalaya(cleared)
4. Kulsi M.P. Project, Assam
5. Oju H.E. Project, Arunachal Pradesh
6. Magochhu H.E. Project, Arunachal Pradesh

CENTRAL GROUND WATER BOARD (CGWB)

The CGWB is conducting scientific and technical studies for ground water assessment, development and management in the North Eastern Region. Major achievements of the North Eastern Region in the year 2017-18 up to March, 2018 are given below:

Major Achievements of the North Eastern Regions

Sl. No.	Activities	Achievements
1.	**Field Activities for Aquifer Mapping:**	
	Ground Water Exploration	Constructed **28** wells (EW- 18, OW- 10).
	Geophysical Studies	Carried five Vertical Electrical Soundings (VES) in NER.
	Water Quality Analysis	Around **1947** nos. of water samples were analysed for the basic constituents, heavy metals (such as Cu, Zn, Fe, Mn, CO, Cd, Cr, Ni, Pb etc.).
2.	**Ground Water Regime Monitoring**	Monitoring of water level from GWMS for the month of **May, August, November, 2017 & January, 2018.**
3.	**Short Term Water Supply Investigation**	**61** Short Term Water Supply Investigation has been carried.
4.	**Ground Water Resources Assessment (No of States/ UT) (as on 31-03-2013)**	Ground Water Resources Assessment (as on March, 2013) completed in all 7 states.

BRAHMAPUTRA BOARD

(i). Mass Awareness activities on Water Conservation under Tribal Sub Plan (IEC activities):

Brahmaputra Board being the nodal organization for the North-Eastern States is going to conduct Mass Awareness activities on Water Conservation under Tribal Sub Plan (IEC activities). The activities are proposed like- (a) Preparation of pamphlet, leaflet etc. (b) Specific emphasis on the need of Tribal by hoarding of banner and (c) Special awareness meeting & On-the-spot Art competition in the states of Nagaland, Mizoram, Arunachal Pradesh and Meghalaya.

(ii) Swachh Bharat Abhiyan:

The Prime Minister of India had given a call for "Swachh Bharat" as a mass movement to realize Gandhiji's dream of a clean India by the 150th birth anniversary of Mahatma Gandhi in 2019. Brahmaputra Board had participated in the "Swachh Bharat Mission" (Clean India campaign) during the year 2017.

NATIONAL PROJECT CONSTRUCTION CORPORATION LIMITED (NPCC)

NPCC is working in eight North Eastern States for the last 35 years for developing the infrastructure and other social amenities for the upliftment of socio-economy of the socio-economy of the peoples of north eastern states as detailed below:

(i). Indo-Bangladesh Border Fencing and Road Works:

Initially, NPCC worked for construction of Fencing in Tripura and Mizoram for 351.0 km mostly in insurgency prone area. NPCC has today made the area total accessible having network of road along the border fencing, where, there were no accessibility & BSF Jawans used to move 20.0 Km. to 30.0 Km. to reach the existing Border. NPCC has already completed 585.38 Km of fencing works, 437.22 Km. of Road Works in the border areas of Indo Bangladesh Border.

(ii). Indo-Bangladesh Border Flood-Lighting Works:

The excellent performance of NPCC encouraged MHA (GoI) for construction of Border Flood Lighting of Tripura & Meghalaya. NPCC has kept performance intact & taken Border Flood Light Work of 666.50 km. in Tripura and 371.10 km. in Meghalaya. The Border Flood Light is helping to BSF 24 hrs. vigil over insurgent groups & illegal migrant of Bangladesh.

(iii). Border Out Post work:

MHA (GoI) has awarded the construction of BOP works in extreme difficult area of Tripura-50 No. posts, Mizoram- 21 No. posts, Assam- 6 No. posts, Meghalaya- 17 No. posts & West Bengal- 94 No. posts for monitoring

Indo-Bangladesh Border fencing along with Flood lighting work

Indo-Bangladesh Border fencing work at Tripura

the border activities by BSF. At present NPCC has completed 84 No. of Border out Posts. NPCC has improved the socio-economy of the people of the north eastern states & people are living fearlessly with their earned money, crops & animal property from illegal migrant. It is creating further national integrity as Govt. has taken all the pain for security, safety & peaceful life of the people of these states.

(iv) National Institute of Electronics & Information Technology (NIELIT) Works:

NPCC is also playing a major role for the creating infrastructure for 10 extension Centres & one Centre of NIELIT in the N.E. states of Mizoram, Nagaland, Manipur, Arunachal Pradesh, Meghalaya & Assam to help the nation for development for the skills

Border Out Post (BOP) at Rangachia in Mizoram

of information technology & teach the people for the better socio-economic development.

(v). Assam Rifle Works:

Construction of complete Establishment of Assam Rifles in all the states of north east with Administrative Block, hospitals, all types of residential quarters, Barracks, Posts, Recreation centres, library building, museum building, MT park, etc. New works are also awarded with expansion of works of Assam Rifles. NPCC has completed the building works of more than 4 lakh Sq. m in total with 950 Km. of Roads and 25 Km. of Security Wall & Lighting for Assam Rifle.

(vi). Other Activities for Development of North Eastern State:

NPCC has served the people of North Eastern States by constructing the barrages & other socio-economic development project with financial support from Japan International Cooperation Agency (JICA). The works carries out by the NPCC cover: Gomti Hydro Project, Maharani Barrage, Khowai Barrage, Manu Barrage, Kalashi Barrage, Tripura Tribal Area Autonomous District Council Works, Khuga Dam in Manipur, College of Fisheries under Central Agriculture University, IGNOU Works, IGNTU, Manipur, Singda Dam, Loktak River Valley Project and Dolaithabi River Valley Project etc.

MINISTRY OF

WATER RESOURCES	RIVER DEVELOPMENT	GANGA REJUVENATION

Annual Report 2017-18

10. Administration Training and Governance

ESTABLISHMENT MATTERS

The Administration Section of the Ministry is primarily responsible for the Establishment, Personnel and Administrative matters of the officers and staff of the Ministry (Proper). The section is the Cadre Controlling Authority of posts borne on CSS/CSSS/ CSCS sanctioned in the Ministry (Proper), Central Water Commission and Central Soil & Materials Research Station.

Administration Section also handles other matters like filling up of posts by Direct Recruitment / Deputation / Promotion, Termination of Probation, Confirmation, Grant of Financial upgradation under Modified Assured Career Progression Scheme, release of annual increments, pay fixation, maintenance of Confidential Reports, sanction of TA/LTC advance, House Building Advance, Motor Car/Scooter / Cycle advances, GPF advance/withdrawals, framing/amendment of Recruitment Rules, finalization of pension/family pension cases, leave of all kinds, forwarding of applications etc. Also deals with ISO Certification in respect of Administration & Ground Water & PP wing.

For prevention of sexual harassment of women employees, a Committee is functioning to look into the complaints of the women working in the Main Secretariat of the Ministry. The Scheduled Castes / Scheduled Tribes and Other Backward Classes (SCs/STs/ OBCs) Cell are also part of the Administration Section. Details of the activities of above Committee /Cell are given in Chapter- 14 (Staff Welfare) of this Report.

IMPLEMENTATION OF TRAINING POLICY OF THE MINISTRY

Administration Division administers the Budget allocated under "Training of Ministry of Water Resources, RD & GR Officers" under HRD & Capacity Building Scheme to train the officers of the Ministry in reputed institutes located in India and abroad in different fields. Officers are also given induction training on joining in this Ministry, deputed on mid-career training at various level/stages in their career as well as for thematic training like leadership development, Stress Management, ethics and values.

For the financial year 2017-18, an amount of Rs.2.00 crore has been allocated for training of MoWR officers. An expenditure to the tune of Rs. 1.65 crore has been incurred by the end of March, 2018. During 2017-18, a total of 210 officers of this Ministry were sent on various training programmes.

23 In-house trainings were also conducted in this Ministry on various topics i.e. GFR-2017, Procurement of Goods, Role of Under Secretary, Effective Personal Secretary, Vigilance matters, Handling of Court Cases, DPC, Recruitment Rules, Leave Rules, Sexual Harassment at Work place, Noting and Drafting etc by availing expertise of in-house trainers as well as faculty from ISTM. Besides this, more than 50 Officers were sent for various Leadership training programme at IIM, Kolkata and Administrative Staff College of India (ASCI), Hyderabad on various topics i.e. Individual Excellence for

Organisational Effectiveness, Leading with Emotional Intelligence, and Organisational Excellence through Leadership etc. One officer was sent for the training programme on Budgeting, Accounting & Financial Management with international component at International Center for Promotion of Enterprises (ICPE), Slovenia. A total of 31 CWES & CGWB Officers of this Ministry were sent for the training programme on Leadership & Management in the field of Water Resources at IIM, Hyderabad in the month of April, 2017 & 28 CWES Officers and CGWB officers attended the training programmes in Organisation Development in Water Sector in the month of February, 2018. Various officers of the cadre of CSS, CSSS and officers of Central Staffing Scheme were sent for the mandatory training programme at ISTM.

Swachhata Pakhawada 2017-18

MINISTRY OF

WATER RESOURCES	RIVER DEVELOPMENT	GANGA REJUVENATION

Annual Report 2017-18

11. Transparency

The Right to Information Act, 2005

The Right to Information Act, 2005 came into effect from 12.10.2005. As provided under Section 4(1) (b) of the Act, all the 18 manuals in respect of Ministry (Sectt.) and its organizations were prepared and have been placed in the Ministry's website http://www.mowr.gov.in. Appointment of Central Public Information Officers (CPIOs) made in terms of section 5 (1) and (2) of the said Act and hosted in the website of the Ministry and concerned organizations.

The Coordination Section of Ministry of Water Resources, RD & GR, Room No. 02, B-wing, Ground Floor, Shastri Bhawan, Dr. Rajendra Prasad Marg, New Delhi has been assigned the task of accepting applications and the fees under the RTI Act. The RTI petitions are forwarded to the concerned CPIOs and the fees are deposited with the DDO, Ministry of Water Resources, River Development and Ganga Rejuvenation. The requisite fees for providing information under RTI Act, 2005 can be paid either through Demand Draft/ Postal Order issued in favour of Pay & Account Officer, Ministry of Water Resources, River Development and Ganga Rejuvenation or by cash.

During the period from 1st April, 2017 to 31st March, 2018, 1242 applications and 45 RTI appeals were received in RTI Cell, Ministry of Water Resources, RD & GR which were forwarded to concerned CPIO/ First Appellate Authority in the Ministry/ Other Public Authority for necessary action as per RTI Act, 2005.

Swachhata Pakhawada 2017-18

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

12. Role of Women in Water Resources Management

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

In pursuance of the provisions in the National Water Policy, farmers are to be involved progressively in various aspects of management of irrigation systems, particularly in water distribution and collection of water charges. The Ministry of Water Resources, while issuing guidelines, specifically emphasized that the States consider representation of women in the Water Users' Associations (WUAs) at all levels. As a result, many States have amended their Irrigation Acts or came out with Specific Acts on Participatory Irrigation Management.

Considering the importance of women in terms of their numerical strength and the significant contribution they make to the agricultural labour force, there is a need to encourage participation of women in management of water resources. Water Users' Associations can contribute significantly in this regard and bring in a new culture among the water users.

In recent past, some of the States, such as Madhya Pradesh have attempted to ensure that all farm owners, be it men or women, are made rightful members of the outlet committees. Efforts have also been made to ensure that where there are no women members, at least one woman from the area must be taken even if she is not a land owner. Further, at least one woman shall be nominated to the Governing Body of the Association.

Swachhata Pakhawada 2017-18






MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

13. Progressive use of Hindi

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

The Second Sub-Committee of Parliamentary Committee on Official Language inspected nine Offices of the Ministry of Water Resources, River Development & Ganga Rejuvenation viz. (1) WAPCOS, Hyderabad; (2) CGWB, Divisional Office, Hyderabad; (3) Purna Sub-division, Central Water Commission, Nanded; (4) Executive Engineer, Middle Brahmaputra Division, Central Water Commission, Guwahati; (5) Chief Executive, Brahmaputra & Barak Basin, CWC, Shillong; (6) CGWB, Jodhpur; (7) CGWB, Faridabad; (8) Superintending Engineer, Project Division, CWC, Faridabad and (9) National Water Academy, CWC, Pune.

The meetings of ministry's Hindi Advisory Committee were held on 15.03.2017 under the Chairmanship of Hon'ble Minister (MoWR, RD & GR) and on 07.10.2017 under the chairmanship of Hon'ble State Minister (MoWR, RD & GR). In these meetings, decisions were taken to promote the use of Hindi in the Ministry and its organizations.

Meetings of official language Implementation Committee of the Ministry have been conducted regularly. In these meetings, the Committee reviewed the progress made in the use of Hindi in the Ministry as well as in its various offices and pinpointed the shortfalls in relation to targets prescribed by Department of Official Language. The measures were also suggested for the removal of the shortfalls.

In order to encourage the use of Hindi in the official work of the Ministry, messages and appeal were issued by the Hon'ble Union Minister of Water Resources, River Development & Ganga Rejuvenation, Hon'ble Minister of State for Water Resources, River Development & Ganga Rejuvenation and Secretary, Ministry of Water Resources, River Development & Ganga Rejuvenation on 21.08.2017.

Hindi Fortnight was organized in the Ministry from 01.09.2017 to 15.09.2017. The competitions like Rajbhasha Quiz, Hindi Noting & Drafting, Hindi Essay, Translation, Hindi Typing, Hind Essay Debate and Hind Poetry Recitation were organized. Officers and employees of the Ministry enthusiastically participated in these competitions. First, Second and Third prizes of Rs. 4000/-, Rs.2500/- and Rs.1500/- respectively were awaded to winners of each of these competitions. There was also provision of four incentive prizes of Rs.1000/- for each of these competitions. The prizes were given to 58 meritorious participants.

To provide on the spot solution for the problem in performing official work in Hindi, a unique training workshop programme "Rajbhasha Aapke Dwar " is being implemented by the Hindi Section of the ministry. In this programme, till date, officers and employees of some sections like

Parliament, Administration, Ground Water, Vigilance etc. were imparted on the spot training in their sections. This initiative is appreciated in the Ministry.

Incentive Schemes like 'Rajbhasha Vaijayanti Puraskar Yojana' and 'Incentive Scheme for doing work in Hindi' were implemented in the Ministry for promoting the Implementation of Official language Policy. 'Rajbhasha Vaijayanti Purashkar Yojana' is for promoting the Hind work in Attached and Subordinate Organizations of the Ministry. The winners are selected after evaluating total work in Hindi of the Organization. 'Rajbhasha Vaijayanti Puraskar Yojana 2015-16' distribution ceremony was held on 10.01.2018. WAPCOS, Gurugram, Narmada Control Authority, Indore and CGWB, Faridabad received first, second and third prizes respectively. Winning offices are given cups and certificates. Under 'The incentive scheme for doing work in Hindi' provision has been made to give cash award each year to the officers and employees on the basis of the work done by them in Hindi.

Besides this "Moulik Pustak Lekhan Yojana" is also going on in the Ministry. Under this head, an amount of Rs. 1.00 lakh has been earmarked as prize money.

The Ministry has organized "First Rajbhasha Sammelan" on 07.11.2017 in Guwahati. Officials of the Ministry and its Organizations participated in this conference. Three sessions were organized in one-day programme, where the experts delivered their lectures on different subjects. The programme was ended with a Kavi Gosthi where eight poets have participated in it.

Swachhata Pakhawada 2017-18

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

14. Staff Welfare

MONITORING OF RESERVATION FOR SCs/STs/OBCs

The Scheduled Castes/Scheduled Tribes and Other Backward Classes (SCs/STs/OBCs) Cell also forms part of Administration Section. It renders secretarial assistance to Liaison Officers for SCs/STs and OBCs in discharging the functions on various matters relating to reservation for SCs/STs/OBCs in Government Services and carrying out inspections of reservation rosters.

The Cell is regulating and monitoring the status of filling up the backlog vacancies for SCs/STs/OBCs in its attached/subordinate offices and taking corrective measures wherever found necessary. Liaison Officer carries out inspections in respect of Attached/Subordinate offices for supervising/rectifying deficiencies for correct implementation of reservation roster.

COMPLAINT COMMITTEE ON SEXUAL HARASSMENT OF WOMEN EMPLOYEES

In Compliance with the guidelines laid down by the Hon'ble Supreme Court of India on prevention of sexual harassment of women employees, a Committee is functioning to look into the complaints of the women working in the Main Secretariat of the Ministry. The composition of the Committee is as below:

(i) Smt. Bindu Sreedathan,
Director : Chairperson

(ii) Shri S.N. Pal,
Under Secretary : Member

(iii) Smt. J. Subhangi,
Section Officer : Member

(iv) Representative of Nari Raksha Samiti, NGO : Member

The Complaints Committee shall be deemed to be the Inquiring Authority appointed by the Disciplinary Authority for the purpose of CCS (CCA) Rules, 1965 and its reports are to be treated as Inquiry Report. It will examine the complaints made against sexual harassment by women employee(s) and, if necessary, conduct an enquiry. On completion of the same, the Committee will submit its findings to the Joint Secretary (Admn), Ministry of Water Resources, RD & GR for further necessary action.

During the year ending 31st March, 2018, no complaint was received by the Committee.

REDRESSAL OF PUBLIC / STAFF GRIEVANCES

A Grievances Redressal Cell was set up in the Ministry of Water Resources, RD & GR which entertains the grievances of employees/officers working in various organizations under the Ministry. Shri Giriraj Goyal, Director (Coord.), has been designated as Director (Public & Staff Grievances) and all grievances are to be disposed off within a period of 60 days. Centralized Public Grievance Redress and Monitoring System (CPGRAMS) software developed by Deptt. of AR & PG, is regularly monitored in the Ministry.

During the period from 1st April, 2017

to 31st March, 2018, a total number of 3404 grievance petitions were received in this Ministry. Besides, 738 grievance petitions were carried forward which were pending at the end of 31st March, 2017. Out of total 4142 grievance petitions, 3944 were settled during the above period.

A list of postal addresses of Public/Staff Grievance officers in the Ministry and its various organizations is at Annexure-VI.

Swachhata Pakhawada 2017-18

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

15. Vigilance

The Vigilance matters relating to this Ministry and its Organizations are handled by the Vigilance Division which functions under the guidance, supervision and control of a part time Chief Vigilance Officer of the level of Joint Secretary assisted by a Deputy Secretary, Under Secretary and the Vigilance Section. Various aspects pertaining to Vigilance cases of all the employees of the Ministry (Proper) and all Group A and retired Officers of the attached/subordinate offices as well as Group-A Officers of other Organizations under the Ministry, including Board level officers of PSUs are dealt with by the Division.

The Vigilance Division functions as a link between the Ministry and the Central Vigilance Commission (CVC) and other Authorities in the matters pertaining to Vigilance. This Division tenders advice, wherever required, on vigilance matters, to the Attached and Subordinate Offices, PSUs, Statutory Bodies etc. under the administrative control of the Ministry, in consultation with various agencies / departments like CVC, UPSC, Department of Legal Affairs and DoPT etc.

This Division monitors the disciplinary cases and related matters of the organizations under the Ministry through periodical returns prescribed by CVC and DoPT, etc. The Division prepares the "List of officers of Doubtful Integrity" and the "Agreed List" in consultation with CBI.

This year, "Vigilance Awareness Week" was observed by the Ministry from 30th October to 4th November, 2017. An essay competition was organized which received wide participation from the employees. All organisations under the Ministry also observed "Vigilance Awareness Week-2017" enthusiastically by conducting various competitions such as essay writing / quiz/ drawing competition and awareness programmes.

Preventive Vigilance Inspection (PVI) is an integral part of vigilance as per the guidelines issued by CVC. The basic aim of PVI is to prevent the possibility of corruption and to encourage the culture of probity and greater transparency in the Government functioning. PVI is concerned to bring awareness about the 'Preventive' measures to be taken to avoid the scope of irregularities in sensitive matters and also to sort out problems at an early stage. Preventive Inspection of 18 Organisations / Regional Offices under the Ministry was planned to be conducted during 2017-18. In all 16 PVIs have been completed during 2017-18.

The Vigilance Division is also responsible for calling for the Annual Property Returns of all Group 'A', 'B' and 'C' Staff and monitoring them.

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

16. Appointment of Persons of Special Needs

MONITORING OF RESERVATION FOR PERSONS WITH SPECIAL NEEDS

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

The relevant reservation rosters as prescribed by the Government are also maintained for planning the reservation of Persons with Special Needs.

MINISTRY OF

WATER RESOURCES | RIVER DEVELOPMENT | GANGA REJUVENATION

Annual Report 2017-18

ANNEXURE – I

ORGANIZATIONAL CHART OF MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

Minister (Water Resources, River Development & Ganga Rejuvenation)											
Minister of State (Water Resources, River Development & Ganga Rejuvenation)							Minister of State (Water Resources, River Development & Ganga Rejuvenation)				
Secretary											
Director General (NMCG)							ADG (STAT)				
Adviser Technical (NWM)	Economic Adviser	Commissioner(CAD)	Adviser(C&M/NWM)	Commissioner (Indus)	Commissioner(SPR)	Commissioner (B&B)	Commissioner (FM)	Executive Dire tor & DDG(NMCG)	JS & FA	JS (RD & PP)	JS (Admn. & GW)

ANNEXURE –II

STAFF IN POSITION IN THE MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION AS ON 31.03.2018

Group A					Group B										Group C				
					Gazetted					Non-Gazetted									
Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC	Total	SC	ST	PH	OBC
96	17	4	-	6	55	5	4	-	-	126	18	2	5	23	147	52	6	4	29

ANNEXURE – III

LIST OF NAMES & ADDRESSES OF SENIOR OFFICERS & HEADS OF ORGANISATIONS UNDER THE MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

S. No.	Name of the Organisation	Head of the Organisation
1.	Government of India Ministry of Water Resources, Room No. 412, IV Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri U.P. Singh, Secretary Tel No. 23710305, 23715919 Fax. 23731553
2.	Government of India Ministry of Water Resources, Room No. 6, 2nd Floor, B wing, Lok Nayak Bhawan, Khan Market, New Delhi.	Shri S.M. Mahajan, Additional Director General (Stat.) Tel No. 24691080 Fax. 24691080
3.	Government of India Ministry of Water Resources, Room No. 403, IV Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri Akhil Kumar, Joint Secretary (Admn.& GW) Tel No. 23710343 Fax. 23730719
4.	Government of India Ministry of Water Resources, Room No.220, 2nd Floor, Block No.3,CGO Complex, Lodi Road, New Delhi.	Dr. C.V. Dharma Rao, Adviser (C&M/NWM) Tel No. 24366614 Fax. 24366614
5.	Government of India Ministry of Water Resources, Room No. 404, IV Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri Sanjay Kundu, Joint Secretary (PP) Tel No. 23711946 Fax. 23711946
6.	Government of India Ministry of Water Resources, Room No. 401, IV Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri Jag Mohan Gupta, Joint Secretary & Financial Adviser, Tel No. 23710297 Fax. 23710297

7.	Government of India Ministry of Water Resources, Room No. 411, IV Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri K. Vohra, Commissioner (SPR) Tel No. 23710107 Fax. 23350051
8.	Government of India Ministry of Water Resources, Room No. 827, 8th Floor, CGO Complex, Lodi Road, New Delhi-110 001	Shri J. Chandrashekhar Iyer , Commissioner (Flood Management) Tel No. 24368238 Fax. 24362780
9.	Government of India Ministry of Water Resources, Room No. 204, 2nd Floor, CGO Complex, Lodi Road, New Delhi-110 001	Shri T.S. Mehra, Commissioner (B&B) Tel No. 24364724 Fax. 24367093
10.	Government of India Ministry of Water Resources, Room No. 814, 8th Floor, CGO Complex, Lodi Road, New Delhi-110 001	Shri P.K. Saxena, Commissioner (Indus) Tel No. 24361540 Fax. 24361540
11.	Government of India Ministry of Water Resources, Room No. 236, 2nd Floor, A wing, Krishi Bhavan, Rafi Marg, New Delhi-110 001	Shri Sanjay Kundu, Commissioner (Pen. River) Tel No. 23382256 Fax. 23382256
12.	Government of India Ministry of Water Resources, Room No. 7, Ground Floor, Shastri Bhavan, Dr. Rajendra Prasad Road, New Delhi-110 001	Shri B.B. Sharma, Economic Adviser Tel No. 23388941 Fax. 23381895
13.	Government of India Ministry of Water Resources, Room No. 236, Krishi Bhavan, New Delhi-110 001	Shri B.R. K. Pillai, Commissioner (CAD) Telefax No. 23382256

Attached Offices		
1.	Central Water Commission, Room No. 326, Sewa Bhawan, R.K. Puram, New Delhi	Shri S. Masood Husain, Chairman (CWC) Tel. No.26715351 Fax: 26108614
2.	Central Soil and Materials Research Station, Room No. 111, Hauz Khas, New Delhi-110016	Shri Hasan Abdullah, Director Tel. No. 26961894, 26967985 Fax: 26967985
Subordinate Offices		
3.	Farakka Barrage Project, P.O. Farakka Barrage, Distt. Murshidabad-742212 (W.B.)	Shri Saibal Ghosh, General Manager Tel. No. 03485-253644 Fax: 03485-253608
4.	Ganga Flood Control Commission, Sinchai Bhawan, III floor, Patna-800015	Shri Arun Kumar Singh, Chairman Tel. No. 0612-2217294 Fax: 0612-2217960
5.	Central Water and Power Research Station, P.O. Khadakwasla, Pune-411024	Ms. V.V. Bhosekar, Director Tel. No. 020-24380552 Fax: 020-24381004
6.	Central Ground Water Board, Jamnagar House, New Delhi	Shri K.B. Biswas, Chairman Tel. No. 0129-2477100 Fax: 0129 2477200
7.	Bansagar Control Board, Samab Colony, Rewa (Madhya Pradesh)	Shri T.D. Sharma, Secretary Tel. No. 07662-226318 Fax : 07662-242433
8.	Sardar Sarovar Construction Advisory Committee, Narmada Bhawan, A Block, IV Floor, Vadodara-390001	Shri M.P. Singh, Secretary Tel. No. 0265-2421438 Fax 0265-2437262
9.	Upper Yamuna River Board 201, “S”, Sewa Bhawan, R.K. Puram, New Delhi-110016	Shri S. Masood Husain, Chairman, Addl. Charge Tel. No. 26108590 Fax: 26195289

Public Sector Undertakings		
10.	Water and Power Consultancy Services (India) Limited, 5th Floor, 'Kailash', 26, Kasturba Gandhi Marg, New Delhi-	Shri R.K. Gupta, Chairman & MD Tel. No.23313881 Fax: 23314924
11.	National Projects Construction Corporation Limited, Plot No.67-68, Sector-25, Faridabad (Haryana)	Shri H.L. Chaudhary, Chairman & Managing Director, Tel. No. 0129-2231269 Fax : 0129-26484842
Registered Societies		
12.	National Institute of Hydrology, Jal Vigyan Bhawan, Roorkee-247667 (Uttarakhand)	Dr. Sharad Kumar Jain, Director Tel. No. 01332-272106 Fax: 01332-272123/273976
13.	National Water Development Agency, 18-20, Community Centre, Saket, New Delhi-110017	Shri M. K. Srinivas, Director General Tel. No. 26519164 Fax: 26513846
14.	National Mission of Clean Ganga, Government of India, Ministry of Water Resources, 1ST Floor,MDCNS Blg., India Gate, New Delhi-110002	Shri Rajiv Ranjan Mishra, Director General (NMCG) Tel No. 23072900 Fax. 23049566
15.	NERIWALM Dolabari, Tezpur, Sonitpur, Assam-784027	Dr. Pankaj Barua, Director(NERIWALM) Tel No. 03712-268107 Fax. 03712-268007
Statutory Bodies		
16.	Narmada Control Authority, Narmada Sadan Sec-B, Scheme No.74-C, Vijay Nagar, Indore-452010	Dr. M.K. Sinha, Executive Member & HoD Tel. No. 0731-2557276 Fax : 0731-2559888
17.	Brahmaputra Board, Basistha, Guwahati	Shri Sanjay Kundu, Chairman Addl. charge Tel. No. 0361-2301099 Fax 0361-2301099

18.	Betwa River Board, Nandanpura, Shivpuri Highway, Jhansi-284003	Shri Jagdish Singh, Chief Engineer Telefax. No. 0510-2480183
19.	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt:Bellary, Karntaka State, PIN : 583225	Shri D. Ranga Reddy, Chairman Tel. No. 040-29808740 Fax 040-29808742

ANNEXURE-IV

BUDGET AT GLANCE

(Rupees in crore)

Central Schemes	**ACTUALS 2016-17**	**BE 2017-18**	**RE 2017-18**	**Exp upto 31.03.2018**
Polavaram Project	100.00	0.00	0.00	0.00
Farakka Barrage Project	107.08	155.00	135.33	117.13
Emergent Flood Protection Works in Eastern & Western Sector	0.00	3.00	0.01	0.00
DRIP	39.84	160.00	95.00	81.10
National Ganga Plan	1440.50	2250.00	2250.00	700.00
Ghat Beautfication of River Front	67.00	50.00	50.00	0.00
National River Conservation Plan	167.50	250.00	723.42	723.22
National Water Mission	4.45	15.00	5.00	1.17
River Basin Management	175.50	199.99	199.99	186.22
Flood Forecasting	39.36	65.00	45.00	39.20
Interlinking of Rivers	0.00	1.00	1.00	0.00
Development of Water Resources Information System	70.08	145.00	70.00	61.93
Ground Water Management & Regulation	112.25	500.00	275.00	254.33
National Hydrology Project	51.77	300.00	185.00	177.90
Research & Development	34.36	40.00	60.00	49.08
Irrigation Management Programme	0.00	0.01	0.00	0.00
Human Resources Development/ Capacity Building	20.94	25.00	29.00	27.31
Infrastructure Development	12.55	45.00	50.00	40.73
Total	**2443.18**	**4204.00**	**4173.75**	**2459.32**
Centrally Sponsored Schemes	**ACTUALS 2016-17**	**BE 2017-18**	**RE 2017-18**	**Exp upto 31.03.2018**
Accelerated Irrigation Benefit Programme	999.86	0.00	0.00	0.00
Har Khet Ko Pani	439.80	1450.00	1888.00	1355.22
Impact Assessment Studies	0.07	1.00	1.00	0.14
Assistance to SYLCP	0.00	1.00	0.01	0.00
Flood Management Programme	149.99	150.00	562.68	562.67
River Management Activities & Work related to Border Areas	25.35	199.96	202.96	187.06
Irrigation Census	16.94	25.00	15.45	17.45
Atal Bhujal Yojana	0.00	0.04	0.04	0.00
Total	**1632.01**	**1827.00**	**2670.14**	**2122.54**

Establishment	ACTUALS 2016-17	BE 2017-18	RE 2017-18	Exp upto 31.03.2018
Secretariat - Economic Services	60.96	73.00	83.00	76.34
Attached, Subordinate & Other offices				
Central Water Commission	309.27	434.00	421.49	332.28
Central Soil & Material Research Station	13.73	15.50	15.35	14.15
Central Water & Power Research Station	55.19	65.00	60.13	58.62
Sardar Sarovar Construction Advisory Committee - SSCAC	0.78	1.25	1.25	0.69
Bansagar Control Board	0.38	0.50	0.50	0.36
Upper Yamuna River Board	3.11	3.00	1.26	8.76
Central Ground Water Board	176.52	240.00	209.38	213.70
National Institute of Hydrology	19.00	23.75	23.75	23.75
Total	**638.94**	**856.00**	**816.11**	**652.31**
Grand Total	**4714.13**	**6887.00**	**7660.00**	**5310.51**

ANNEXURE – V

LIST OF CENTRAL PUBLIC INFORMATION OFFICERS / APPELLATE AUTHORITIES IN THE VARIOUS SECTIONS / WINGS OF THE MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

S. No.	Name & Designation of CPIO appointed (S/Shri/Smt.)	Name of the Section/ Desk/ work	Name & Designation of the Appellate Authority appointed (S/Shri/Smt/Kum)
1.	A.K. Kaushik, Under Secretary (Admn) Tel. No. 011-23738126 Emailid: usadmn-mowr@nic.in	Administration Section/Cash Section SC/ST/OBC Cell	Chandan Mukherjee, DS (Admn/Cash/E-I/E-Ill) Tel. No. 011-23711459 Email id : dsadmn-mowr@nic.in
2.	Narendra Singh, US (E-I) Tel. No. 011-23716928 Email id: use1-mowr@nic.in		
3.	Anil Kumar Wahi, Under Secretary (E-lll) Tel. No. 011-23766907 Email id: usgw2-mowr@nic.in		
4.	R.K. Ojha, Under Secretary (ID &e-Gov) Tel. No. 011-23710303 Email id: rk.ojha25@nic.in	e-Governance Cell & ID	Ashish Kumar, Dir(GA/ Co-ord/ ID&e-Gov) Tel. No. 011-23716747 Email id :dirid- mowr@nic.in
5.	Ashok Kumar Gupta, Under Secretary (Co-ord.) Tel. No. 011-23074005 Email id: ashok.kgupta@nic.in	Coordination Section	
6.	Y P. Yadav, Under Secretary (GA) Tel. No. 011-23719627 Email id: yp.yadav48@gov.in	General Admn.	
7.	SK. Kataria, Under Secretary(GW &IEC) Tel. No. 011-23716928 Email Id: usgw2-mowr@nic.in		Surender Kumar Garg, DS (PSU & Parliament) Tel. No. 011-23708150 Email id : dsparl-mowr@nic.in
8.	Pratip Deb, Under Secretary (PSU/O&M) Tel. No. 011-23716928 Email id: pratip.deb@nic.in	Public Sector Undertakings Section and PPP Cell/O&M	
9.	Amit Kumar Singh, Under Secretary (Parliament) Tel. No. 011-23714350 Email id: amitk.singh32@gov.in	Parliament	
10.	R.N. Dixit,Under Secretary (E-II & GWE) Tel. No. 011- 23766944 Emai id: use2-mowr@nic.in	E-II & GWE	Khatchin Langel, Dir (GWE & E-II) Tel. No. 011-23714734 Email id: k.langel@nic.in

11.	Arun Kumar,Under Secretary (Vig/ E-lV) Tel. No. 011-23716894 Email id: usvig-mowr@nic.in	Vigilance Section/E-IV	Ms. Surinder Kaur, Director (Vigilance & E-IV Tel. No. 011-23711988 Email id: direst-mowr@nic.in
12.	Mukesh Kumar, Under Secretary (EA & IC) Tel. No. 011-23074005 Email id: m.kumar70@nic.in	External Assistance & International Co-operation Desks (EA&IC) Including Foreign Training & Bilateral issues.	Banarsi Ram, DS (EA & IC) Tel. No. 011- 23716747 Email id : dscoord-mowr@nic.in
13.	Shraddha Mathur, Assistant Director (OL) Tel. No. 011-24367106 Email id shraddha.mathur@nic.in	Official Language Section	M.C. Bhardwaj, Joint Director (OL) Tel. No. 011-23711486 Email id: mc.bhardwaj@nic.in
14.	Veena Satyawadi, Assistant Director (OL) Tel. No. 011-23719033 Email id: veenasatyawadi@nic.in		
15.	Rajaram Purohit, Jr. Hydrologist (NHP) Tel. No. 011-21420147 Email id: rr.purohit@nic.in	Hydrology Project	N.K. Manglik, SJC (NHP) Tel. No. 011-24367109 **Email id :sic2nhp-mowr@gov.in**
16.	B.L. Meena,Under Secretary (B&B) Tel. No. 011-24367116 Email id: bl.meena15@nic.in	Matters of Brahmaputra & Barak Wing	Ajay Kumar Gupta, Sr. Joint Commissioner (B&B) Tel. No. 011-24367590 Email id: ak.qupta28@gov.in
17.	M.S. Sahare, Sr. Joint Commissioner (FM) Tel. No. 011-24392095 Email id: mssahare@nic.in	Flood Management Wing	J. Chandrasekhar Iyer, Commissioner (FM) Tel. No. 011-24368238 Email id: commer-mowr@nic.in
18.	R.R Sambharia, Sr. Joint Commissioner (FM) Tel. No. 011-24362160 Email id: rrsambharia-cwc@nic.in	Flood Management Wing	
19.	S.K. Basu, Under Secretary (PP) Tel. No. 011-23719627 Email id: uspp-mowr@nic.in	Policy Planning Section	Bhupesh Kumar, Sr. Joint Commissioner (PP) Tel: 011-23719503 Email Id: sjcpp-mowr@nic.in
20.	Vinod Kumar, Under Secretary (IFD) Tel. No. 011- 23714350 Email id: kumarv.bharti@gov.in	IFD	S.L. Meena, Director (Finance) Tel: 011-23711360 Email id: dirfin-mowr@nic.in
21.	Vijay Shrivastava, Under Secretary (Budget) Tel. No. 011-23719302 Email id: vijayk.srivastava@nic.in	Budget	S.L. Meena, Director (Finance) Tel: 011-23711360 Email id: dirfin-mowr@nic.in

22.	Bamane M. J., DD(PP) Tel: 011-23716683 Email ID: bamane.m@gov.in	Planning Unit(PP)	Ch. David, Jt. Director(PP) Tel. 011-23716683 E mail ID: david.ch63@gov.in
23.	T.D. Sharma Director (CADWM) Tel. No. 011-23382481 Email id: sharma.td69@nic.in	CAD related matters	B.R.K. Pillai, Commissioner (CAD) Tel. No. 011-23382256 Email: ravi.pillai@nic.in
24.	Mannu Ji Upadhyay, Deputy Commissioner (BM) Tel. No. 011-24368344 Email id : mannuji-cwc@nic.in	River Basin Management, Administration of Bihar, UP & MP Reorganisation Act, Inter State Water Disputes Act, Inter State Water Disputes Tribunal, technical matters of NWDA and Inter-linking of Rivers	Virender Sharma, Sr. Joint Commissioner (BM) Tel. No. 011- 24367109 Email id: sjcbm-mowr@nic.in
25.	S.K. Gaur, Section Officer (Projects) Tel. No. 011-24362129 Email: id: gaur.sk@nic.in	Project Section	Bhupinder Singh, Sr. Joint Commissioner (SPR-II) Tel. No. 011-23385186 Email id: sjcpr-mowr@nic.in
26.	Manoj Kumar Sharvar, Under Secretary (Pen River) Tel. No. 011-23383059 Email id: uspenriv-mowr@nic.in	Peninsular River Wing	S.K. Kamboj, Sr. Joint Commissioner (Pen. River) Tel. No. 011-23388020 Email id: **skkamboj-cwc@nic.in**
27.	Avanti Verma Dy. Commisioner (SPR) Tel. No. 011-24363003 Email id :dcspr-mowr@gov.in	Minor Irrigation & Water Bodies	Rahul Kumar Singh, Sr. Joint Commissioner (Ml) Tel No : 011-23387834 Email id: rahulkrsingh-sjc@nic.in / sjcmi-mowr@nic.in
28.	Avanti Verma Dy. Commisioner (SPR) Tel. No. 011-24363003 Email id: dcspr-mowr@gov.in	SPR-I	A K Srivastava, Sr. Joint Commissioner (SPR-I) Tel No : 9971594822 Email id: aksriv-cwc@nic.in
29.	Rajveer Singh, DC (Indus) Tel. No. 011-24360332 Email id: dcindus-mowr@nic.in	Indus Wing	Rakesh Kumar, Sr. JC (Indus) Tel. No.011- 24361467 Email id: kumar.rakesh73@gov.in
30.	Om Prakash Gupta, SEO (Ml Stat) Tel. No. 011-24656135 Email id: om.pgupta@gov.in	Minor Irrigation Statistics	Bindu Sreedathan, Director (Ml Stats) Tel. No. 011-24699496 Email id: **dirmi-mowr@nic.in**
31.	S.K. Mohiddin, Scientist 'C' (National Water Mission) Tel. No. 011-24368343 Email id: mohiddin.sk@nic.in	National Water Mission	Dr. C.V. Dharma Rao Adviser(C&M/NWM) Tel. No.011- 24366614 Email id: dharma.rao@nic.in

32.	K.K. Sapra, US (NMCG) Tel. No. 011-23049417 Email id: sapra.kk@gov.in	NMCG & NGRBA	Nityanand Ray, Dy. Secretary (NMCG) Tel. No. 011-23049506 **Email id: nityananda.ray@nic.in**
33.	Ashok Kumar Sr.AO Tel. No. 011-23387732 Email id: ashok.kr82@gov.in	Matters related to Principal Accounts Office	Shri Narinder Pal Singh Asst. Controller of Accounts Tel No : 011-23384843 Email id: np.singh82@gov.in
34.	Nafe Singh, Pay & Accounts Officer (FBP) Tel. 03485-253648 Email id: gmfbp@gov.in	Matters related to Pay & Accounts Office (FBP)	Sakesh Prasad Singh , Controller of Accounts Tel. No. 011-23386644 Email id: ca-mowr@nic.in
35.	Sunita R. Shinde, Sr. Accounts Officer (CWPRS) Tel 020-24381813 Email id: sunita-robert@yahoo.com	Matters related to Pay Accounts Office (CWPRS)	Ram Darash Chouhan, Controller of Accounts Tel. No. 011-23386644 Email id: rd.chouhan@nic.in
36.	Balbir Singh, Sr. Accounts Officer (CGWB) Tel: 0129-2477125 Email id: paro-cgwb@gov.in	Matters related to Pay & Accounts Office (CGWB)	
37.	Upendra Malhotra, Sr. Accounts Officer (CWC) Tel No. 011-26711043 Email id: upendermalhotra-cwc@nic.in	Matters related to Pay & Accounts Office (CWC)	
38.	J.P. Singh, Sr. Accounts Officer (CSMRS) Tel. No. 011-26850358 Email Id: pao-csmrs@nic.in	Matters related to pay Accounts Office (CSMRS)	

Note: In case work of any CPIO/ Appellate Authority is changed due to transfer/ retirement/ any other reasons and a new official joins in place of the existing CPIO/ Appellate Authority, he/ she would automatically be the CPIO/ Appellate Authority of the allotted work. In case any CPIO/ Appellate Authority proceeds on leave/ training, the concerned Link Officer or the officer who is entrusted with the charge of the post of the concerned Division/ Branch Head would automatically be the CPIO/ Appellate Authority of the allotted work.

ANNEXURE -VI

LIST OF POSTAL ADDRESSES OF PUBLIC/ STAFF GRIEVANCE OFFICERS IN THE MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION AND ITS VARIOUS ORGANISATIONS

S. No.	**Name of the Organization**	**Address**	**Name & Designation of P.G./ S.G. Officer**
1.	Ministry of Water Resources, River Development and Ganga Rejuvenation	Room No.421, Shram Shakti Bhavan, New Delhi-110001 (Tele No. 011-23716747)	Shri Ashish Kumar, Director (Admn.) & Director (PG & SG) Email id: dirgw-mowr@nic.in
2.	Narmada Control Authority	Narmada Sadan, Sector-B, Scheme No. 74, Vijay Nagar, Indore – 452010(MP) (Tele No. 0731-2554477)	Mrs. Suman Sinha , Secretary and Grievance Redressal Officer Email id: **accy.nca@nic.in**
3.	Bansagar Control Board	Bansagar Control Board, Saman Colony, Mob:9711051441 Rewa (MP) (Tele No. 07662-226318/ 0755-2762059) (Fax No. 07662-242433/ 0755-2550253)	Shri Kiran Pramanik, Secretary, Bansagar Control Board, Director (Staff Grievances) Email id: **bcb242433@gmail.com**
4.	Betwa River Board	O/o Pay & Account Officer, Betwa River Board, Nandanpura, Jhansi-284003 (U.P) (Tele No. 0510-2480279)	Ms. Sonam Diwedi, Pay & Account Officer (Finance) & Public Grievance Officer
5.	Central Ground Water Board	CGWB, CHQ, Faridabad Mob: 9999594969 (Tele No.0129-2477111) (Fax No. 0129-2477125)	Col. Rajesh Kumar Gaur, Director (Admn) & Public Grievances officer Email id: diradm-cgwb@nic.in
6.	Central Soil and Materials Research Station	Room No. 309, CSMRS, Olof Palme Marg, Hauz Khas, New Delhi – 110 016 (Tel No. 011-26581370 / 26581368 / 26850025) (Fax No.-011-26853108)	Shri Hari Dev, Scientist 'E' (RM-I) & Director (Grievances) Email id: **haridev@nic.in**
7.	Central Water Commission	Room No. 313(S), Sewa Bhawan, R.K. Puram, New Delhi-110066 (Tele No. 011-26187232) (Fax No. 011-26195516)	Shri Ashis Banerjee, Secretary & Grievances Officer Email id: **secy-cwc@nic.in**
8.	Central Water & Power Research Station	Central Water & Power Research Station, P.O. Khadakwasla Research Station, Pune – 411024 (Tele No. 020-24103414 / 24103401) (Fax No. 020-24381004)	Shri T. Nagendra, Scientist 'E' & Chairman Email id: **directorcwprs@gov.in**

9.	Farakka Barrage Project	P.O. Farakka Barrage, Distt. Murshidabad, West Bengal-742212 (Tele No. 03485 – 253285) (Fax No. 03485-253608) Mob:- 9350846515 / 9064642084	Shri M.S. Varma Superintending Engineer (Coord.) & Director (Staff Grievances)
10.	Ganga Flood Control Commission	Ganga Flood Control Commission, Sinchai Bhawan, IIIrd Floor, Patna-800015 (Tele No. 0612-2215222) (Fax No. 0612-2222294, 2202643) Mob:- 9431106479	Shri Amit Prabhakar, Director (Admn.) & Director (Staff Grievances & Public Grievances) Email id: **gfccpatna@gmail.com**
11.	National Institute of Hydrology	Jal Vigyan Bhawan, Roorkee-247667 (Uttarakhand) (Tele No. 01332-272106 / 249218)	Dr. J.V. Tyagi, Scientist G, Public Grievance Officer & OIC, Staff Grievances Email id: **director.nihr.gov.in**
12.	National Projects Construction Corporation Limited	NPCC Ltd., Plot No. 148, Sector 44, Gurugram, Haryana (Tel - 0124-4888160-65) (FAX No.-0124-2385223) Mob:9971165707	Shri Nitin Saxena, Director (Public Grievance) Email id: legal.npcc1957@gmail.com Mrs. Jasmine Dhar Singh, DGM(HR) Email id: hree.npcc@nic.in
13.	National Water Development Agency	18-20, Community Centre, Saket, New Delhi-110017 (Tele No. 011-26852735) (Fax No.011- 26960841)	Shri R.K. Jain, Chief Engineer (HQ) & Grievance Officer Email id: **chqnwda.rediffmail.com**
14.	Sardar Sarovar Construction Advisory Committee	Sardar Sarovar Construction Advisory Committee, Narmada Bhavan, "A" Block, 4th Floor, Indira Avenue, Jail Road, Vadodara – 390001, Gujarat (Tele No. 0265-2421272) (Fax No. 0265-2437262)	Shri Shekharendu Jha, Deputy Secretary (Grievances) Email id: **sscac-mowr@nicin**
15.	Water & Power Consultancy Services (India) Ltd.	76-C, Institutional Area, Sector-18, Gurugram-122015 (Tele No. 0124 -2399421 / 2399443) (Fax No. 0124-2349448)	Ms. Simmi Wadhwa, OSD to CMD, Deputy CVO (Staff/Public Grievances) Email id: **grievances@wapcos.co.in**
16.	Brahmaputra Board	Basistha, Guwahati – 781029 (Tele No.0361-2300128) (Fax No. 0361-2308588)	Shri I. Hussain, Secretary (Staff/Public Grievances) Email id: **bbrd-ghy@nic.in**

17.	Upper Yamuna River Board	Upper Yamuna River Board, Wing No. 4, Ground Floor, West Block No. 1, R.K. Puram, New Delhi-110066 (Tele No. 011- 26174147 / 26184025) (Fax No. 011- 26184025 / 26174147)	Shri D.P.Mathuria, Member Secretary & Director (Public Grievances) Email id: **uyrb-mowr@nic.in**
18.	Tungabhadra Board	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt: Bellary, Karnataka- 583225 (Tele No.08394-259113)	Shri D. Ranga Reddy, Secretary & Director of Grievances Email id: **secretarytbb@yahoo.com**
19.	The River Ganga (Rejuvenation, Protection and Management) Authority	1st Floor, Major Dhyanchand National Stadium, India Gate, New Delhi – 110002 (Tele No. 011-23049506)	Shri Nityanand Ray, Deputy Secretary (NMCG) & Director of Grievances. Email id: nityananda.ray@nic.in

ANNEXURE-VII

THE ESTIMATED FUND REQUIREMENT (CENTRAL ASSISTANCE AS WELL AS STATE SHARE) FOR COMPLETION OF 99 PROJECTS

Category	No. of Projects	Fund required for completion (Rs. in crore)			Central Share (Rs. in crore)	Irrigation Potential Utilisation (Lakh Ha.)
		AIBP	CAD	TOTAL		
Priority-I projects (Completion by 3/2017)	23	7956	5466	13423	6535	14.53
Priority-II projects (Completion by 3/2018)	31	8080	4825	12905	4269	12.95
Priority-III projects (Completion by 12/2019)	45	32510	18757	51268	20538	48.45
Total	**99**	**48546**	**29049**	**77595**	**31342**	**76.03**

Note: Figures mentioned are as per information compiled /received from States. However, while processing CA proposals, the figures considered would be as per actual and therefore may change.

ANNEXURE-VIII

STATE-WISE SUMMARY OF NUMBER OF PROJECTS, THEIR ESTIMATED BALANCE COST, ADMISSIBLE CENTRAL ASSISTANCE AND TARGETED POTENTIAL UTILIZATION OF 99 PROJECTS

(Rs. in crore)

Sl. No.	Name of States	No. of Projects				Balance cost as on 1.04.2016	Balance CA admissible as on 1.04.2016	Balance State Share as on 1.04.2016	Targeted Irrigation Potential (Th. Ha.)
		Priority-I	Priority-II	Priority-III	Total				
1.	Andhra Pradesh		8		8	1818	610.6	1207.6	263.3
2.	Assam	2		1	3	832	307.3	525.0	124.9
3.	Bihar			2	2	459	199.0	259.7	37.3
4.	Chhattisgarh			3	3	715	199.0	516.1	47.6
5.	Goa			1	1	44	26.3	17.6	14.5
6.	Gujarat			1	1	8107	3685.7	4421.4	1792.0
7.	Jammu & Kashmir	3		1	4	356	184.0	171.5	61.4
8.	Jharkhand			1	1	3426	2232.8	1193.3	236.8
9.	Karnataka	2		3	5	3185	1837.3	1347.4	252.8
10.	Kerala			2	2	220	98.3	121.2	38.1
11.	Madhya Pradesh	2	11	1	14	11732	3624.9	8107.3	872.6
12.	Maharashtra	7		19	26	19950	5503.2	14446.6	850.8
13.	Manipur	2			2	602	309.9	291.7	37.0
14.	Odisha	1	2	5	8	4628	2299.6	2327.9	327.7
15.	Punjab	2			2	363	143.7	219.3	92.0
16.	Rajasthan	1		1	2	1564	733.3	830.9	315.6
17.	Telangana	1	9	1	11	7666	4226.3	3439.8	585.1
18.	Uttar Pradesh		1	3	4	11929	5120.8	6808.4	1653.0
	Total	**23**	**31**	**45**	**99**	**77595**	**31342**	**46253**	**7603**

Note: Figures mentioned as per information compiled / received from States. However, while processing CA proposals, the figures considered would be as per actual and therefore may change.

ANNEXURE-IX

COMPLETION OF AIBP WORKS OF PRIORITY PROJECTS DURING 2016-17

Sl. No.	Project Name	Ultimate Irrigation Potential (Th. Ha.)	Completion of CAD Works
Andhra Pradesh			
1.	Maddigedda	1.42	Works not required
Chhattisgarh			
2.	Maniyari Tank	14.5	Mar-19
3.	Kharung	10.3	Mar-19
Karnataka			
4.	Sri Rameswar Irrigation	13.8	Mar-19
Madhya Pradesh			
5.	Singhpur Project	10.2	Mar-19
6.	Mahuar Project	13.8	Mar-19
7.	Sagad	17.1	Mar-19
Maharashtra			
8.	Bawanthadi (IS)	27.7	2018-19
9.	Lower Panzara	6.79	2018-19
10.	Dongargaon	2.77	Works not required
11.	Warna	54.8	Works not required
Odisha			
12.	Upper Indravati(KBK)	85.95	Mar-18
13.	Rukura-Tribal	7.65	Mar-18
Punjab			
14.	Kandi Canal Extension (Ph.II)	23.33	Works not required
15.	Rehabilitation of Patiala Feeder & Kotla Branch Project	68.62	Works not required
Telangana			
16.	Gollavagu Project	3.85	Mar-19
17.	Rallivagu project	2.43	Mar-19
18.	Mathadivagu Project	3.44	Mar-19

LIKELY COMPLETION OF AIBP WORKS OF PRIORITY PROJECTS DURING 2017-18

S.No.	Project Name	Irrigation Potential already created (Th. Ha.)	Completion of CAD works
Andhra Pradesh			
1.	Gundlakamma	23.44	2019-20
2.	Tadipudi LIS	62.14	2019-20
3.	Thotapally	25.9	2019-20
4.	Musurumilli	9.01	2019-20
5.	Pushkara LIS	53.98	2019-20
6.	Yerracalva	5.06	To be included
	Total	**179.53**	
Assam			
7.	Dhansiri	53.26	Mar-18
8.	Champamati	10.02	2018-19
	Total	**63.28**	
Karnataka			
9.	Bhima LIS	21.34	2019-20
Madhya Pradesh			
10.	Sindh Project Phase II	130.59	Mar-19
11.	Indira Sagar Project Canal Phase - I & II (km. 0 to km. 142)	53.6	Mar-18
12.	Omkareshwar Project Canal Phase-IV (OSP lift)	44.03	Mar-18
13.	Indira Sagar Project Canal Phase - V (Khargone Lift)	9.39	Mar-18
	Total	**237.61**	
Maharashtra			
14.	Lower Dudhna	29.76	Mar-19
15.	Tillari	5.01	Mar-18
16.	Nandur Madhmeshwar Ph-II	3.98	2019-20
17.	Upper Kundalika	0.1	2019-20
	Total	**38.84**	

Odisha			
18.	RET irrigation	0	Mar-19
19.	Telengiri	0	Mar-19
20.	Lower Indra (KBK)	18.5	Mar-17
	Total	**18.5**	
Rajasthan			
21.	Narmada Canal	239.17	Works not required
22.	Modernisation of Gang Canal	69.16	2018-19
	Total	**308.33**	
Telangana			
23.	Peddavagu @ Neelwai project	0	Mar-19
24.	Palemvagu project	2.23	Mar-19
25.	SRSP St.II	155.07	Mar-19
26.	Rajiv Bheema L.I. Scheme	4.86	Mar-19
27.	SriKomaram Bheem project	3.77	Mar-19
	Total	**165.92**	
Uttar Pradesh			
28.	Bansagar Canal	50	Works not required

ANNEXURE-X

CA RELEASED DURING 2016-17 & 2017-18 UNDER AIBP-PMKSY

(Rs. in crore)

S.No.	State	2016-17		2017-18	
		CA Released	No. of Projects	CA Released	No. of Projects
1.	Andhra Pradesh	7.40	1	15.23	2
2.	Bihar			46.32	1
3.	Chhattisgarh	13.29	1	17.25	2
4.	Gujarat	961.88	1	1410.49	1
5.	Jammu & Kashmir			9.57	2
6.	Jharkhand	145.75	1	305.10	1
7.	Karnataka	135.47	3	459.52	3
8.	Madhya Pradesh	300.15	18	181.27	9
9.	Maharashtra	379.88	23	363.02	18
10.	Manipur	126.99	2	25.42	2
11.	Odisha	457.66	8	464.71	5
12.	Punjab	52.42	2		
13.	Rajasthan	45.89	2	216.87	2
14.	Telangana	545.45	5	13.24	1
15.	Uttar Pradesh	135.63	3	65.6	2
	Total	**3307.86**	**70**	**3593.61**	**51**

ANNEXURE-XI

STATE-WISE FUNDS RELEASED UNDER "FLOOD MANAGEMENT PROGRAMME" DURING 11TH & 12TH PLAN AND 2017-18

(Rs. in crore)

Sl. No.	State	Funds Released during 11th Plan	Funds Released During 12th Plan							Total Funds Released upto 31.03.2018
			2012-13	2013-14	2014-15	2015-16	2016-17	Total (XII Plan)	During F.Y. 2017-18	
1.	Arunachal Pradesh	78.77		16.83		47.39	23.69	87.91	21.18	187.86
2.	Assam	744.90	2.51		15.25	47.14		64.89	245.49	1055.28
3.	Bihar	680.79	54.48	88.57	24.92	16.67		184.64		865.43
4.	Chattisgarh	15.57		3.75				3.75		19.32
5.	Goa	9.98	2.00					2.00		11.98
6.	Gujarat	2.00						0.00		2
7.	Haryana	46.91						0.00		46.91
8.	Himachal Pradesh	165.31	19.92	9.75	115.20	27.00	50.00	221.87	87.5	474.68
9.	Jammu & Kashmir	243.50	39.36	28.29	15.16	46.58	40.56	169.95	110.4	523.85
10.	Jharkhand	17.07	4.27					4.27		21.34
11.	Karnataka	20.00						0.00		20.00
12.	Kerala	63.68			55.22			55.22	19.05	137.95
13.	Manipur	65.03	0.95	16.96	6.45			24.36		89.39
14.	Mizoram	3.40			1.46	0.47		1.93	0.48	5.81
15.	Nagaland	28.96	15.45		13.08	2.51	23.13	54.17		83.13
16.	Orissa	95.64						0.00		95.64
17.	Puducherry	7.50						0.00		7.5
18.	Punjab	40.43						0.00		40.43
19.	Sikkim	82.86		2.43		5.72		8.15		91.01
20.	Tamilnadu	59.82						0.00		59.82
21.	Tripura	20.91						0.00		20.91
22.	Uttar Pradesh	290.69	45.42	30.48	21.83	13.50		111.22	13.55	415.46
23.	Uttrankhand	49.63		53.14	43.82	57.02		153.98		203.61
24.	West Bengal	642.87	9.49	128.81	7.84		12.61	158.75	65.03	866.65
Total		**3476.21**	**193.85**	**379.00**	**320.23**	**264.00**	**149.99**	**1307.07**	**562.67**	**5345.95**
Spilled over works of X Plan		**89.79**								**89.79**
Grand Total		**3566.00**						**1307.07**	**562.67**	**5435.74**

ANNEXURE-XII

STATE-WISE AREA PROTECTED AND POPULATION BENEFITTED UNDER FLOOD MANAGEMENT PROGRAMME DURING 11TH & 12TH PLAN

Sl. No.	States	11th Plan		12th Plan		Total (11th & 12th Plan)	
		Area protected (in lakh ha.)	Population benefited (in lakh)	Area protected (in lakh ha.)	Population benefited (in lakh)	Area protected (in lakh ha.)	Population benefited (in lakh)
1.	Arunachal. Pradesh	0.566	0.697	0.000	0.000	0.566	0.697
2.	Assam	4.871	97.848	1.516	22.960	6.387	120.808
3.	Bihar	10.522	70.920	13.330	42.247	23.852	113.167
4.	Goa	0.002	0.150			0.002	0.150
5.	Gujarat			0.000	0.330	0.000	0.330
6.	Himachal			0.050	0.900	0.050	0.900
7.	Jharkhand			0.162	1.850	0.162	1.850
8.	J&K	0.900	0.000			0.900	0.000
9.	Manipur	0.280	1.582			0.280	1.582
10.	Nagaland	0.004	0.600			0.004	0.600
11.	Orissa	1.556	7.202			1.556	7.202
12.	Sikkim	0.201	2.397			0.201	2.397
13.	Uttar Pradesh	0.538	4.005			0.538	4.005
14.	Uttrankhand	0.001	0.053	0.004	0.202	0.005	0.255
15.	West Bengal	0.150	11.810			0.150	11.810
16.	Tripura	0.002	0.013	0.008	0.027	0.010	0.040
	Total	**19.593**	**197.277**	**15.070**	**68.516**	**34.663**	**265.793**

GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES,
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NEW DELHI