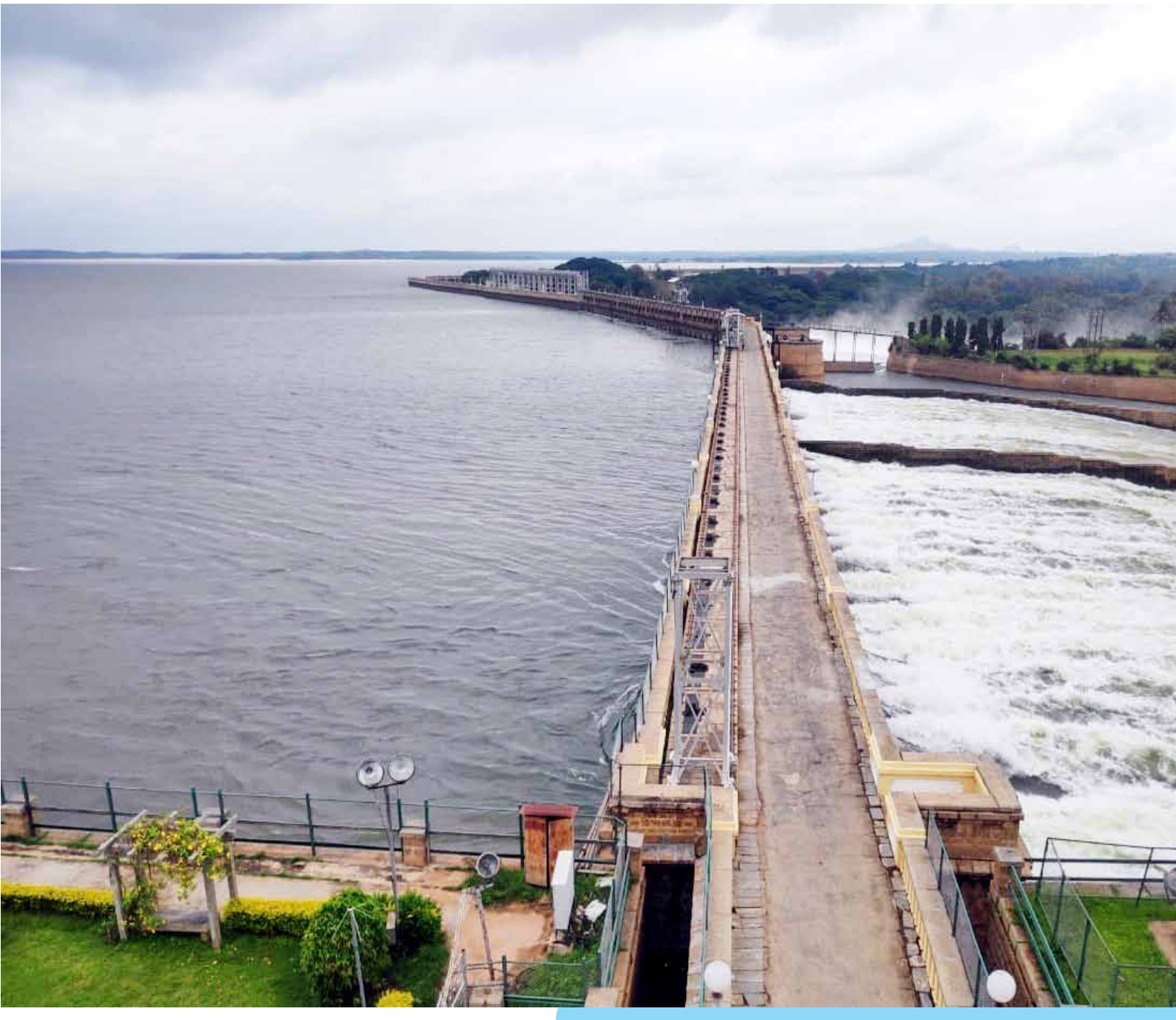
Annual Report

2019-20

सत्यमेव जयते

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



A Panoramic View of Krishna Raja Sagara Dam, Karnataka

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CHAPTER-1

OVERVIEW

DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

1. Overview

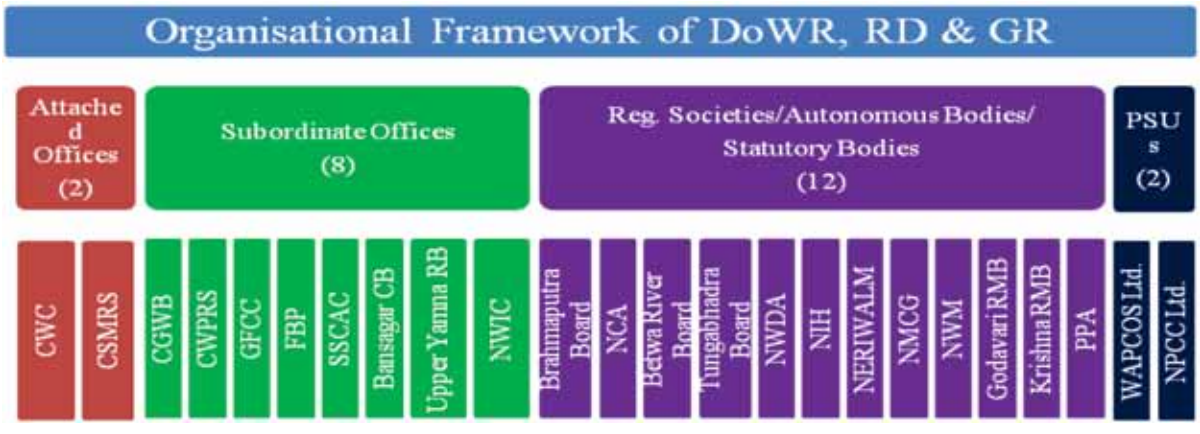
1.0 Introduction

Water is a natural resource fundamental to life, livelihood, food security and sustainable development. It is also a finite resource. Therefore, development, conservation and management of water resources are crucial especially for developing economy like India where the demands are rising rapidly due to increase in population, urbanization and industrialisation.

The Department of Water Resources, River Development and Ganga Rejuvenation (DoWR, RD & GR) is responsible for laying down policy guidelines and programmes for the development, conservation and management of water as a national resource; overall national perspective of water planning and coordination in relation to diverse uses of water; water-laws and legislations; addressing inter-State and trans-boundary water issues; bilateral and multi-lateral cooperation; general policy, guidelines and programmes for assessment, development and regulation of the country's water resources; water quality assessment; rejuvenation of River Ganga and its tributaries and also conservation and abatement of pollution of other rivers.

The Department is also allocated the subjects pertaining to regulation and development of inter-State rivers; implementation of awards of Tribunals; technical guidance, scrutiny, clearance and monitoring of the irrigation, flood control and multi-purpose projects; ground water management; flood proofing; water logging; sea erosion and dam safety.

The Department performs its functions with the support of its specialized agencies consisting of two attached offices (Central Water Commission and Central Soil and Materials Research Station);



eight 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, Upper Yamuna River Board and National Water Informatics Centre); twelve Registered Societies / Autonomous Bodies/ Statutory Bodies etc.(National Mission for Clean Ganga, National Water Mission, National Institute of Hydrology, National Water Development Agency, North Eastern Regional Institute of Water and Land Management, Narmada Control Authority, Brahmaputra Board, Betwa River Board, Tungabhadra Board, Krishna River Management Board, Godavari River Management Board and Polavaram Project Authority) and two public sector enterprises (WAPCOS Limited and National Projects Construction Corporation Limited).

The Department is under the Ministry of Jal Shakti headed by the Hon'ble Union Minister Shri Ganjendra Singh Shekhawat, who has assumed charge on 31st May, 2019 and Hon'ble Minister of State Shri Rattan Lal Kataria who assumed charge on the same day. Shri U.P. Singh is the Secretary of the Department. The organization chart of the Department is at ***Annexure-I.*** The present staff strength of the Department is given at ***Annexure-II***. The list of Senior Officers & Heads of Organizations under the Department along with their addresses is at ***Annexure-III.***

At present there are 14 wings in the Department, namely, Brahmaputra & Barak, Indus, State Projects, Finance, Administration, River Development & Public Policy, International Cooperation and Ground Water, National Mission for Clean Ganga, National Water Mission,Command Area Development and Water Management, Economic Advisory, Flood Management, Minor Irrigation Statistics and National River Conservation Directorate.

Finance Wing: The Budgetary allocations are essential to undertake any activity of the schemes and programmes of the Government. No expenditure can be incurred from the public treasury except with the sanction of the Parliament. The annual budget is accordingly presented by the Government in the Parliament. The Parliament, after deliberations on the Demand for Grants of various Ministries, passes the Annual Financial Statement.

Different Wings of the Department													
Brahmaputra & Barak	Indus	State Projects	Finance	Administration	River Development & Public Policy	International Cooperation & Ground Water	Ganga Rejuvenation	National Mission for Clean Ganga	Command Area Development & Water Management	Economic Advisory	Flood Management	Minor Irrigation Statistics	National River Conservation Directorate

The Government gets authority to incur expenditure only after the Annual Financial Statement and Appropriation Bill passed by the Parliament get the assent of the President. The Budget section, after compiling the information received from Subject Matter Divisions, prepares Detailed Demands for Grants and Statement of Budget Estimates and sends to the Ministry of Finance for incorporation of the same in the Annual Budget.

The Actual Expenditure of the Department on net basis in F.Y. 2018-19 was Rs. 7422.08 Cr. The budget outlay of the Department for FY 2019-20-Budget Estimates (B.E.) was Rs.8245.25 Cr. on net basis which has been reduced to Rs. 7518.21 Cr. in the Revised Estimates (R.E.). The actual expenditure till 31.12.2019 was Rs. 5815.33 Cr. The scheme-wise Budget at a glance of the Department showing Actual Expenditure in F.Y. 2018-19, B.E. 2019-20, R.E. 2019-20 and expenditure up to 31.12.2019 is given at ***Annexure-IV.***

2.0 Major Schemes and Programmes of the Ministry

Some of the activities and achievements of the Department under various schemes are summerised below with further details covered under Chapter -3.

2.1 National Mission for Clean Ganga (NMCG)

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 7.10.2016, consequent to the constitution of National Council for Rejuvenation, Protection and Management of River Ganga (referred as National Ganga Council) vide notification no. S.O. 3187(E) dt. 7-10-2016 under EPA, 1986.

The Act envisages five tier structure at national, state and district level to take measures for prevention, control and abatement of environmental pollution in river Ganga and to ensure continuous adequate flow of water so as to rejuvenate the river Ganga as below:

- National Ganga Council under Chairmanship of Hon'ble Prime Minister of India,
- Empowered Task Force (ETF) on river Ganga under Chairmanship of Hon'ble Union Minister of Jal Shakti,
- NMCG,
- State Ganga Committees, and
- District Ganga Committees in every specified district abutting river Ganga and its tributaries in the states,

NMCG has a two tier management structure and comprises of Governing Council and Executive Committee. Both of them are headed by Director General, NMCG. Executive Committee has been authorized to accord approval for all projects up to Rs.1000 crore. NMCG has signed Memorandum of Understanding (MoUs) with various Central Ministries such as Ministry of Human Resources Development, Ministry of Rural Development, Ministry of Railways, Ministry of Shipping, Ministry of Tourism, Ministry of Ayush, Ministry of Petroleum, Ministry of Youth Affairs and

Sports, Department of Drinking Water & Sanitation and Ministry of Agriculture for effective implementation and success of its multi-disciplinary programme.

2.2 Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

2.2.1 Significant Initiatives in the Implementation of PMKSY

Prioritization of 99 Projects

- A Committee under the Chairmanship of Hon'ble Minister (WR), Chhattisgarh was constituted vide MoWR, RD & GR order dated 2nd March, 2016 to look into the issues related to implementation of AIBP. The committee in consultation with States identified Ninety-Nine (99) ongoing irrigation projects under AIBP for completion in phases up to December, 2019.
- The Union Cabinet on 27.07.2016 approved establishment of the Mission for completion of 99 prioritized projects in phases by December, 2019 including their CAD&WM works.

Innovation in funding

- The arrangement of funds for 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 adequate 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.

Improvement in Process

- A Mission with the Officer of the level of Additional Secretary (or above) in the DoWR,RD&GR as the Mission Director has been established for completion of 99 prioritized projects in phases by December, 2019 including their CAD&WM works.
- A Council headed by CEO, NITI Aayog and having Secretary (DoWR,RD&GR), Secretary (AC&FW), Secretary (RD), Secretary (Finance) and Chairman (NABARD) as members has been constituted which shall look after the overall implementation of works and policy matters. Chief Secretaries (or their representative) of the States having large number of projects to be completed under this programme are also member.
- A High Level Empowered Committee (HLEC) comprising of Finance Minister, Minister of Jal Shakti, Minister of Agriculture, Cooperation and Farmer's Welfare, Minister of Rural Development, Vice Chairman, NITI Aayog has been constituted, which would review the progress of the identified 99 MMI projects and other components under PMKSY and also provide policy guidance for mid-term course correction.

- *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.
- Proposal for release of Central Assistance (CA) to be made by concerned officers of State Govt. and CWC, jointly.
- The progress of the projects in physical as well as financial terms is monitored through the field units of CWC. In addition, third party monitoring of these projects is also being done through PMU, NABARD is also carrying out monitoring visits as per their norms.
- A GIS based portal for monitoring the progress of the projects is also under finalization. Further, a mobile application has been developed for geo-tagging the project components on the GIS portal.

Total Central Assistance (CA) of Rs. 14,033.63 Cr. (AIBP- 11,489.31 Cr.; CAD- 2,544.32 Cr.) has been provided for these projects since 2016-17, out of which Rs. 1,902.77 Cr. (AIBP- 1,738.76 cr.; CAD- 164.01 Cr.) has been provided during the year 2019-20.

PMKSY-AIBP Dashboard

2.2.2 Command Area Development and Participatory Irrigation Management

The Centrally Sponsored Command Area Development (CAD) Programme was launched in 1974-75 to envisage integration of all activities relating to irrigated agriculture in a coordinated manner with multi-disciplinary team under a CAD 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) since XII Five Year Plan. The programme is under implementation as a sub-component of Har Khet Ko Pani (HKKP) component of 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 National Water Policy emphasizes participatory approach in water resources management. 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 (WUA) in their respective jurisdiction with effect from 2008-09. PIM is being implemented through CADWM programme. Under this programme 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. Each WUA is also given a one –time infrastructure grant of Rs. 3 lakh for creation of office, godown or other suitable facility. The programme also provides for training and hand-holdings support (through NGOs) to the WUAs for their capacity buiding.

2.2.3 Surface Minor Irrigation (SMI) Schemes

Under the SMI scheme, since 12th plan onwards, 5,838 schemes are ongoing with an estimated cost of Rs. 13,222 crore. CA of Rs. 6,531 crore has been released to states upto March, 2019. Further, 2,821 schemes have been reported to be completed upto March, 2019. Target irrigation potential creation of these schemes is 10.412 L Ha and out of this, 6.547 L Ha is reported to be created till March, 2019. In the current financial year, Rs. 694.71 crore has been released to SMI schemes till 11.03.2020.

2.2.4 Repair, Renovation & Restoration (RRR) of Water Bodies

Under the RRR of Water Bodies scheme, since 12th plan onwards, 2,219 schemes are ongoing with an estimated cost of Rs. 1,910 crore. CA of Rs. 369 crore has been released to states upto March, 2019. Further, 1,293 water bodies have been reported to be completed upto March, 2019. Target irrigation potential restoration of these schemes is 1.888 L Ha and out of this, 0.954 L Ha is reported to be restored till March, 2019. In the current financial year, Rs. 64.78 crore has been released to RRR of Water Bodies schemes till 11.03.2020.

2.2.5 Special Package for Completion of Irrigation Projects to address agrarian distress in Vidarbha and Marathwada region and drought prone areas of rest of Maharashtra

The approval of the above scheme

was given on 18.07.2018. The Scheme aims to provide special package of Rs. 3,831.41 Cr. as Central Assistance (CA) to complete 83 SMI (Surface Minor Irrigation) and 8 MMI (Major & Medium Irrigation) projects benefitting Vidarbha, Marathwada and drought prone areas of rest of Maharashtra.

2.3. Atal Bhujal Yojna (ATAL JAL)

Atal Bhujal Yojana (ATAL JAL) is a new Central Sector Scheme of the Department launched on 25.12.2019 by Hon'ble Prime Minister Shri Narendra Modi in the presence of Hon'ble Defence Minister Shri Rajnath Singh and Hon'ble Minister of Jal Shakti Shri Gajendra Singh Shekhawat on 25.12.2019. The scheme has been approved with an outlay of Rs. 6,000 crore, to be implemented over a period of 5 years (2020-21 to 2024-25). Out of the total outlay of Rs. 6,000 crore, 50% will be in the form of loan from the World Bank and the balance 50% will be in the form of matching contribution from the Government of India. The objective of the Scheme is to improve the management of groundwater resources in the water stressed areas through community participation in identified priority areas in 7 States, viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The Scheme will promote community led ground water management and behavioral changes with primary focus on demand side management.

2.4. Flood Forecasting

CWC is providing Flood Forecasting service at 325 stations, of which 197 are level forecasting stations on major rivers and 128 are inflow forecasting stations on major dams/barrages. Out of this, Flood forecasting service at 76 stations have been started during 2019. It covers 20 major river systems in the country across 25 States and UTs viz., Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Sikkim, Telangana, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal, Daman and Diu, Jammu & Kashmir, and National Capital Territory of Delhi.

2.5. Flood Management & Border Area Programme

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 Pancheshwar Multipurpose Project including matters of Pancheshwar Development Authority (PDA).

The States/UTs are provided promotional central financial assistance through Flood Management Programme (FMP) and River Management Activities & Works related to Border Areas (RMBA) schemes of Department, which are now merged into a single scheme titled "Flood Management and Border Areas Programme (FMBAP)" for the three year period from 2017-18 to 2019-20.

2.6. National Hydrology Project

National Hydrology Project (NHP) has been approved by the Cabinet as a Central Sector Scheme for establishment of National Water informatics Centre (NWIC) as a repository of nation-wide water resources data. NHP is a Central Sector Scheme, with 100% grant to the States with World Bank Assistance to the tune of 50% of the project cost. It has pan India coverage with 50 Implementing Agencies (IAs) (including 11 from Central Government and 39 from States).

2.7. Information, Education and Communication

Major activities undertaken by IEC Section during the FY 2019-20 includes;

i. Participation in Fairs/Exhibitions

ii. 6th India Water Week

iii. 2nd National Water Awards 2019

iv. Water Heroes: Share Your Stories Contest

v. Monthly Magazine 'Jal Charcha'

vi. Electronic Media Campaign

2.8. 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 CWC (iii) Information Technology Development Plan of the DoWR, RD & GR, and (iv) e-Governance of the DoWR, RD & GR.

2.9. Dam Rehabilitation and Improvement Project

Dam Rehabilitation and Improvement Project (DRIP) is the World Bank assisted project with the provision of rehabilitation of 223 dams located in the seven States (namely, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Tamil Nadu and Uttarakhand) along with institutional strengthening with system wide management approach. It has become effective from 18th April 2012 for implementation over a period of six-years. The project cost has been revised by the Government of India from Rs. 2100 Crore to Rs. 3466 Crore in September 2018. It has also been granted time extension of two years and now the official closing date of the program is 30th June 2020.

2.10. National Projects

The Union Cabinet in its meeting held on 7th February 2008 gave its consent to the proposal for implementation of National Projects with Central Assistance of 90% of project cost in the form of grant to projects meeting the following criteria:

(i) International projects where usage of water in India is required by a treaty or where planning and early completion of the project is necessary in the interest of the country.

(ii) Inter-State projects which are dragging on due to non-resolution in inter- state issues relating to sharing of costs, rehabilitation, aspects of power production, etc., including river inter-linking projects.

(iii) Intra-State projects with additional potential of more than 2 lakh hectare and with no dispute regarding sharing of water and where hydrology is established.

(iv) Further, 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 are eligible for inclusion as a National Project with certain conditions.

Sixteen Projects have been declared as national projects so far.

2.11. National River Conservation Plan

Subsequent to the amendment of the Allocation of Business Rule, 1961 vide notification dated 14.06.2019, Conservation, development, management and abatement of pollution of rivers and National River Conservation Directorate (NRCD) have been transferred to DoWR, RD & GR, Ministry of Jal Shakti. NRCD implements the National River Conservation Plan (NRCP), a Centrally Sponsored Scheme.

The objective of NRCP is to improve the water quality of rivers, which are major water sources in the country, through implementation of pollution abatement works in various towns along identified polluted stretches of rivers on cost sharing basis between the Central and State Governments. *(Website: www.nrcd.nic.in)*

2.12. Jal Shakti Abhiyan (JSA)

Jal Shakti Abhiyan (JSA) is a mission-mode water conservation campaign launched on 1st July, 2019 by Shri Gajendra Singh Shekhawat, Hon'ble Minister, Ministry of Jal Shakti. The Department of Drinking Water and Saniation, Ministry of Jal Shakti coordinated this collaborative effort of various Ministries of the Government of India and State Governments. DoWR, RD & GR, Ministry of Jal Shakti had deputed 446 Technical Officers from its specialized agencies such as CWC, CGWB etc. to provide technical support and guidance to the Central team deputed for each of the 256 identified water stressd District, led by Additional Secretary/ Joint Secretary level officer. Targeted activities have been taken up in the campaign under five key interventions, namely, (i) water conservation and rainwater harvesting, (ii) renovation of traditional and other water bodies/ tanks, (iii) reuse and bore well recharge structures, (iv) watershed development, and (v) intensive afforestation.

3.0. Organizations and Institutions

A brief description of the various Organisations and Institutions of the Department is presented below with elaborations covered under Chapter -7.

3.1 Attached Offices

3.1.1 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 is entrusted with the general responsibility of initiating, coordinating and furthering, in consultation with the State Governments concerned, schemes for control,

conservation and utilization of water resources throughout the country for the purpose of Irrigation, Flood Control, Drinking Water Supply and Hydro Power Development.

The Commission has three technical wings, namely:

- Design and Research Wing
- Water Planning and Projects Wing
- River Management Wing (Website: www.cwc.gov.in)

3.1.2. Central Soil and Material Research Station

CSMRS 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 spheres of activities of the Research Station are covered under the three main disciplines namely Soil, Rock and Concrete. The core areas are Soil Mechanics, Rockfill Technology, Geosynthetics, Soil Dynamics, Rock Engineering, Engineering Geophysics, Geotechnical Instrumentation, Concrete Technology, Concrete Diagnostics and Numerical Modeling. *(Website: www.csmrs.gov.in)*

3.2. Subordiate Offices

3.2.1. Central Ground Water Board

Central Ground Water Board (CGWB) is entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country based on principles of economic and ecological efficiency and equity. The data generated from various studies taken up by CGWB provide a scientific base for water resource planning by stakeholders. Besides advising states and other user agencies on planning and management of ground water resources, Central Ground Water Board also provides technical know-how for scientific and sustainable exploration, development and management of India's ground water resources. *(Website: www.cgwb.gov.in)*

3.2.2. Central Water and Power Research Stataion

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 more than 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. *(Website: www.cwprs.gov.in)*

3.2.3. Ganga Flood Control Commission

Ganga Flood Control Commission (GFCC) was established in 1972 with its Headquarter at Patna. 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, Chhattisgarh, Madhya Pradesh, Delhi, Haryana, Himachal Pradesh and Rajasthan on Flood Management. *(Website: www. gfcc.bif.nic.in)*

3.2.4. Sardar Sarovar Construction Advisory Commetee

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. *(Website: www. sscar.gov.in)*

3.2.5. 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 2,245 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*. (Website: www.fbp.gov.in)*

3.2.6. Bansagar Control Boad

Bansagar Control Board (BCB) was set up vide Government of India, Ministry of Agriculture and lrrigation 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. *(Website: www.bcb.nic.in)*

3.2.7. Upper Yamuna River Board

A Memorandum of Understanding (MoU) was signed by the Chief Ministers of Himachal Pradesh, Haryana, Uttar Pradesh, Rajasthan and National Capital Territory of Delhi on 12th May, 1994 regarding allocation of utilizable surface flow of River Yamuna upto Okhla Barrage (Upper Yamuna) among the co-basin States. In order to implement the said MoU, Upper Yamuna River Board (UYRB) was constituted by the Resolution No. 10(66)/71-IT dated 11th March 1995 of MoWR, RD & GR, Govt. of India in accordance with the provision of the MoU. After creation of Uttaranchal State in 2000, the resolution was modified to include Uttaranchal (now Uttarakhand) also in the Board in 2001. *(Website: www.uyrb.gov.in)*

3.2.8. National Water Informatics Centre

The National Water Informatics Centre (NWIC) has been created vide notification dated 28th March, 2018 to be

repository of nation-wide water resources data, providing a 'Single Window' source of updated data on water resources and allied themes; and to provide value added products and services to all stake holders for its management and sustainable development.

NWIC managed the pan-India Water Resources Information System *(India-WRIS: http://indiawris.gov.in)* which provides comprehensive water resources data in line with the Hydro-Meteorological Data Dissemination Policy, formulated by the Ministry of Jal Shakti in November 2018, which has the objective to make non-sensitive data collected through the use of public funds available for legitimate use, enabling better decision making and meeting society's needs.

3.3. Registered Societies/ Autonomous Bodies / Statutory Bodies etc.

3.3.1. 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 Jal Shakti) to study the feasibility of the links under Peninsular Component of National Perspective Plan. NWDA is fully funded by Government of India to carry out detailed survey and investigations of possible reservoir sites and inter-connecting links etc. *(Website: www.nwda.gov.in)*

3.3.2. National Water Mission

National Water Mission (NWM) was set up as per the National Action Plan on Climate Change (NAPCC) which was approved by the Government of India and released by the Hon'ble Prime Minister on 30th June 2008. NAPCC laid down the principles and identified the approach to be adopted to meet the challenges of impact of climate change through institutionalization of 8 national missions, one of which was the 'National Water Mission'. The main objective of NWM is "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management". *(Website: www.nwm.gov.in)*

3.3.3. National Institute of Hydrology

The National Institute of Hydrology (NIH), a Govt. of India Society under the MoJS, 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 MoJS, Govt. of India. The objectives of the Institute are:

- 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,
- 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. *(Website: www.nihroorkee.gov.in)*

3.3.4. North Eastern Regional Institute of Water and Land Management

North Eastern Regional Institute of Water and Land Management (NERIWALM) is a Registered Society under the administrative control of the DoWR, RD & GR, Government of India. This is only Water and Land Management Institute (WLMI) established and governed by Government of India and is serving eight states of the North East. It imparts trainings to enhance knowledge, skill and capacity of in-service personnel working in the Departments of Water Resources/ Irrigation, Soil Conservation, Agriculture & Horticulture, Rural Development etc. including Water Users Associations (WUAs) and farmers in the NE region of India. *(Website: www.neriwalm.gov.in)*

3.3.5. Narmada Control Authority

Narmada Control Authority and Review Committee constituted in 1980 for proper implementation of the decisions and directions of the Tribunal vested with powers for the implementation of the orders of the Tribunal with respect to the storage, apportionment, regulation and control of the Narmada water, sharing of power benefits from Sardar Sarovar Project (SSP), regulated release of water by Madhya Pradesh, acquisition of land likely to be submerged under the Sardar Sarovar Project by the concerned States, compensation, resettlement/ rehabilitation of the oustees, sharing of costs and implementation of the environmental safeguard measures. *(Website: www.nca.gov.in)*

3.3.6. Betwa River Board

Betwa River Board (B.R.B) was constituted in 1976 by an Act of parliament to execute the Rajghat Dam Project and Power House. The project authority started construction of the project under the overall guidance of Betwa River Board after promulgation of Betwa River Board Act 1976. The benefits and cost of the above projects are being shared equally by both the State Governments. *(Website: www.brb.nic.in)*

3.3.7. Tungabhadra Board

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. *(Website: http://tbboard.gov.in)*

3.3.8. Brahmaputra Board

The Brahmaputra Board was constituted by an Act of Parliament received the assent of the President on 1st September,1980 and published for general information 'The 'Brahmaputra Board Act, 1980 (No. 46 of 1980)'. The jurisdiction of Brahmaputra Board covers all the North Eastern States including Sikkim and North Bengal. The organizational setup of Brahmaputra Board has been modified after restructuring order issued by GoI on 10th January, 2019 which provides for establishment of regional offices headed

by Deputy Chief Engineer/Superintending Engineer in all the State capitals of North Eastern States. *(Website:www.brahmaputraboard.gov.in)*

3.3.9. Apex Council and Krishna & Godavari River Management Boards

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 constituted the Apex Council for supervision of the functioning of the Godavari River Management Board and Krishna River Management Board vide Gazette Notification dated 29th May, 2014. The KRMB was constituted vide Gazette Notification No: S.O.1391 (E) dated: 28th May, 2014 in accordance with sub-sections (1), (4) and (5) of Section 85 of the Andhra Pradesh Reorganisation Act, 2014. *(Website- KRMB: http://krmb.cgg.gov.in and GRMB: www.grmb.gov.in)*

3.3.10. Polavaram Project Authority

Polavaram Irrigation Project (PIP) is a multi-purpose irrigation project on the river Godavari near Ramayyapeta village of Polavaram mandal in West Godavari District of Andhra Pradesh State envisages construction of a dam to create ultimate irrigation potential of 2.91 Lakh Ha. The project also envisages generation of 960 MW of hydro power, drinking water supply to a population of 28.50 Lakh in 540 villages, diversion of 80 TMC of water to Krishna river basin. The Project has been declared as a National Project as per section 90 of AP Reorganisation Act, 2014.

3.4. Public Sector Enterprises

3.4.1. WAPCOS Limited

WAPCOS Limited is a "MINI RATNA-I" Public Sector Enterprise under the aegis of the MoJS, DoWR, RD & GR. 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 home country and global presence in the field of Water, Power and Infrastructure sectors. The quality management systems of WAPCOS comply with the Quality Assurance requirements of ISO 9001:2015 for Consultancy Services in Water Resources, Power and Infrastructure Development Projects. *(Website: www.wapcos.gov.in)*

3.4.2. 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 Limited is a "MINI RATNA"(Category-I) and "ISO 9001:2015" accredited Public Sector Enterprise under the aegis of the Union Ministry of Jal Shakti and is well established in the Country with its Registered Office at New Delhi, Corporate Office at Gurugram and 14 Zonal Offices in the state capital of different states. *(Website: http://npcc.gov.in)*

CHAPTER-2

WATER RESOURCES SCENARIO

DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

2. Water Resources Scenario

1.0 Water Availability

The average annual water availability of any region or country is largely dependent upon hydro-meteorological and geological factors. As per the study report, "Reassessment of Water Availability in Basins Using Space Inputs" of CWC published in 2019, India receives mean annual precipitation of about 3880 Billion Cubic Meter (BCM). The average annual water availability, after evaporation, is assessed at 1999.20 BCM. Due to geological and other factors, the utilizable water available is limited to 1122 BCM per annum, comprising of 690 BCM of surface water and 432 BCM of ground water. Out of this, the water potential utilized is around 699 BCM, comprising of 450 BCM of surface water and 249 BCM of groundwater. Total requirement of the country for different uses for high demand scenario for the years 2025 and 2050 has been assessed as 843 Billion Cubic Meter (BCM) and 1180 BCM respectively.

Water availability per person declines progressively with the increase in population. For India, the average annual per capita water availability of water for the years 2001 and 2011 was assessed at 1816 cubic meters and 1545 cubic meters respectively. The average annual per capita water availability is projected to further reduce to 1340 and 1140 in the years 2025 and 2050 respectively. As per the commonly used Falkenmark Indicator, annual per-capita water availability of less than 1700 cubic meters is considered as water stressed condition, whereas annual per-capita water availability below 1000 cubic meters is considered as a water scarcity condition.

2.0 Constitutional Provisions on Management of Water Resources

Water is a subject matter included in Entry 17 of List II (State List), subject to the provisions of Entry 56 of List I (Union List) under the Seventh Schedule of the Constitution. Entry 17 of List II of the the Seventh Schedule provides that, "Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List I."

Entry 56 of List I (Union List) of Seventh Schedule provides that "Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest." As such, the Union Government is conferred with powers to regulate and develop inter-State rivers under Entry 56 of List I of the Seventh

Schedule to the extent declared by the Parliament by law to be expedient in the public interest. The Union Government also has the power to make laws for the adjudication of disputes relating to waters of inter-State river or river valleys under Article 262 of the Constitution.

3.0 National Water Policy, 2012

National Water Policy was first formulated in 1987 which was subsequently reviewed and revised in the year 2002 and 2012. The National Water Policy (NWP), 2012 serves as a policy guideline for development and management of water resources in the country. The salient features of National Water Policy 2012 are as follows:

- Accorded highest priority to safe drinking water and sanitation, achieving food security, supporting poor people dependent on agriculture for their livelihood and high priority allocation for minimum eco-system needs.
- A portion of river flows should be kept aside to meet ecological needs.
- Setting up of Water Regulatory Authority has been recommended. Incentivization of recycle and re-use has been recommended.
- Emphasis on the need for a national water framework law, comprehensive legislation for optimum development of inter-State rivers and river valleys.
- Compatible agricultural strategies and cropping patterns and improved water application methods, such as drip / sprinkler irrigation should be adopted.
- Declining ground water levels in over-exploited areas should be arrested by introducing improved technologies of water use, incentivizing efficient water use and encouraging community based management of aquifers. In addition, wherever necessary, artificial recharging projects should be undertaken.
- Integrated Water Resources Management (IWRM) taking river basin / sub-basin as a unit should be the main principle for planning, development and management of water resources.

The National Water Policy, 2012 recommended the States to draft/revise their Water Policies in accordance with the NWP, 2012 keeping in mind the basic concerns and principles as a unified national perspective. As per available information, 16 States/UT, namely, Andhra Pradesh, Chhattisgarh, Goa, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Puducherry and Meghalaya have finalized and adopted their State Water Policies.

The National Water Policy, 2012 has been in operation for over seven years now. Meanwhile, challenges such as growing river pollution, water scarcity, ensuring drinking water availability/ supply, depletion of groundwater, Irrigation Potential Creation (IPC) and Irrigation Potential Utilisation (IPU) gap, low water use efficiency, drying up of springs, adoption of cropping pattern as per the water availability, etc., have emerged significantly in water sector,

which requires to be addressed through appropriate revision of National Water Policy. In order to meet the present challenges in water sector, revision of National Water Policy, 2012 has been envisaged by the DoWR, RD & GR, Ministry of Jal Shakti. Accordingly a Drafting Committee has been constituted on 5th November, 2019 to revise the National Water Policy, 2012.

4.0 Draft National Water Frame work 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, Dr. Mihir Shah Committee was constituted 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, 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 was circulated to States/ UTs and the concerned Central Ministries for 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 their comments on the proposed National Water Framework Bill.

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;

(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. DoWR, RD & GR is regularly pursuing the State Governments for seeking their cooperation for early enactment of the National Water Framework Bill.

CHAPTER-3

MAJOR PROGRAMMES

DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

3. Major Programmes

1.0 Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

PMKSY was launched during 2015-16, 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: -

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

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

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

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

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

(vi) Introduce sustainable water conservation practices;

(vii) 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;

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

Gosikhurd Irrigation (National) Project, Maharashtra

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

PMKSY components

(i) Accelerated Irrigation Benefits Programme (AIBP), [Implementation by DoWR,RD&GR, MoJS]

(ii) Har Khet Ko Pani (HKKP), [Implementation by DoWR,RD&GR, MoJS]

(iii) Per Drop More Crop, [Implementation by DoAC&FW, Ministry of Agriculture & Farmers Welfare]

(iv) Watershed Development [Implementation by DoLR, Ministry of Rural Development]

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 crores in five years as brought out below:

Projected physical target and indicative outlay (GoI share)

Component	Implementing Ministry/ Department	Physical Target (in lakh ha)	Financial outlay (in Rs. crores)
		2015-2020	
AIBP	DoWR,RD&GR	7.50	11060
Har Khet Ko Pani	DoWR,RD&GR	21.00	9050
Per Drop More Crop	DoAC&FW	100.00	16300
Watershed Development	DoLR	11.50	13590
Total			**50000**

1.1. Prioritization of Projects in 2016-17

One of the major reasons for the projects to remain incomplete under AIBP was inadequate provision of Central and State shares of counterpart funds. As a result, large amount of funds spent on these projects were locked up while the benefits envisaged at the time of formulation of the projects could not be achieved. This was a cause for concern which calls for initiative at the national level to remedy the situation. Accordingly, a Committee headed by Minister (Water Resources) of Chhattisgarh was constituted in 2016-17 to deliberate on the issues related to implementation of projects under PMKSY including prioritization of projects. On the basis of information supplied by concerned States to the Committee, 99 major and medium irrigation projects were identified by the Committee for completion by 2019.

In July, 2016, the proposal to complete 99 prioritized projects under AIBP, including their Command Area Development and Water Management (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 CADWM works) with Central Assistance (CA) of Rs. 31,342 crore. Ultimate Irrigation Potential of these projects is 76.03 Lakh ha. out of which 41.39 Lakh ha. had been created upto 31.03.2016 and the balance potential of 34.64 Lakh ha. is envisioned to be created through 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. Further, the State Governments, if required, may also borrow funds from NABARD for the State Share.
- In respect of the State Share availed by States from NABARD, interest subvention is provided by the Central Government so that overall interest rate for State share comes to about 6%, in order to make it attractive for the States and encourage them to raise requisite State share for early completion of projects. States that have signed MoA with NABARD in this regard and availing State Share from LTIF is as under:

States Availing Funds for State Share from NABARD

State	MoA signed with NABARD	Funds availed by State
Andhra Pradesh	Yes	Yes
Assam	Yes	-
Bihar	Yes	-
Chattisgarh	Yes	-
Gujarat	Yes	Yes
Jharkhand	Yes	Yes
Madhya Pradesh	Yes	Yes
Maharashtra	Yes	Yes
Manipur	Yes	Yes
Odisha	Yes	Yes
Punjab		
Rajasthan	Yes	Yes
Telangana		
Uttar Pradesh	Yes	Yes
Total	**12**	**9**

- The progress of the projects in physical as well as financial terms is monitored through the field units of CWC. 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.
- The use of pressurized pipe irrigation and micro irrigation wherever feasible is being promoted to increase efficiency. In Odisha & Maharashtra, land acquisition of 6200 ha & 4920 ha respectively has been avoided in distribution system by adopting underground Piped Distribution (PDN) and appx. cost saving thereof is Rs. 1500 cr. Other States are also sensitized 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

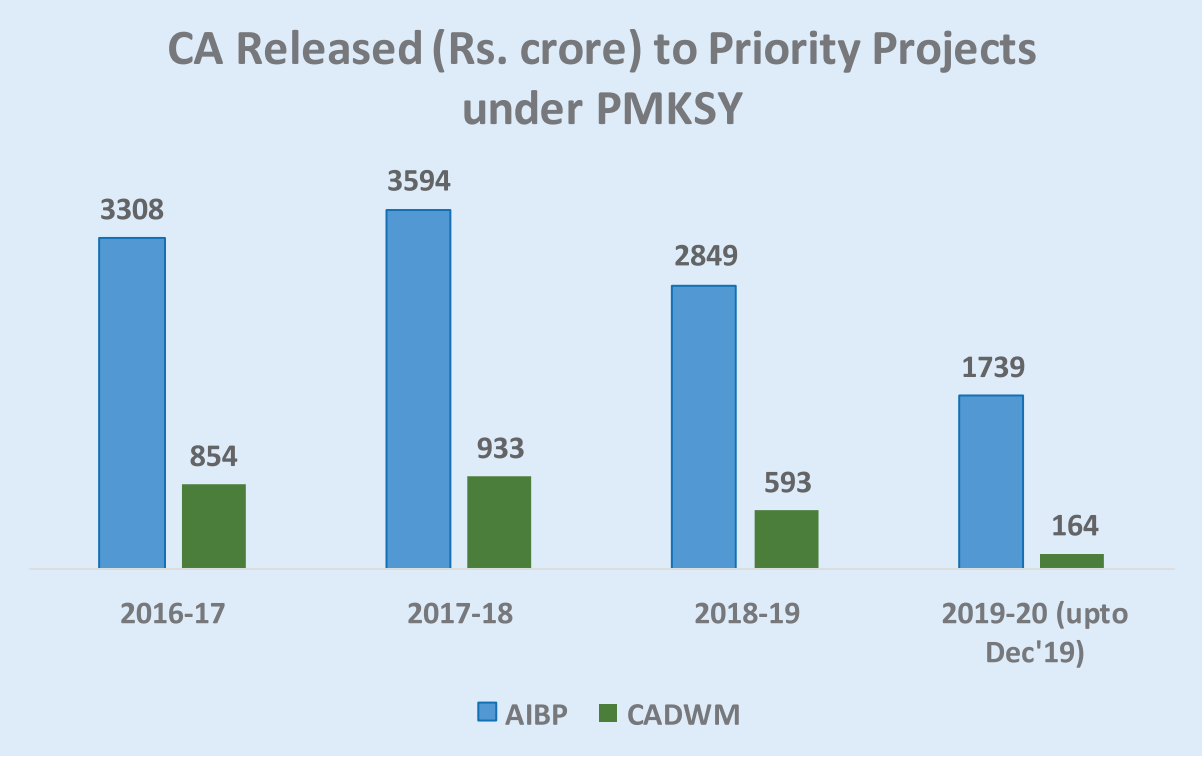
- Out of 99 prioritized projects, AIBP

works of 40 Priority projects have been reported to be complete/ almost complete by June 2019 by the concerned State Governments, the details are given at ***Annexure-V.***

- The cropped area of 45.74 L Ha. during 2018 in the command of the 99 Priority Projects has been assessed by the Bhaskaracharya Institute For Space Applications and Geo-Informatics (BISAG).
- Funds released so far under PMKSY for these 99 projects is as under:

Release of funds during 2016-18 & 2018-19

Sr. No.	Item		Funds Released (Rs. in cr.)				
			2016-17	2017-18	2018-19	2019-20	Total
1	CA	AIBP	3307.88	3593.60	2849.07	1738.76	11489.31
		CAD	853.97	933.13	593.21	164.01	2544.32
	Total CA		**4161.85**	**4526.73**	**3442.28**	**1902.77**	**14033.63**
2	State Share from LTIF	AIBP	3324.51	4717.27	8300.58	6367.76	22710.12
		CAD	10.47	108.45	8.25	288.72	415.89
	Total State Share		**3334.98**	**4825.72**	**8308.83**	**6656.48**	**23126.01**
	Total (CA+ State Share)		**7496.83**	**9352.45**	**11751.11**	**8559.25**	**37159.64**



- State wise fund released for AIBP works under 99 Priority Project under PMKSY is given at ***Annexure-VI.***

Some of the Completed AIBP Projects

Clockwise from Top Left (Lower Panzara Project- Maharashtra, Singhpur Project- Madhya Pradesh, Sri Rameshwar Project- Karnataka, Sagad Project- MP)

Monitoring and Review of the progress of projects under PMKSY

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

Hon'ble Minister (Jal Shakti) reviewing the progress of the PMKSY Projects during July, 2019

1.2. Command Area Development and Water Management (CADWM)

Objective:

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

Coverage:

The Programme was restructured and renamed as Command Area Development and Water Management (CADWM) Programme w.e.f. 01-04-2004. The Programme is being implemented *pari-passu* with AIBP since XIIth Five Year Plan. The programme is under implementation as a sub-component of HKKP component of 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.

Programme Components:

(a) **Structural Intervention:** includes survey, planning, design and execution of:

(i) On-Farm Development (OFD) works;

(ii) Construction of field, intermediate & link drains;

(iii) Correction of system deficiencies; and

(iv) Reclamation of waterlogged areas.

(b) **Non-Structural Intervention:** includes activities directed at strengthening of 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 levelling, 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.

Programme Implementation:

All CAD works are planned, designed, tendered and executed by the State Governments through its pertinent Departments. 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 DoWR, RD & GR involving an Engineering and Management Consultants; and the monitoring visits are also undertaken by the Consultants. 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 Department. CADWM Wing of Department processes the case for approval of competent level for inclusion of Project under CADWM Program. The overall Project implementation is reviewed, coordinated and guided at half yearly intervals by the Project Implementation Review Committee (PIRC).

Financing Pattern:

Funds under PMKSY (HKKP) for the CAD component are being provided to the State Governments as per Cost Sharing Ratios (which is applied on the Ceiling Costs) as below:

S. No.	Activities Eligible for Funding	Cost Sharing Ratio
(a)	All activities of Structural interventions	50:50 (Centre : State)
(b)	All activities of Non-Structural interventions excluding Functional Grant to WUAs	60:40 (Centre : State)
(c)	Functional Grant to registered WUAs	45:45:10 (Centre: State: Farmer)
(d)	Incremental Establishment Cost	50:50 (Centre : State)

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

Physical & Financial Progress:

The core components of physical works under CADWM relates to construction of field channels. Since its inception in 1974-75 up to March, 2019, CCA of about 23.038 Mha has been covered. Central Assistance of about Rs. 9,640.352 crore has been released to States under the CAD Programme.

The physical and financial achievement of the projects during the given Plan periods is summarised in the Table below:-

Sl. No	Plan Period	Financial	Physical
		Central Assistance Released (in Rs. Crores)	CCA covered (in Million Ha)
1	Upto VIII Plan	1680.738	13.952
2	IX Plan	751.656	1.801
3	X Plan	818.568	2.314

4	XI Plan	1957.264	2.08
5	XII Plan		
(a)	Up to 2015-16	1887.876	1.419
(b)	2016-17 to 2019-20 (up to Dec. 2019)	2544.25	1.472
	Total	**9640.352**	**23.038**

During 2016-17 to 2019-20 (up to December, 2019), Central Assistance (CA) of Rs. 2,544.25 crore has been provided to prioritized projects under PMKSY (CADWM). The state – wise details of Central assistance and State share released through NABARD under CADWM program for the period 2016-17 to 2019-20 (up to December,2019) is given at ***Annexure –VII.***

1.3. Participatory Irrigation Management (PIM)

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 is 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 84,779 Water Users' Associations are reported to have been formed in various States covering an area of 17.84 million hectare under various commands of irrigation projects.

PIM is implemented through CADWM program as part of it's structural intervention. CADWM work is presently being implemented in 99 prioritized AIBP projects under PMKSY (HKKP). As on April, 2016; total 4515 WUAs had been created. Then during 2016-17 about 1264 WUAs have been formed in State of Assam, Gujarat, J&K, Karnataka, Madhya Pradesh, Maharashtra, Odisha and Punjab. Again during 2017-18, 263 WUAs have been formed in State of Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Maharashtra, Manipur, Odisha, Punjab and Rajasthan. Further in 2018-19 a total of 929 WUAs were formed in states of Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Karnataka, Maharashtra, Odisha and Telangana. Thus, a total of 6,981 WUAs have been formed against the target set of 13,734 WUAs.

1.4 Relining of Sirhind Feeder from RD 119700 to 447927 and relining of Rajasthan Feeder from RD 179000 to 496000 of Punjab

Cabinet has approved the funding of Relining of Sirhind Feeder and Rajasthan Feeder of Punjab on 26.09.2018. Sirhind and Rajasthan Feeders take off upstream of Harike Head works and flow through Punjab before crossing over to Rajasthan. The twin canals run parallel have a common bank and were constructed in 1960s as lined (brick) channels to convey water to command areas in Punjab and Rajasthan. Rajasthan Feeder is exclusively meant for providing water to Indira Gandhi Nahar Project which serves seven districts of Western Rajasthan including major cities like Jodhpur, Bikaner, Jaisalmer are totally dependent on Indira Gandhi Nahar Project for drinking water. It also supplies water to Power Plants at Suratgarh, Ram Garh etc.

It saves 560 cusec of water which would stabilize/ improve irrigation in 98,739 ha. of area in Rajasthan to benefit the entire Western Rajasthan immensely. It also saves 256 cusec of water which would stabilize/ improve irrigation in 20740 ha. of area in Rajasthan and 48356 ha. in Punjab and address the problem of water-logging in 84,800 Ha of land in Muktsar, Faridkot and Ferozpur districts in South-West Punjab.

Its funding through NABARD under 99 PMKSY-AIBP projects under LTIF, the approved cost of relining of Sirhind Feeder Canal is Rs. 671.478 Cr and that of relining of Rajasthan Feeder Canal is Rs. 1,305.267 Cr., at 2015 PL. Of the total estimated cost, Rs. 826.168 Cr would be provided as Central Assistance (Rs. 205.758 Cr for Sirhind Feeder and Rs. 620.41 Cr for Rajasthan Feeder). This is in addition to Rs 156 crore of Central Assistance released earlier for these projects. The project would be completed in 3 working seasons (March to June) of 70 days each starting from March-June, 2019 and ending March-June, 2021.

During 2019-20, the works of Sirhind Feeder in 20 km of its tail reach have been taken up as per working time available and 75% of these works have been reported to be completed (progress upto Nov. 2019).

1.5 Surface Minor Irrigation (SMI) Schemes

Under the SMI scheme, since 12th plan onwards, 5,838 schemes are ongoing with an estimated cost of Rs. 13,222 crore. CA of Rs. 6,531 crore has been released to states upto March, 2019. Further, 2,821 schemes have been reported to be completed upto March, 2019. Target irrigation potential creation of these schemes is 10.412 L Ha. and out of this, 6.547 L Ha. is reported to be created till March, 2019. In the current financial year, Rs. 694.71 crore has been released to SMI schemes till 11th March, 20120.

1.6 Repair, Renovation & Restoration (RRR) of Water Bodies

Under the RRR of Water Bodies scheme, since 12th plan onwards, 2219 schemes are ongoing with an estimated cost of Rs. 1910 crore. CA of Rs. 369 crore has been released to states upto March, 2019. Further, 1293 water bodies have been reported to be completed upto March, 2019. Target irrigation potential restoration of these schemes is 1.888 L Ha.

and out of this, 0.954 L Ha is reported to be restored till March, 2019. In the current financial year, Rs. 64.78 crore has been released to RRR of Water Bodies schemes till 11th March, 20120.

1.7 Special Package for completion of Irrigation Projects to address agrarian distress in Vidarbha, Marathwada and other chronically drought prone areas of Rest of Maharashtra

The approval of the above scheme was given on 18.07.2018. The proposal aims to provide special package of Rs. 3831.41 Cr. as Central Assistance (CA) to complete 83 SMI (Surface Minor Irrigation) and 8 MMI (Major & Medium Irrigation) projects benefitting Vidarbha, Marathwada and drought prone areas of rest of Maharashtra. Total estimated balance cost of these projects is Rs. 13,651.61 Cr. as on 1.04.2018. By completion of these schemes, an additional potential of 3.77 LHa. would be created in above areas. So far under this package, CA of Rs. 800 Cr has been provided to the projects (Rs. 500 crore during 2018-19; Rs. 300 crore during 2019-20).

Features of the Special Package

Under the Special Package, Central Government will provide Central Assistance (CA) @ 25% of the balance cost of these 91 projects as on 1.4.18 as well as 25% reimbursement for the expenditure incurred during 2017-18. The arrangement of State share to be borrowed by the State shall be made through NABARD within their FRBM limit, if required, for implementation of these projects (91 nos.).

S. No.	FY	CA Released under Special Package (Rs. in Crore)		
		CA	No. of Projects CA Released (Amount of CA)	
			SMI	MMI
1	2018-19	500	56 (Rs. 170.57 cr)	07 (Rs. 329.43 cr)
2	2019-20	300	72 (Rs. 166.69 cr)	06 (Rs. 133.31 cr)
	Total	**800**	**337.26 cr.**	**462.74 cr.**

Status of Projects

Under the Special Package, 09 SMI projects have been reported to be completed so far

Varkhede Londhe Project of Maharashtra

with an Ultimate Irrigation Potential 4,498 ha. In all 15,435 ha. of irrigation potential has been created since 2018-19.

2.0 National Projects

The Union Cabinet on 7th February 2008 gave its consent to the proposal of the DoWR, RD & GR, MoJS (earlier Ministry of Water Resources) on implementation of National Projects with Central Assistance of 90% of project cost which meets the following criteria:

(i) 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.

(ii) 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.

(iii) 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.

(iv) As per the modified 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 are eligible for inclusion as a National Projects with certain conditions.

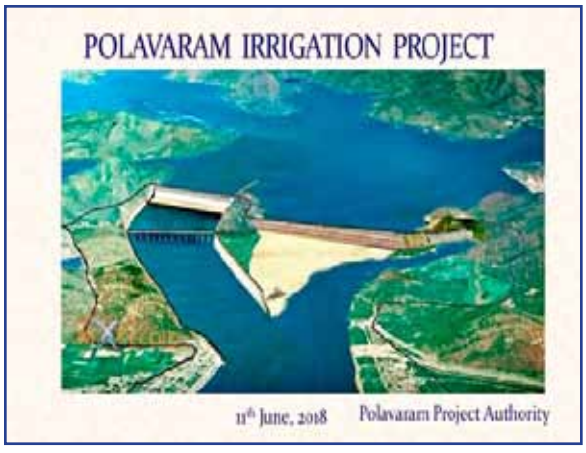
Sixteen Projects have been declared as national projects so far and are taken up for execution after the concerned States obtain techno-economic clearance, other statutory clearances and investment clearance. These are: Gosikhurd Irrigation Project, Shahpurkandi Dam Project, Teesta Barrage Project, Saryu Nahar Pariyojna, Indira Sagar Polavaram Project, Lakhwar Multipurpose Project, Renuka Dam Project, Kishau Multipurpose Project, Ujh Multipurpose project, Ken Betwa Link Project, Kulsi Dam Project, Noa-Dihing Dam Project, Bursar HE Project, Gyspa HE Project, 2nd Ravi Vyas Link Project and Upper Siang Project.

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.

Polavaram National Project

Polavaram Irrigation Project (PIP) is a multi-purpose irrigation project on river Godavari in Andhra Pradesh to create ultimate irrigation potential of 2.91 Lakh Ha. The Project also envisages generation of 960MW of hydro power, drinking water supply to a population of 28.50 Lakh in 540 villages, by diversion of 80TMC of water to Krishna river basin.

It has been declared as a National Project as per Section 90 of AP Reorganization Act, 2014. Central Government is funding 100% of the remaining cost of the irrigation component, as on 01.04.2014, Government of Andhra Pradesh is executing the irrigation component of the project on behalf of Government of India.



The approved cost of Polavaram Irrigation Project is Rs. 55,548.87 Cr (at 2017-18 price level). After declaration of National Project, a sum of Rs. 8,614.16 Cr. has been released for execution of Polavaram Irrigation Project during 2014-2020 (so far), out of which Rs. 1,850 Cr has been released during 2019-20. An expenditure of Rs. 16,935.83 crore has been incurred for the project works and the project has achieved physical progress of 67.09% up to October, 2019.

Polavaram Project Authority (PPA) has engaged M/s WAPCOS and CSMRS as Project Management Consultant and Quality Consultant for the Project.

Saryu National Project:

Saryu Nahar Pariyojana (National Project) is one of the 99 priority projects under PMKSY (AIBP) implemented in three phases. Main diversion structure and link channels are completed. Component of the project under the scheme of National Projects are some of the balance canal works of Phase-II and Phase – III of the project which involves construction of Rapti Main Canal and its complete distribution system.

The project as a whole, envisages irrigation potential of 14.04 lakh ha out of which 4.73 Lakh ha is to be created under the scheme of National Projects. Total Central Assistance released under said National Project is Rs 1884.81 cr. so far, out of which Rs. 358.22 cr. has been released during 2019-20.

Gosikhurd Project

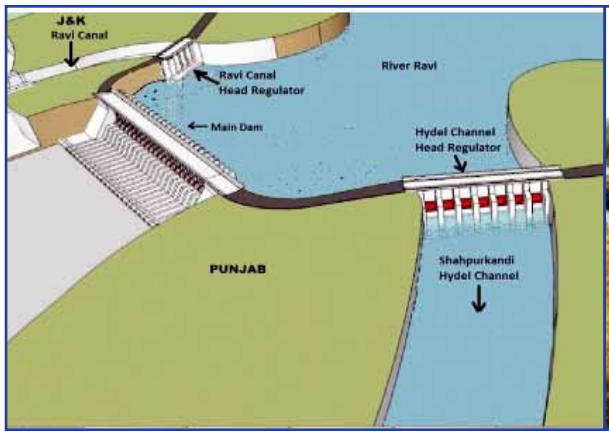
Gosikhurd National Project

Gosikhurd Irrigation Project is one of the 99 priority projects under PMKSY (AIBP) and envisages construction of earth dam across river Wainganga in Bhandara district of Maharashtra. The project will provide irrigation benefits to 2,50,800 ha (Ultimate Irrigation potential) along with other benefits. Total Central Assistance released under this National Project is Rs. 3,400.68 Cr so far, out of which Rs. 50.34 cr. has been released during 2019-20.

Shahpurkandi Dam (National Project)

The work on the project has been suspended since 30.08.2014 following dispute between the States of Jammu & Kashmir and Punjab. However, an agreement was reached between Punjab and Jammu & Kashmir States under the aegis of erstwhile MoWR,RD&GR at New Delhi on 8th September, 2018 to resume works of Shahpur Kandi Dam project in Punjab on river Ravi. Work has been resumed w.e.f. 1st November, 2018.

Government of India has approved the funding for "Implementation of Shahpurkandi Dam (National Project) on River Ravi in Punjab State" with an estimated cost of the Rs 2715.70 crore out of which, the Irrigation component (28.61% of approved cost) and Power



component (71.39% of approved cost) amounts to Rs.776.96 crore and Rs.1938.74 crore respectively. In this regard, Central Assistance of Rs 485.38 crore would be provided for the balance works portion of Irrigation Component of the said project amounting to Rs.564.632 crore.

After completion of the Project, water would be made available to the state of Punjab and J&K to provide irrigation in 5000 ha and 32173 ha respectively. In addition, water being released to provide irrigation in 1.18 Lac Hectare of area under UBDC system in Punjab at present would be managed /regulated efficiently and irrigation in the area would be benefitted. The project would be completed by June 2022. Rs. 60.0 crore has been released as Central Assistance to the project during 2019-20.

Teesta Barrage National Project

Teesta Development Plan consists of three Phases. Benefits envisaged are irrigation benefit to CCA of 922 Th Ha (Phase-I), 1000MW Hydro Power (Phase-II) and Navigation Link between Brahmaputra & Ganga (Phase-III). The Sub-stage – I, on completion, would create irrigation potential of 527 Th. Ha. over a CCA of 342 Th. Ha.

The estimated cost of the Project is Rs. 2988.61 Cr [at 2008 Price level]. The total expenditure up to 04/2014 (including expenditure under the scheme of National Projects) is Rs.1459.18 Cr. The Government of India has released Central Assistance of Rs.178.20 Cr under the scheme of National Projects.

Lakhwar Multipurpose National Project

For implementation of Lakhwar Multipurpose National Project, an agreement amongst the States of Himachal Pradesh, Uttarakhand, Uttar Pradesh, Haryana, National Capital Territory of Delhi and Rajasthan on Construction of Lakhwar Project in Upper Yamuna Basin has been signed by Hon'ble Chief Ministers of the Co Basin States on 28.08.2018.

Renukaji Dam National Project

For implementation of the Renukaji Dam National Project, an agreement amongst the States of Himachal Pradesh, Uttarakhand, Uttar Pradesh, Haryana, National Capital Territory of Delhi and Rajasthan in Upper Yamuna Basin has been signed by Hon'ble Chief Ministers of the Co-Basin States on 11.01.2019.

3.0 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 (now Ministry of Jal Shakti) for the implementation of Inter-Linking of Rivers (ILR) programme. Sixteen meetings of the Special Committee for Inter-Linking of Rivers (ILR) have been held so far (last meeting held on 21.8.2019 at New Delhi), wherein State Irrigation/ Water Resources Ministers along with the Secretaries of various States participated.

Interlinking of Rivers under NPP

- Secretary (DoWR, RD & GR) held a meeting with Chief Secretaries of Governments of Uttar Pradesh and Madhya Pradesh on 20.07.2019 for finalisation of Memorandum

of Agreement (MoA) for implementation of Ken-Betwa Link Project.

- Director General, NWDA, New Delhi held a meeting with Principal Secretary of Irrigation & Water Resources, Govt of Uttar Pradesh on 30.08.2019 for water sharing of Ken-Betwa link project.
- Modified Draft Cabinet Note for constitution of National Interlinking of Rivers Authority(NIRA) has been prepared and sent to Ministry of Jal Shakti.
- The Central Empowered Committee(CEC) of Hon'ble Supreme Court submitted its recommendations to the Supreme Court during August 2019.
- Preparation of Detailed Project Report of Cauvery-Vaigai-Gundar link project is in progress.
- Draft DPR of Alternate Study of Godavari-Cauvery link project has been completed and circulated.
- Preparation of Pre-feasibility Report of integration of Parbati-Kalisindh-Chambal link with Eastern Rajasthan Canal Project is in progress.

Intra State Links

- Environmental Clearance of Kosi-Mechi intra-State link project of Bihar has been accorded by MoEF&CC.
- Preparation of DPRs of Damanganga (Ekdare) - Godavari and Damanganga (Vagh Val)- Vaitarna-Godavari (Kadva Dev) Link Projects of Maharashtra are continued. MoU signed between WRD, Govt of Maharashtra and NWDA for preparation of DPR of these two link projects on 19.06.2019 at Hyderabad.

4.0 Flood Management and Border Area Programme (FMBAP)

Flood Management Wing

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 Pancheshwar Multipurpose Project including matters of Pancheshwar Development Authority (PDA).

The States/UTs are provided promotional financial central assistance through Flood Management Programme (FMP) and River Management Activities & Works related to Border Areas (RMBA) schemes of Department, which have been merged into a single scheme FMBAP for the three year period from 2017-18 to 2019-20. Grants-in-Aid amounting to Rs. 1398.0 crore under FMP component and Rs. 484.0 crore under RMBA component of FMBAP have been released to States/UTs between April 2017 and December 2019.

4.1. 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 which has been continued.

Under the FMP scheme, a total of 522 works were approved during XI & XII Plan. Central assistance amounting to Rs. 6,262.12 crore has been released to States/ UTs under FMP/ Flood Management component of FMBAP scheme since XI Plan till December, 2019. The completed works during XI and XII Plans have provided reasonable protection to 34.663 lakh ha. area and benefitted 265.793 lakh population. The details of Central Assistance released till December, 2019 and area protected during XI & XII Plans are given in ***Annexure-VIII & Annexure-IX*** respectively.

4.2. River Management Activities and Works related to Border Areas

The above Central Sector scheme was approved for implementation during XII Plan which has been continued. The scheme has three components viz., (i) Hydrological observations and flood forecasting on common border rivers with neighboring countries, (ii) Investigations of Water Resources projects in neighboring countries, and (ii) Grant-in-Aid to States/ UTs for flood management/ anti –sea erosion.

(i) Hydrological observations and flood forecasting on common border rivers with neighboring countries: Activities under this component includes:

- **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.

- **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.

- **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: Activities/ projects under this component are:

- **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).

- **Surveys & Investigation of SaptaKosi High Dam and Sun Kosi Storage cum Diversion Scheme:**

As per the bilateral Agreement, the Joint Project Office-SaptaKosi & Sun Kosi Investigation (JPO-SKSKI) is carrying out field investigations for SaptaKosi 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. Grant-in-aid amounting to 707.2 crore has been released to States/UTs under RMBA/ RMBA component of FMBAP since XII Plan till December, 2019.

5.0 National Mission for Clean Ganga (NMCG)

National Council for Rejuvenation, Protection and Management of River Ganga constituted (referred as National Ganga Council) vide notification no. S.O. 3187(E) dt. 7-10-2016 under EPA' 1986. The Act envisages five tier structures at national, state and district level to take measures for prevention, control and abatement of environmental pollution in river Ganga and to ensure continuous adequate flow of water so as to rejuvenate the river Ganga.

5.1 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.

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 31.12.2019 an aggregate of 516.84 MLD capacity created and 96 MLD rehabilitated and sewerage network of 3010.45 km has been completed and made operational under NGRBA/ Namami Gange. Further, STP projects with additional treatment capacity of 3743.14 MLD new capacity and 1114.39 MLD rehabilitation capacity, sewerage network projects of 5061.48 km have been sanctioned and are in various stages of implementation. NMCG has so far sanctioned 152 Sewerage Infrastructure projects at Rs. 23,423.44 Crore under Namami Gange Program. The overall statuses of these Sewerage Infrastructure Components are tabulated below:

State	No. of Projects	Total Sanctioned Cost (Rs. Crore)	Total Expenditure (Rs. Crore)	No. of projects completed
Uttarakhand	34	1151.18	459.39	23
Uttar Pradesh	50	10407.31	2360.09	16
Bihar	30	5328.60	986.02	1
Jharkhand	2	156.12	119.04	1
West Bengal	22	3789.71	1010.84	3
Haryana	2	217.87	217.94	2
Delhi	11	2361.08	505.19	-
Himachal Pradesh	1	11.57	-	-
Total	**152**	**23423.44**	**5658.51**	**46**

Hybrid annuity based PPP model

Hybrid Annuity based PPP model(HAM) was approved by Government of India in May 2016. Since then NMCG has sanctioned 29 projects worth of Rs. 10,816.81 Crores, 13 projects have already been awarded, bids have been received for 3 projects and balance 13 are under tendering. For first set of projects - 82 Million Liters per Day (MLD) Sewage Treatment Plants (STPs) in Haridwar and 50 MLD STP in Varanasi, the concession agreements were signed on 11th October 2017. In Haridwar one 14 MLD STP has already become operational and another 68 MLD STP is expected to be operational by January 2020. Mathura sewage scheme (new 30 MLD STP and 20 MLD TTP and 37.3 MLD existing) is the first project under this concept, which has already progressed to complete second construction milestone. Other projects awarded under this model include 475 MLD STPs (425 existing and 50 MLD new) in Kanpur, 326 MLD STPs (254 MLD existing and 72 MLD new) in Pryagraj, 187 MLD STPs(22 MLD existing and 165 MLD new) in Howrah, Bally and Baranagar & Kamarhati) and 150 MLD new STP in Digha & Kankarbagh, in Patna. The construction in Kanpur and Prayagraj projects have already started.

Industrial Pollution

a. Re-inventorisation & identification of 1072 Grossly Polluting Industries (GPIs) on main stem of river Ganga and its tributaries completed in 2019.

b. Inspection of 1072 GPIs has been commenced by 16 third party technical institutions w.e.f. April 2019. As on 11th December, 2019, inspection of 726 GPIs (647 by TPIs + 79 by CPCB) has been completed except 346 tanneries connected with CETP, Jajmau which are closed by UPPCB.

c. In 2018, Third Party Inspection (TPI) of 961 GPIs completed by engaging 12 institutes of repute. Out of 961 inspections carried out (952 by Third Party technical institutes + 9 by CPCB) in 2018, 636 are complying and 110 are non-complying and 215 are self-closed. Action has been taken on 110 non-complying industries in which 110 GPIs are issued closure directions under Section 5 of the E(P) Act. Closure was ensured through District Administration.

d. Industries are facilitated through Charter based participatory approach for reduction in water consumption, effluent generation and pollution load by adoption of cleaner technologies & waste minimization practices.

5.2 MONITORING OF POLLUTION

a. Water Quality Monitoring

The monitoring of water quality of river Ganga is carried out under Namami Gange programme by Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) in 5 Ganga main stem States at 96 Manual Water Quality stations. Water quality of river Ganga is also carried out through a network of 36 Real Time Water Quality Monitoring Stations (RTWQMS). Additional 40 RTWQMS are also being set up.

b. River Surface Cleaning

River surface cleaning services through trash skimmers have been hired for 05 towns. These trash skimmers are operational in, Patna, Sahibganj, Howrah, Nabadwip, and Delhi.

c. Ghat Cleaning

IL&FS Environmental Infrastructure and Services Ltd. (IEISL) has been engaged for cleaning of 84 ghats in Varanasi. Similar ghat Cleaning activities have been taken up for cleaning of 87 ghats at Bithoor, Kanpur, Prayagraj and Mathura- Vrindavan in Uttar Pradesh at a cost of Rs. 12.97 crore for 3 years. Also Cleaning of 72 ghats of Haridwar, Uttarakhand has been taken up at a cost of Rs. 15.9 Crore for 3 years.

d. Real Time Water Quality Monitoring Stations (RTWQMS)

There are 36 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.

5.3 RIVER FRONT DEVELOPMENT

Details of the River Front development project is as under:–

• Cost: Rs. 336.73 Crore • Expenditure: Rs. 283.56 Cror	➢ No. of Ghats: 20 (16 Complete) ➢ Promenade: 6.6 km (5 km Complete) ➢ Crematoria : 1 - Completed ➢ Buildings: 3 Completed ➢ Completed - Audio visualTheatre at Baharwa Ghat • Completed - Community cum Eco Centre at Collectorate Ghat and Community cum Cultural Centre at Raja Ghat.

5.4 AFFORESTATION

Forestry Intervention for Ganga is being implemented by five Ganga bank States under the Namami Gange programme, as per the DPR prepared by FRI Dehradun. NMCG has sanctioned Rs. 269.76 cr. for afforestation work in 29624 ha. land during the year 2016-20. For implementation of balance work under the FRI-DPR, MoEF&CC has agreed to carry out afforestation through the State & Centre CAMPA fund.

6.0 Atal Bhujal Yojna (ATAL JAL)

Atal Bhujal Yojana (ATAL JAL) is a new Central Sector Scheme of the Department launched by the Hon'ble Prime Minister Shri Narendra Modi in the presence of Hon'ble Defence Minister Shri

Rajnath Singh and Hon'ble Minister of Jal Shakti Shri Gajendra Singh Shekhawat on 25.12.2019. The primary objective of this Scheme is to improve the management of groundwater resources in the water stressed areas of the selected 7 States, viz., Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.

The scheme has been approved with an outlay of Rs.6,000 crore, to be implemented over a period of 5 years (2020-21 to 2024-25). Out of the total outlay of Rs. 6000 crore, Rs.3,000 will be in the form of loan from the World Bank and the balance Rs. 3,000 will be in the form of matching contribution from the Government of India.

The scheme lays emphasis on community participation and demand side interventions for sustainable groundwater management in identified water stressed areas and also envisages improved source sustainability for Jal Jeevan Mission, positive contribution to the Government's goal of 'doubling farmers income' and inculcating behavioural changes in the community to facilitate optimal water use. The scheme will benefit 8353 water stressed Gram Panchayats of Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.

Number of Districts, Blocks and Gram Panchayats Covered: State-wise

SN.	State	Districts	Blocks	GPs
1	Gujarat	6	24	1,816
2	Haryana	13	36	1,895
3	Karnataka	14	41	1,199
4	Madhya Pradesh	5	9	678
5	Maharashtra	13	35	1,339
6	Rajasthan	17	22	876
7	Uttar Pradesh	10	26	550
	TOTAL	**78**	**193**	**8,353**

The Scheme has two components, viz. Institutional Strengthening & Capacity Building component, and Incentive Component. The Institutional Strengthening & Capacity Building component of the scheme will facilitate the strengthening of institutional arrangements and capacity in the States through strong data base, scientific approach and community participation for enabling them to sustainably manage their groundwater. The Incentive Component is for incentivizing the States to achieve the pre-defined results with emphasis on community participation, demand management and convergence among various on-going schemes of the Central and State Governments and consequent improvement in ground water regime.

Hon'ble Prime Minister Sh. Narendra D. Modi launching Atal Bhujal Yojna (ABHY) along with Hon'ble Home Minister Sh. Rajnath Singh & Hon'ble Minister of Jal Shakti Sh. Gajendra Singh Shekhawat at Vigyan Bhawan, New Delhi on 25.12.2019.

7.0 Farakka Barrage Project (FBP)

Farakka Barrage Project (FBP) was commissioned in 1975 for preservation and maintenance of Kolkata Port and for increasing the navigational depth of the Bhagirathi- Hooghly waterways.

Major achievement of work(s) during 01.11.2019 to 31.12.2019 for Farakka Barrage and projected works of FBP are as follows:

i. The work for replacement of 35 gates in Farakka Barrage - (Physical progress 54%).

ii. The work for replacement of 31 gates in Farakka Barrage is under progress.

iii. Renovation/Special repair and improvement of PSC bridge road over Farakka Barrage. (Major part of the work has been completed with physical progress 85%)

iv. Design, Fabrication, Manufacturing, Supply, Insurance, Transportation to site, etc. of two tier Fish Lock gates both U/S & D/S at bay no 25 & 25A of Farakka Barrage, misc. Hydro-mechanical/ electro-mechanical components with three years operation & maintenance Contract is under progress.

v. Emergency Anti-Erosion Works at upstream left bank of Farakka Barrage Project near Ch. 2750 m towards the Marginal Embankment near village Birnagar on river Ganga (Total working curve length 477 m & total 3 no of reaches) has been Completed.

vi. Bank protection work at downstream left Bank of river Ganga near Hussainpur area from Ch 4900 to Ch 6700 (Total working curve length 1998 m & total 15 no of reaches) has been Completed.

vii. Construction of Boundary Wall of the Khejuriaghat Colony at Left Bank of River Ganga in Farakka Barrage Project is going on. (Physical progress is 50%)

viii. Construction of Security wall throughout the Township, FBP Colony Part-I,II,III & IV at Farakka Barrage Project, Murshidabad, West Bengal (Total length 8 km) is going on.(Physical progress is 95%)

ix. Special repair of internal road of Farakka Barrage Project Township for a length of 9 km (approx.) is going on.(Physical progress is 90%)

x. Special repair of internal road of Chittaranjan Market at Farakka Barrage Project (length of 429.00 mtr.) (Physical progress is 95%)

xi. Construction of Security Gate around FBP Colony in different places at FBP is in progress.

xii. Special Repair & Painting of Officer's Hostel, Annexe Building and fencing of garden (Annexe Building) at FBP Colony (Phase-I) has been Completed.

xiii. Special repair/renovation of Transit House (SE-01) and qtr. no SE-02 of FBP Colony has been Completed.

xiv. Special repair/renovation of UBI Building (SE-09) of FBP Colony. (Physical progress is 90%)

xv. Special repair/renovation of Principal Building, Primary section and boundary wall of FBPHS School. (Physical Progress is 60%)

xvi. Special repair/renovation of the Ladies hostel in FBP Colony. (Physical Progress is 75%)

xvii. Special repair/renovation of the Dormitory Building in FBP Colony. (Physical Progress is 75%)

xviii. Special repair/renovation of Soil Lab in FBP Colony. (Physical Progress is 40%)

xix. Special repair/renovation of EE type, A type, B type, C type qtrs. in FBP Colony

xx. Filling up of bed scour pockets up to RL (+) 3.00 by dumping nylon crates filled with sand filled HDPE bags in Feeder Canal in between RD 0.200 to RD 0.700 under Farakka Barrage Project (Phase-I) has been Completed.

xxi. Special protection work for canal bank in the left bank of Feeder Canal (total working length 1783 m & total 3 no of reaches) has been Completed.

xxii. Emergent work for filling up of bed scour pockets by sand filled gunny/ poly bags filled in Nylon crates in Feeder Canal in between RD 48.150 to RD 49.05 (Phase-I) -(Physical progress is 65%)

xxiii. Filling up of bed scour pockets up to RL (+) 5.00 by dumping nylon crates filled with sand filled HDPE bags in Feeder Canal in between RD 0.200 to RD 0.700 under Farakka Barrage Project (Phase-II) has been taken up and likely to be started soon.

xxiv. The ongoing works pertaining to installation of new gates at Farakka Barrage and Fish Lock gates to continue.

xxv. All the works pertaining to O&M of Farakka Barrage and its ancillary structures will continue.

Bank protection work at downstream left Bank of river Ganga near Hussainpur area

Renovation of Gates of Farakka Barrage

Renovation/Special repair and improvement of PSC bridge road over Farakka Barrage

Visit of Hon'ble Minister (DoWR, RD&GR) on 5th Nov.,2019 on the event of "Ganga Amantran Abhiyan"

8.0 Development of Water Resources Information System (DWRIS)

Development of Water Resources Information System (DWRIS) Scheme, a continuing scheme of XII five year plan, is under implementation during 2017-18 to 2019-20 with the financial implication of Rs. 682.42 crore, for collection of Hydro-Meteorological and Water Quality Data, storage and dissemination to the users for policy formulation, planning and designing of Water Resources Projects, management of water resources, timely dissemination of flood forecast, etc.

Activities under Development of Water Resources Information System (DWRIS) scheme

- Hydrological Observations (river water level, river flow, sediment, water quality, rain fall) at 878 existing sites and 720 new Hydrological Observation sites
- flood forecasting at 325 stations
- Development of Hydrodynamic models for flood forecasting to enhance lead time of flood forecasts from 24 hrs to 72 hrs.
- Reassessment of Water Availability in the country completed.

9.0 Minor Irrigation (MI) Census & Census of Water Bodies

"Rationalization of Minor Irrigation Statistics (RMIS)" was launched in 1987-88 in the DoWR, RD & GR, MoJS, with 100% assistance to the States/UTs. In 2017-18, the scheme was renamed as "Irrigation Census" and brought under the Centrally Sponsored umbrella scheme,"PMKSY and other schemes" to build up a comprehensive and reliable database in the Minor Irrigation (MI) sector for effective planning and policymaking.

Under the Scheme, each State/UT has identified a Nodal Department and a Statistical Cell for compilation of minor irrigation statistics for the entire State/UT. These cells are responsible for conducting census of MI schemes and the Census of Water Bodies with the help of staff of State/UT Governments at district/block/ village levels.

A detailed information on various parameters like irrigation sources (dug well, Shallow Tube well, Medium Tube well, Deep Tube well, Surface Flow and Surface Lift schemes), Irrigation Potential Created (IPC), Irrigation Potential Utilized (IPU), ownership, holding size of land by the owner, devices used for lifting water, source of energy, cost/maintenance of schemes and their funding, energy conserving devices such as sprinkler and drip irrigation, use of non-conventional energy sources such as solar pumps, windmills etc. is collected. A database on minor irrigation works in the country has been generated 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 Report of 5th MI Census has been published (also available on Department's website).

Standing Finance Committee (SFC) under the Chairmanship of Secretary (DoWR,RD&GR) for 6th Minor Irrigation Census and Census of Water bodies has approved to conduct the Census at a cost of Rs.168.14 crore for 6th MI Census and Rs.89.64 crore for Census of Water bodies respectively for the period 2017-18 to 2019-2020. The Department had initiated the process of conduct of 6th MI Census along with Census of Water Bodies for the first time immediately after the approval of the scheme by SFC in January, 2018.

A Memorandum of Understanding (MoU) has been signed by D/o Water Resources, River Development & Ganga Rejuvenation with National Informatics Centre (NIC) for development of mobile Application and software for data entry and validation of 6th MI Census and first Census of Water Bodies. The provision for capturing the latitude, longitude and photograph of water bodies has been kept in the Census of Water Bodies. The mobile App developed by NIC for the purpose was pilot tested along with the software for data entry and validation in four Regional Data Processing Workshops held at Northern, Southern, Eastern &Western regions. After the finalisation of mobile App & software including mandatory Security Audit, the field work of 6th MI Census and first Census of Water Bodies was launched at the end of January, 2019. The State/UT Governments constituted a State level Steering Committee under the Chairmanship of Principal Secretary of the Nodal Department with representatives of Agriculture, Urban Development, Fisheries, CWC, CGWB, etc. for monitoring and guiding the Census work in the State/ UT. All the States/UTs conducted the State level Steering Committee Meetings in which the detailed Action Plan for conducting the Census was approved. This was followed by conduct of State level training workshops, printing of schedules, procurement of mobile devices for capturing latitude, longitude & photograph, district/block level training workshops and launch of field work.

While Andhra Pradesh has completed the field work of 6th MI Census and first Census of Water Bodies, the field work is fast progressing in the States of Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Kerala, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand, Andaman & Nicobar Islands and Chandigarh. The remaining States/ UTs of Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, West Bengal, Delhi & Puducherry are in the

process of completing the preliminary activities like printing of schedules, mobile procurement, training, etc. and will be launching the field work shortly.

An expenditure of Rs. 42.58 cr. up to 31st December, 2019 has been incurred against a Budget Estimate (BE) of Rs. 50 cr. for the financial year 2019-20.

10.0 Flood Forecasting (FF)

CWC is providing Flood Forecasting service at 325 stations, of which 197 are level forecasting stations on major rivers and 128 are inflow forecasting stations on major dams/barrages. Overall 940 automatic data collection stations with sensors and satellite transmission system, three Earth receiving Stations viz New Delhi, Jaipur and Burla and 25 Modelling Centres equipped with latest computer systems for analysis of data, flood forecast formulation and its dissemination to concerned agencies expeditiously have been installed on various river basins.

During the flood season, CWC operates Flood Control Room on 24x7 basis at Headquarter in New Delhi and 29 Division Offices spread throughout the country for monitoring the flood situation. On an average, about 7000 forecasts are being issued during flood season every year by the CWC. Normally, these forecasts are issued 6 to 30 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.

10.1. Regular Flood Forecasting Activity from 1st May 2019

During the flood season 2019, 9754 flood forecasts (6004 level forecast and 3750 inflow forecasts) were issued. Out of which 8451 (86.64%) 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 e SWIS since monsoon to monitor the current status of the river. A summary of flood situation observed during 1st May to 31st December 2019 is given below:

Extreme Flood situation in flood forecasting Stations:

Four flood forecasting (FF) stations flowed in Extreme Flood Situation as detailed under:

SN	State	District	River	Station	Period	
					From	To
Flood Forecast Stations						
1.	Assam	Dhubri	Brahmaputa	Dhubri	17/07/2019 1800hrs	18/07/2019 0600 hrs
2.	Bihar	Madhubani	Kamlabalan	Jhanjharpur	14/07/2019 0400 hrs	14/07/2019 1300 hrs
3.	Maharashtra	Nasik	Godavari	Nasik	04/08/2019 1300 hrs	04/08/2019 1800 hrs
4.	Maharashtra	Satara	Krishna	Arjunwad	08/08/2019 1200 hrs	10/08/2019 1500 hrs

Extreme Flood Situation in Monitoring Stations: 33 Flood Monitoring Stations flowed in Extreme Food Situation as detailed under:

- River Aie at Aie NH Xing in Barpeta district of Assam on 11th July 2019.
- River Kosi at Birpur in Supaul district of Bihar on 13th July 2019.
- River Kosi at Saharghat in West Champaran district of Bihar from 14th to 15th July 2019.
- River Burhi Gandak at Kanti in Muzzafarpur district of Biharfrom 17th July 2019 to 23rd July 2019.
- River Krishna at Huvinahedgi in Raichur district of Karnataka on 11th August 2019.
- River Dudhganga at Sadalga in Belagavi district of Karnataka from 7th to 14th August 2019.
- River Ghataprabha at Gokak Falls in Belagavi district of Karnataka from 6th to 12th August 2019.
- River Tungabhadra at Shivamogga in Shivamogga district of Karnataka from 7th to 11th August 2019.
- River Hemavathi at Sakleshpur in Hassana district of Karnataka from 8th to 11th August 2019.
- River Varadha at Marol in Dharwad district of Karnataka from 9th to 10th August 2019.
- River Yagachi at Thimmanahalli in Hassan district of Karnataka from 9th to 10th August 2019.
- River Malaprabha at Cholachguda in Bagalkot district of Karnataka from 9th to 10th August 2019.
- River Kabini at T.Narasipur in Mysuru district of Karnataka from 11th to 12th August 2019.
- River Cauvery at Kollegal in Chamarajnagara district of Karnataka on 12th August 2019.
- River Hemavathi at Akkihebbal in Mandya district of Karnataka from 10th to 12th August 2019
- River Agahanashini at Santeguli in Uttara Kannada district of Karnataka on 6th August 2019.
- River Kabini at Muthankera in Wayanad district of Kerala from 9th to 10th August 2019.
- River Valapatnam at Perumannu in Kannur district of Kerala from 7th to 11th August 2019.
- River Kuttyadi at Kuttyadi in Kozhikode district of Kerala from 8th to 9th August 2019.
- River Chaliyar at Kuniyil in Malappuram district of Kerala from 9th to 10th August 2019.
- River Pulanthodu at Pulamanthole in Palakkad district of Kerala from 9th to 10th August 2019.
- River Cauvery at Biligundulu in Dharmapuri district of Tamilnadu from 12th to 13th August 2019.
- River Kalisindh at Salavad in Jhalawar district of Rajasthan from 15th to 16th August 2019.
- River Krishna at Kurundwad in Kolhapur district of Maharashtra on 10th August 2019.

- River Panchganga at Terwad in Kolhapur district of Maharashtra from 7th to 14th August 2019.
- River Warna at Samdoli in Sangli district of Maharashtra from 8th to 10th August 2019.
- River Savitri at Mahad in Raigad district of Maharashtra on 6th August 2019.
- River Wainganga at Kumhari in Balaghat district of Madhya Pradesh on 9th September 2019.
- River Chambal at Udi in Etawah district of Uttar Pradesh on 18th September 2019.
- River Chambal at Mandawara in Kota district of Rajasthan from 13th to 18th September 2019.
- River Kalisindh at Salavad in Jhalawar district of Rajasthan from 14th to 15th September 2019.
- River Ghataprabha at Mudhol in Bagalkote district of Karnataka from 21st to 25 th October 2019.
- River Bhavani at Odendurai in Coimbatore district of Tamil Nadu on 17th November 2019 and 1st December 2019.

Severe Flood situation for flood forecasting Stations:

96 Flood Forecasting Stations flowed in Severe Flood Situation in the States during the period 1st May to 31st December 2019 as shown below:

Sl. No	State	District	River	Station
1	Arunachal Pradesh	East Siang	Siang	Passighat
2.	Assam	Jorhat	Brahmaputra	Neamatighat
3.		Golaghat	Dhansiri(S)	Numaligarh
4.		Sonitpur	Jia-Bharali	N T Road Crossing
5.		Sivsagar	Desang	Nanglamoraghat
6.		Sonitpur	Brahmaputra	Tezpur
7.		Sivasagar	Dikhow	Sivasagar
8.		Dibrugarh	Buridehing	Chenimari(Khowang)
9.		Lakhimpur	Subansiri	Badatighat
10		Golaghat	Dhansiri (S)	Golaghat
11		Nagaon	Kopili	Kampur
12		Morigaon	Kopili	Dharamtul
13		Kamrup	Puthimari	N H Crossing
14		Nalbari	Pagladiya	N T Rd Crossing
15		Barpeta	Beki	Beki Rd Bridge
16		Barpeta	Manas	N H Crossing
17		Kamrup	Brahmaputra	Guwahati (DC Court)
18		Goalpara	Brahmaputra	Goalpara
19		Kokrajhar	Gaurang	Kokrajhar
20		Dhubri	Sankosh	Golokganj

Sl. No	State	District	River	Station
21		Cachar	Barak	Annapurnaghat
22		Cachar	Barak	Badarpurghat
23		Hailakhandi	Katakhal	Matizuri
24		Karimgunj	Kushiyara	Karimgunj
25	Bihar	Sitamarhi	Lakhanadi	Runisaidpur
26		Madhubani	Kamalabalan	Jainagar
27		Buri Gandak	Samastipur	Samastipur
28		Kishanganj	Mahananda	Taibpur
29		Katihar	Mahananda	Jhawa
30		Gopalganj	Gandak	Dumariaghat
31		Adhwara	Sitamarhi	Sonbarsa
32		Motihari	Buri Gandak	Lalbegiaghat
33		Darbhanga	Bagmati	Hayaghat
34		Purnea	Mahananda	Dhengraghat
35		Muzzafarpur	Bagmati	Benibad
36		Darbhanga	Adhwara Group	Ekmighat
37		Supaul	Kosi	Basua
38		Darbhanga	Adhwara Group	Kamtaul
39		Sitamarhi	Bagmati	Dheng Bridge
40		Khagaria	Kosi	Baltara
41		Muzzafarpur	Buri Gandak	Sikandarpur(Muzzafarpur)
42		Araria	Parwan	Araria
43		Samastipur	Buri Gandak	Rosera
44		Khagaria	Buri Gandak	Khagaria
45		Katihar	Kosi	Kursela
46		Patna	Ganga	Hatidah
47		Patna	Ganga	Patna Gandhighat
48		Munger	Ganga	Munger
49		Bhagalpur	Ganga	Kahalgaon
50		Patna	Sone	Maner
51		Siwan	Ghaghra	Darauli
52		Siwan	Ghaghra	Gangpur Siswan
53		Patna	Punpun	Sripalpur
54		Patna	Ganga	Dighaghat
55		Bhagalpur	Ganga	Bhagalpur
56		Buxar	Ganga	Buxar
57	Chhattisgarh	Bastar	Indravathi	Jagdalpur
58	Uttar Pradesh	Balrampur	Rapti	Balrampur
59		Barabanki	Ghaghra	Elginbridge

Sl. No	State	District	River	Station
60		Ballia	Ganga	Ballia
61		Auraiya	Yamuna	Auraiya
62		Jalaun	Yamuna	Kalpi
63		Muzzafarnagar	Yamuna	Mawi
64		Badaun	Ganga	Kachlabridge
65		Faizabad	Ghaghra	Ayodhya
66		Ballia	Ghaghra	Turtipar
67		Ghazipur	Ganga	Ghazipur
68		Allahabad	Ganga	Allahabad
69		Allahabad	Ganga	Phaphamau
70		Varanasi	Ganga	Varanasi
71		Mirzapur	Ganga	Mirzapur
72		Banda	Yamuna	Chillaghat
73		Allahabad	Yamuna	Naini
74		Hamirpur	Betwa	Shahjina
75	Himachal Pradesh	Sirmaur	Yamuna	Paonta Sahib
76	NCT Delhi	North Delhi	Yamuna	Delhi Rly Bridge
77	Kerala	Palakkad	Bharathapuzha	Kumbidi
78	Karnataka	Kalaburagi	Bhima	Deongaon Bridge
79	Uttarakhand	Dehradun	Ganga	Rishikesh
80		Haridwar	Ganga	Hardwar
81	West Bengal	Coochbehar	Raidak-I	Tufanganj
82		Coochbehar	Jaldhaka	Mathabhanga
83		Jalpaiguri	Teesta	Domohani
84		Murshidabad	Ganga	Farakka
85	Jharkhand	Sahibganj	Ganga	Sahibganj
86	Odisha	Rayagada	Vamsadhara	Gunupur
87		Bhadrak	Baitarani	Akhuapada
88		Gajapati	Vamsadhara	Kashinagar
89	Andhra Pradesh	Srikakulam	Nagavali	Srikakulam
90		East Godavari	Godavari	Kunavaram
91		Kurnool	Tungabhadra	Mantralayam
92	Maharashtra	Bhandara	Wainganga	Pauni
93		Bhandara	Wainganga	Bhandara
94	Madhya Pradesh	Mandla	Narmada	Mandla
95		Hoshangabad	Narmada	Hoshangabad
96	Gujarat	Bharuch	Narmada	Bharuch

11.0 National Hydrology Project (NHP)

National Hydrology Project (NHP) has been approved as Central Sector Scheme with a total outlay of Rs. 3,679.7674 crore [Rs. 3,640 crore for National Hydrology Project (NHP) and Rs. 39.7674 crore for establishment of National Water Informatics Centre (NWIC) as a repository of nation-wide water resources data]. NHP is a Central Sector Scheme, with 100% grant to the States with World Bank Assistance to the tune of 50% of the project cost. It has pan India coverage with 50 Implementing Agencies (IAs) (including 11 from Central Government and 39 from States).

Objectives:

- To improve the extent, quality, and accessibility of water resources information,
- To create decision support system for floods and basin level resource assessment/planning.
- To strengthen the capacity of targeted water resources professionals and management institutions in India."

Impact: The major impact of NHP is providing an enabling platform to the various Implementing agencies on pan-India basis for taking informed decision related to scientific management of precious water resources in the country and providing platform to Central agencies, States, research institutes for discussing water management issues. However, few specific highlights are as below:

- Under NHP impetus is being provided for installation of real time data acquisition system, and accordingly around 13500 surface and ground water monitoring sites are being established throughout the country through which real time data would be transmitted to the Central and state Data Centres apart from the centralized online water Resources information system. Contracts have already awarded in respect of 2760 such systems whereas bidding is in process for around 4760 systems. The data of these stations is being integrated into Centralised database system. During last two years of implementation of NHP, 30 implementing agencies (other than CWC and CGWB) have joined Centralised database system for Water Resources Data. The available information is now being disseminated through Water Data online module of India WRIS.
- Modification of Hydro-met Data Dissemination Policy has been carried out for easy sharing of data.
- Under Project initiative has been undertaken to upscale Web based Water Resources Information System accessible to all the stakeholders including all the citizens of India. This information system would contain data in respect of surface as well as ground water, quantity as well as quality. The first version of the system has been launched on 30th July 2019.

- Establishment of National Water Informatics Centre (NWIC) has been done.
- Facilitated Collaboration between CWC and Google for improving flood prediction system and High resolution Digital Elevation Models are being prepared
- Capacity building of Central and State Implementing Agencies is being done for taking digital initiatives which include using advance techniques of remote sensing, Geographical information system, digital elevation models etc.
- 2nd International Conference under NHP on Sustainable Water Management Conducted Successfully at Pune during 06-08 November, 2019 with 700+ Participants.
- Capacity building of IAs. Till date 205 trainings have been conducted, where in 2370 Staff trained. Other then the Training, 75 Workshops, Conferences, Study Tours, Seminar etc. have been conducted under NHP.
- As per the mandate of World Bank, Mid Term Review (MTR) was held and the Project Implementation Plan (PIP) was revised based on the progress of work by different Implementing Agencies.
- Till now, the INR 428 Cr fund has been released to Implementing Agencies, out of which the total Expenditure of INR 287.30 Cr has been incurred.

12.0 Research and Development (R&D)

R&D activities under the scheme includes basic and applied research, creation and up-gradation of research facilities and training of personnel etc. implemented through the apex organizations of Department viz., CSMRS, CWPRS, NIH, and CWC; and research projects sponsored by the Department. Under the sponsored research projects, the Department provided financial assistance to IITs, Universities, research organizations etc. for taking up research in water sector through three Indian National Committees (INCs) constituted by the Department and Standing Advisory Committee headed by Secretary (DoWR, RD&GR). The Indian National Committees (INCs) constituted by the Department are: Indian National Committee on Surface Water (INCSW), Indian National Committee on Ground Water (INCGW) and Indian National Committee on Climate Change (INCCC).

As decided in the reveiew meeting taken by Secretary, DoWR, RD&GR in August, 2019, the three Committees are being merged into a single Committee known as Indian National Committee on Water Resources (INCWR).

Dissemination of the Research output:

The research outputs under the scheme are kept in public domain for the benefit of general public, experts, policymakers and other stakeholders. A special portal "Water Knowledge Portal"(KWP) is being developed as a knowledge hub for all the water related research results at one platform. The R&D Program has also helped in capacity building and creation of additional facilities, research and infrastructure at various Research institutes in India.

12.1 Outcome of R&D Schemes:

Physical Achievements:

Particulars	Year					
T - Target A - Achievement	2017-18		2018-19		2019-20 (till Dec, 2019)	
	T	A	T	A	T	A
Technical Reports Submitted (Nos.)	200	182	150	115	165	130
Research Papers Published(Nos.)	240	133	150	114	290	190
Completion of physical/ Numerical/ mathematical model/desk studies/New Geotechnical investigation/ Evaluation of DPR/Compliance on DPR	115	237	140	152	125	106
Training of Personnel(Nos.)	150	977	650	579	660	596
Training Programmes/ Conferences Organized(Nos.)	34	26	25	21	22	27

Achievements of the R&D Division during the year:

- Research Chair on "Water Sector Conflicts and Governance" at Centre for Policy Research (CPR) was established.
- Workshop was organised on Technical Textile, Standard Operating Procedure [SOP] for application of the Technical Textiles for the various water resources works is prepared in the form on manual. The unified Schedule of Rates were complied at one place for easy preparation of estimates and tender documents for various departments/agencies associated with application of TT in water sector.
- Action research was awarded to NIH, Roorkee on IWRM plan for water security (Pond Hydrology) in identified villages of Western Uttar Pradesh is carried out.
- Guideline for providing financial assistance for organising seminar/ symposium/workshop etc. for dissemination of R&D activities of DoWR, RD&GR, MoJS has been revised.
- Guidelines for streamlining the International collaborations of the MoJS with International Association and other organisations and for taking up R & D Schemes under the Department.

13.0 National Water Mission (NWM)

National Water Mission (NWM) was set up as per the National Action Plan on Climate Change (NAPCC) which was approved by the Government of India and released by the Hon'ble Prime Minister on 30th June 2008. On 6th April, 2011, Union Cabinet approved the comprehensive Mission Document for NWM.

The main objective of NWM is "conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management".

The five goals identified by the comprehensive mission document for National Water Mission are:

(i) Comprehensive water data base in public domain and assessment of the impact of climate change on water resource,

(ii) Promotion of citizen and state actions for water conservation, augmentation and preservation,

(iii) Focused attention to vulnerable areas including over-exploited areas,

(iv) Increase water use efficiency by 20%,

(v) Promotion of basin level integrated water resources management.

39 Strategies for achieving these goals were also identified. These strategies are meant for integrated planning for sustainable development with active participation of the stakeholders. In pursuance to the approval accorded by the Union Cabinet to the National Water Mission, a Mission Directorate was established.

14.0 Human Resources Development and Capacity Building (HRD-CB)

The Human Resource Development and Capacity Building 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 Do WR, RD &GR.

The following major activities were undertaken by IEC Section during the FY 2019-20:

Participation in Fairs/Exhibitions

Some of the major exhibitions/ fairs are: 5th Smart Cities India 2019, National Conference-cum-Exhibitions & Awards on Innovative Water Solutions, 23rd National Exhibition, Vision Rajasthan 2019, 20th Geosmart India, 24th Sundarban Kristi Mela-O-Loko Sanskriti Utsab & 3rd Krishi & Wellness India 2019 expo.

Non-financial/ goodwill support extended towards various Conferences/ Seminars etc. Some of the major events are Municipalika 2019, 5th India Industry Water Conclave, 3rd World Water Summit 2019, South World Expo 2019, 5th Water Innovation Summit 2019, XIII World Aqua Congress 2019, India Smart Utility Week 2020, 3rd Emerging North East 2020, 13th IWA International Water Reuse Conference 2021.

Organization of Workshops /Seminars/ Conferences

6th India Water Week

India Water Week is a regular forum to discusses, talks, strategizes with eminent stakeholders through

seminars, exhibitions and sessions to build public awareness, to get support to implement key strategies for conservation, preservation and optimum use of available water. India Water Week (IWW-2019) is the sixth event of its kind with the theme "Water Cooperation – Coping with 21st Century Challenges" focusing on need and importance of water use across all sectors.

6th India Water Week (IWW) 2019 was organized through NWDA during 24th to 28th September, 2019 at Vigyan Bhawan, New Delhi was attended by more than 1500 national and international delegates. IWW 2019 has been organized by the DoWR, RD & GR in co-ordination with nodal Ministries of Agriculture; Environment, Forest & Climate Change; Rural Development; Drinking Water Supply and Sanitation; Power; New and Renewable Energy; NITI Aayog along with their associated expert organizations and Public Sector Units, key International Bodies and Private and Public business houses.

Organisation of Mass Awareness Programs

2nd National Water Awards 2019

The Department has instituted National Water Awards for various categories including Best State, Best District, Best Village Panchayat, Best Municipal Corporation/other Municipal Bodies, Best Schools, Best TV Show, Best Newspaper etc. in the field of water conservation. The 1st National Water Awards was held on 25.02.2019 at Mavalankar Hall, Constitution Club of India, New Delhi. 2nd National Water Awards has been launched by this Department on 1st September, 2019 to recognize the efforts of individuals, organisations, district & state authorities etc. in the field of water conservation & its management..

Water Heroes: Share Your Stories Contest

A contest named "Water Heroes: Share Your Stories" has been launched on 1st September, 2019 on MyGov Portal running till 30th June, 2020 with the objective of promoting value of water in general and for supporting country-wide efforts on water conservation and sustainable development of water resources. Each month, a maximum of 10 entries will be selected for cash prize of Rs. 10,000/- each. 10 winners have been selected for the month of September, October and November 2019.

Publicity through Print media

Monthly Magazine 'Jal Charcha'

The Department has come up with the monthly magazine to engage with the stakeholders which would also help in informed decision-making at the central level. The magazine is also an effort to bring best practices in water sector to the national stage and move ahead in the direction of creating water consciousness in the minds of the people of the country. Given the vastness of the subject, while the theme of the magazine would change with every issue, effective management of water resources in an integrated manner will remain at the helm. Three regular series – Rivers, Dams and Conservation – inform readers about the country's rivers and water storage projects and best practices. The idea is to provide opportunity to all stakeholders to express them on pressing matters of water management. Monthly

Magazine "Jal Charcha" is being circulated on monthly basis to 5,500 recipients

Two advertisements on Calling of entries for 2nd National Water Awards were published on 25.11.2019 & 15.12.2019 in prominent newspapers across the country.

Electronic Media Campaign

- 36 Radio Story telling episodes 'Paani Ki Chitthi' on creating mass awareness on water conservation were broadcast on FM Channels across the country.
- Various Video spots/ documentary films on successful work done by this Department, best practices of State Government, 2nd National Water Awards, Rainwater Harvesting techniques, water conservation etc. are being produced through NFDC for telecasting them on Social Media Handles of this Department.
- Non-financial logo support was extended towards "Aakhri Boond" water campaign of ITV Network.
- Non-financial logo support was extended towards "Har Ek Boond" water campaign of Republic TV Network.

15.0 Infrastructure Development (ID)

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 CWC (iii) Information Technology Development Plan of the Department, and (iv) e-Governance of the Department. The Scheme aims at providing better working environment in the offices, creation of assets and savings on payment of monthly rent.

Competent Authority has approved the implementation/continuation of the Infrastructure Development Scheme for the Department 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 & Building component of the Scheme and Rs.16.40 crore is for IT component.

CWC – Land & Building

The renovation and modernization of CWC (HQ) at Sewa Bhawan is almost completed. The works in West Block -I & II is in progress. The renovation work of Kalindi Bhawan, CWC, Delhi is to be completed during FY 2019-20.

The construction of RCC structure of G+3 office building of CWC/GFCC at Patna has been completed and finishing works of the building is under progress. It is likely to be completed by March 2020. Works for construction of hutments at Ramshahighat, boundary wall construction at Ayodhya & Kopergaon and Sub-division building at Prayagraj are under progress.

The work for dedicated water supply lines at CWC, Jammu is being executed by PHE Department of J&K, and certain building works at CWC, Jammu are almost completed.

The work of renovation/

modernisation of 80 nos. toilets at CWC (HQ), SewaBhawan, WB - I&II, New Delhi, amounting to Rs 4.84 Crore, is in progress.

CGWB – Land & Building

The construction of building of National Ground Water Training & Research Institute (NGWT&RI) building at Naya Raipur is almost completed, and it is likely to be completed in the FY 2019-20.

The works for the construction of office building of CGWB in Guwahati are inprogress and likely to be completed in FY 2019-20.

The construction of office building at Ahmedabad and Ambala has been started. The work is in progress. Building plan for construction of Divisional office, workshop-cum-store at Jammu has been approved from local authority and construction work is in progress.

Construction of boundary wall, guard room for Divisional workshop & store at Jodhpur likely to be completed in the financial year 2019-20.

e-Governance of the Department

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

i. Department has completely operationalized e-Office. This Department 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 Department has even linked its e-Office instance with Central Ground Water Board, Ministry of Power, Department of Expenditure, Department of Personnel & Training, CWC and Department of Legal Affairs enabling inter-departmental transfer of e-Files amongst the these Departments.

ii. The Department has sanctioned requisite funds to NIC for operationalizing e-Office in Central Water & Power Research Station, CWC, Central Soil & Materials Research Station, Ganga Flood Control Commission. e-Office is under implementation in these Attached Offices/ Subordinate Organizations under the Department.

iii. The new Website of the Department was launched on 22nd January, 2018. After extensive efforts the website has been made fully compliance with Guidelines for Indian Government Websites (GIGW) and Standardization Testing and Quality Certification (STQC) prescribed by Department of Administrative Reforms & Public Grievances.

iv. Social Media accounts including Facebook and Twitter of all the Attached Offices/Subordinate Organizations under the Ministry have been operationalized. Focus has been made on regular updation of websites of all these attached offices.

v. Digital Signatures have been procured and provided to most of the officials with signing authority.

vi. The MIS / Dashboard for monitoring the Physical and financial achievement of 99 projects under

PMKSY has been launched in public domain and regular monitoring is being done through the Portal.

vii. The development of e-Human Resources Management System (eHRMS) for 6 Organizations viz. CWC, 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 been completed 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.

Land & Building of the Department

Renovation of Fifteen Rooms has been undertaken in Lok Nayak Bhawan, Krishi Bhawan and Shram Shakti Bhawan. The works for the other rooms and toilets are in process.

16.0 Dam Rehabilitation and Improvement Project (DRIP)

16.1 Dam Rehabilitation and Improvement Project

Government of India, with financial assistance from World Bank initiated the DRIP in April 2012 with an objective to improve the safety and operational performance of selected existing dams along with dam safety institutional strengthening with system wide management approach. The Scheme has provision to rehabilitate 223 dams, with Project cost of Rs. 3,466 Cr. The dams located in 7 States namely Jharkhand, Karnataka, Kerala, Madhya Pradesh, Odisha, Tamil Nadu and Uttarakhand are covered in the ongoing DRIP.

It is a State Sector Scheme with Central Component. There are three objectives of DRIP i.e. (a) Component-I: Rehabilitation of Dams and its Appurtenant Structures, (b) Component-II: Institutional Strengthening and (c) Component-III: Project Management.

DRIP is being implemented and coordinated by CWC. The overall progress of DRIP is being monitored by National Level Steering Committee (NLSC) headed by Secretary (DoWR, RD&GR) as its Chairman. A Technical Committee under the Chairmanship of Member (D&R), CWC is in place with appropriate representation from all partner agencies, IMD, Ministry of Power etc. to review the progress of Scheme and to look into technical issues in the Scheme on regular basis to ensure smooth implementation. So far 24 TC meetings have been conducted. World Bank is conducting regular Implementation Support and Review Mission on bi-annual basis to review the overall progress of project implementation, implementation arrangement, assessed the key challenges, lessons learnt, and provided guidance on corrective measures for speeding up implementation and disbursement, and issues are being taken at appropriate level. So far, 14 nos. of Missions have been conducted.

16.2 Achievements /Activities during FY 2019-20:

1) Physical rehabilitation: at 156 dams completed to address various

safety concerns of dams, safety of downstream people, property, environment and ecology of river. During FY 2019-20, rehabilitation activities have been completed at 67 dams so far.

2) Financial achievement: Out of the Project cost of Rs 3,466 Cr, expenditure incurred till December 2019 is Rs 2,111 Cr. During FY 2019-20, the expenditure incurred is Rs 240 Cr

3) Dam Break Analysis and Inundation Mapping- So far Dam Break Analysis(DBA) and Inundation mapping have been completed for 205 dams. During FY 2019-20, 41 DBA has been prepared and shared with concerned DRIP Implementing Agencies.

4) Publication of Emergency Action Plans (EAP) : EAP for 159 dams prepared, 90 published and 27 nos. of Stakeholder Consultation Meetings conducted. During FY 2019-20, 72 EAPs have been published so far.

5) Operation and Maintenance (O&M) Manuals for 143 dams prepared. During FY 2019-20, so far, 41 O&M Manuals have been published

6) Dam Health and Rehabilitation Monitoring Application (DHARMA), a web-based asset management tool developed to support the effective collection and management of dam data. The licenses for this tool have been provided to 17 States and 3 Central Agencies. This tool has 966 nos of official users with stored data of 1454 nos of large dams. Also. 6 nos. of training on DHARMA implementation have been organized in this year benefiting 215 state officials.

7) 12 nos. of new Guidelines and Manuals on various aspects of dam safety published on various aspects of dam safety, 6 nos. of guidelines/ manuals under finalization.

8) MoUs signed with 2 Central Agencies viz CSMRS and CWPRS for capacity building under DRIP during the month of May 2019 and June 2019 respectively.

9) Seismic Hazard mapping of whole country to enhance the Country's preparedness to handle seismic risk associated w.r.t. water resources and other important structures. This is being done with help of IIT Roorkee and CWPRS Pune. IIT Roorkee has almost completed the study for South India, whereas CWPRS, Pune is doing for North and North East India.

10) 165 nos of National training programs conducted so far, wherein about 5000 officials trained on various facets of dam safety. During FY 2019-20, 46 Trainings on various areas of dam safety were conducted in different implementing agencies benefitting 1095 officials.

11) Memorandum of Understanding (MoU) was signed on October 22, 2020 for availing Consultancy Services of CWC for vetting & approval of designs & drawings related to the construction of additional spillway for Hirakud Dam under Dam Rehabilitation and Improvement Project (DRIP).

12) Development of Rapid Risk Screening Framework: CWC with technical assistance of World is developing a framework for Rapid Risk Screening of dams for prioritising resource allocation. Two workshop have been held i.e. October 2019 and January 2020,

13) Special Studies of Bhakra Dam: Advance Numerical Modelling of Bhakra Dam has been completed. The study aimed to analyze the structures to understand reasons of distress and suggesting befitting remedial measures.

14) Conferences: Three National Dam Safety Conferences and Two International Dam Safety Conferences have been organized under the project so far with an overwhelming response from the dam safety professionals, researchers, academicians, industries from the Country as well as overseas.

15) Multiple software were procured under DRIP like STAAD, Plaxis 3D, FLAC 2D & 3D, Rocscience and Geostudio. Training programmes on these design and analysis software were organized for CWC officials under DRIP.

16.3 Dam Rehabilitation and Improvement Project II (DRIP-II)

Based on the success of ongoing DRIP, the DRIP Phase-II and Phase-III with a much larger financial outlay has been initiated. The Government of India and World Bank approved this Scheme in-principle. The Project will be implemented in 18 States and 2 Central Agencies, with a provision to rehabilitate 687 dams at an estimated cost of Rs 10211 Cr. The duration of the project will be 10 years with each of its two Phases having duration of six years and an overlap of two years between them. The proposed operationalization of the Project is expected in early 2020.

The Project has four components (i) Rehabilitation and Improvement of dams and associated appurtenances, (ii) Dam Safety Institutional Strengthening in participating States and CWC, and (iii) Project Management and (iv) Revenue Generation through Incidentals. The Project is under preparatory phase. 14 Nos of Consultation and Appraisal meetings have been organized by CPMU and World Bank with officials of Water Resources Department of the states on preparatory activities to be completed before loan negotiation of DRIP Phase II and Phase III.

Dam Safety Review Panels (DSRP) has been constituted by 18 agencies and so far, 198 DSRP inspections have been carried out. Design Flood Review (DFR), to check Hydrological Safety of dams, have been completed for 264 dams, wherein DFR for 174 dams have been approved. Training on Design flood Review has been carried out in 7 states (Manipur, Meghalaya, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh and Chhattisgarh) by CWC officials as a part of preparatory activities for new DRIP Phase II & Phase III. Water Resources Departments of Rajasthan, Odisha, Karnataka and Manipur have submitted PSTs with all technical and financial details for 8, 6, 2 and 2 project dams respectively and submitted to CPMU & World Bank for approval. World Bank has approved 4 Project Screening Templates (PSTs) so far.

17.0 NATIONAL RIVER CONSERVATION PLAN

17.1 National River Conservation Directorate (NRCD)

The Government of India has, vide Notification No. 1763 dated 14th June, 2019, transferred National River Conservation Directorate (NRCD) including the National River Conservation Plan (NRCP) Scheme from Ministry of Environment, Forest and Climate Change (MoEF&CC) to the DoWR, RD & GR under the Ministry of Jal Shakti. The National River Conservation Plan (NCRP) is a Centrally Sponsored Scheme for conservation of rivers by providing financial assistance to State Government for taking up pollution abatement works of rivers other than Ganga and its tributaries.

17.2 National River Conservation Plan (NRCP)

The Ganga Action Plan (GAP) was launched in 1985 to take up pollution abatement programme of River Ganga. The Ganga Action Plan was expanded to cover other rivers under NRCP in the year 1995. The objective of NRCP is to improve the water quality of rivers, which are major source of water in the country, through implementation of pollution abatement on cost sharing basis between the Central and State Governments.

The pollution abatement works taken up under the NRCP include:

- Interception and diversion works/ laying of sewerage system to capture raw sewage flowing into the rivers through open drains and diverting them for treatment.
- Setting up of Sewage Treatment Plants (STPs) for treating the diverted sewage.
- Construction of Low Cost Sanitation Toilets to prevent open defecation on river banks.
- Construction of Electric Crematoria and Improved Wood Crematoria to conserve the use of wood.
- River Front Development works, such as improvement of bathing ghats.
- Public participation & awareness and capacity building, etc.

Presently, NRCP (excluding Ganga and its tributaries) covers polluted stretches of 34 rivers in 77 towns spread over 16 States at a sanctioned cost of Rs.5,870.55 crore. An amount of Rs.2,510.63 crore has been released to various State Governments for implementation of various pollution abatement schemes and a treatment capacity of 2,522.03 million litres per day (mld) has been created so far under NRCP (excluding Ganga and its tributaries).

The following rivers are covered under NRCP:

Sl. No.	River
1	Adyar
2	Beas
3	Bhadra
4	Brahmani
5.	Cauvery
6	Cooum
7	Devika
8	Diphu & Dhansiri
9	Ghaggar
10	Godavari
11	Krishna

Sl. No.	River
12	Mahanadi
13	Mandovi
14	Mindhola
15	MulaMutha
16	Musi
17	Narmada
18	Nambul
19	Pennar
20	Pamba
21	Panchganga
22	Rani Chu
23	Sabarmati
24	Satluj
25	Subarnarekha
26	Tapti
27	Tapi
28	Tunga
29	Tungabadra
30	Tamrabarani
31	Tawi
32	Vaigai
33	Vennar
34	Wainganga

17.3 Major works taken-up under NRCP

i. **Pollution Abatement of Rivers Satluj, Beas & Ghaggar in Punjab:** Under Phase–I of NRCP, pollution abatement works in 6 towns namely Ludhiana, Jallandhar, Phagwara, Phillaur, Kapurthala and Sultanpur Lodhi amounting to Rs.215.71 crore were sanctioned for pollution abatement of rivers Satluj and Beas. Under these projects, 8 STPs having total capacity of 461.2 mld have been created in the above mentioned towns. These STPs are being maintained by the State Government agencies, as operation and maintenance of the assets created under NRCP is the responsibility of the concerned State Governments and their agencies.

Under Phase–II of NRCP in Punjab, works for pollution abatement of rivers Satluj & Beas amounting to Rs. 501.61 crore in 11 towns have been sanctioned and the targeted STP capacity of 187 mld has been created. These towns are Banga, Bholath, Dasuya, Hoshiarpur, Moga, Mukerian, Nawanshehar, Tanda as well as the Phase-I towns of Phagwara, Phillaur and Jalandhar.

Projects amounting to Rs. 57.10 crore have also been sanctioned for pollution abatement of river Ghaggar in 4 towns, namely Patran, Moonak, Lehragaga and Khanauri and creation of 15 mld treatment capacity has been created under these projects.

ii. **Sabarmati River Conservation Project at Ahmedabad, Gujarat:** For conservation of river Sabarmati in Ahmedabad, projects amounting to Rs. 365.01 crore were sanctioned under Phase-I of NRCP works are completed and a total sewage treatment capacity of 232 mld has been created in 2 STPs alongwith other sewerage infrastructure facilities, including community toilet complexes at various locations in the town.

The ongoing Sabarmati River Conservation Project Phase–II at Ahmedabad has been sanctioned at a cost of Rs. 444.44 crore. Under this phase, works related to laying

of new sewers, strengthening/ rehabilitation of the existing sewerage system, construction of sewage pumping stations. Under the project, a STP of 48 mld has already been commissioned against the treatment capacity of 210.5 mld was envisaged.

iii. **Pollution Abatement of River Mindhola at Surat, Gujarat:** Under the project for 'Conservation of river Mindhola at Surat', works relating to sewerage networks, sewage pumping stations along with creation of sewage treatment capacity of 53 mld has been sanctioned at a cost of Rs.262.13 crore. Under the project, a STP of 53 mld has already been commissioned.

iv. **Pollution Abatement of Rivers in Odisha and Coastal area of Puri, Odisha:** For pollution abatement of rivers Mahanadi and Brahamini in the towns of Cuttack, Talcher, Chandbali and Dharamshala, projects at a total cost of Rs. 12.29 crore stand sanctioned. The works sanctioned under the project pertain to interception & diversion of sewage, sewage treatment plants (STPs), low-cost sanitation, bathing ghats and improved wood crematoria. Sewage treatment capacity of 33mld in Cuttack has also been created, apart from other municipal infrastructure works.

For pollution abatement of coastal area in the town of Puri, a project amounting to Rs. 80.45 crore has been sanctioned under NRCP.

v. **Pollution Abatement of Rivers Devika & Tawi at Udhampur, Jammu and Kashmir:** The Project of 'pollution abatement of rivers Devika & Tawi at Udhampur' was sanctioned in September, 2018 at an estimated cost of Rs.186.74 crore. Major components proposed under the project include laying of swer lines 129.27 km length, setting up 3 Sewage Pumping Stations & construction of 3 Sewage Treatment Plants (STPs) of 13.60 million litre per day (mld) capacity.

vi. **Pollution Abatement of River Mula-Mutha at Pune, Maharashtra (Externally Aided Projects):** The project of "Pollution abatement of River Mula- Mutha at Pune'' has been sanctioned in January, 2016 at a cost of Rs.990.26 crore. Loan assistance of 19.064 billion yen is being provided by Japan International Cooperation Agency (JICA) for the project. The project cost will be shared in 85:15 ratio respectively and to be completed by January, 2022.

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CHAPTER-4

INTER-STATE RIVER ISSUES

DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

4. Inter-State River Issues

1.0 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 valleys thereof. The Act was last amended in August, 2002 on the basis of the recommendations of 'Sarkaria Commission' on Centre - State relations.

In order to further streamline the adjudication of inter-State river water disputes, the Inter-State River Water Disputes (Amendment) Bill, 2019 was introduced in Lok Sabha on 25.07.2019. The Bill has been considered and passed by Lok Sabha on 31.07.2019. The Bill envisage to establish a single 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.

2.0 Inter-State Water Disputes Tribunal

2.1. MAHANADI WATER DISPUTES TRIBUNAL

The Government of Odisha had filed a complaint dated 19.11.2016 under Section 3 of the Inter-State River Water Disputes Act, 1956 read with Inter State River Water Dispute Rules, 1959. Odisha requested the Union Government for Constitution of a Tribunal under Section 4 (1) of the Inter-State River Water Disputes 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 to refer the complaint to the Tribunal under Section 5 (1) of the Inter-State River Water Disputes Act, 1956. In this connection, the Central Government has constituted Mahanadi Water Disputes Tribunal vide Gazette Notification No. 1114 (E) dated 12.03.2018. Subsequently, reference has been made to the Tribunal vide letter dated 17.04.2018. The matter is currently under adjudication in the Tribunal and 11 hearings of the Tribunal have been held so far.

Expenditure incurred by the Tribunal

Sl. No.	Specifications	Rs. in lakh
1	Budget Allocation for 2019-20	4.20
2	Expenditure from 04/19 to 12/19	0.86
3	Cumulative Expenditure upto 31/12/19	0.86

2.2. 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 on 30th December, 2010.

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 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 forwarding 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 after hearing the parties delivered its decision on 19.10.2016 on the preliminary issues relating to jurisdiction and scope of Section 89 of Act No. 6 of 2014. The report has been forwarded to the Ministry on 19-10-2016.

After decision on preliminary issues, parties filed their pleadings on merit of the case. The replies of the pleadings and the rejoinders thereof were exchanged. The cross-examination of witnesses of the State of Andhra Pradesh has concluded. Now the cross examination of the witnesses of the State of Telangana is going on. On close of evidence of witnesses of Telangana, the parties will start their arguments. The term of the Tribunal has been extended for a further period of one year w.e.f. 01.08.2019.

Expenditure incurred by the Tribunal

Sl. No.	Specifications	Rs. in lakh
1	Budget Allocation for 2019-20	387
2	Expenditure from 4/19 to 12/19	282
3	Cumulative Expenditure up to 31/12/2019	2826

2.3. VANSADHARA WATER DISPUTE TRIBUNAL (VWDT)

The Supreme Court had directed Central Government to constitute the Vasandhara 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.

The Central Government has 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.

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. Ms. Justice Pratibha Rani has assumed the charge of Member of this Tribunal on 27.08.2018.

The Tribunal heard the submission of the parties on 22.01.2019, 05.03.2019, 06.03.2019, 03.04.2019, 04.04.2019, 05.04.2019. The next hearing of the Tribunal was scheduled to be held on 09.07.2019. In the meantime on 08.07.2019 State of Odisha filed an application for modification of order dated 05.04.2019.

On 09.07.2019 the Tribunal took up the said I.A. for hearing and directed the parties to complete the pleading and the matter was adjourned to 27.08.2019. On 27.08.2019 the Tribunal, after hearing the parties, reserved its order on I.A. 1/2019. On 23.09.2019 the Tribunal pronounced its order dismissing the I.A. and directed to list the main matter on 10.01.2020 for further direction.

Expenditure incurred by the Tribunal

Sl. No.	Specifications	Rs. In lakhs
1.	Budget Allocation for 2019-20	511.11
2.	Expenditure upto 31 December,2019	297.85
3.	Cumulative Expenditure upto 31/12/19	316.683

2.4. MAHADAYI WATER DIPUTES TRINBUNAL

The Government of India on 16.11.2010 under Section 3 of the Inter-State River Water Disputes Act 1956 (as amended) constituted a Tribunal known as Mahadayi Water Disputes Tribunal (MWDT) for adjudication of the water disputes relating to the inter-state river Mahadayi and the river valley thereof among the States of Goa, Karnataka and Maharashtra. The Chairman of the Tribunal is a former Judge of the Supreme Court of India and the other two Members are former Judges of the High Courts. Hon'ble Mr. Justice J.M. Panchal, Chairman of the Tribunal took over the charge of the post of Chairman on 1.11.2011 after His Lordship's superannuation as Judge from the Supreme Court of India and Hon'ble Mr. Justice Viney Mittal and Hon'ble Mr. Justice P.S. Narayana former Judges of the Punjab & Haryana High Court and Andhra Pradesh High Court had taken charge as Members on 16.11.2010 and 1.12.2010 respectively.

The Hon'ble Tribunal after completion of the procedure for examination of all the evidence, the award was reserved on 21.2.2018. Thereafter, in the course of time the Tribunal prepared its award containing 12 Volumes running into about 2900 pages and forwarded the same to the Hon'ble Union Minister for the MoJS on 14.8.2018. However, on 20.8.2018 the State of Goa has filed an application under Section 5(3) of Inter-State Water Disputes Act with additional affidavit. The State of Goa thereafter on 20.9.2018 has also filed a detailed application under Section 5(3) of the Act seeking clarifications on certain points in the Award dated 14.8.2018. The States of Maharashtra and Karnataka have also filed their respective applications under Section 5(3) of the Act on 5.11.2018 and 13.11.2018 respectively. All the aforesaid applications filed by the three party States are pending adjudication before the Hon'ble Tribunal.

It is further pointed out that Advocate for the State of Karnataka filed its reply on 20.11.2018 to the application filed by the State of Goa under Order 39 Rule 2A of the Code of Civil Procedure, 1908 read with Section 5(3) of the Inter State River Water Disputes Act, 1956 and the Advocate for the State of Goa filed an Affidavit on 18.12.2018 in Rejoinder on behalf of the State of Goa to the reply dated 20.11.2018 filed by the State of Karnataka. The Secretary to the Government of India, DoWR, RD & GR, filed a Reference dated 14.01.2019 along with Schedule of clarifications.

All the aforesaid applications, filed by three party States as well as the references filed under section 5(3) of the Inter-State River Water Disputes Act, 1956, by the three party States as well as the Central Government, are pending adjudication before the Hon'ble Tribunal.

Expenditure incurred by the Tribunal

Sl. No.	Specifications	Rs. in Lakh
1	Budget allocation for 2019-20	445
2	Expenditure incurred by the Tribunal from 1.4.2019 to 31.12.2019	306
3	Anticipated expenditure of the Tribunal from 1.1.2020 to 31.3.2020	105

2.5. RAVI & BEAS WATERS TRIBUNAL

The Ravi and Beas Waters Tribunal was set up in the year 1986 as per Sub-section (1) and sub-section (2) of Section 14 of the Inter State River Water Disputes Act, 1956 (33 of 1956) to resolve the water dispute among the three states Punjab, Rajasthan and Haryana. The Tribunal had already submitted its report on 30.1.1987.

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. Consequently, the President of India has issued a reference to Hon'ble Supreme Court of India regarding the constitutionality / validity of the Act. It is also stated that the Presidential reference No.1 of 2004 U/A 143(1) of the constitution of India has since been disposed off by the Hon'ble Supreme court of India vide judgment dated 10.11.2016. In its Order the Supreme Court has answered negative in regard to the Punjab Termination of Agreement Act 2004. Thus, Court has transmitted its opinion to the President of India in accordance with the procedure prescribed in Part V of the Supreme Court Rules, 2013.

Consequent upon the above development the President of India for passing further order on the reference pending before the Tribunal has been extended upto 5th August 2020.

The Financial Expenditure of the Tribunal for the year 2019-20 is given in the following Table.

Expenditure incurred by the Tribunal

Sl. No.	Specifications	Rs. in Lakh
1	Budget Allocation for 2019-20 (BE)	289.85
2	Budget Allocation for 2019-20 (RE)	207.60
3	Expenditure incurred by the Tribunal 2019-20 (upto Dec.,2019)	95.40

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CHAPTER-5

INTERNATIONAL COOPERATION

DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

5. International Cooperation

1.0 Bilataral Cooperation

DoWR, RD & GR has signed Memorandum of Understanding (MoUs) with different countries on cooperation in the field of water resources management and development; Brief of MoUs signed during 2019 is given below**:**

Memorandum of Understanding with United States Geological Survey: MoU has been signed with U.S. Geological Survey of the Department of the Interior of the United States of America and DoWR, RD & GR to pursue scientific and technical cooperation in the field of water resources in Dec, 2019.

Memorandum of Understanding with MARVI Partners Australia: MoU has been signed between Central Ground Water Board under DoWR, RD & GR and MARVI Partners, Australia for Collaboration in Capacity Building, Research and Development and Making Impact for Sustainable Groundwater Management on 22.11.2019.

Visit of Hon'ble Minister to Israel and Hungary: Hon'ble Minister of Jal Shakti visited Israel for participating at the Israel- India, Strategic Partnership on water event which took place in Jerusalem on 18th November, 2019 and also participated in WATEC Israel 2019 at Tel-Aviv, Israel. Hon'ble Minister also attended Budapest Water Summit, 2019 held in Budapest during 15th to 17th Oct, 2019 in which Hon'ble Minister had bilateral meeting with President of Hungary, Minister of Interior of Hungary and Minister of Agriculture of Hungary.

2.0 Foreign Visits/ Deputation

Foreign Trainings for Capacity Building in Water Sector: To enhance capacity building of the officers of DoWR, RD & GR and its orgainsations, during the period from April, 2019 to March, 2020, about 200 officers had been deputed for foreign trainings, visits, seminars and conferences in the field of water resources management, micro-irrigation, water use efficiency, irrigation management, enhancing crop production, flood disaster risk management, dam safety and rehabilitation, waste water treatment, sewage treatment, morphological modeling, ecosystem conservation etc.

3.0 Indo-Bangladesh Joint Rivers Commission

3.1 Indo-Bangladesh Joint Rivers Commission

An Indo-Bangladesh Joint Rivers Commission (JRC) is functioning since 1972 with a view to maintain liaison in order to ensure the most effective joint

efforts in maximizing the benefits from common river systems.

3.2 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 validity of Treaty is 30 years. The sharing of water as per the Treaty is being monitored by a Joint Committee headed by Members, JRC from both sides. The 71st & 72nd meeting of Joint Committee were held at Kolkata (in February, 2019) & Dhaka (in April, 2019) respectively.

3.3 Water Resources Secretary Level Meeting between India and Bangladesh held in Dhaka during August 07- 08, 2019

A Water Resources Secretary Level meeting between India and Bangladesh was held in Dhaka during 7-8 August, 2019. The Indian delegation was led by Shri U.P. Singh, Secretary, (DoWR, RD & GR), and the Bangladesh delegation was led by Mr. Kabir Bin Anwar, Secretary, Ministry of Water Resources, Government of People's Republic of Bangladesh. On the important issue of sharing of waters of seven trans-boundary rivers viz. Manu, Muhuri, Khowai, Gumti, Feni, Dharla and Dudhkumar, the meeting directed the Technical Level Committee of JRC to expeditiously prepare the draft Framework of Interim Sharing Agreement of these rivers based on the updated data and information at the earliest.

India-Bangladesh 71st meeting of the Joint Committee held at Kolkata on 15th February, 2019

Water Resources Secretary Level Meeting between Bangladesh and India held in Dhaka on August 08, 2019

3.4 India-Bangladesh Joint Team meeting held in New Delhi on 27th September, 2019

A meeting of the India Bangladesh Joint Team was held in New Delhi on 27th September, 2019 as a follow-up to the decision taken in the Water Resources Secretary level meeting held at Dhaka on 7-8 August, 2019. The Joint Team in its meeting suggested the composition of the Joint Technical Committee (JTC) with members from both sides as well as formulated its Terms of Reference (ToR) to conduct the Feasibility Study of the Ganges-Padma Barrage Project (GBP) for optimum utilization of the water received by Bangladesh.

3.5 Signing of MoU between Ministry of Jal Shakti, Government of India and Ministry of Water Resources, Government of Bangladesh

During the visit of Prime Minister of Bangladesh to India, a Memorandum of

Understanding (MoU) was signed on 5th October, 2019 between Secretary, DoWR, RD & GR, and Secretary, Department of Water Resources, Government of People's Republic of Bangladesh on withdrawal of 1.82 cusec of water from Feni River by India for drinking water supply scheme for Sabroom town of Tripura, India.

4.0. INDIA-NEPAL COOPERATION

4.1. Pancheshwar Multipurpose Project

In February 1996, His Majesty's Government of Nepal and Government of India had signed a Treaty (known as "Mahakali Treaty") for integrated development of the Mahakali River. The Pancheshwar Development Authority (PDA) was also set up with approval of both the Governments in September, 2014. The Project would provide hydro energy to stabilize the power grid in the region which is of value, and address water deficit by long distance water transfer in due course.

4.2. SaptaKosi High Dam Multipurpose Project and Sun Kosi Storage cum Diversion Scheme (including Kamala Diversion)

The India-Nepal Joint Project Office has started functioning in Biratnagar, Nepal since August 2004 with the mandate of jointly carrying out field investigations and preparation of DPR for SaptaKosi High Dam Multipurpose Project and Sun Kosi Storage cum Diversion Scheme (SSDS). Investigation of Kamla Multipurpose Project, which is now a component of SSDS, and preliminary study of the Bagmati Multipurpose Project were added to its mandate in October, 2004.

The Seventh Meeting of the Governing Body (GB) of Pancheshwar Development Authority (PDA) was held on November 29, 2019 in New Delhi, India. The Indian delegation was led by Mr. U.P. Singh, Secretary, DoWR, RD & GR, and Co-Chairman of GB, PDA. The Nepalese delegation was led by Mr. Dinesh Kumar Ghimire Secretary, Ministry of Energy, Water Resources and Irrigation (MoEWRI), Government of Nepal, and Co-Chairman of GB, PDA.

The fifth Meeting of the Joint Committee (JC) of Pancheshwar Development Authority (PDA) on administrative and financial matters was held on November 27-28, 2019 in New Delhi, India. The Indian delegation was led by Mr. Nitishwar Kumar, Joint Secretary (Administration), DoWR, RD & GR, and Co-Chairman of Joint Committee, PDA. The Nepalese delegation was led by Mr. Pravin Raj Aryal, Joint Secretary, Ministry of Energy, Water Resources and Irrigation (MoEWRI), Government of Nepal, and Co-Chairman of Joint Committee, PDA.

The 16th meeting of the Joint Team of Experts (JTE) between Nepal and India was held on 25-26 July, 2019 at New Delhi. The Indian Team was led by Mr. R.K Sinha, Member (River Management), CWC, and the Nepali Team was led by Mr. Madhu Prasad Bhetuwal, Director General, Department of Electricity Development, Government of Nepal (GoN).

5.0. INDIA –CHINA COOPERATION

In 2002, the Government of India inked a MoU with People's Republic of China upon provision of hydrological information of the Yalu zangbu/ Brahmaputra River in Flood Season by China to India. As per MoU, Chinese side provided hydrological information of three stations, namely Nugesha, Yangcun and Nuxia located on River Yalu zangbu/ Brahmaputra of the period from 1st June to 15th October every year, which is utilized by the CWC in the formulation of flood forecasts. This MoU was further renewed in June, 2008, May, 2013 and June, 2018 with a validity of further five years.

During the visit of Hon'ble Prime Minister of India to China in October, 2013, both sides signed a separate "MoU on Strengthening Cooperation on Trans-Border Rivers" on 23.10.2013, therein mutually agreed upon start date of hydrological information of three stations on Yalu zangbu/Brahmaputra River from Year 2014 as 15th May instead of 1st June upto 15th October of every year as per MoU signed in May, 2013. The hydrological information in flood season is provided by China to India in accordance with the signed MoU & implementation plan (IP).

Similarly, a separate MoU with China signed on 11.04.2005 upon provision of hydrological information of the Langqen Zangbo/Sutlej River in Flood Season by China to India. Chinese side provided Hydrological information of Tsada station from 2007. The MoU was renewed in Dec, 2010 for further five year and renewed again on 06.11.2015 for further five years.

During the visit of Hon'ble President of the People's Republic of China in November, 2006, it was mutually agreed upon to set up an Expert Level Mechanism (ELM) to discuss interaction and co-operation upon provision of hydrological data in flood season, emergency management and other issues regarding trans-border Rivers as agreed between them. Twelve meetings of ELM have been held so far. Last meeting (12th) was held during 12-13 June 2019 at Ahmedabad, India. The next 13th meeting of ELM is scheduled to be held in China in 2020.

6.0. INDIA-BHUTAN COOPERATION

"Comprehensive Scheme for Establishment of Hydro-meteorological and Flood Forecasting Network on rivers Common to India and Bhutan" consists of hydro-meteorological/ meteorological stations network located in Bhutan and Operation & Maintenance (O&M) carried out by the Royal Government of Bhutan (RGoB) with funding from Government of India (GoI). The data received from these stations are utilised by the CWC for formulating flood forecasts. A Joint Expert Team (JET) consisting of officials from the Government of India (GoI) and the Royal Government of Bhutan (RGoB) meets twice in a year to review the progress and other requirements of the scheme. The latest (35th) meeting of JET was held at Paro (Bhutan) during 6th-7th March, 2019.

The matter related to problem of floods created by the Rivers originating from Bhutan and coming to India was taken up bilaterally with the Royal Government of Bhutan (RGoB). A Joint Group of Expert (JGE) on Flood Management has been constituted to discuss and assess the probable causes and effects of the recurring floods and erosion in the

southern foothills of Bhutan and adjoining plains in India and recommend to both Governments appropriate and mutually acceptable remedial measures. The latest (9th) meeting of JGE was held during 7th-8th January, 2020 at Punakha,Bhutan.

In accordance with the decision taken during the first meeting of JGE, a Joint Technical Team (JTT) between the two countries was constituted to provide technical support to JGE on flood management. Total six meetings of the JTT have been held so far. The latest 6th meeting of JTT was held at Jalpaigudi, West Bengal (India) during 12th-13th September, 2019.

7.0. INDUS WATERS TREATY 1960

Under the Indus Waters Treaty 1960, India 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).

In fulfilment of the requirement 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 2018-19 for the Indus, the Jhelum & the Chenab basin had been compiled and sent to Pakistan as per the provisions of Indus Waters Treaty during November, 2019.

Extra ordinary flood flow data for agreed sites on the rivers Ravi, Sutlej, Tawi and Chenab was also communicated by India to Pakistan through telephone during 01st July to 10th October, 2019 to undertake advance flood relief measures.

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

1. Revised DPR of Sunni HEP (373 MW) on Sutlej River in H.P.
2. Mandi HEP (15 MW) on Mandi Nallah on tributary of Swan River (J&K)
3. Kulan Rambari HEP (25 MW) on Sindh Nallah on tributary of Jhelum River (J&K)
4. Phagla HEP (14 MW) on Chang Nallah on sub-tributary of Jhelum River (J&K)

Pong Dam Oustees

One meeting of High Powered Committee set up by Hon'ble Supreme Court under the Chairmanship of Secretary (DoWR, RD & GR) was held to resolve the issues related to resettlement of Pong Dam Oustees.

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CHAPTER-6

EXTERNAL ASSISTANCE IN WATER RESOURCES SECTOR

DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

6. External Assistance in Water Resources Sector

1.0 Background

The DoWR, RD & GR assists the State Governments/ Union Territories in availing external assistance from different multilateral funding agencies to fill up the resource gap and state of the art technology in the country. There are 15 ongoing externally aided projects being implemented in various States of the country with the assistance from different funding agencies, viz. the World Bank (5), Asian Development Bank (6), Japan International Cooperation Agency (JICA) (3) and New Development Bank (NDB) (BRICS) (1).

Brief of these ongoing externally aided projects is given in the table below:

Funding Agency	Name of State	Name of Project	Effective date/ Closing date	Project cost USD in million	Loan amount USD/ XDR/ YEN in million	State Govt/ USD in million	Cumulative Disburse-ment USD/ XDR /YEN in million
WB	Andhra Pradesh	Andhra Pradesh Integrated Irrigation and Agriculture Transformation Project	5.11.2018/ 4.11.2024	INR 1600 cr	USD 172.21	480 cr	USD 28.43
WB	Tamil Nadu	Tamil Nadu Irrigated Agriculture Modernization Project	23.01.2018/ 22.01.2024	454	USD 318	136	USD 64.39
WB	Uttar Pradesh	5298 IN (IDA): Uttar Pradesh Water Sector Restructuring Project, Phase-II	24.10.2013/ 31.10.2020	515	XDR 239.4	155	XDR 120.97
WB	CWC, Madhya Pradesh, Odisha, Kerala, Tamil Nadu, Karnataka, Uttarakhand & DVC	7943-IN (IBRD): Dam Rehabilitation and Improvement Project	18.4.2012/ 30.6.2020	533	USD 276.65	110.46	USD 117.53

Funding Agency	Name of State	Name of Project	Effective date/ Closing date	Project cost USD in million	Loan amount USD/ XDR/ YEN in million	State Govt/ USD in million	Cumulative Disburse-ment USD/ XDR /YEN in million
WB	West Bengal	8090-IN (IBRD): West Bengal Accelerated Development of Minor Irrigation Project	19.3.2012/ 20.12.2019	205	USD 155	50	USD 12.59
		5014-IN (IDA): West Bengal Accelerated Development of Minor Irrigation Project					XDR 78.20
ADB	Assam	Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program Phase-2	13.12.2018/ 13.12.2020	82.41	60.16	22.25	USD 14.951
ADB	Karnataka	3172-IND: Karnataka Integrated & Sustainable Water Resources Management Investment Program-1	7.5.2015/ 31.12.2019	40.25	USD 26	14.25	USD 22.504
ADB	Karnataka	Sustainable Coastal Protection and Management Investment Program-2	15.12.2017/ 28.9.2020	93.54	USD 65.50	28.04	USD 30.193
ADB	Madhya Pradesh	Madhya Pradesh Irrigation Efficiency Improvement Project	22.11.2018/ 21.11.2026	535.71	375	155	USD 55.387
ADB	Odisha	3265-IND: Odisha Integrated Irrigated Agriculture and Water Management Investment Program-2	07.06.2016/ 17.09.2018	89.95	USD 65.75	24.20	USD 65.75

Funding Agency	Name of State	Name of Project	Effective date/ Closing date	Project cost USD in million	Loan amount USD/ XDR/ YEN in million	State Govt/ USD in million	Cumulative Disburse-ment USD/ XDR /YEN in million
ADB	Tamil Nadu	3394-IND: Climate Adaptation in Vennar Sub-basin in Cauvery Delta Project	14.07.2016/ 30.6.2021	144	USD 100	44	USD 57.46
JICA	Andhra Pradesh	Andhra Pradesh Irrigation & Livelihood Improvement Project Phase-2	6.7.2018/ 31.7.2025	2000 cr	1683 cr	316 cr	JPY 287,559,375 million
JICA	Odisha	IDP-244: Rengali Irrigation Project Phase -2	14.7.2015/ 14.7.2026	42,850 JPY	33,959 JPY	8,891 JPY Million	JPY 2,350,921, 701
		IDP-244A: Rengali Irrigation Project Phase -2					JPY 434,769,611
JICA	Rajasthan	IDP-259: Rajasthan Water Sector Livelihood Improvement Project Tranche-I	26.10.2017/ 26.10.2024	1069 cr	YEN 13145	160 cr	JPY 2,911,157, 211
		IDP-259A:Rajasthan Water Sector Livelihood Improvement Project Tranche-I			YEN 580		JPY 111,798,392
NDB	Rajasthan	Rajasthan Water Sector Restructuring Project in Desert Area Tranche-I	31.5.2018/ 12.8.2023	958 cr	USD 100	287 cr	USD 43.218

1.1 Andhra Pradesh Integrated Irrigation and Agriculture Transformation Project

Objective of the project:

The objective is to enhance agricultural productivity and improve efficiency of 1200 minor irrigation tanks through catchment/watershed treatment approach with a total ayacut of about 1.2 lakh hectare benefitting about 2 lakh small and marginal farmers.

Cost of the project: INR 1600 crore

Progress of work:

- Out of total budget allocation of Rs. 173.86 crores for the year 2018-19, Rs. 4.28 crores have been incurred up to 20.01.2019;
- About 1000 Minor Irrigation (MI) tanks being rehabilitated and modernized.

1.2 Tamil Nadu Irrigated Agriculture Modernisation Project Phase - 2

Objective of the project:

To increase irrigated agriculture productivity in a sustainable water resources management framework for selected Cauvery sub-basin stakeholders.

Cost of the project: US$ 454 million

Progress of works:

- Final World Bank Report on phase-I is already completed;
- 5009 tanks are rehabilitated;
- Storage capacity improved is 9%;
- Conveyance efficiency improved in PAP system upto 92%;
- Increase in Irrigated area is 3.65 to 5.08 lakh Ha;
- Production increase in agriculture for SRI is 26%

1.3 Uttar Pradesh Water Sector Restructuring Project Phase-2

Objective of the Project:

- Strengthening of institutional and policy framework for integrated water resource management for the entire State.
- Increase agricultural productivity and water productivity by supporting farmers in targeted irrigation areas.

Status of Progress of Project:

- Modernization and Rehabilitation of Parallel Lower Ganga Canal System:
- Agreements signed for lining work of parallel Lower Ganga Canal (10 packages) for Rs.1104 crore. Physical progress is 77%. Financial progress is Rs.810.37 cr.
- Rehabilitation of Haidergarh Branch System (Sarda Sahayak):
- An agreement for rehabilitation work worth Rs.134.66 crore was signed in Sept'2014. Physical progress is 100% and Financial progress is Rs.124.59 cr.
- Modernization and Rehablitation of Rohini, Jamini & Sajnam Dam Canal System (Betwa):
- The Rohini Dam canal system's physical works have been completed. Physical progress is 70% and financial progress is Rs.111.43 cr.

- Renovation and automation work of Narora Barrage is completed.
- Development of River Basin Assessments & Plans for all major River Basins in Uttar Pradesh (Yamuna, Ganga, Ramganga, Gomti, Ghaghra, Sone, Rapti & Gandak) – The Date of start of the agreement is 10.3.2016. Gomti, Gandak & Rapti basin plan have been submitted. The work is in progress (to be completed likely by March 2020).
- Assessment of impact of climate change on water resources of the state – It is under progress, proposed cost is Rs.143 lakh. The Item has been deleted from the project.
- Establishment of Flood Management Information System (FMIS) – Work is completed, FMIS centre has been established, requisite manpower deployed, website is launched.
- Real Time Data Acquisition System for Rapti Basin – Installation of 43 ARGs at selected sites, 13 AWLGs at river sites and 3 AWLGs at Dam & barrage site is completed. All the instruments are deployed & started sending data.
- The target of 100 nos. Deep Special Monitoring Wells has been achieved. Out of 200 nos 190 nos Medium and Shallow Special Monitoring Wells has been completed.

1.4 Dam Rehabilitation and Improvement Project (DRIP)

In April 2012, Ministry of Water Resources, River Development & Ganga Rejuvenation through CWC with an objective to improve safety and operational performance of selected dams, along with institutional strengthening with system wide management approach, embarked upon the six year Dam Rehabilitation and Improvement Project (DRIP) with World Bank assistance at a cost of INR 2100 Crore (US$M 437.5). Government of India in September 2018, approved the revised cost of DRIP amounting to INR 3466 Crores (US$M 533) along with two years extension with revised scheduled closure June 2020. The project is being implemented across seven states namely Kerala, Madhya Pradesh, Odisha, Tamil Nadu, Karnataka, Uttarakhand and Jharkhand for rehabilitation and improvement of 198 selected dams.

DRIP includes investments targeted towards: (i) physical and technical dam rehabilitation and improvement focusing on structural and non-structural measures and constitutes about eighty four percent of the total cost of the project; and (ii) managerial upgrading of dam operation and maintenance, with accompanying institutional reforms and strengthening regulatory measures pertaining to safe and financially-sustainable dam operations. DRIP also deals with need based restoring capacity to their full reservoir capacity of few dams , achieving effective utilization of the stored water, and managing and monitoring the long-term performance of the dams.

DRIP is to bring new initiatives in the dam safety area through technological advancement, innovative rehabilitation materials, best global practices, capacity building, cross learning, technical regulations and strengthening of Central &

respective State Dam Safety Organisations, etc. DRIP has been successful in bringing together dam owners, engineers, scientists, academicians, industries, World Bank as well as renowned dam safety professionals. In addition to rehabilitation of dams, other important activities include Design Flood Review, publication of important Guidelines as well as Manuals dealing with Dam Safety Management, preparation of O&M Manuals, Emergency Action Plans, development of web based asset management tool i.e. Dam Health And Rehabilitation Monitoring Application (DHARMA), Seismic Hazard Mapping along with development of Seismic Hazard Assessment Information System (SHAISYS), organisation of Dam Safety Conferences, national and international training programmes, technical exposure visits etc.. Such initiative is creating a wave of awareness among dam safety officials and giving a significant boost to the safety of such selected structures.

Under DRIP, capacity building in dam safety area of eleven academic institutions is being done. Also, capacity building of two Central Agencies i.e. Central Soil and Material Research Station (CSMRS) as well as Central Water and Power Research Station (CWPRS), is also one of the activities. Collaboration with few renowned international agencies for capacity building includes Deltares Netherlands, Bureau of Reclamation USA, Japan Water Agency Japan, Entura. Also, few global dam safety experts also helping CWC to achieve the objectives of DRIP. The overall supervision and coordination has been entrusted to CWC, and is being assisted by Egis Eau, Engineering and Management Consultant.

1.5 West Bengal Accelarated Development Of Minor Irrigation Project (WBADMIP)

Objective of the project:

To enhance agricultural production of small and marginal farmers in the project area by developing minor irrigation schemes, strengthening community- based irrigation management, support agriculture development, crop diversification and use of new technologies, and creating income-generating opportunities.

Cost of the Project: US$ 205 million

Implementation Progress

Project activities	Commitments 2012-2019	Cumulative Achievement
Schemes/ Structures selected (nos.)	2879	3274
Water Users Associations formed (Nos.)	2500	2267
Ongoing Minor Irrigation (MI) Schemes (Nos.)	Nil	1085
Completed Minor Irrigation Schemes (Nos.)	2879	2263
Command Area Development (CAD))in Ha)	75000	63239
Agriculture demonstrations (Nos.)	20000	28481
Horticulture demonstration (Nos.)	15000	25840
Fishery demonstration (Nos.)	500	552
Beneficiaries covered (Nos.)	100000	105835

Status of Civil works

Project Component	Target (Rs. in Crore)		Progress achieved (Rs. in Crore)	
	Rs.	%	Rs.	%
Strengthening community based institutions	33	2.39	33.00	100.00
Irrigation system development & improvement	1000	72.46	731.54	73.15
Agriculture Development	30	2.17	23.70	79.00
Horticulture Development	45	3.26	41.66	92.58
Fisheries Development	25	1.81	22.35	89.40
Project Management	247	17.90	149.72	60.62
Total	**1380**	**100.00**	**1001.97**	**--**

1.6 Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program (AIFRERMIP), Tranche-II

Objective of Project:

The project is funded by ADB with provision of comprehensive, cost-effective and sustainable structural and non-structural measures in the 4 (four) selected strategic sub project locations at Palasbari, Gumi, Kaziranga and Dibrugarh.

The non-structural measures include institutional capacity building of the Water Resources Department, Govt. of Assam, imparting of community-based disaster management support to project affected persons and other Land Acquisition activities for the structural measures.

Cost of the Project: INR 515 Cr.

Progress of Works: 65%

1.7 Karnataka Integrated Sustainable Water Resources Management Investment Program (KISWRMIP) –Tranche 1

Objective of the project:

The tranche-I of the program envisages modernization of Gondi Canal System and taking up Integrated Water Resources Management (IWRM) components in K8 sub-basin of Krishna River Basin.

Cost of the project: US$ 40.25 million. As of Jan-2020 an expenditure of Rs. 230.92 Crores and Rs. 145.93 Crores is reimbursed by ADB under KISWRMIP.

Modernisation of Gondi Main Canal-Rs.128.95 Cr.

- Gondi Irrigation System has a total command area of about 4,600 ha
- As of Dec-2019 end, Lining of entire 115.05 kms of Gondi Main Canal and distributaries along with structures is completed.
- Installation of 91 Flow Measurement and Telemetry stations and 6

weather stations in Gondi, Upper Tunga Project, Bhadra Project, Singatalur LIS and Tungabhadra Left Bank Canal is completed.

- 243 Command Area Development works are directly awarded to the Water User's Co-operative Societies (WUCS) in the Gondi Command area as Community Participation Packages (CPPs). All the packages are completed.
- The project is physically completed as on 31-12-2019. Action is being taken to reimburse the expenditure from ADB.

1.8 Sustainable Coastal Protection and Management Investment Program (SCPMIP)–2 (Karnataka)

Objective of the project:

The program aims to address immediate coastal protection needs and coastal instability using environmentally and socially appropriate solutions; with a focus on artificial reefs, onshore berms and beach nourishments for 3 coastal States namely Karnataka, Maharashtra and Goa.

Cost of the project: US$ 150 million

Implementation progress:

All the works undertaken under tranche-1 i.e. construction of 08 inshore berms and Ullal, rehabilitation of Ullal breakwaters, construction of 02 offshore reefs and consultancy are completed.

- The tranche-2 of the project was signed on 26.10.2017 and the coastal length protection planned is about 54 km.
- Construction of groynes and beach nourishment and Udyavara, 27 nos. Out of 35 groynes have been completed, 05 nos. are in progress.
- At Maravanthe, all 15 nos. of straight groynes completed.
- Construction of geo-textiles revetment at Someshware, design revision was required due to change in site conditions, ADB has concurred to the revised design for 10 groynes, and now preparatory works commenced.
- So far amount of civil works awarded is Rs.321.04 crores and cumulative disbursement upto Dec, 2018 is about Rs.161.39 crores.

1.9 Madhya Pradesh Irrigation Efficiency Improvment Project (Kundalia Irrigation Project)

Objective of the project:

Kundaliya Irrigation Project will develop 1,25,000 hectares of new, highly efficient micro irrigation network in Rajgarh District in Madhya Pradesh. The Kundaliya Irrigation Project (KIP) will include the design and construction of a highly efficient and productive new pressurized irrigation system with automated volumetric control for efficient, reliable and flexible water delivery services.

Cost of the project: US$ 530 million

Progress of work:

The project has 02 sub-projects namely (i) Kundaliya Irrigation Project (KIP) and (ii) Sanjay Sarovar Irrigation Project (SSIP). The contract is to design, build and operate

(3 years design build & 5 years operation services) with pressured pipeline. The project envisages the coverage of area by micro irrigation at end of 8th year to be 95%. The micro irrigation such as drip and sprinkler will supply water to the tail end of the canal.

1.10 Odisha Integrated Irrigated Agriculture and Water Management Investment Program Phase -2

Objective of the project:

The aims of the project is to enhance the productivity and sustainability of minor, medium and major irrigation schemes in the northern river basins and a part of the Mahanadi delta.

Cost of the project: US$ 89.95 million

Progress of Civil Works:

Sr. No.	Name of the Project	Packages awarded		Latest Cost (Rs. in cr)	Export Incurred (Rs. in Cr)	Financial Progress
1.	Pattamundai Canal	31	145.96	147.69	143.16	97%
2.	HLC Range-I Canal	14	58.12	59.22	57.68	97%
3.	Machhagaon Canal	21	78.52	76.34	73.04	96%
4.	MCII	17	110.43	111.33	48.91	44%
5.	Ramial	9	30.8	31.93	31.85	100%
6.	Kanjhari	7	30.03	31.19	31.19	100%
7.	Kansbahal	7	22.13	19.01	16.7	88%
8.	Saline Embankment	12	93.07	92.41	76.78	83%
	Total	**118**	**569.06**	**569.12**	**479.31**	**84%**

A. **Rehabilitation of Minor Lift Irrigation Project** (750 Nos. of MLIPs)- Implementation of MLI Project had been dropped due to delay in procurement which is due to non-responsive bidding and non-participation of bidders in some cases.

B. **PP Strengthening**: Pani Panchayat Strengthening has been taken up in 135 PPs through WALMI, Odisha.

C. **Command Area Development**: CAD workds have been completed in 27145.8 Ha.

D. **Restoration of Saline Embankments**: There were 12 numbers of packages taken up under OIIAWMIP Tranche-2 out of which 2 incomeplete packages are under progress and will be completed by June 2020.

1.11 Climate Adaptation in Venner Sub-Basin in Cauvery Delta Project

Objective of the project:

The aim of the project is to strengthen key irrigation and drainage system, build climate resilient hydraulic infrastructure and improve water management in the Venner sub-basin of the Cauvery Delta in Tamil Nadu.

Cost of the project: US$ 144 million

Progress of work:

- Progress of civil works under ADB in Harichandranathi River is 73%, in Adappar is 68%, in Vellaiyar is 57%, in Pandavaiyar is 95%, in Valavanar is 95%, Vedharanyam canal is 92% and in Pumping Station is 95%. Whereas Financial Progress achieved is 67%.

1.12 Andhra Pradesh Irrigation and Livelihood Improvement Project Phase II (JICA Funded)

Objective of the project:

The project aims to modernize/ renovate about 20 major and medium irrigation sub-projects and restore 445 minor irrigation sub-projects and improving livelihoods of farmers and other rural communities in Andhra Pradesh state.

Cost of the project: INR 2000 Crores

Progress of works:

- **Major/Medium Irrigation Sub projects:** Administrative sanctions have been accorded for 19 major/ medium irrigation sub-projects. Tenders have been called for 14 major/ medium irrigation sub-projects, out of which works are under progress in 9 sub-projects. Works will be commenced in 5 sub-projects very shortly. Tenders will be called for the remaining projects in the coming months.
- **Minor Irrigation sub projects:** Administrative sanction has been issued for 237 out of 445 minor irrigation sub projects. Out of 237 tanks, tenders were finalized for 226 tanks and for 182 tanks agreements are concluded. Works are in progress.
- **Institutional arrangement:** Staff in PMU has been deployed. PMC (Nippon Koei Ltd) has been actively participating in the activities of the project. Agency has been selected to carry out baseline survey.
- **Participatory Irrigation Management (PIM):** NGO's (supporting organizations) have been deployed in all districts and they are involving in PIM activities of the project.
- **Promotion of Farmers Producers Organisations (FPOs):** Steps are being taken to promote 20 FPOs in this project. Already 4 No of FPOs are identified for support.
- **Livelihood support program:** Activities are started in Animal husbandry and Fisheries support programs to improve the livelihood of the people in project area.
- **Pilot programs: (a) Food Value Chain:** Pilot Project Implementation Consultancy (PPIC) has been deployed to conduct base line survey and to assist in implementing Food Value Chain activities. (b) Agriculture Mechanisation and Training Centre (AMTC): Suitable sites have been identified to establish 2 nos of AMTC's in the state. Ernst & Young LLP is selected as PPIC. The agency already started working in the project.

1.13 Rengali Irrigation Project Phase - 2

Objective of the project:

The objective of the project is to increase agriculture production by constructing irrigation systems (main canal and distribution systems), establishing water users associations and promoting livelihood support activity.

Cost of the project: INR 2255 crore

Progress of civil works:

- The Construction of Main Canal works are being taken up under 17 Nos. of packages;
- Of the 27 civil works packages, 4 packages are under construction costing Rs.101.02 crore;
- Land acquisition (out of taraget of 330.41 Acre, only 1646.55 Acre has been acquired;
- Left canal system, out of total CCA of 1,14,300 ha only 37,614 ha has been completed.

1.14 Rajasthan Water Sector Livelihood Improvement Project Tranche - I

Objective of the project:

To increase the productivity of irrigated agriculture through improved surface irrigation systems, introduction of micro irrigation systems, improving water management and strengthen agriculture support services etc.

Cost of the project (phase-I): INR 1069.40 crore

Status of civil works:

- Administrative and financial sanction of tranche-I for Rs.1069.40 crore issued;
- Project Management Consultant under RWSLIP has been engaged;
- Civil work order amounting to Rs.432.13 crore for 31 sub-projects has been awarded;
- Cumulative expenditure upto Dec'19 is Rs.292.41 crore.

1.15 Rajasthan Water Sector Restructuring Project in Desert Area Tranche - 1

Objective of the project:

The project envisage rehabilitation & modernization of Indira Gandhi Nahar Project (IGNP) system which will improve the availability of water in 1,81,618 Ha of CCA and will also reclaim 33,312 Ha of water logged area in the region.

To strengthening/ capacity building of water user associations, to improve CAD activities including micro irrigation, irrigated agriculture intensification & diversification, fostering and capacity building of institutions.

Cost of the project (Tranche I): INR 958 crore

Progress of works:

Name of component	Main components of the works	Total quantity as per agreement	Cumulative Achieved quantity	% achieved of total quantity
Extension, Rehabilitation Modernization (ERM) works, Indira Gandhi Feeder (IGF) and IGMC	Earthwork (unit- cum)	10915998	7229032	66.22 %
	Production of concrete (unit – cum)	273879	171785	62.72 %
	CC/PCC Block canal lining (unit – sqm)	7848496	6168224	78.59 %
	Brick masonry (unit- cum)	5355	905	16.90 %
	Steel (unit – MT)	946	789	83.40 %
	Supply, install & fixing of Sluice regulator (unit-sqm)	316	0	0
	Construction of Reinforcement Cement Concrete for canal Structures(unit- cum)	11588	9829	84.82%

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CHAPTER-7

ORGANISATIONS AND INSTITUTIONS

DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

7. Organisations and Institutions

1.0 Attached Offices

1.1 CENTRAL WATER COMMISSION (CWC)

1.1.1. INTRODUCTION:

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

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

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

1.1.2. MAJOR ACTIVITIES

(i) Hydrological Observations:

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, (iv) silt besides selected meteorological parameters including snow observations at key stations. The data collected from sites is scrutinized, validated and published in the form of Water Year Book, Water Quality 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.

During the 12th Plan, 730 new hydro-meteorological observation stations have been opened where about 275 sites were made fully operational by the end of December 2019.

(ii) Water Quality Monitoring:

Monitoring water quality at 552 key locations (519 on HO network and 33 Water Quality Sampling Stations) covering all the major river basins of India. In a three tier laboratory system, level- I laboratories located at field water quality monitoring stations with physical parameters such as temperature, colour, electrical conductivity/total dissolved solids; pH and dissolved oxygen of river water are observed. There are 18 level–II laboratories located at selected Division Offices throughout India to analyze 25 nos. physico-chemical characteristics and bacteriological parameters of water. Five (5) level-III / II+ laboratories are functioning at Coimbatore, Delhi, Guwahati, Hyderabad and Varanasi where 41 parameters including heavy metals / toxic parameters and pesticides are analysed.

The National River Water Quality Laboratory, CWC, New Delhi is accredited with National Accreditation Board for Testing and Calibration Laboratories (NABL) in accordance with Standard ISO/IEC17025:2005 in the discipline of chemical and biological testing since April, 2016. During 2018-19, 11 more Water Quality Laboratories of CWC which are functioning under different Divisional Offices of CWC located at Agra, Bangalore, Bhubaneswar, Chennai, Coimbatore, Gandhinagar, Hyderabad, Kochi, Pune, Varanasi and Nagpur have also obtained NABL Accreditation in chemical discipline.

(iii) Survey and Investigation:

The Survey & Investigation of Rukni Irrigation Project (Assam) was completed during 2018-19 and DPR was submitted to the State Government. The survey and investigations for four other projects namely, Kalez Khola HE Project (Sikkim), Sonai Irrigation Project (Assam), Tarumchu HEP (Sikkim) and Kali Khola HEP (Sikkim) were continued during 2018-19. Further, the work for Berenium Project (J&K) and 31 Irrigation Projects in Jharkhand was started during 2018-19.

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. The JPO has been extended till next JCWR meeting proposed.

(iv) Project Appraisal:

During the year 2019-20 (upto December 2019), technical examinations of 13 water resources projects (07 irrigation and 06 flood management) were completed and accepted by the Advisory Committee of DoWR, RD & GR. The irrigation projects accepted by the Advisory Committee would provide irrigation to 2,00,608 Ha area and flood management projects will provide protection to about 12.19 lakh persons and 7,56,534 Ha of land.

The appraisal of civil aspects including appraisal of cost estimates for 6 hydroelectric projects have been completed during the current year (upto December 2019). Other components of hydro-electric projects are appraised in Central Electricity Authority (CEA). The Techno-Economic Clearance (TEC) to these projects is also accorded by the CEA. During the year, 2019-20 (up to December, 2019), CEA has accorded TEC to 1 hydroelectric project having total installed capacity of 930 MW.

A web-enabled Project Appraisal Management System (e-PAMS) has been developed by CWC for online submission and techno-economic appraisal of DPRs of Irrigation and Multipurpose projects submitted by the State Governments.

A National Workshop on e-PAMS was organized at New Delhi for the stakeholders. Necessary training to the Stakeholders/users are being conducted by CWC.

Presently, 08 Irrigation projects and 01 Flood project have been submitted and are under appraisal on e-PAMS.

The 143rd meeting of the Advisory Committee of DoWR, RD&GR on Irrigation, Flood Control & Multipurpose Projects approved the project on "Implementation of Coastal protection measures at Someshwara, Mangalore- Construction of two no's of offshore reefs and sand nourishment at an estimated cost of Rs.84.87 Crore under Sustainable Coastal Protection and Management Investment Programme (SCPMIP) of Karnataka (Tranche – II)".

(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 was to ensure the achievement of physical and financial targets and achieve the targets of creation of irrigation potential.

During 2019-20, a total of 47 (20 Major and 27 Medium) projects were under General Monitoring, 149 (73 Major, 55 Medium and 21 ERM) on-going projects under PMKSY-AIBP are targeted by CWC field units. During 2019-20 (up to December, 2019), 01 monitoring visits was undertaken in respect of projects under General Monitoring. Similarly, 50 visits were undertaken and 34 Status Reports were issued (up to December, 2019) for projects under PMKSY-AIBP.

(vi) Morphological Studies:

Every year Floods causing severe

damage to life and property in spite of existing flood control measures taken both by Central and State Governments.

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

The details and status of these studies are given below:-

Sl. No.	Institute	Name of Rivers	Status
1.	IIT Roorkee	Ganga, Sharda, Rapti	Final Report Submitted
2.	IIT Delhi	Kosi, Bagmati, Yamuna	Draft Report Submitted
3.	IIT Guwahati	Bramhaputra, Subansiri, Pagladiya	Final Report Submitted
4.	IIT Madras	Krishna, Tungbhadra	Final Report Submitted
5.	IIT Kharagpur	Mahananda, Mahanadi, Hoogly	Final Report Submitted
6.	SVNIT Surat	Tapi	Final Report Submitted

(vii) National Water Mission and Climate Change Issues:

Climate Change cell was created in CWC in August, 2007 to provide inputs and assistance to NWM secretariat in examining the research proposals related to climate change received in NWM Secretariat.

Monitoring of Glacial lakes/Water bodies in the Himalayan Region of Indian river basin are being carried out on monthly basis from June to October every year to study, monitor the changes in the spatial extent of the glacial lakes and water bodies greater than 50 Ha. area with the area of base year 2009 using satellite data received from NRSC, Hyderabad. The Monitoring has been done during the year and monthly Monitoring Reports have been sent to Central/State Govt. agencies and other stakeholders.

CWC has developed a model for Snow Melt Runoff Forecasting in Himalayan River Basin namely, Satluj, Beas, Chenab, Yamuna and Ganga in association with NRSC, Hyderabad. Using the model, CWC has issued Seasonal and Short Term Snowmelt Runoff forecast in Himalayan river basins during 2018.

(viii) Hydrological Studies:

The Hydrological Studies Organization (HSO), a specialized unit under Design and Research (D&R) Wing of CWC, carries out hydrological studies in respect of the Water Resources projects in the country. 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:

- Water availability/Yield Studies.
- Design flood estimation.
- Sedimentation studies.
- Diversion flood studies.

The country has been divided into 7 zones and further into 26 hydro-meteorologically homogeneous sub-zones and flood estimation models are developed for each subzone to compute the design flood in un-gauged catchments. So far, flood estimation reports covering 24 sub-zones have been published.

During the year 2019-20 (up to December, 2019), Technical examination of hydrological aspects of DPRs in respect of 54 projects have been carried out in CWC. Out of this, 28 projects have been cleared and comments were issued for 16 projects. Further, during the year 2019-20, CWC has also carried out Design Flood Review Studies of the 115 projects in the following states.

Sl. No.	State Name	No. of projects
1	Rajasthan	45
2	Andhra Pradesh	14
3	Goa	2
4	Telangana	22
5	Chhattisgarh	5
6	Odisha	3
7	Manipur	4
8	Uttar Pradesh	9
9	Meghalaya	4
10	Kerala	7

These dams are likely to be included for rehabilitation under the proposed Phase-II of DRIP.

(ix) Design Consultancy:

CWC 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.

At present CWC is providing design consultancy to 99 projects. Out of this, 27 projects (including 3 from neighbouring countries) are at construction stage; 46 projects (including 3 from neighbouring countries) are at DPR stage and 26 projects (including 3 from neighbouring countries) involve special problems.

In addition to above, technical examinations of design aspects of DPRs of 75 nos. of Hydro-electric/ Irrigation/ Flood Management/ Multi-Purpose Projects were also carried out during the year (till Dec 2019). These include 7 projects from neighbouring countries, namely, Indo-Nepal (1), Myanmar (2), Republic of Malawi (1), Afghanistan (2) and Bhutan (1). Out of these, DPRs 13 nos. of projects have been cleared. Remaining DPRs of 62 nos. of projects are at various stage of examination.

(x) National Register of Large Dams:

Dam Safety Organisation (DSO), CWC compiles and maintains the Register of Large Dams across the country in the form of National Register of Large Dams (NRLD) based on information provided by State Govts./ PSUs. As per the latest information compiled under the National Register of Large Dams (NRLD)- 2019 maintained by CWC, there are 5745 large dams in the country as on June, 2019. Out of this, 5334 large dams have been completed and 411 large dams are under construction. The NRLD is available on CWC Website. National Register of Large Dams (NRLD)- 2019 was released by Chairman, CWC on 27th June,2019.

(xi) National Committee on Dam Safety (NCDS):

Ministry of Irrigation, Government

of India constituted a Standing Committee under the Chairmanship of Chairman, CWC in 1982 to review the existing practices and to evolve unified procedures of dam safety for all dams in India. Subsequently, 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, and Act as a forum for exchange of views on techniques adopted for remedial measures to relieve distress in dams.

(xii) Dam Safety Bill:

Dam Safety Bill, 2019 was introduced in Lok Sabha on 29th July, 2019 and passed on 2nd August, 2019. The bill has been sent to select committee for further discussion. Dam safety Bill will provide for surveillance, inspection, operation and maintenance of the specified dam for prevention of dam failure related disasters and provide for institutional mechanism to ensure their safe functioning and for matters connected there with or incidental thereto.

(xiii) Technical examination of projects for foundation and seismic aspects

Detailed Project Reports of 06 nos. of river valley projects in various states namely, State of Odisha, Himachal Pradesh, Uttarakhand, Andhra Pradesh and Madhya Pradesh have been examined with respect to geological investigations related to foundation engineering & seismic aspects; and observations issued. Out of 06 projects, 02 projects have been cleared and Compliance of comments from project authorities is awaited in respect of the remaining projects.

(xiv) 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. 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.

35th meeting of NCSDP was held on 19th June, 2019, wherein the site specific seismic study reports of 04 projects were finalized by the Committee& 03 projects were from previous meeting (i.e.) 34th meeting held on 26th February 2019.

(xv) Dam Break and Other Special 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 2019-2020, Dam break analysis of Matatila Dam, Uttar Pradesh, has been carried out and report has been sent to project authorities and, Dam break analysis of Ranjit Sagar Dam,

(Punjab), Tungabhadra Dam (Karnataka), Ram Ganga Dam (Uttar Pradesh) are under progress.

(xvi) Software Management

Subject Matter Division (SMD) under D&R Wing is entrusted with the work of management of IT hardware/ software at Head Quarter CWC and to promote e-governance activities in CWC. Several IT applications are being developed/ implemented in coordination with various stakeholders. Works related to the implementation of e-Office in CWC (HQ) & field offices, SPARROW, e-HRMS software, e-procurement practices in all offices of CWC, supervision of Job Portal Work Charged Recruitment System software hosted at CWC website, Development/ Customization of CWC-Intra software for Stationery & Complaint Management in CWC (HQ) are dealt by SMD. During the year 2019-20 (till December, 2019) the expenditure is Rs. 288.46 Lakhs against Rs 435.46 Lakhs budget allotments. Development of Mobile and Web Application as per GIGW and CERT-In Guidelines for Assessing and Improving the Performances of CWC using Balance Scorecard Method, Development of Mobile and Web Application as per GIGW and CERT-In Guidelines is under process in SMD.

(xvii) Environmental Management:

(a) Environmental Evaluation/ Impact Assessment Study

CWC undertakes Environmental Evaluation/Impact Assessment Study of Completed Water Resources Projects. 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 (Orissa), Ramganga Project (Uttar Pradesh) and Singur Project(Andhra Pradesh) has been completed so far.

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

The works of "Sedimentation Assessment Study of 40 reservoirs using Remote Sensing Technique" was awarded to MERI, Nashik. Out of list of 40 reservoirs and a supplementary list of 16 reservoirs, 23 reservoirs are found feasible for study. The Sedimentation Assessment Study for Kakki Reservoir (Kerala), Dudhganga (Maharashtra) and Matatila (UP) were completed during the year 2019-20 (upto December 2019). Sedimentation Assessment study of Kakki reservoir has been conducted using Microwave data (instead of optical data). This has been tried for the first time in CWC. The advantage of using microwave data is that the images are not affected by cloud cover, and we get images of the reservoirs near FRL during monsoon season as well (which is relatively difficult with optical imageries as when the reservoir is full, most of the time it is monsoon season and it is cloudy). The studies in respect of following reservoirs are under progress:

- Idamalayar Reservoir (Kerala)
- Gobind Sagar Reservoir (Himachal Pradesh)

1.2. CENTRAL SOIL AND MATERIAL RESEARCH STATION (CSMRS)

1.2.1 Intrduction:

CSMRS 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 primarily functions as an adviser and consultant to the various Departments of Government of India, State Governments and Government Undertakings.

The spheres of activities of the Research Station are covered under the three main disciplines namely Soil, Rock and Concrete. The core areas are Soil Mechanics, Rockfill Technology, Geo-synthetics, Soil Dynamics, Rock Engineering, Engineering Geophysics, Geotechnical Instrumentation, Concrete Technology, Concrete Diagnostics and Numerical Modeling.

1.2.2. Investigations for projects:

The investigations comprised field and laboratory investigations in the areas of Soil, Rock, Rockfill, Geo-synthetics, Concrete and its constituents.

The details of projects investigated/ under investigation during 2019-20 in continuation of previous year are as under:

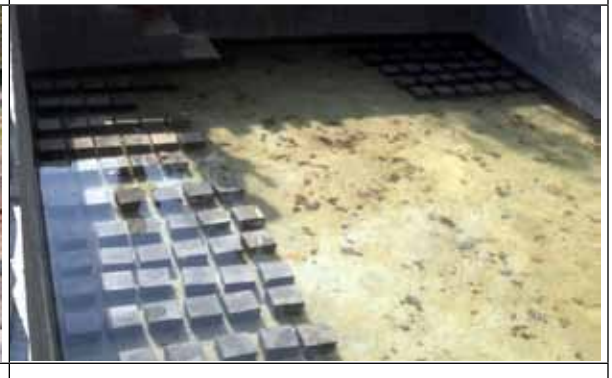
Sl. No	Project Name	Cost of Consultancy for the Year 2019-20	Date of commission / initiation	Likely completion / completed date
International Projects:				
1	Kholongchhu HE project, Bhutan	8,59,373 Concrete 51,33,661 Rock 26,61,062 Soil	24.11.2017 17.03.2017 07.04.2017	31.05.2019 31.03.2020 25.09.2019
2	Kuri Gongri Project, Bhutan	27,01,691 Conc 51,05,910 Rock 12,27,026 EG 35,39,521 RF	01.07.2018 16.05.2018 29.01.2018 30.08.19	31.05.2019 31.12.2019 23.07.2018 15.02.20
3	Punatsangchhu-I & II H.E. Project, stage II, Bhutan	66,00,000 18,92,105	01.01.2018 15.05.2019	31.05.2019 19.09.2019
4	Shatoot H E Project, Afganistan	32,84,736 RF	01.10.2019	31.12.2020
Indian Projects- in North-East India				
5	Myntdu Leskha Stage-II H E Project, Meghalaya	18,12,297	16.04.2019	31.06.2020
6	Turini HE Project, Mizoram	14,58,614	09.10.19	31.03.2020
7	Umangot HEP, Meghalaya	21,44,258	23.01.2018	07.02.2019
Projects in other parts of India				
8	Adi Badri (Yamuna Nagar) Haryana	24,82,943	20.07.2018	31.03.2020
9	Bhaunrat Dam Project, UP	10,01,588 Conc 26,30,937 Concrete & Soil MoU	12.01.2018 01.02.2019	31.05.2019 31.01.2021
10	Bina Complex Irrigation Project, Madhya Pradesh	23,64,120	01.03.2018	30.04.2019
11	Damanganga-Vaitarna-Godavari intrastate link Project, Maharashtra	24,46,165 Conc 21,67,820 Soil 49,61,000 RM-L	01.02.2019 01.01.2019 15.10.19	31.07.2019 31.03.2020 31.10.2020

Sl. No	Project Name	Cost of Consultancy for the Year 2019-20	Date of commission / initiation	Likely completion / completed date
12	Flood Protection Division, GAGRET, District Una, Himachal Pradesh	69,053	18.06.2019	31.07.2019
13	Isarda Dam, Rajasthan	5,38,132 RM-F 41,005 RM-L	15.05.19 15.05.19	30.08.19 31.05.19
14	Kanhar Dam Project, Uttar Pradesh	11,03,525 RF MoU 8,43,050	21.01.19 18.01.2019	31.03.20 21.05.2019
15	North Koel Project, Jharkhand	39,75,389	22.11.2018	--
16	Pakaldul H E Project, J&K	27,24,864	01.01.19	11.10.19
17	Palamuru Rangareddy Lift Irrigation Scheme, Telangana	38,34,536 RF	24.08.18	16.08.19
18	Polavaram Project, Andhra Pradesh	43,01,934 MoU for QA/QC till completion of project 8,67,815 RF	12.02.2018	--
19	Pump Storage Project, Tehri, Uttarakhand	19,72,776 6,72,794	01.05.2018 01.11.2019	31.10.2019 31.03.2020
20	Rihand Dam Project, U.P	4,24,728 4,67,201	24.04.2018 01.04.2019	02.04.2019 31.03.2020
21	Reservoir Projects, Jharkhand(CWC)	11,03,596	22.3.2019	31.03.2020
22	Sardar Sarovar Project, Gujarat	4,95,825 5,45,408	13.04.2018 01.04.2019	11.04.2019 31.03.2020
23	Sharavathy PSP, Karnataka	15,27,157	14.09.2017	31.05.2019
24	Sirkari Bhyol Rupsiabagar HEP, Uttarakhand	20,86,422 Conc 8,70,158 Che 29,47,311 RM-L 24,50,000 RM-F	11.05.2016 11.05.2016	30.06.2019 31.03.2020
25	Sunni Dam Project, HP	7,85,449 Concrete 56,82,572 Rock	01.03.2018 14.09.2018	30.06.2019 31.12.2019
26	Thana Plaun HEP, HP	7,88,514 Concrete 30,88,387 Rock	01.08.18 12.04.2018	30.05.2019 30.04.2019
27	Turga Pumped Storage Project, West Bengal	28,88,497	27.03.2018	31.03.2020
28	Vishnugad Pipalkoti HE Project, Uttarakhand	19,98,240	06.11.2017	05.11.2019
29	Vyasi HE Project, Uttarakhand	14,12,885 13,56,996	26.09.2017 01.06.2019	31.05.2019 30.06.2020
30	Phina Singh medium Irrigation Project, Himachal Pradesh	15,21,558	31.10.2018	12.03.2019
31	Song Dam Drinking Water Project, Uttarakhand	20,36,993	05.11.19	31.03.2020

Sunni Dam Project, Himachal Pradesh

	
In-situ shear test in dam site drift	**Hydraulic Fracturing test in power house drift**

Bhaunrat Dam Project, Uttar Pradesh

	
Curing of Spillway Structure by ponding	**Concreting is in progress by boom placer**
	
Concrete mix design in progress	**Concrete cubes in curing tank**

Polavaram Irrigation Project, Andhra Pradesh

	
Spillway Overview	**Upstream coffer dam work in progress**

NH crossings work in progress in LMC

Bed formation work in progress in RMC

1.2.3. Other Achiements of CMSRS During 2019-20

Success Indicators	Achievements Anticipated till March 2020
Technical reports brought out / published	70 Nos.
Publication of Research Papers	45 Nos.
Evaluation of Detailed Project Reports and technical comments on compliance to DPR	05 Nos. 35 Nos.
Training programme organized	08 Nos.

1.2.4. Self-sponsored Research Schemes:

The self-sponsored research schemes currently in progress are as follows:

- Effect of molding water and compaction densities on the Permeability Characteristics of Soils
- Effect of molding water content on the Shear Strength Characteristics of Soils
- Comparison of theoretical and laboratory permeability for coarse grained soil
- Remediation of Expansive Soil by using Polymer
- Effect of molding water on Swelling Pressure of Expansive Soils
- Research Scheme on "Dispersivity of Soils"
- In-situ stresses measurement of rock mass
- Crack Initiation and Propagation in Brazilian test of Transversely Isotropic Rocks
- Study on behavior of abrasiveness, impact and flexural strength.
- Stabilization of dispersive soil by addition of additives(Study of mechanics of dispersion under the scheme of stabilization of dispersive soil)
- Chemical remediation of soil contaminated with hazardous heavy metals by washing with chelating agents
- Alkali Carbonate Reactivity-Reaction mechanism and behavior in concrete
- Use of Artificial Aggregates (Iron & Steel Slag) as Partial Replacement of Natural Aggregates in Concrete
- Effect of alkalinity on setting time of cement.

- Self-Healing of Concrete for Repair of Cracks" approved by the competent authority

2.0 SUBORDINATE OFFICES

2.1. CENTRAL GROUND WATER BOARD (CGWB)

2.1.1. Major 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:

(i) National Aquifer Mapping and Management (NAQUIM) Programme

National Aquifer Mapping and Management Programme (NAQUIM) initiated, under Ground Water Management and Regulation (GWMR) scheme in the year 2012, with an objective of delineating and characterizing aquifers and developing management plans for enhancing the sustainability of ground water resources. Out of ~32 lakh km2 area of the entire country, an area of ~25 lakh km2 has been identified to be covered under aquifer mapping in phases. Activities under the program have been divided into- (i) Data Compilation, Generation and Integration, (ii) Preparation of aquifer maps & (iii) Formulation of aquifer management plans.

(a) Activities under NAQUIM: Various data generation activities viz. exploratory drilling, geophysical surveys, chemical quality studies and hydrogeological surveys have been taken up for getting scientific information of aquifers for preparation of aquifer maps and management plan.

- **Ground water exploration:** CGWB has constructed 499 boreholes up to 31st December, 2019 as a part of data generation. In addition to these, around 4989 boreholes (including 456 boreholes constructed in the year 2019-20- from April to Dec. 2019) have been constructed till date through outsourcing (initiated in 2017-18).
- **Geophysical Studies:** CGWB has carried out 661 Vertical Electrical Soundings (VES), 14.07 line km resistivity profiling and 16 geophysical loggings till 31st December, 2019 in various parts of the country. In addition to these, around 2715 VES (1106 VES done in 2018-19 & 1609 in 2019-20) and 44.6 line km resistivity profiling has been done through outsourcing (initiated in 2018-19) for generation of data under Aquifer mapping.
- **Water Quality Analysis:** Around 28,939 ground water samples have been analysed for basic constituents and heavy metals till Dec. 2019. Findings of exploration, geophysical, water quality, water level monitoring, hydrogeological survey, aquifer performance tests, slug test (as applicable) etc. studies are integrated for developing aquifer maps and management plans.

By the end of March 2019, aquifer maps and management plans were developed for an area of ~10.83 lakh km2. Till December, 2019, an additional area of nearly 80,000 km2 has been covered under aquifer mapping and management plan thereby making the total area coverage in the country as ~11.6 lakh km2 (since 2012).

(b) Implementation of NAQUIM: The aquifer maps and management plan are finalized through a three tier review *viz*. at Regional Directorate level, Member level at CHQ and finally by National Level Expert Committee (NLEC). The maps and management plans developed as a part of this programme are shared with the concerned State Governments through the State Ground Water Coordination Committees (SGWCC), which are headed by the Secretary/ Principal Secretary in-charge of ground water departments in the respective States. Aquifer Maps and Management plans are also shared with the respective District Authorities for implementation of ground water management plans and integration of information in other programs.

- **Eighth Meeting of National Inter-Departmental Steering Committee (NISC):** A National Inter-Departmental Steering Committee (NISC) has been constituted as the apex body for overall guidance for implementation of NAQUIM at National level. Secretary, DoWR, RD & GR is the Chairman, with representatives from related Ministries like Science & Technology, Earth Sciences, Rural Development, Drinking Water & Sanitation etc. Eighth meeting of NISC was held on 14th Oct, 2019 at DoWR, RD&GR.
- **Meeting of National Level Expert Committee:** A National Level expert committee (NLEC) has been constituted by DoWR, RD & GR with Secretary to review the Aquifer Maps and Management plan. The seventh meeting of NLEC was held on 27th, 28th and 29th October, 2019.
- **Dissemination of NAQUIM outputs:** Aquifer maps and management plans prepared as a part of this programme have been shared with the respective State Governments through State Ground Water Coordination Committee (SGWCC) headed by the concerned Principal Secretaries of respective States. The maps and management plans are helping the agencies (State Govts.) involved in water management in better decision making.
- **Facilitating Public Interaction on Aquifer Maps and Management Plans:** CGWB initiated Public Interaction Programmes (PIP) to disseminate outputs of NAQUIM studies to the stakeholders at grassroots level. The interaction involves representation from Panchayats, block and district level administration, NGOs, farmers, health & sanitation workers and other stakeholders. Till 31st Dec. 2019, 79 public interaction programs (PIP) have been organized, with participation of around 4500 persons, in different parts of the country.

'Jal Chaupals' created awareness among the local people about overuse of water while preparing Water Budget.

Public Interaction Program at Mandwadi Village, Rajpur block Aspirational Barwani district.

(c) Major Outcomes of NAQUIM

- As an outcome of Aquifer mapping in Ballia (Bairia Block) and Ghazipur (Karanda Block) district of Uttar Pradesh, 72 arsenic safe wells have been constructed in the second aquifer (Avoiding Arsenic infested first aquifer) and main wells handed over to the State Govt. facilitating arsenic safe drinking water to the entire populace in these two blocks.
- In the sandstone areas covering parts of east and west Godavari and Krishna Districts, aquifer recharge plan have been prepared utilizing excess surface water from proposed Polavaram and Chintalapudi lift irrigation project through 1475 ground water recharge shafts in tanks.
- Ground water management plans of Lalitpur and Jhansi Districts released by Hon'ble Minister of Jal Shakti in a function at Lalitpur.

Tamil Nadu

- CGWB provided technical guidance and carried out the field level inspection for feasibility of structures and pinpointing sites. DPRs have been prepared by state for implementation. Total cost of the project is Rs.890.00 Lakhs & Rs.336.52 Lakhs respectively.
- Based on the results of Aquifer mapping undertaken, Suitable Geo-tagged sites were suggested for Water conservation/ Recharge-in-top crystalline aquifers in the premises of Heavy Alloy Penetrator Project, (MoD) Tiruchirappalli. Similar suggestions have been made in respect of following :-
- Indian Maritime University, Headquarters, Uthandi, Kancheepuram District

- Ordinance Factory, Tiruchirappalli, Tiruchirappalli district
- Officers Training Academy, St. Thomas Mount, Chennai
- Cordite Factory, Aruvankadu, The Nilgiris District

Madhya Pradesh

- Based on aquifer management plans, geo-tagged locations for constructions of water conservation structures were suggested to State Ground Water Survey Department (GWD), Sagar; in villages of Sagar block (Sagar district) namely Arjani, Hapsili, PathariyaJat, Sagar outskirts, Renjha (PatneshwarDham).
- State govt. has finalized Water conservation/ AR sites in 9 blocks in districts of Chattarpur (3), Tikamgarh (3), Panna (1), Damoh (1) &Sagar (1) amounting to ~ 220 cr.
- The Ground water Management plan based on NAQUIM study, proposes construction of 436 recharge structures in 150 villages spread across an area of 1055 sq km.

Gujarat

- Based on aquifer management plans, the Gujarat Water Resources Development Corporation Limited was provided assistance for preparation of the water security Plan for Dabhoda, Dahisana, Davol, Mekubpura and Varetha villages of Mahesana District.
- Based on the results of Aquifer mapping undertaken.
- Suitable Geo-tagged sites were suggested for Water conservation in the Air Force Station, Gandhinagar.
- Extraction of ground water from Aquifer I (Alluvium) with depth range 35 to 40m and Aquifer II (Basalt) with depth range 110 to 120m was suggested in Air Force Station, Vadodara for solving drinking water issues.
- Extraction of ground water from Aquifer-I (Basalt) (Depth Range up to 150m) was suggested for providing sustainable drinking water in Air Force Station, Khambalya, Jamnagar.

(d) Institutional Collaborations

o A Memorandum of Understanding (MoU) has been signed between **CGWB and the National Centre for Earth Science Studies (NCESS)** Thiruvananthapuram, Ministry of Earth Sciences, Govt. of India on 24th April, 2019 for a tenure of two years **to study the Submarine Ground Water Discharge (SGD) zones along the Indian subcontinent and its islands**. The study aims at-

- Identification of submarine groundwater discharge and salt water intrusion along the east and west coast of India upto 50 m depth and computation of SGD flux for carbon and nutrient load &
- Assessment of site-specific societal and environmental implications of SGD.

o CGWB has undertaken collaboration with **Geological**

Survey of India, Ministry of Mines, Govt. of India on **Sharing of 1:50,000 Scale Geological Map Data, Hydrogeological Maps for National Project on Aquifer Management**. The objective of the collaboration includes sharing of available 1:50,000 Scale map data (comprising of Lithological and structure layers), Ground water quality and aquifer mapping data generated out of NAQUIM with GSI.

- CGWB has entered into a MoA with **National Institute of Hydrology (NIH), Roorkee**, Uttarakhand for **analysis of stable isotopes of hydrogen and oxygen in groundwater samples collected from different parts of the country**. So far, about 1300 groundwater samples from different parts of the country have been analyzed and the results are being used under the NAQUIM studies.
- CGWB has undertaken collaborative study with **Geological Survey of India**, Ministry of Mines, Government of India for study on **sustainability of springs in parts of Almora district, Uttarakhand**. The study has been completed and the report is under preparation.
- **MoU between CGWB and MARVI Partners-** An MoU has been signed between CGWB, DoWR, RD&GR, MoJS, Government of India and MARVI (Managing Aquifer Recharge and Sustaining Groundwater Use through Village-level Intervention) partners *(namely- Western Sydney University, Australia; CSIRO Land and Water, Australia; Arid Communities and Technologies, Bhuj, Gujarat; Development Support Centre, Ahmedabad; Maharana Pratap University of Agriculture and Tecchnology, Udaipur; Vidya Bhawan Krishi Vigyan Kendra, Udaipur, Rajasthan)* at Dr Ambedkar International Centre, New Delhi on 22.11.2019 in the august presence of Honorable Union Minister, MoJS, Shri Gajendra Singh Shekhawat; Minister of Education, Government of Australia, Mr. Dan Tehan, Federal; Honourable Minister of State, MoJS, Shri Ratan Lal Kataria; Shri U P Singh, Secretary, DoWR, RD & GR, MoJS and Prof Barney Glover AO, Vice-Chancellor & President, Western Sydney University.

Memorandum of Understanding (MoU) between CGWB and MARVI Partners at Dr Amberkar International Centre, New Delhi on 22.11.2019

- **MoU between BARC and CGWB for Capacity building of chemists of CGWB for ultra-trace levels of uranium determination in ground water:** MoU has been executed between BARC and CGWB for **Capacity building of chemists of CGWB for ultra-trace levels of uranium determination in ground water** on 4th June, 2019. As per the MoU, BARC will provide training for the analysis of uranium in ground water samples to the scientists of CGWB at their facility. The training will include lectures and hands on experiments on analysis of uranium in ground water. This will enhance the capability of CGWB Chemists working in CGWB for analysis of uranium in ground water samples collected by CGWB.

  In order to develop adequate facilities for uranium analysis at all the 16 Regional Laboratories of Central Ground Water Board, the procurement of Fluorimeters (Uranium analyser) has been initiated and it is in advance stage of finalisation. The BARC has supported CGWB in framing the technical specifications of fluorimeters.

(ii) Water Supply Investigations

The Board provides assistance to defense establishments and other 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 113 investigations during this year up to 31st December 2019.

(iii) Ground Water Regime Monitoring

Ground water levels in the country are monitored through a network of about 22965 Ground Water Observation Wells four times a year. During the current year water levels monitoring as per the schedule has been carried out during the months of April/May 2019, August 2019 and November 2019.

(iv) Estimation of Ground Water Resources

The Dynamic Ground Water Resources of the country are assessed jointly by respective State Ground Water Departments and Central Ground Water Board. The ground water resource assessment methodology has been revised (GEC 2015) and Ground water resources assessment for the base year 2017 based on the new methodology has been completed.

(v) Water Conservation/Artification Recharge Initiatives

a) Water Conservation / Artificial Recharge initiatives in identified water stressed areas of nine over-exploited blocks falling in eight States i.e. Andhra Pradesh, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana & Tamil Nadu have been taken up on pilot basis. The programme is being implemented in convergence with MGNREGA through technical support from CGWB, DoWR, RD&GR, MoJS.

b) Aquifer Rejuvenation through construction of suitable area specific Artificial Recharge structures in Aspirational

districts- The main objective of the project is Aquifer Rejuvenation through construction of area specific Artificial Recharge structures to establish successful & replicable techniques for similar water stressed/over exploited/semi critical areas thereby projecting the impact of aquifer rejuvenation in terms of sustainability of resources. In this study artificial recharge structures have been constructed in parts of following three blocks of three Aspirational Districts of Maharashtra, Andhra Pradesh and Telangana state.

State	Name of the Block & District	Category of Block/ Watershed	Structures constructed
Maharashtra	Osmanabad Osmanabad	Semi Critical	Check Dam: 55 likely to be finished by March, 2020. Recharge Well: All 43 completed. Piezometer: All 20 completed. Installation of AWLR completed.
Andhra Pradesh	Pulivendula, YSR Kadapa	Over Exploited	Check Dam: All 16 completed, Percolation Tank: All 4 completed Sub Surface Barrier: 01 completed. Recharge Shafts: 35 completed. Piezometer: 13 completed
Telangana	Bachannapet, erstwhile Warangal	Over Exploited	Check Dam: All 06 completed, Sub Surface Barrier: 01 completed Recharge Shaft: All 31 completed Piezometer: All 08 completed

c) Status of Bridge cum Bandhara sites' in parts of Amrawati and Wardha districts, Maharashtra State - DoWR, RD & GR, has taken a policy decision for construction of Bridges cum Bandharas (BCB) on pilot basis. In the study, Bridges cum Bandharas (BCB) structures are being constructed at the following locations of Maharashtra state:

i) On Jamb river of Sarwadi Village (NH-6), Tehsil: Karanja, District: Wardha

ii) On Nala near Ajra Phata Village, Tehsil: Samhdrapur, Distrcct: Wardha

iii) On Pigdi River, Tiwasa village, Tehsil: Tiwasa, District: Amravati

iv) On Yasoda River, near Deoli village, Tehsil: Deoli, District: Wardha

v) On Wagholi River, near village Jamni, Tehsil: Selu, District: Wardha

Construction of BcB at Sarwadi Village (NH-6), Tehsil: Karanja, District: Wardha has been completed and the work at the remaining 04 BCB is in advance stage and likely to be completed by March 2020.

Bridge cum Bandhara at Sarwadi

d) Creation of Rain Centers at Regional offices of Central Ground Water Board: Rain Centers have been created at all the Regional offices of CGWB to impart guidance to the public for adoption of Rain Water Harvesting. So far 60 such programs have been organized through the regional offices of CGWB in the country.

e) Adoption of Rain Water Harvesting in CGWB buildings: Rain Water Harvesting have been adopted at all the places where the Board is having its owns building in the country.

(vi) Rajiv Gandhi National Ground Water Training & Research Institute (RGNGWTRI):

The Institute located at Raipur, Chhattisgarh caters to the training requirements of CGWB, Central and State Govt. Organizations, Public Sector Undertakings (PSUs), Academic Institutions, NGOs etc. in the field of ground water. Since XII plan, keeping in view the requirements of NAQUIM, RGNGWTRI, under HRD and Capacity Building Scheme of DoWR, RD&GR, MoJS, has been implementing a three-tier training programme/ course.

(vii) Human Resources Development

During the year 2019-20 (till 31st Dec., 2019), 81 numbers of Training Courses (41-Tier I, 11-Tier II and 29- Tier III) were conducted by RGNGWTRI and a total of 5064 Trainees (811- Tier I, 396-Tier II and 3857- Tier III) got trained including 1516 female participants. National Level training courses (Tier-I) were conducted at RGNGWTRI, Raipur. The State and Block Level training programmes (Tier-II and Tier-III) were organized by RGNGWTRI through the Regional Offices of CGWB.

Summary details of the training programmes are given in table.

Training Programmes	Total No. of Trainings Conducted	Total No. of Participants	Female participants
Tier – I (National Level)	41	811	185
Tier – II (State Level)	11	396	77
Tier – III (Block Level)	29	3857	1254
Total	**81**	**5064**	**1516**

Capacity building of Ground Water Professionals on Mathematical Modelling of Ground Water System by Rajiv Gandhi National Ground Water Training & Research Institute during 22.07.2019 to 02.08.2019 at Raipur

Tier-II training program on "Local Ground Water Issues" was organized at MLS University, Udaipur, during 5-7 August, 2019. Total 24 participants (including 7 women) attended the training program.

(viii) 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. The functions/ responsibilities of CGWA include:

- 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.

Important activities of CGWA during the period mentioned are given below:

- **Processing of Applications for Grant / Renewal of No Objection Certificate (Noc) for Ground Water Withdrawal**

  CGWA continued to evaluate applications from Industries/ Infrastructure Units / Mining Projects for grant of NOC for ground water withdrawal as per provisions of the extant guidelines. A total of 1963 nos. of new NOCs were issued during the period.

- **Monitoring of Compliance of Conditions Stipulated in the NoC**

  In order to ensure compliance of the conditions of NOCs by proponents, site inspections were carried out by authorized officers of CGWA. Subsequently, Show-cause notices were issued to units, which were not found to have fully complied with the NOC conditions. Orders for sealing of bore/tube wells and/or disconnection of electricity supply through the concerned DCs/ DMs were also issued in respect of units,

which did not give satisfactory replies to the show-cause notices.

- **On Site Inspection by CGWB**

  On-site inspections were carried out by the Regional Offices of CGWB to check the compliance of NOCs accorded by CGWA before recommending the renewal applications to CGWA, New Delhi. Necessary show- cause notices were issued to the project proponents who have not complied with the conditions of the NOC issued by CGWA.

2.2. CENTRAL WATER AND POWER RESEARCH STATION (CWPRS)

2.2.1. Introduction:

CWPRS is an apex Research and Development institution in the field of hydraulics and allied research in the water and power sector for more than 100 years for evolving safe and economical planning and design of Water Resources Structures, River engineering, Hydropower generation, and Ports and Water ways projects. CWPRS has offered its services to neighbouring countries viz., Bangladesh, Bhutan, Afghanistan, Myanmar, Nepal, Singapore, etc., as well as countries in Middle East.

The research activities at CWPRS can be grouped into seven major disciplines viz. River Engineering, River and Reservoir Systems Modelling, Reservoir and Appurtenant Structures, Coastal and Offshore Engineering, Foundation and Structures, Applied Earth Sciences, Instrumentation, Calibration and Testing Facilities.

Years	Jobs Awarded		Reports Submitted	Papers Published	Training of Personnel	Training Programmes / Conferences organized
	Nos.	Amount (Rs.)				
2018-2019	156	24,82,90,802	100	81	803	24
2019-2020 (upto Nov'19)	110	16,15,47,108	69	14	281	12

2.2.2. Areas of Expertise:

The research activities at CWPRS can be grouped into seven major disciplines as listed below:

a) **River Engineering**: Major studies related to river training and bank protection works, hydraulic design of barrages and bridges, measuring water & sediment discharge etc., are carried out under River Engineering studies. Significant studies during the period include

- Studies for flood protection and management of inter state Ghaggar River
- Studies for flood and erosion control of River Chenab
- Studies of RRTS (Rapid Rail Transit System) bridge across river Hindon

b) **River and Reservoir Systems Modelling**: Important studies related to flood estimation & forecast, reservoir sedimentation & water quality studies are carried

out using mathematical models and field surveys.

- Development of testing and calibration facility for water quality sensors under NHP
- Assessment of water quality of Khadakwasla Dam
- River Rejuvenation of Mula and Mutha River flowing through Pune City

c) Reservoir and Appurtenant Structures: Hydraulic design for spillway and energy dissipation systems, reservoir sedimentation & flushing, water conductor system studies is carried out using physical and mathematical models. Sedimentation in reservoirs is also assessed through remote sensing.

- Hydraulic and numerical model studies for reservoir sluicing for pakal dul Kwar, H.E. project Jammu and Kashmir
- Hydraulic model studies for sluicing of sediment from reservoir of Kishan Ganga H.E. project Jammu and Kashmir
- Mathematical Model studies for reservoir sedimentation, Ratle H.E. project Jammu and Kashmir
- Hydraulic model studies for Hathnikund Barrage Haryana.

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., is undertaken for development of various ports and harbors under this discipline.

Major projects carried out for the port development schemes of Project Varsha, Mumbai port, Kamarajar Port, Vishakhapatnam port, Cochin port, Mormugao port, JNPT, ALHW port in Campbell bay, Andaman and Nicobar Islands, Kolkatta port, V. O. Chidambarnar, Paradip port, Vadhwan port, Kudamkulam port and various fishing harbours in Kerala and Tamilnadu states, Porbandar and Okha Ports in Gujarat.

e) Foundation and Structures: Laboratory and field test studies are carried out to determine the soil, rock and concrete properties. Mostly the studies undertaken by this discipline are pertaining to Dams, Power plants etc. Some of the major studies include:

- Estimation of in-situ material properties by Flat Jack test for Massanjore dam.
- 3D stress and stability analysis by FEM of one non overflow and one spillway block of Massanjore dam.

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 carried out in various dams, canals, nuclear and thermal power plants etc. Some of the major

studies carried out are indicated below:

- Vibration measurement studies on concrete Gravity Dam of Umiam Stage-I Hydro Electric Project, Meghalaya
- Vibration studies for Kolhewadi Dam Power House, Koyna Hydro Electric Project (KHEP) Stage-III, Maharashtra.
- Seismic Hazard Assessment of North East India.
- Micro earthquake study for sawalkote HEP, Kishtwar, J & K.
- Site specific Seismic Design Parameters for Kuri-Gongri H.E. Project, Bhutan for WAPCOS (1) Ltd.

g) Instrumentation, Calibration and Testing Facilities: Important studies related to installation and monitoring of instruments in Dams, Hydroelectric power plants etc., calibration of instruments and their testing are carried out at CWPRS. Hydraulic Instrumentation is used for data collection on physical hydraulic models. Field data collection is carried out on coastal parameters like water level, velocity, wave-height etc. A Random Sea Wave Generation (RSWG) system is used for wave flumes and basins. Dam instrumentation is provided on prototype. Few important studies include:

- Measurement of water discharge through penstocks of Koyna stage II and III generating units for MAHAGENCO, Pophali.
- Efficiency evaluation of inline pipe hydro-turbine for Kirloskar Energen, Maharashtra.
- Field investigation of flow meters installed at irrigation raw water network of JSW Steel Ltd. Dolvi Works, Maharashtra.

2.2.3. Significant Achievements:

(i) Collaboration through MoU & MoA:

a) MOA between CWPRS & EIL: A MoA has been signed between CWPRS and Engineering India Limited (EIL) to collaborate in offering consultancy services including studies, assignments & research in India & abroad.

b) MoU between CWPRS & DVC: MoU has been signed between Damodar Valley Corporation (DVC) and CWPRS during 11th World Bank review mission to promote mutual cooperation in establishing seismological instrumentation network and for collecting, processing, monitoring, analyzing and archiving the data generated at seismological instrument station of the specified dams.

c) MoU between CWPRS and CWC: MoU has been signed between CWC and CWPRS under the DRIP program, to carry out the study on "Seismic Hazard Assessment of North and North-East India".

d) MoU between CWPRS and CWC: MoU has been signed between CWC (CWC), State Government (Maharashtra & Gujarat) and Central Water and Power Research Station (CWPRS) to carry out the study on "Field observation and data collection under the scheme of ***Coastal Management Information System*** (CMIS)".

(ii) Letter of Appreciation:

- A new Greenfield airport known as Navi Mumbai International Airport (NMIA) is being developed by City and Industrial Development Corporation of Maharashtra Limited (CIDCO) in Panvel creek at Kopre-Panvel area of Navi Mumbai. CIDCO has reported that this important phase of NMIA viz., recoursing of Ulwe River has been successfully completed as per the recommendation given by CWPRS. According to CIDCO, now the Ulwe River in this region is flowing smoothly and there is no threatening situation in Ulwe River after the completion of recourse channel as suggested by CWPRS.
- The Solar Power Plant of 700 KWp was Inaugurated at CWPRS by Hon'ble Union Minister of MoJS , in the presence of Shri U.P.Singh, Secretary, DoWR, RD & GR and Dr. (Mrs.) V.V. Bhosekar, Director CWPRS on 20th August, 2019. MoJS directed CWPRS to implement generation of Solar Power to promote ecological and sustainable growth as per the MNRE directives. Therefore CWPRS has, taken up the work of installation of roof top Solar Power Plant in CWPRS Campus to meet the power demand and to affect savings by reducing the use of conventional Energy from the Grid.

2.3. GANGA FLOOD CONTROL COMMISSION (GFCC)

2.3.1. INTRODUCTION

GFCC was established in 1972 with its Headquarter 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

Hon'ble Union Minister, MoJS, inaugurating Solar Power plant in the presence of Shri U.P.Singh, Secretary, DoWR, RD & GR and Dr. (Mrs.) V.V.Bhosekar, Director, CWPRS.

of the Ganga basin States are part time Members/permanent invites.

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.

Like previous years, this year also, the KHLC/GHLSC inspected the flood protection works on river Kosi and Gandak during 16-17 December, 2019 and 23-25 October, 2019 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. During the current year GFCC is in process of updating the Comprehensive plan through State of the art technology under National Hydrology Project (NHP).

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, e) Rudraprayag to Badrinath & Rudrapryag to Kedarnath.

Out of five reaches the assessment study has been completed for 3 reaches. Survey and data collection work for Rudrapryag to Kedarnath has been completed in current financial year. Assessment study report for Haridwar to Rudrapryag, Rudraprayag to Badrinath & Rudrapryag to Kedarnath is under progress.

iv. Monitoring of Important Flood Management Schemes:

GFCC is monitoring about 138 flood management schemes which, inter-alia, include:

a) 114 flood management schemes supported under " flood Management Programme"

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:

50 number of Flood management schemes were received in GFCC from Ganga Basin States during 2019-20 including spill over projects from previous years, out of which 28 schemes received in current financial year. 26 schemes were accorded techno-economic clearance, 4 schemes were dropped and 20 schemes are under examination in GFCC.

COMMITTEES

i. India-Nepal Joint Committee on Water Resources (JCWR):

An India-Nepal Joint Committee on Water Resources (JCWR) headed by the Water Resources Secretaries of both the countries is functioning with the mandate to act as umbrella committee for all other sub-committees and groups under it. Chairman, GFCC is a member of the JCWR. Eight meetings of JCWR have been held so far. The last meeting was held in Delhi on 11th January, 2019.

ii. Joint Standing Technical Committee (JSTC):

This Committee was constituted during the 3rd meeting of India-Nepal Joint Committee on Water Resources (JCWR) held from 29.09.2008 to 01.10.2008 in Kathmandu (Nepal). Chairman, GFCC is the Team Leader of Indian side of the Committee. The main function of JSTC is to coordinate with existing committees and sub-committees under the JCWR. Six meetings of JSTC have been held so far. The last meeting was held in New Delhi on 09.01.2019 and 10.01.2019 in which various issues were discussed and decisions taken for follow up action in the matter.

iii. Joint Committee on Inundation and Flood Management (JCIFM) between India and Nepal:

During the 4th meeting of Joint Committee on Water Resources held in March, 2009 at New Delhi, a Committee for flood management known as Joint Committee on Inundation & Flood Management (JCIFM) was constituted after merging various other Committees namely SCIP, HLTC, JCFM, SCEC and SCFF into a single Committee. The terms of reference of JCIFM are:

- The JCIFM shall be an umbrella Committee to implement the decisions of JSTC in inundation and flood management issues.
- The JCIFM shall address the issues related to flood management and inundation and can form Task Group(s), if required.
- The JCIFM shall monitor the progress of works and provide guidance to task group(s) and report to JSTC.

The 12th meeting of the Committee was held during 26-31 May, 2019 at Kathmandu. In the meeting various issues relating to flood inundation and Flood Management were discussed and decision taken.

(iv) Ganga Flood Control Board Meeting (GFCB):

The 17th meeting of Ganga Flood Control Board (GFCB), chaired by Hon'ble Minister of Jal Shakti was held on 28th May, 2015 at Patna, in which various issues related

to Ganga basin States were discussed and necessary action on the decisions of said meeting are being taken by GFCC.

(v) Ganga Flood Control Commission (GFCC):

The 52nd meeting of Ganga Flood Control Commission (GFCC) was held on 3rd June, 2019 at Delhi under the Chairmanship of Shri A.K. Sinha, Chairman, GFCC during which the problems faced by the States in implementing recommendations given in the Comprehensive Plans and other relevant issues were discussed.

2.4. SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE (SSCAC)

2.4.1. INTRODUCTION

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, DoWR, RD & GR 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 work of Unit - I and Unit-II has been almost completed by the Government of Gujarat. The residual work, which is very nominal, is being looked after by SSCAC.

2.5. BANSAGAR CONTROL BOARD (BCB)

2.5.1. INTRODUCTION

Bansagar Control Board was set up vide Government of India, Ministry of Agriculture and lrrigation 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 Jal Shakti is the Chairman of the Board and Union Minister of Power, Chief Ministers, Minister-in-charge of lrrigation and Finance of the three States and Minister-in-charge of Electricity of Madhya Pradesh are members. The expenditure on the office of the Board is met out of budge grant of Department 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 2019-20 the reservoir got filled up to Reservoir Level 341.64(FRL)m on 18.09.2019

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 the Bansagar Dam (2019-20):

As per the information provided by the Water Resource Department, Government of Madhya Pradesh, the total water released to the States of Madhya Pradesh, Uttar Pradesh and Bihar from April, 2019 to 13 January, 2020 is 2070.973 M.Cum, 24.868 M.Cum and 1036.408 M.Cum respectively.

2.6. UPPER YAMUNA RIVER BOARD (UYRB)

2.6.1 INTRODUCTION

UYRB was constituted by the Resolution No. 10(66)/71-IT dated 11th March 1995 of MoWR, RD & GR, Govt. of India in accordance with the provision of the MoU. After creation of Uttaranchal State in 2000, the resolution was modified to include Uttaranchal (now Uttarakhand) also in the Board in 2001.

Three storage projects viz. Lakhwar (on the river Yamuna with 330 MCM live storage & 300 MW power generation in the State of Uttarakhand), Kishau (on the river Tons, a tributary of river Yamuna with 1324 MCM live storage & 660 MW power generation in the States of Uttarakhand & HP) & Renukaji (on the river Giri, a tributary of river Yamuna with 498 MCM live storage & 40 MW power generation in the State of HP) MPPs have been identified to be constructed in Upper Yamuna basin. All the three projects have been declared as National Projects in 2008 under which 90% funding of the irrigation/drinking water component of the projects shall be provided by the Central Govt. as central assistance and rest amount will be borne by the basin States

Organization:

The Board consists of Member, CWC as part time Chairman and one nominee each from the States of Uttar 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 CGWB and CPCB as part time Members.

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, Uttar Pradesh, Uttarakhand, and National Capital Territory of Delhi under the Chairmanship of the Hon'ble Minister, MoJS.

Function of UYRB:

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 up to and including Okhla barrage.

Activities of UYRB:

Investigation works of above mentioned three storage projects were started in around 1976 and the same were declared as National Projects in 2008. In spite of these, the construction of these projects could not be started. Signing of agreement for the construction of Lakhwar & Renukaji MPPs amongst basin States could only be done by the Hon'ble Chief Ministers of the basin States of Uttar Pradesh, Himachal Pradesh, Uttarakhand, Haryana, Rajasthan and NCT of Delhi on 28th August, 2018 & 11th January, 2019 respectively after consistent efforts of DoWR, RD & GR.

Hon'ble Minister, Ministry of Water Resources, River Development and Ganga Rejuvenation (erstwhile), Government of India with Hon'ble Chief Minister of both States for resolving issues related to obtaining consent from the State of Himachal Pradesh and Uttarakhand on the draft of the revised MoU related to Kishau Multipurpose Project Meeting was held on 11st January, 2019.

UYRB worked 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.

A Committee was constituted with Superintending Engineers from Haryana, UP and Rajasthan with EE, UYRB as Member Secretary for joint measurement of discharge & inspection of the canal system to minimize theft. This committee has recently carried out its fifth joint observation on dates 26.04.2019 & 01.05.2019.

UYRB officials have also carried out inspections of Agra Canal and Bharatpur Feeder Canal on 27th November, 2019 so that Bharatpur Feeder Canal in Rajasthan receives it's due share of Yamuna water from Ading distributary of Agra Canal.

Pre-construction activities of office building of UYRB at Board's land namely Plot No. C-56/3, Sector–62, Noida are in progress. The revised layout drawings as per directions of NOIDA were submitted to the Authority for its approval. The same have been approved and issued by NOIDA vide dated 29.01.2020.

2.7. FARAKKA BARRAGE PROJECT (FBP)

2.7.1. INTRODUCTION

FBP was commissioned in 1975 for preservation and maintenance of Kolkata Port and for increasing the navigational depth of the Bhagirathi-Hooghly waterways. The Farakka Barrage comprises of a 2245m long barrage across river Ganga at Farakka in Murhsidabad district of West Bengal, a canal Head Regulator at Farakka for diverting 40,000 cusec water to 38.38 km long feeder canal and Jangipur barrage, besides the rail-cum-road bridge built across river Ganga at Farakka, Navigation lock at Farakka, Jangipur and Kalindri, a road-cum-rail bridge across the feeder canal, townships at Farakka, Ahiron and Khajuriaghat having 4000 dwelling units. The appurtenant

structures include flood embankment marginal bunds, afflux/ guide bund etc. The existing navigational lock at Farakka has been transferred in April, 2018 to IWAI under Ministry of Shipping for their operational requirement.

FBP authority has been assigned following major responsibilities:

- Operation & Maintenance of Main Barrage
  - (a) 112 gates on main Barrage
  - (b) 11 gates on Head-Regulator
  - (c) 15 gates of Jangipur Barrage
  - (d) 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 Road (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, 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 and machineries etc.

2.7.2. Major Achievements:

i. Emergency Anti erosion work at upstream right bank of River Ganga near Burning Ghat to Ganga Pump House Area.

ii. Emergency Anti Erosion Work at downstream left bank of river Ganga near Hossianpur Area (working length 330.00 m).

iii. Partial restoration of 9th marginal embankment (breach portion) on Left Bank of River Ganga U/S of Farakka Barrage between Ch. 1950.00 m and Ch. 2150.00 m (Total working length 200 m).

iv. Protective measures of eroded bank at u/s left bank of Farakka Barrage near Birnagar area in between Ch. 2177 to 2229 and in between Ch. 2520 to Ch (Total working length 212.00 m).

v. Restoration of bank slope in the u/s of Farakka Barrage near village Birnagar on Left Bank of River Ganga in between Ch. 2235.00 m and Ch. 2268 m, 2470 m and 2520 m and 2520 m and 2590 m.

vi. Restoration of bank slope in the D/S of Farakka Barrage near village Chakbahadurpur on Left Bank of River Ganga in between Ch. 3700.00 m and Ch 3880 m (Total Working length 180 m).

vii. Transfer of the Existing Navigational lock at Farakka to MoS/IWAI.

viii. The work for replacement of 35 gates is in progress (Physical progress is 2%).

ix. The work of Construction of walk-way Bridge over piers of Farakka Barrage

x. Renovation/Special repair and improvement of PSC bridge road over Farakka Barrage is in progress & ahead of schedule. (Physical progress is 20%).

2.8 NATIONAL WATER INFORMATICS CENTRE (NWIC)

2.8.1 Role and Primary Activities of NWIC

National Water Informatics Centre (NWIC) is a newly established subordinate Office of the Department set up to act as a repository of nation-wide data on water resources of the country. The Centre has been established as a part of larger National Hydrology Project (NHP) approved by the Cabinet in April, 2016 to, *inter-alia*, improve the extent, quality, and accessibility of water resources information and to provide tools/systems for informed decision making for water resources assessment, planning and management.

NWIC is tasked to act as a central repository of water resources data and to provide a single window source on water resources and allied themes. In this regard the Centre is entrusted with:

- Maintaining, updating, collating and disseminating water data through a National Web based platform.
- Sharing hydro meteorological data amongst Central and State Governments; institutions, academia, planners and general public through web portal for easy access and downloading data based on their area of interest.
- Providing technical support to organizations dealing with water emergency response for hydrological extremes.

The primary activities of the Centre include:

- Maintenance of online web portal, www.indiawris.gov.in, a comprehensive "Water Resources Information System" (WRIS) in public domain for awareness and involvement of all concerned for effective integrated water resources management. The data collection, generation and presentation into the portal are continuous activities. The various types of data available in IndiaWRIS through different modules are Rainfall, Reservoir Storage Level, Water level and discharge at Hydrological Observation sites, Ground Water level etc.
- Generating new content and development of new modules.
- Enriching existing content of India-WRIS by adding new layers.
- Maintenance of Server and IT infrastructure.
- Sharing of hydro-meteorological and other water resources-related data amongst Central and State Government Organisations, dissemination of information to various stake holders like Administrators, policy makers, Water planners and general public by providing easy access through web portal and facilitating data downloads based on their area of interest.

2.8.2 Activities undertaken during the year

Key activities performed by NWIC in during the year 2019-20 are listed below:

- The main focus was given to establish the required IT infrastructure necessary for the data centre. In this regard, a comprehensive proposal involving a total estimated cost of Rs. 1.20 crore for strengthening IT infrastructure Centre was devised and necessary approvals were obtained. Procurement of IT equipment under the proposal is currently underway.
- New modules in India-WRIS were developed with the help of National Project Monitoring Unit (NPMU) of NHP. The new modules developed at NWIC are Aquifer Systems, Ground Water Resources, Ground Water Prospects etc.
- The India-WRIS server was shifted from NRSC, Hyderabad to NWIC premises in New Delhi.
- NWIC has been added as an Implementing agency under NHP.
- NWIC is in the process of Development of "Integrated Water and Crop Information and Management System" (IWCIMS). The System is envisaged to have an Integrated Water and Agriculture Platform with Decision Support system which would act as a single authoritative system for all the Water, Agriculture and Weather-related parameters. The system will integrate from various sources of data such as State level, Central Level and Global Level etc. The Request for Proposals for the development of IWCIMS has been floated on 6th Feb 2020 in central public procurement portal.

3.0 Registered Societies Statutory Bodies/ Autonomous Bodies

3.1. NATIONAL WATER DEVELOPMENT AGENCY (NWDA)

3.1.1 INTRODUCTION

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 Jal Shakti) to study the feasibility of the links under Peninsular Component of National Perspective Plan. NWDA is fully funded by Government of India. The functions of NWDA have been modified from time to time and the present functions are furnished below:

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

(b) To carry out detailed studies about the quantum of water in various

Peninsular River systems and Himalayan River systems which can be transferred to other basins/ States after meeting the reasonable needs of the basin/States in the foreseeable future.

(c) To prepare feasibility report of the various components of the scheme relating to Peninsular Rivers development and Himalayan Rivers development.

(d) To prepare detailed project report of river link proposals under National Perspective Plan for Water Resources Development after concurrence of the concerned States.

(e) To prepare pre – feasibility / feasibility / detailed project reports of the intra-state links as may be proposed by the States. The concurrence of the concerned co-basin States for such proposals may be obtained before taking up their FRs / DPRs.

f) To undertake/construct/repair/ renovate/rehabilitate/implement the projects either on its own or through an appointed Agency/ Organization/PSU or Company and the projects forming part of Interlinking of Rivers, for completion of projects falling under PMKSY of which projects under Accelerated Irrigation Benefits Programme (AIBP) are also included and similar other projects.

g) NWDA to act as a repository of borrowed funds or money received on deposit or loan given on interest or otherwise in such manner, as directed by MoWR, RD & GR(now MoJS) and to secure the repayment of any such borrowed funds/ money/deposits/loan etc. by way of mortgage, pledge, change or lien upon all or any other property, assets or revenue of the society both present and future.

Hon'ble Union Minister of Jal Shakti 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(DoWR,RD&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.

3.1.2 HIGHLIGHTS OF ACTIVITIES

a. Interlinking of Rivers under National Perspective Plan (NPP)

- Secretary (DoWR, RD & GR) held a meeting with Chief Secretaries of Governments of Uttar Pradesh and Madhya Pradesh on 20.07.2019 for finalisation of Memorandum of Agreement (MoA) for implementation of Ken-Betwa Link Project.
- Director General, NWDA, New Delhi held a meeting with Principal Secretary of Irrigation & Water Resources, Govt of Uttar Pradesh on 30.08.2019 for water sharing of Ken-Betwa link project.
- Modified Draft Cabinet Note for constitution of National Interlinking

of Rivers Authority (NIRA) has been prepared and sent to Ministry of Jal Shakti.

- The Central Empowered Committee (CEC) of Hon'ble Supreme Court submitted its recommendations to the Supreme Court during August 2019.
- Draft DPR of Alternate Study of Godavari-Cauvery link project has been completed and circulated.
- Preparation of Detailed Project Report of Cauvery-Vaigai-Gundar link project is in progress.
- Preparation of Pre-feasibility Report of integration of Parbati-Kalisindh-Chambal link with Eastern Rajasthan Canal Project is in progress.

b. Intra State Links

- Environmental Clearance of Kosi-Mechi intra-State link project of Bihar has been accorded by MoEF&CC.
- Preparation of DPRs of Damanganga (Ekdare)-Godavari and Damanganga (Vagh Val)-Vaitarna-Godavari (Kadva Dev) Link Projects of Maharashtra are continued. MoU signed between WRD, Govt of Maharashtra and NWDA for preparation of DPR of these two link projects on 19.06.2019 at Hyderabad.

c. Activities in the North Eastern Region

- The Draft Feasibility Report of Manas-Sankosh-Teesta-Ganga (MSTG) has been completed and is under finalisation. The finalised report will be sent to Govts of Bihar, Assam and West Bengal for their comments/views.

3.1.3 DETAILS OF FUNCTIONS/ MEETINGS

- 6th Special General Meeting, 33rd Annual General Meeting of NWDA and 16th Meeting of Special Committee for ILR were held on 21.08.2019 under the Chairmanship of Hon'ble Minister for Jal Shakti, at Vigyan Bhawan, New Delhi.
- 11th Meeting of Task Force for Interlinking of Rivers was held on 18.10.2019 under the Chairmanship of Shri Sriram Vedire, Advisor, DoWR,RD&GR, MoJS.
- The 6th India Water Week was organised during the period 24th – 28th Sept.2019 at Vigyan Bhawan, New Delhi.

3.1.4 FINANCIAL PROGRESS

- The budget estimate for the year 2019-20 was Rs. 83.00 crore. The revised Budget Estimate for the year 2019-20 is also Rs. 83.00 crore and the actual expenditure upto December, 2019 was Rs. 55.32 crore.
- NWDA disbursed an amount of Rs. 1962.77 crore to the State Govts and Rs. 0.53 crore for North Koel Project as Central Assistance under PMKSY/ AIBP Funding during the period 01.04.2019 to 31.12.2019.

Tentative activities expected/ anticipated during the period 01.01.2020 to 31.03.2020

- The 67th meeting of Governing Body of NWDA is likely to be held subject to receipt of Audit report of NWDA for the year 2018-19.
- Release of further Central Assistance to various States/Projects under PMKSY-AIBP programme, if any.
- Continuation of post DPR activities of Priority links.

3.2. NATIONAL WATER MISSION (NWM)

3.2.1. INTRODUCTION

NWM was set up as per the National Action Plan on Climate Change (NAPCC) which was approved by the Government of India and released by the Hon'ble Prime Minister on 30th June 2008.

The five goals identified by the comprehensive mission document for National Water Mission are:

(i) Comprehensive water data base in public domain and assessment of the impact of climate change on water resource,

(ii) Promotion of citizen and state actions for water conservation, augmentation and preservation,

(iii) Focused attention to vulnerable areas including over-exploited areas,

(iv) Increasing water use efficiency by 20%,

(v) Promotion of basin level integrated water resources management.

Activities and new initiatives taken during the year under the above goals and its strategies

(i) Preparation of States Specific Action Plans for Water Sector

National Water Mission envisaged developing State Specific Action Plans for Water Sector covering Irrigation, Industry, domestic and waste water of a State/UT. NWM is providing financial assistance of Rs. 50 lakh to major states and Rs. 30 lakh to small states/UTs as a grant for formulation of SSAPs for water sector. NWM engaged two nodal agencies for coordination and monitoring of SSAP formulation. North Eastern Regional Institute of Water and Land Management (NERIWALM), Tejpur has been engaged for coordinating and monitoring SSAP formulation for 19 States and National Institute of Hydrology (NIH), Roorkee is coordinating & monitoring with remaining 17 States/UTs. So far, 28 States / UTs have signed MoUs with the nodal agencies and 5 States have submitted the first phase of inception report.

(ii) HRD & Capacity Building and Mass Awareness Programmes

NWM has organized capacity building & training workshops with the help of CWRDM, Kerala; NIHIDA, Orrisa; & WALMI, Karnataka for sensitization, training and capacity building of Panchayati Raj Institutions, Urban Local Bodies (ULBs), Water User Associations (WUAs) and other Stakeholders in equitable and sustainable management of water.

NWM has produced a five minute Profile video to create awareness about the goals and activities of NWM. Two jingles were also made and aired in FM channels exhorting people to conserve water in their daily activities.

(iii) Setting up of National Bureau of Water Use Efficiency (NBWUE)

It is proposed to set up a "National Bureau of Water Use Efficiency (NBWUE)" through a notification under Article 3(3) of the Environment (Protection) Act, 1986. The proposed Bureau will have the overall responsibility of improving water use efficiency across various sectors namely irrigation, drinking water supply, power generation, industries, cities etc. in the whole country.

(iv) Baseline Studies

Increasing water use efficiency by 20% is one of the major goals of the National Water Mission. Baseline studies have been undertaken for improving Water Use Efficiency in irrigation sector.

26 baseline studies covering 5 states viz. Assam, Manipur, Maharashtra, Andhra Pradesh and Telangana have been taken up in the first phase. These studies have been awarded to NERIWALM (Tezpur) - 5, WALMTARI (Hyderabad) 10 no, WALMI (Aurangabad) 6 and CWRDM (Kerala) – 5.

(v) Demonstration / Benchmarking / Pilot projects

A study on 'Benchmarking Industrial Water Use to assist policy for enhancing Industrial Water use in India' is being done by TERI for evaluation of water use in water intensive industries (viz. thermal power plants, textiles, pulp & paper and steel industry) in India through secondary data collection and water audits to identify the specific interventions to enhance water use efficiency and facilitate the process of setting up of guidelines and benchmarks for industrial water use to assist the policy.

(vi) "Sahi Fasal" Campaign

Creating awareness among farmers on micro-irrigation, soil moisture conservation and initiating dialogues among policy makers to improve procurement policies, effective pricing of inputs are key steps towards promoting the concept of Sahi Fasal. The campaign of sahi fasal was kick started in a workshop held in Amritsar, one of the over-exploited blocks of the country, on 14th November 2019. 2nd, 3rd and 4th Workshop in this

series were held in Delhi on 26-27 November 2019, Aurangabad on 13th January 2020 and Kurukshetra on 14th February, 2020 respectively, which were attended by thousands of farmers.

(vii) NWM Water Awards

In 2019, NWM for the first time came out with "NWM Water Awards" to draw national attention to critical aspects of water and promote innovations that offer solutions in 10 categories defined under the goals of the mission. The rationale was to support and incentivize solutions and share them with a larger audience to generate awareness and inspire.

The Awards were decided in a systematic process starting with nationwide advertisements in 81 newspapers – national and regional- inviting entries for the awards in a specified format for standardized, objective evaluation by screening and Jury committee constituted by the government. The NWM Water awards, 2019 were presented by Sri Gajendra Singh Shekawat, Hon'ble Minister for Jal Shakti on 25th September 2019 at a function in the Plenary Hall of the Vigyan Bhawan in a function graced by Sri Rattan Lal Kataria, MoS, Jal Shakti. 22 winners were awarded in different categories.

(viii) Water Talks

On the occasion of World Water Day on 22nd March, 2019, The 'WATER TALK' lecture series was launched and inaugurated by Shri U.P Singh, Secretary, DoWR,RD & GR.

The aim of 'WATER TALK' is to stimulate awareness, (thinking), build capacities of stakeholders and encourage people to become active participants

sustain life by saving water on earth. 'WATER TALK', the lecture series, wherein leading Water experts are invited to present inspiring and broadening perspectives on current water issues in the country.

NWM has so far organized eleven 'Water-Talks' on the topics - "Water for All", "Groundwater", "Water Conservation", "Ecology Inclusive Economy", "Agriculture, Groundwater and Energy nexus", "Water Conservation on Hiware Bazaar in Maharshtra and Dewas in Madhya Pradesh", "Innovation and Water", "Water Conservation in Banda District, UP", 'Groundwater Management and Governance in India', 'A New Water Strategy for India' and " Seechewal Model of Water Rejuvenation".

(ix) R & D Projects

NWM has funded two projects namely "Hydro-Geological Assessment and Socio-Economic Implications of Depleting Water Resources in Nainital, Uttrakhand" by CEDAR, Dehradun in collaboration with IIT Roorkee and another "Irrigation Efficiency Improvement through On-farm Water Management" By IIT, Roorkee at Bargi Command area in Madhya Pradesh during the year.

3.3. NATIONAL INSTITUTE OF HYDROLOGY (NIH)

3.3.1. INTRODUCTION

The NIH is established in December 1978 at Roorkee. The Institute is fully aided by the MoJS. The objectives of the Institute are:

- 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,
- 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 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. These Centres are: (1) Hard Rock Regional Centre (Belagavi), (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).

3.3.2. Studies and Research:

Major Research Areas (beyond XIIth Plan) are as under:

- 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

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

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

- Nuclear Hydrology
- Remote Sensing & GIS
- Soil Water
- Water Quality
- Hydro-meteorological observatory

During the year 2019-2020 (up to Dec. 2019), the Institute has published 118 papers in reputed international and national journals and proceedings of international and national conferences and symposia. During the year, 34 internal and 65 sponsored R&D studies were going on. 22 consultancy projects were completed and 38 are continuing in the year 2019-2020.

Some of the important R & D studies completed during the year include

Catchment scale evaluation of cold-arid cryospheric system hydrology for Ganglass catchment in Ladakh, Development of windows based NIH BASIN model for water resources assessment of river basins, Runoff modeling of Shyok River in Karakorum Range, Water availability analysis for Subarnarekha basin, Effect of climate change on sediment yield to Pong reservoir, Hydrological Investigation of springs of Baan Ganga watershed in Jammu & Kashmir, Groundwater flow modeling for lower Bina river watershed.

Some of the studies under progress include Assessment of environmental flows and development of habitat suitability curves for the aquatic species of Yamuna river and some western Himalayan streams, Impact of climate change on runoff and sediment yield for a major tributary of river Brahmaputra, Development of four pilot riverbank filtration demonstrating schemes in different hydro-geological settings for sustainable drinking water supply, Evaluation of seasonal extreme rain events for river basins across India, Development of water accounts for Subarnarekha Basin, Rejuvenation of selected village ponds in Baghpat, Ghaziabad, Muzaffarnagar and Meerut districts of Uttar Pradesh, Assessment of water resources in ungauged catchments of west flowing rivers of Karnataka.

One of the main objectives of the Institute is to transfer the developed technology to the target users. During the year 2019-20, the Institute has organized 32 training programmes for field engineers, scientists, researchers, etc. and organized जल संसाधन एवं पर्यावरण विषय पर राष्ट्रीय जल संगोष्ठी–2019.

3.3.3. National Hydrology Project:

Keeping in view the NHP objectives and initiatives, NIH is involved in the following activities of NHP:

- **Purpose Driven Studies (PDS)**: The R&D Session at NIH is coordinating research activities and reviewing & monitoring the progress of PDSs. One R&D Session was organized on 6-7 August, 2019. Total 41 PDS were approved during six R&D Sessions organized so far.
- **Training and Workshop**: During the year, 07 courses were organized by NIH at Roorkee, Chandigarh, Bhopal & Mizoram. Training reports of all the courses have been prepared. One Workshop was organized on "Integrated Water Resources Management (IWRM)" during 04 – 05 Sept. 2019 at NIH, Roorkee.
- **Centre of Excellence for Hydrologic Modelling**: two studies are under progress: (i) Integrated Assessment of the Impacts of Climate Change on the Hydrology of Narmada basin through Hydrological Modelling Approaches, and (ii) Integrated Management of Water Resources for Quantity and Quality in Upper Yamuna Basin up to Delhi and joint study with IIT Kharagpur on "Development Testing of a Large – Scale Conceptual Hydrological Model" is under progress.
- **Decision Support System (DSS):** A contract for Consultancy Services for Decision Support System (Planning & Management) including Maintenance and Updating of DSS (PM) for a period of 7.5 years was signed between NIH & M/s DHI (India) Water & Environment Pvt. Ltd., New Delhi on 5th August 2019. Inception report of the DSS (PM) has been submitted by DHI (India).

3.3.4. NMSHE Project: Integrated Hydrological Studies for Upper Ganga Basin up to Rishikesh

DST has approved a project proposal entitled *"Integrated Hydrological Studies for Upper Ganga Basin up to Rishikesh"* under the National Mission for Sustainable Himalayan Ecosystem (NMSHE).This project, which has been approved by the DST in January, 2016 at total cost of Rs.13.04 Crore, envisages to focus on issues of comprehensive integrated hydrological studies for upper Ganga basin up to Rishikesh. Following 11 sub-projects have been formulated with different study teams:

a) Development of hydrological database in Upper Ganga basin

b) Real-time snow cover information system for Upper Ganga basin

c) Glacial Lakes & Glacial Lake Outburst Flood (GLOF) in Western Himalayan region

d) Assessment of downstream impact of Gangotri glacier system at Dabrani and future runoff variations under climate change scenarios

e) Observation and modeling of various hydrological processes in a small watershed in Upper Ganga basin

f) Hydrological modeling in Alaknanda basin and assessment of climate change impact

g) Hydrological modeling in Bhagirathi basin up to Tehri dam and assessment of climate change impact

h) Study of river - aquifer interactions and groundwater potential in the upper Ganga basin up to Dabrani

i) Understanding of hydrological processes in study basin by using isotopic techniques

j) Environmental Assessment of Aquatic Ecosystem of Upper Ganga Basin

k) Water Census and Hotspot analysis in selected villages in Upper Ganga basin

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

During the year **2019-20,** the NERIWALM targets to conduct of **65** programmes for different stakeholders like officers, farmers, Women groups/ farmers and student. Total number of **1239** participants is benefited from such training programmes. The breakup of number of programmes and participants for different target groups is given in the Table.

Types of programme	Target Group	Target for 2019-20	Achievement (April to December, 2019)	Anticipated Achievement (Jan to March, 2020)
Two weeks training programme	Farmers	-	1	
One week training programme	Officers	5	5	1
	Farmers	-	0	
	NGOs	-	0	
	Student	-	19	
Three days training programme	Officers	15	2	3
	Farmers	10	3	3
	WUAs	06	1	1
	NGOs/SHGs	03	0	1
Two days training programme	Officers	-	1	
	Farmers	-	2	
	NGOs	-	0	
	Student	-	0	
One day training programme	Officers	-	2	
	Farmers	06	3	2
	WUAs	08	0	2
	Students	-	5	
ToT (One week)	Farmers	03	1	
	WUAs	03		
	NGOs	02	1	
Total Training		**61**		

Types of programme	Target Group	Target for 2019-20	Achievement (April to December, 2019)	Anticipated Achievement (Jan to March, 2020)
Seminar, Workshop, Conference	Officers	02	5	
	WUAs	02		1
	Farmers	-		
	Students	-		
Grand Total		**65**	**51**	**14**

3.5. NATIONAL MISSION FOR CLEAN GANGA (NMCG)

3.5.1. INTRODUCTION

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) dt. 7-10-2016 under EPA, 1986.

The Act envisages five tier structures at national, state and district level to take measures for prevention, control and abatement of environmental pollution in river Ganga and to ensure continuous adequate flow of water so as to rejuvenate the river Ganga as below:

- National Ganga Council under Chairmanship of Hon'ble Prime Minister of India,
- Empowered Task Force (ETF) on river Ganga under Chairmanship of Hon'ble Union Minister of Water Resources, River Development and Ganga Rejuvenation,
- NMCG,
- State Ganga Committees, and
- District Ganga Committees in every specified district abutting river Ganga and its tributaries in the states,

NMCG has a two tier management structure and comprises of Governing Council and Executive Committee. Both of them are headed by Director General, NMCG. Executive Committee has been authorized to accord approval for all projects up to Rs.1000 crore. Similar to structure at national level, State Programme Management Groups (SPMGs) acts as implementing arm of State Ganga Committees. Thus the newly created structure attempts to bring all stakeholders on one platform to take a holistic approach towards the task of Ganga cleaning and rejuvenation.

NMCG has signed Memorandum of Understanding (MoUs) with various Central Ministries such as Ministry of Human Resources Development, Ministry of Rural Development, Ministry of Railways, Ministry of Shipping, Ministry of Tourism, Ministry of Ayush, Ministry of Petroleum, Ministry of Youth Affairs and Sports, Ministry of Drinking Water & Sanitation and Ministry of Agriculture for synergizing their efforts for the common cause of Ganga Rejuvenation.

3.5.2 FUNDING & SANCTION OF PROJECTS

NMCG receives grants from GOI for implementing the Namami Gange Program. Allocations to NMCG from GOI are divided into four components viz.: (i) NRCP – Externally Aided Program, (ii) NRCP – Non Externally Aided Program, (iii) National Ganga Plan, and (iv) Ghat Works and Beautification of River Fronts. During the FY 2019-20 against Budget allocation of Rs. 1970.00 crore DoWR, RD & GR has released an amount of Rs. 1253.40 crore to NMCG. NMCG released an amount of Rs. 1972.55 crore (till 15.01.2020) to State Programme Management Groups and other implementing agencies for the implementation of project under Namami Gange.

3.5.3 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.

a. 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 31.12.2019 aggregate of 516.84 MLD capacity created and 96 MLD rehabilitated and sewerage network of 3010.45 km has been completed and made operational under NGRBA/ Namami Gange. Further, STP projects with additional treatment capacity of 3743.14 MLD new capacity and 1114.39 MLD rehabilitation Capacity, sewerage network projects of 5061.48 km have been sanctioned and are in various stages of implementation. NMCG has so far sanctioned 152 Sewerage Infrastructure projects at Rs. 23,423.44 Crore under Namami Gange Program. The overall statuses of these Sewerage Infrastructure Components are tabulated below:

State	No. of Projects	Total Sanctioned Cost (Rs. Crore)	Total Expenditure (Rs. Crore)	No. of Projects completed
Uttarakhand	34	1151.18	459.39	23
Uttar Pradesh	50	10407.31	2360.09	16
Bihar	30	5328.60	986.02	1
Jharkhand	2	156.12	119.04	1
West Bengal	22	3789.71	1010.84	3
Haryana	2	217.87	217.94	2
Delhi	11	2361.08	505.19	-
Himachal Pradesh	1	11.57	-	-
Total	**152**	**23423.44**	**5658.51**	**46**

Hybrid annuity based PPP model

Hybrid Annuity based PPP model (HAM) was approved by Government of India in May 2016. Since then NMCG has sanctioned 29 projects worth of Rs. 10816.81 crores. Out of these 13 projects have already been awarded, bids have been received for 3 projects and balance 13 are under tendering. For first set of projects - 82 Million Liters per Day(MLD) Sewage Treatment Plants(STPs) in Haridwar and 50 MLD STP in Varanasi, the concession agreements were signed on 11th October 2017. In Haridwar one 14 MLD STP has already become operational and another 68 MLD STP is expected to the operational by January 2020. 50 MLD STP in Varanasi is expected to operational by March 2020. Mathura sewage scheme (new 30 MLD STP and 20 MLD TTP and 37.3 MLD existing) is the first project under this concept, which has already progressed to complete second construction milestone. Other projects awarded under this model include 475 MLD STPs (425 existing and 50 MLD new) in Kanpur, 326 MLD STPs (254 MLD existing and 72 MLD new) in Pryagraj, 187 MLD STPs (22 MLD existing and 165 MLD new) in Howrah, Bally and Baranagar & Kamarhati) and 150 MLD new STP in Digha & Kankarbagh, in Patna. The construction in Kanpur and Prayagraj projects has already started.

b. Industrial Pollution:

The status of miscellaneous activities related to abatement of industrial pollution is as under:

- Re-inventorisation & identification of 1072 Grossly Polluting Industries (GPIs) on main stem of river Ganga and its tributaries completed in 2019.
- Inspection of 1072 GPIs has been commenced by 16 third party technical institutions w.e.f. April 2019. As on 11th December, 2019, inspection of 726 GPIs (647 by TPIs + 79 by CPCB) has been completed except 346 tanneries connected with CETP, Jajmau which are closed by UPPCB.
- In 2018, Third Party Inspection (TPI) of 961 GPIs completed by engaging 12 institutes of repute. Out of 961 inspections carried out (952 by Third Party technical institutes + 9 by CPCB) in 2018, 636 are complying and 110 are non-complying and 215 are self-closed. Action has been taken on 110 non-complying industries in which 110 GPIs are issued closure directions under Section 5 of the E(P) Act. Closure was ensured through District Administration.
- Industries are facilitated through Charter based participatory approach for reduction in water consumption, effluent generation and pollution load by adoption of cleaner technologies & waste minimization practices.
- Charters implemented for Pulp & Paper, Sugar, Distillery and Textile sectors.
- Zero Liquid Discharge achieved in molasses based Distilleries.
- Zero black liquor discharge achieved in Pulp & Paper sector in five Ganga River Basin States.

- Fresh water consumption reduced from 150-200 L/t of cane to < 50 L/t of cane in Sugar Sector.
- Percent compliance of GPIs increased from 39% to 69 % (2017 vs 2018).
- All GPIs in Ganga basin have been directed to install Online Continuous Effluent Monitoring System (OCEMS) at their outlet. The outlet data are directly uploaded on a server and SMS alert system for non-compliant units have been operationalized. As on 11th December, 2019, 899 out of 1072 GPIs have established OCEMS connectivity to CPCB server. SMS alert on Non-compliant status shared with CPCB/SPCB/Industry / Local Administration (DM Office).
- New 20 MLD CETP is being constructed at Jajmau (sanctioned cost Rs 617 crore) with Odour Control Systems, Zero Liquid discharge (ZLD) based pilot plant of 200 KLD capacity for demonstration and Modular Chrome Recovery System.
- Upgradation for 6.25 MLD CETP is sanctioned under Namami Gange for Rs. 13.87 crore for Mathura Textile Cluster with recycling of 50% of treated water and is under tendering.

C. MONITORING OF POLLUTION

- **Water Quality Monitoring**

➢ The monitoring of water quality of river Ganga is carried out under Namami Gange programme by Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) in 5 Ganga main stem States at 96 Manual Water Quality stations. Water quality of river Ganga is also carried out through a network of 36 Real Time Water Quality Monitoring Stations (RTWQMS). Additional 40 RTWQMS are also being set up.

➢ The observed water quality indicates that Dissolved Oxygen which is an indicator of river health has been found to be within acceptable limits of notified primary bathing water quality criteria and satisfactory to support the ecosystem of river across all seasons and also for almost entire stretch of river Ganga.

➢ Due to various pollution abatement initiatives taken by the Government under the Namami Gange Programme, the water quality assessment of river Ganga in 2019 has shown improved water quality trends as compared to 2014. The Dissolved Oxygen levels have improved at 21 locations, Biological Oxygen Demand (BOD) levels and Faecal coliforms have improved at 39 and 19 locations, respectively.

➢ Bio-monitoring of river Ganga is carried out on annual basis. It has been observed that water quality of Ganga supports diversified community structure and the river stretches show slight to moderate level of pollution with respect to Biological Water Quality Criteria (BWQC), which is a suggestive criteria considered by CPCB. The

bio-assessment results show improving trends in the biological water quality of the river.

- Strengthening of laboratories in terms of infrastructure, instrumentation and manpower of State Pollution Control Boards (SPCBs) of 5 Ganga main stem States viz. Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal is in progress under the project "Strengthening of Laboratories of SPCBs" sanctioned under Namami Gange programme at an estimated cost of Rs 85.97 crores.

- **River Surface Cleaning**

River surface cleaning services through trash skimmers have been hired for five towns. These trash skimmers are operational in, Patna, Sahibganj, Howrah, Nabadwip, and Delhi.

- **Ghat Cleaning**

IL&FS Environmental Infrastructure and Services Ltd. (IEISL) has been engaged for cleaning of 84 ghats in Varanasi. Similar ghat Cleaning activities have been taken up for cleaning of 87 ghats at Bithoor, Kanpur, Prayagraj and Mathura- Vrindavan in Uttar Pradesh at a cost of Rs. 12.97 crore for three years. Also Cleaning of 72 ghats of Haridwar, Uttarakhand has been taken up at a cost of Rs. 15.9 Crore for three years.

- **Real Time Water Quality Monitoring Stations (RTWQMS):**

There are 36 Real Time Water Quality Monitoring Stations (RTWQMS) installed and operational on main stem of river Ganga and its major tributaries. The data generated is centrally complied at CPCB. In addition to the existing 36 locations, 40 new sites have been identified for installation of Real Time Water Quality Monitoring Stations (RTWQMS).

CPCB completed survey of feasibility study of setting up 40 in May 2018. NOCs have been received for some of the proposed stations and bids have been floated through e-procurement portal on 20.11.2018. Pre-bid meeting with representatives of firms was held on 06.12.2018. 'List of Amendments' to the pre-bid meeting was published on 28.03.2019 in e-procurement portal, and bids were opened on 23.04.2019.

3.5.4 RIVER FRONT DEVELOPMENT:

Details of the River Front development project is as under:–

• Cost: Rs. 336.73 Crore • Expenditure: Rs. 283.56 Crore	• No. of Ghats: 20 (16 Complete) • Promenade: 6.6 km (5 km Complete) • Crematoria : 1 - Completed • Buildings: 3 Completed • Completed - Audio visual Theatre at Baharwa Ghat • Completed - Community cum Eco Centre at Collectorate Ghat and Community cum Cultural Centre at Raja Ghat.

Ghats/ Crematoria

Details of Ghats/ Crematoria taken up in states are as under:

Status of Ghats and Crematoria Projects

S. No	State	No. of Projects	No. Of			Sanctioned Cost (in Cr)	Revised Cost (in Cr)	Status					
			Ghats (G)	Crematoria (C)	Total (T)			Completed		Under Progress		Under Tendering	
								G	C	G	C	G	C
[I] Old Sanctioned Projects (before 2018)													
1	Uttarakhand	8	21	22	43	276.54	190.25	21	22	0	0	0	0
2	Uttar Pradesh	11	85	11	96	656.21	337.32	75	11	10	0	0	0
3	Bihar	6	12	1	13	156.98	63.78	9	0	3	1	0	0
4	Jharkhand	4	13	3	16	70.76	62.07	11	3	2	0	0	0
5	West Bengal	4	9	3	12	21.00	16.77	6	0	3	3	0	0
A	Sub Total	33	140	40	180	1181.49	670.19	122	36	18	4	0	0
[III] New Sanctioned Projects (in 2018-19)													
1	Uttar Pradesh	2	2	0	2	11.16	1.64	1	0	1	0	0	0
2	Bihar	4	12	2	14	29.08	39.36	0	0	9	2	3	0
B	Sub Total	6	14	2	16	40.237	41.00	1	0	10	2	3	0
C	Total (A + B)	39	154	42	196	1221.727	711.19	123	36	28	6	3	0
[IV] Clean Ganga Fund													
1	Uttarakhand	2	0	2	2	1.81	1.81	0	0	0	2	0	0
2	Uttar Pradesh	1	7	3	10	27.41	27.41	0	0	7	3	0	0
3	Bihar	2	9	1	10	43.71	43.71	0	0	9	1	0	0
4	West Bengal	1	7	0	7	5	5	0	0	7	0	0	0
D	Sub Total	6	23	6	29	77.93	77.93	0	0	23	6	0	0
E	Grand Total (C + D)	45	177	48	225	1299.66	789.12	123	36	51	12	3	0

3.5.5 RURAL SANITATION AND GANGA GRAM:

a) Rural Sanitation:

Department of Drinking Water & Sanitation has constructed 10,83,688 no. of Individual Household Latrines (IHHLs) in 4465 Ganga bank villages and declared Open Defecation Free (ODF), for which NMCG has released Rs. 829.0 Cr. to Department of Drinking Water & Sanitation.

b) 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.

Apart from construction of Individual Household Latrines (IHHLs) and other activities, Solid Liquid Waste Management (SLWM) is one of the priority activities under the Ganga Gram scheme, which is being implemented in all the identified 4465 villages along the Ganga River. NMCG has released Rs. 124.0 Cr. to Department of Drinking Water & Sanitation for the implementation of the project.

Status of SLWM is given below:

State	No. of Villages	Total Gram Panchayats	DPR prepared	DPR Approved	Implemen-tation Completed	Ongoing	Fund released by NMCG for SLWM (Rs. in Cr.)
Bihar	468	271	12	0	0	5	62.08
Jharkhand	66	26	26	26	0	26	0
Uttar Pradesh	1604	1011	966	909	3	750	20
Uttarakhand	222	130	130	130	83	101	0
West Bengal	2105	224	80	76	0	76	41.88
Total	**4465**	**1662**	**1214**	**1146**	**86**	**958**	**124.0**

Afforestation is also an another priority activity under the Ganga Gram scheme, for which NMCG has released Rs. 67.0 cr. to the State Forest Departments of the 5 Ganga basin States.

3.5.6 BIODIVERSITY CONSERVATION:

NMCG is working with State Forest Departments, Wildlife Institute of India (WII), Dehradun and Central Inland Fishery Research Institute (CIFRI) for conservation of endangered Aquatic species and their habitats in Ganga river basin.

NMCG has awarded a project to Wildlife Institute of India (WII), Dehradun on "Biodiversity Conservation & Ganga Rejuvenation" to support the aquatic biodiversity conservation of the river Ganga at a cost of Rs. 24.84 cr. for three years (2016-19). The project ended in December 2019.

Under this project:

a) Base line survey was carried out in the main stem of Ganga River to understand the present status and distribution of the identified aqualife of Ganga River. Survey identifies more than 49% of the Ganga river stretch with high biodiversity values in terms of

presence of priority aquatic species such as river dolphins, otters, gharials and aquatic birds.

b) Crucial habitat for endangered aquatic species such as River Dolphins, Gharials, turtles, along with other higher vertebrates species being conserved with the support of local communities.

c) Rescue-Rehabilitation Centers for aquatic wildlife and Nature Interpretation Centers established and operationalized at Narora, Sarnath, Bhagalpur and Kolkata

d) Developed a cadre of over 1000 trained Ganga Prahari to support the biodiversity monitoring, rescue operations, plantation and cleanliness activities under Ganga Rejuvenation Programme.

3.5.7 AFFORESTATION:

Forestry Intervention for Ganga is being implemented by the five Ganga bank States under the Namami Gange programme, as per the DPR prepared by FRI Dehradun. NMCG has sanctioned Rs. 269.76 cr. for afforestation work in 29624 ha. land during the year 2016-20. For implementation of balance work under the FRI-DPR, MoEF&CC has agreed to carry out afforestation through the State & Centre CAMPA fund.

3.5.8 ECO TASK FORCE/GANGA TASK FORCE:

Ganga Task Force(GTF), a unit of Territorial Army, Ministry of Defence was established by NMCG during the year 2017 with the following objectives.

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 GTF has started its activities in Prayagraj, Kanpur & Varanasi.

3.5.9 E-FLOW:

Central Government issued an Order vide gazette notification number S.O. 5195(E), dated the 09.10.2018 specifying the minimum environmental flows to be maintained in river Ganga in the identified stretches. The notified e-flow regime is as follows:

I. For Upper Ganga river basin (origin to Haridwar):

S. No.	Seasons	Months	(%) Percentage of Monthly Average Flow Observed during each of preceding 10-daily period
1	Dry	November-March	20
2	Lean	October, April & May	25
3	High Flow	June to September	30**

**30% of monthly flow of high season flow.

II. For river Ganga below Haridwar upto Unnao:

S. No.	Location of Barrage	Minimum flow releases immediately downstream of barrages (In Cumecs) Non-Monsoon (October to May)	Minimum flow releases immediately downstream of barrages (In Cumecs) Monsoon (June to September)
1	Bhimgoda	36	57
2	Bijnor	24	48
3	Narora	24	48
4	Kanpur	24	48

3.5.10 GANGA KNOWLEDGE CENTER (GKC):

Ganga Knowledge Center (GKC) was approved as a sub component of Institutional Strengthening Component (ISC), wherein, role of GKC was defined as Project Management Group (PMG) of NMCG under the project proposal of MoEF & CC's project namely – "World Bank Assistance to National Ganga River Basin Authority". Under Namami Gange Programme, many activities which were proposed as a part of proposal of World Bank funded GKC were expanded and made different activities under Namami Gange Programme such as communication and outreach, Research and Development and GIS cell establishment and many others. In this regard to consolidate and review the activities of GKC a meeting was held on 21.08.2017 wherein it was decided that GKC is conceptualized as a decision support system (DSS) for NMCG, drawing upon the larger mandate of NMCG as provided under Authority Order 2016.

3.5.11. GEOGRAPHICAL INFORMATION SYSTEM (GIS):

Geographical Information System (GIS) comes under Ganga Knowledge Centre of Namami Gange Programme. The scope of work under GKC includes development of a high quality web portal for River Ganga, an integrated information base (MIS) on projects, a state-of-the-art-library, a comprehensive Geographical Information System (GIS) based mapping system of the Ganga basin, arrangements for supporting research, pilots and new ideas and engaging stakeholders through forums, events, publications, interactive models.

Significance of GIS framework has brought a paradigm shift in visualization of all crucial spatial and non-spatial information of Ganga basin. Further decision support system developed with GIS domain helps in efficient decision planning making, execution and monitoring of projects as well as providing platform for central repository of all data related to Ganga and geo-tagging of infrastructure created under this program as well monitoring of projects.

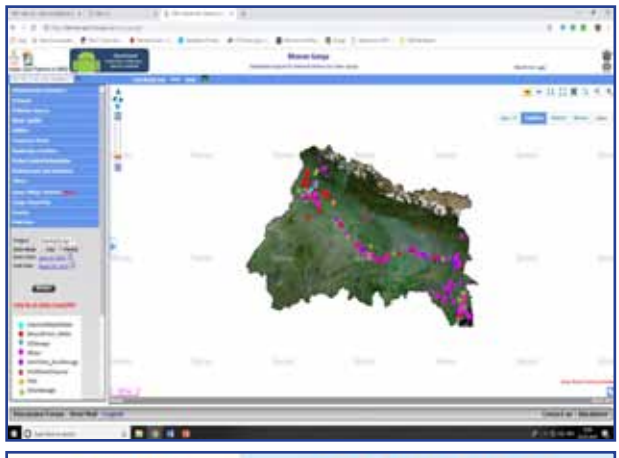
a. Generation of High Resolution DEM & GIS ready database for part of River Ganga for NMCG

GIS Project on "Generation of high resolution DEM & GIS ready database for part of River Ganga for NMCG" is executing by Survey of India, Dehradun. Deliverables of mapping would be Digital Elevation Model/ Digital Terrain Model (The bare

earth model has vertical accuracy better than 50 cm), contour of 1.0 m, ortho-photos (25 cm Ground sampling distance or better), GIS ready dataset, outlet/vent of sewerage and other discharge from all dwelling units, industrial, commercial and all type of other institutions mapping from the sources outlet to the public drainage network, the entire public network integrated with the present project mapping, crematoria, ghats, RFD, solid waste disposal sites, STP/ETP/ CETP etc. for defined project area of interest. GIS ready datasets including high resolution DEM would facilitate major support to Ganga river basin management by embedding GIS in different aspects of planning and implementation at National/ State/Local level; bringing GIS support in decision making; enable a sound process of monitoring development and identifying critical hotspots.

b. Reconstructing the Ganga of the past from Corona archival imagery

GIS Project on "Reconstructing the Ganga of the past from Corona archival imagery" is executing by IIT Kanpur. Deliverables of Corona project would be as make all processed Corona images available for upload on public portal such as Bhuvan Ganga, develop an Atlas of the Ganga River showing a comparison between 1960s and present, establish the reference condition of the Ganga river and quantify the changes in morphological characteristics and land use/land cover within the Ganga valley between 1960s and present, propose a policy document on 'desirable' landuse within the Ganga valley, capacity building for Corona image processing through training workshops including development of a working manual.



3.5.12 GANGA MONITORING CENTER (GMC):

It is proposed to have three categories of GMCs viz. Category A, B and C on the basis of infrastructure, expertise and human resource of the organisations / institutions involved, optimum inter GMC distance and water quality / quantity monitoring parameters. The administrative, financial, operational and sustainability aspects of such monitoring centres have also been conceptualized. Concerning the implementation aspect, first Meeting on GMC for Comprehensive Qualitative & Quantitative Study on Drains Discharging Wastewater in River Ganga / Tributaries and their Impact on Water Quality was held on April 24, 2019 in NMCG. The proposals received earlier have been revised for allocation of work related to monitoring of major sources of pollution like drains, STPs, ETPs, CETPs and their impact on water quality of river Ganga.

For identification, designation and allocation of work at GMC-A level, fresh proposals received from Aligarh Muslim University (AMU), Wildlife Institute of India (WII), Central Inland Fisheries Research Institute (CISR-CIFRI), National Environmental Engineering Research Institute (CSIR-NEERI), Pollution Control Research Institute-BHEL (PCRI) and Indian Institute of Toxicology Research (CSIR-IITR) were examined for technical and financial competence and the final administrative concurrence of the same is in progress. Draft MoU, highlighting agreement terms on role & responsibilities; physical / financial scope; work allocation plan; methodological aspects of monitoring and its frequency; guidelines for data generation & submission; fund flow arrangement etc. has been shared with the aspirant institutes under consideration for GMC-A category.

3.5.13. BIOMONITORING:

Bio-monitoring of river Ganga at various locations (Haridwar to Diamond Harbour in West Bengal) has been carried out to study the Benthic Macro Invertebrates, which reflects the biological health of river. It has been observed that water quality of Ganga supports diversified community structure and the river stretches shows slight to moderate level of pollution with respect to Biological Water Quality Criteria (BWQC) which is a suggestive criteria considered by CPCB. Total 352 sampling events have been done for bio monitoring; Number of families observed is more than 500.

3.5.14. RESEARCH AND DEVELOPMENT INITIATIVES:

Alternative Methods of Wastewater treatment – Bioremediation

Various new initiatives for pollution abatement in River Ganga have been initiated. Some of these are outlined in brief: -

i. Innovative technology for drain treatment

Following types of treatment technologies have been proposed by the proponent for the treatment of drains.

a. In-situ bioremediation of sewage

- Microbe based
- Enzyme based
- Nutrient based
- Nano technology based

b) Micro-bubble purification

c) De-watering tube purifying system

d) Phytorid treatment technology/ Constructed wetland

e) Eco Bio Block

f) Green Bridge

Modular (containerize) sewage treatment plant (Mobile)

ii. Study by National Environmental Engineering Research Institute (NEERI) on Special Quality of Ganga Water

CSIR-NEERI has been engaged by NMCG to conduct study on "Assessment of Water Quality and Sediment Analysis to understand the Special Property of Ganga River". The study has been completed by NEERI and report submitted to NMCG. Further, a study to understand non-purefying properties of river Ganga in both water and sediment has also been awarded in August 2017. Interim report has been submitted by NEERI.

3.5.15. Important Activities

- **Inauguration and Foundation Stone Laying of projects in Haridwar:** Inauguration and foundation stone laid for the projects worth Rs. 5,894 Crore at Chandi Ghat in Haridwar on 21st February 2019.

- **Foundation Stone Laying Ceremony at Bihar:**

- Foundation stone of sewerage projects worth Rs 2785.23 Cr in Chhapra, Bihar was laid on 28th February 2019. Six Ghats with a cost of 19.75 crore at Sonepur was also inaugurated.

- **Inauguration and Foundation Stone Laying Ceremony of projects for Uttar Pradesh worth nearly Two Thousand Crore:** Inauguration and foundation stone laid at Lucknow on 7th March 2019 for several projects under Namami Gange programme worth over Rs 1969.57 crore for preventing the flow of 28.5 crore litres of sewage per day into river Gomti, Yamuna Ram Ganga, Kali and Ganga from 14 towns in Uttar Pradesh.

- **Global Water Awards:** NMCG has been awarded Distinction in the category 'Public Water Agency of the Year' by Global Water Intelligence at the Global Water Summit in London on 9th April 2019.

- **World Water Week 2019, Stockholm, Sweden (August 25-30,2019):** NMCG participated in the World Water Week 2019 held at Stockholm, Sweden during 25th to 30th August, 2019.

- **6th India Water Week:** NMCG participated in the 6th India Water Week-policy and technology showcase event organized by MoJS, held from 24th to 28th September 2019 at Vigyan Bhawan and the exhibition at Indira Gandhi National Centre for Arts (IGNCA), New Delhi.

- **Inauguration of Sarai project in presence of King and Queen of Sweeden:** Their Majesties, King Carl XVI Gustaf and Queen Silvia of Sweden, Chief Minister of Uttarakhand, Shri Trivendra Singh Rawat, Union Minister of Jal Shakti,

Shri Gajendra Singh Shekhawat, Dr. Maja Fjaestad, Secretary of State, Sweden, Mr. KlasMolin, Ambassador of Sweden to India, Shri Rajiv Ranjan Mishra, Director General, NMCG, and Ms. Monika Kapil Mohta, Ambassador of India to Sweden, inaugurated the 14 MLD Sewage Treatment Plant (STP) at Sarai in Haridwar on 5th December 2019.

MEETING OF NATIONAL GANGA COUNCIL:

Hon'ble Prime Minister Shri Narendra Modi chaired the first meeting of the National Ganga Council in Kanpur, Uttar Pradesh on 14th December 2019.

India Water Impact Summit-2019: MoJS, Government of India and the Centre for Ganga River Basin Management and Studies (cGanga) led by IIT Kanpur organized the 4th India Water Impact Summit from 5-7 December 2019 at the Vigyan Bhawan, New Delhi.

3.6. NARMADA CONTROL AUTHORITY (NCA)

3.6.1. ORGANISATION:

The Authority is headed by the Secretary, DoWR, RD & GR, as its Chairman, with Secretaries of the Union Ministries of Power, Environment, Forests and Climate Changes, 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 Independent Members appointed by the Central Government and four part time Members nominated by party States.

The Review Committee for Narmada Control Authority (RCNCA) is headed by the Union Minister of Jal Shakti, D/o WR, RD & GR comprises Union Minister for Environment, Forest and Climate Change 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), and Regional Offices at Indore, Bhopal & Vadodara, Liaison Unit in New Delhi and Field Offices at Mandla, Hoshangabad, Kevadia and Indore.

3.6.2. PROGRESS OF SARDAR SAROVAR PROJECT

a. SARDAR SAROVAR DAM

As per the decision of 89th Meeting of NCA held on 16th June, 2017, the work of lowering of gates of SSP was completed by the GoG and reservoir filling schedule to fill the SSP reservoir up to FRL EL. 138.68 m during 2017 was finalized by the SSRRC in its 51st meeting held on 27.06.2017. Due to lesser rains in the year 2018-19, the

SSP reservoir could be filled only up to EL. 128.79 m in the month of November, 2018. An expenditure of Rs.68, 620.18 crore has been incurred on Sardar Sarovar Project upto September, 2019.

b. NARMADA MAIN CANAL

Works on Narmada Main Canal (NMC) from Head Regulator to Gujarat Rajasthan border (Ch. 0 to 458.318 Km) is completed. Works of 74.0 Km. Narmada Main Canal in Rajasthan is also complete.

In Gujarat the works on all branch canals of NMC from 0 to 458.318 Km have almost been completed except Kachchh Branch Canal. 99.24 % of distribution systems in NMC from 0 Km to 144.5 Km up to minor level almost completed. In Rajasthan portion, works pertains to Distributaries (Flow & Lift) including Sub-distributaries, minors & Sub-minors were almost completed to 99.77%.

c. UTILIZATION OF WATER

The Narmada water is being supplied to Central Gujarat/ North Gujarat and Saurashtra region of Gujarat. From the Sardar Sarovar Dam Govt. of Gujarat has created an irrigation potential of 16.56 Lakh ha. out of total planned 17.92 Lakh ha. up to minor level and the CCA development up to Sub-minor level is 14.874 Lakh ha. Against 18.45 Lakh ha till June, 2019. Around 10,67,277 ha area has been irrigated & drinking water supply to the quantity of 1542.69 MCM provided till June, 2019 during the water year i.e. from July, 2018 to June, 2019 in Gujarat. Rajasthan has also created an irrigation potential of 2.45810 Lakh ha to utilize Narmada water. Drinking water benefits is being provided to 1541 Villages & 03 Towns Sanchore, Bhinmal and Jalore Town of Jalore District in Rajasthan. 1.8 Lakh ha area has been irrigated till December, 2018 during the water year i.e. July, 2018 to June, 2019.

3.6.3. RESETTLEMENT AND REHABILITATION ACTIVITIES

SARDAR SAROVAR PROJECT (SSP) PROGRESS OF R&R

Upto 31st December, 2019

Dam height	State	No. of Villages affected	Total PAFs	Total PAFs resettled	Balance PAFs likely to be resettled
138.68m.	Gujarat	19	4763	4763	Nil
	Maharashtra	33	4180	4180	Nil
	Madhya Pradesh	178	23599	23599	Nil
Total		**230**	32542	32542	Nil

3.6.4. ACTIVITIES OF ENVIRONMENT SECTION

Narmada Control Authority, through its Environment Sub-group (ESG) and Environment Committee with the active cooperation of all Party States, have planned environmental safeguard measures and implemented *pari-passu* with the progress of work on the project. Various environment safeguard measures planned and implemented through concerned State Government Agencies

were compiled and documented the draft Report entitled "Environment Safeguard Measures: Sardar Sarovar Project; December 2019".

This draft report was then circulated to all party States (viz Madhya Pradesh, Maharashtra, Gujarat and Rajasthan) vide its letter No. NCA/Env/Report 2019/667, dated 11.11.2019 and the party States were requested to go through the Report and suggest any corrections/modifications.

No comments were received from party States within stipulated time which vindicated the Report. In view of this, it was proposed to the Chiarman of Environment Sub-group of NCA to finalize the report to be circulated amongst Party States. The final report was then approved by Chairman, Environment Sub-group of NCA in December 2019.

3.6.5. MAJOR ACHIEVEMENTS

Project benefitted in terms of irrigation capacity, hydropower generation, mitigating drought condition and fulfilling water requirement of drinking and industries but also effective resolution of all grievances of all PAFs with complete participation of Grievance Redressal Authorities (GRAs) through quasi judicial process along with implementation of environmental safeguard measures. The filling of Sardar Sarovar Reservoir upto FRL i.e. EL 138.68 m was achieved on 15th September, 2019 with proper dam safety inspection & verification of submergence areas through satellite imageries with participation of BISAG in a phased manner with the cooperation of all party States of Gujarat, Madhya Pradesh, Maharashtra and Rajasthan. NCA has been included in the NHP project as an implementing agency for implementation of RTDAS in Narmada basin.

3.6.6. ENERGY MANAGEMENT CENTRE (EMC)

Energy Management Centre (EMC), NCA, Indore is planning, scheduling & coordinating activities of Power Generation of Sardar Sarovar Power Complex (River Bed Power House 6X200 MW & Canal Head Power House 5X50 MW) in consultation with Western Regional Power Committee (WRPC), Western Regional Load Dispatch Centre (WRLDC), Central Electricity Authority (CEA) and beneficiary States & concerned State Generation/Transmission departments. The total energy generation at SSP complex was 3234.257 MUs (2613.720MUs from RBPH & 620.537 MUs from CHPH) during the FY 2019-20 (01st April, 2019 to 06th January, 2020*)*. The net power available at bus bar in RBPH switchyard (after allowing for station auxiliaries) was shared among the party States i.e. Madhya Pradesh, Maharashtra and Gujarat in the ratio of 57%, 27% and 16% respectively as prescribed by the NWDT Award. During the FY 2019-20 (up to 06th January, 2020) SSP machines were operated for 2649:33 hours in synchronous condenser mode.

Performance of River Bed Power House (RBPH), SSP [6 x 200 MW]

The total energy generation achieved from RBPH from 1stApril, 2019 to 06th January, 2020 was 2613.720 MUs. The anticipated energy generation from RBPH, SSP for remaining month of 2020 of F.Y. 2019-20 is 160.72 MUs.

Performance of Canal Head Power House (CHPH), SSP [5 x 50 MW]

The total energy generation achieved from CHPH from 1st April, 2019 to 06th January, 2020 was 620.537 MUs. The anticipated energy generation from CHPH, SSP for remaining months of F.Y. 2019-20 is 275.81 MUs.

3.6.7. WATER ACCOUNTING

NCA prepares Annual Water Account (AWA) of Narmada Basin and the AWA for the year 2017-18 has been prepared and circulated to the party States. The Utilizable Flow at Sardar Sarovar Dam during the water year 2017-18 was 15.62 MAF (19264.62 MCM). The share of Utilizable Flow for Madhya Pradesh was 10.18 MAF/12556.41 MCM, Gujarat 5.02 MAF/6192.20 MCM, Maharashtra 0.14 MAF/172.00 MCM and Rajasthan 0.28 MAF/344.01 MCM. The actual utilization by the party States were 12.96 MAF/15993.14 MCM, with break up as Madhya Pradesh 7.54 MAF/9299.63 MCM, Gujarat 5.40 MAF/6665.99 MCM, Maharashtra NIL and Rajasthan 0.02 MAF/27.52 MCM.

3.7 BRAHMAPUTRA BOARD

3.7.1 INTRODUCTION

The Brahmaputra Board was constituted by an Act of Parliament received the assent of the President on 1st September, 1980 and published for general information 'THE BRAHMAPUTRA BOARD ACT, 1980 (No. 46 of 1980)'. An act to implementation of measures for the control of floods and bank erosion in the Brahmaputra Valley and for matters connected therewith.

The jurisdiction of Brahmaputra Board covers all the North Eastern States including Sikkim and North Bengal. The organizational setup of Brahmaputra Board has been modified after restructuring order issued by GoI on 10th January, 2019 which provides for establishment of regional offices headed by Dy. Chief Engineer/Superintending Engineer in all the State capitals of North Eastern States.

A High Powered Review Board to oversee the work of the Brahmaputra Board was constituted with the Union Minister of Jal Shakti as the Chairman, Chief Minister of Assam, Manipur, Meghalaya, Nagaland, Tripura, Arunachal Pradesh, Mizoram, and Union Minister / Ministers of State - Finance, Surface Transport, Power, Agriculture, Ministers of State- Jal Shakti and Secretary, DoWR, RD & GR, Chairman of CWC as Members and Chairman of Brahmaputra Board as the Member-Secretary. Member (RM), CWC is a permanent Invitee.

The Members of the High Powered Review Board appointed by the Government of India vide Resolution No. 2(17)/80/FC/460 dated 19.03.1982 and as amended vide Resolution No.23/8/925-ER dated 01.10.1992.

A standing Committee constituted under sub-section (8) which shall perform, exercise and discharge such of the functions, powers and duties of the Board as may be prescribed or as may be delegated to it.

3.7.2 THE NORTH EASTERN HYDRAULIC & ALLIED RESEARCH INSTITUTE (NEHARI):

This institute was established in 1996. The main functions of NEHARI are

material testing, carrying out Hydraulic model studies etc. Facilities such as Hydraulic Laboratory with model trays and flumes and Laboratories for testing soil, concrete, other construction materials and foundation rock exist in the institute. An Advisory Committee of NEHARI was constituted under the Chairmanship of Chairman, Brahmaputra Board with members from CWPRS, CSMRS, CGWB, IITG, WAPCOS, NERIWALM & NWA-Pune to govern the functions of NEHARI. A meeting was held on 13.08.2018 with representatives from different organizations expressed their keen interest in Hydraulic model studies after learning the facilities and capabilities of the institute in conducting physical Hydraulic Model Studies. A Committee consisting with members from CWC, CSMRS, CWPRS and Brahmaputra Board was constituted to assess the present condition in existing infrastructure, equipments, machineries and requirement of new equipments in different laboratories at NEHARI for making it fully functional vide Notification dated 16.11.2018 In the 2nd meeting of Advisory Committee of NEHARI was held on 11.01.2019 at Brahmaputra Board headquarters and decided to revitalize NEHARI on priority basis on the report of the committee visited on 10.01.2019.

3.7.3 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.

3.7.4 ACHIEVEMENTS OF THE YEAR

a. Master Plans

Preparation of Master Plans (Status)

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 as under-

Part	River	Number	Status
Part-I	Main stem Brahmaputra River	1	Approved by Government of India
Part-II	Master Plan on Barak River and its tributaries except Dhaleswari	1	Approved by Government of India
Part-III	Master Plan on tributaries of the Brahmaputra and rivers of Tripura including Majuli Island and Dhaleswari	68	Approved by Government of India-50 Master Plans Approved by the Board and submitted to MoWR,RD&GR for approval- 3 Master Plans Awaiting for decision on International Aspects & Inter-state ramification – 1 Master Plan

Part	River	Number	Status
			Further updated as per suggestion of MoWR,RD&GR utilising tools of modern technology – 6 Master Plans Draft Master Plan under preparation - 3 Master Plans New Master Plans identified - 5 Sub-basins Preparation of Master Plan of Imphal river Basin of Manipur is taken up. 8 numbers of approved Master Plans to be taken up for updating/modification.
Total		**70**	

Three Master Plans viz. Teesta, Tangani and Kynshi are under process of approval of Govt of India. Modification of six draft Master Plans is continued. Three Master Plans are under preparation and five are in the identified list for preparation.

b. 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. Status of these Projects is summerised in ***Annexure-X.***
- Scientific dissemination and improvement of water management practices of Local Tribes and indigenous people of NE region has been taken up in association with NERIWALM. Four areas of NE region have been identified in First Phase.
- Soft measures for Flood and Erosion Management-Brahmaputra Board has proposed to take up a Pilot project at two sites viz. Right Bank down-stream of Kordoiguri and at Dakhinpat in Majuli Island in collaboration with IIT, Guwahati for "hard & soft measures" termed as Bio-engineering method for Flood and Erosion Management.
- For preparation of Detailed Project Report to check flash flood and erosion in BTC area by Pagla/Baitamari, Aie, Beki, Pagladiya, Sankosh, Gangia and Saralbhanga rivers, work has been allotted to WAPCOS as Project Management Consultant (PMC).

c. 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. It is situated between latitudes 26º45'N and 27º10'N, and longitudes between 93º40'E and 94º35'E. 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 then, 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. Works under Immediate measures, Emergent measures, Phase I, Phase-II & III have been 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 the then MoWR, RD&GR (presently MoJS) and Ministry of DoNER allocated Rs 207 crore for the same. Execution of the scheme is in progress. 70% of the works completed so far and targeted to complete by March 2020. Rs. 325.26 crore spent till December 2019 for erosion protection works in Majuli since 2004. Board has assigned work of office campus at Majuli to NPCC as PMC for monitoring of protection work and for further survey and investigation activities.

Financial Implication

For Expenditure incurred by Brahmaputra Board up to 31st December 2019 on undertaking measures protection of Majuli Island from floods and erosion are detailed below-

Rs. in crore

No.	Description	Estimated Cost	Actual Expr.	Remarks
1	Phase-II & Phase-III	115.99	127.48	Completed
2	New scheme "Protection of Majuli Island from flood and erosion of river Brahmaputra"	233.57		
	i. Funded by MoDoNER	207.00	131.88	Physical progress 70%
	ii. Spent from Grants-in-aid of MoWR,RD&GR	26.57		Work yet to start

Protection of Majuli Island from flood and erosion of River Brahmaputra (Bankrevetment) at Salmara, Majuli

ii. Restoration of Dibang and Lohit Rivers at Dhola - Hatiguli

The scheme "Avulsion of Brahmaputra at Dhola-Hatighuli (Measures for diversion of River Dibang and Lohit to their original courses) with ancillary anti-erosion measures" prepared by Government of Assam was approved by Ministry of Water Resources, Government of India in the Technical Advisory Committee (TAC) meeting held in May, 2002 and Brahmaputra Board was entrusted with the responsibility for execution of the scheme. Total expenditure of Rs 78.46 crore has so far been incurred by Brahmaputra Board on execution of works envisaged under Phase-I, Phase-II, Phase-III and Phase-IV. With construction of 'Tie-Bund', the lands which hitherto were part of main channel of Dibang River are now completely protected from floods and erosion. The desertees from the areas have returned back and restarted cultivation in a big way.

Eleven villages under Doomduma Revenue Circle in an area of about 1500 ha. are now protected from floods, since the year 2004 onwards, on construction of retirement bund at Hatighuli area on Left bank of Lohit river. Phase – IV works completed in March 2016 with details of expenditure as under:

Sl. No.	Description	Estimated Cost (Rs. in crore)	Actual Expenditure (Rs. in crore)
1	Phase-IV (December 2013)	54.43	56.59 (up to December 2018)
2.	Phase-V	24.95	

For continuation of benefits accrued from the schemes implemented in four phases of works of scheme Avulsion of Brahmaputra at Dholla Hatghuli, it is proposed to convert the existing tie-bund into a full-flagged embankment at Bahbari. DPR of Rs. 24.95 crore techno-economically cleared by CWC. The work is under process of implementation.

iii. Other Schemes:

a. Protection of Balat Village in Meghalaya on River Umngi (Estimated cost Rs. 10.18 crore): Part –I of scheme amounting Rs. 5.63 crore was taken up for implementation and completed in January 2016. DPR for Phase-II works has been techno-economically cleared by CWC for Rs. 12.87 crore. The work is under process of implementation.

Works executed for Protection of Balat Village from erosion of River Umngi in South West Khasi Hills District of Meghalaya

b. Anti-erosion works for protection of Mankachar, Kalair-Alga International Border area from erosion of river Brahmaputra, Assam:

Work of bank revetment works with boulder spur has to be modified substituting boulder with Geo-bag due to ban by Hon'ble High Court of Meghalaya on boulder extraction. Out of three major components of works of RCC porcupine screens completed and the retirement bund also almost completed. Due to changed scenario after laying of RCC porcupine screens, a sub-committee of TAC-BB has visited the area and on the basis of report of sub-committee & decided by the TAC-BB implementation of third component i.e. Bank Revetment works is being carried out. The work is being executed in three groups. Work of Group I has been completed. Work of Group II is in progress and 8% progress has been achieved up to December 2019. Work order for Group III has been issued and work is likely to be started shortly. Scheme is expected to be completed by March 2020. Expenditure up to December 2019 is Rs. 15.12 crore.

Works at Mnakachar, Kalair-Alga

c. Anti-erosion measure in Masalabari in Assam near International Border: Masalabari area, located near Indo-Bangladesh Border on the right bank of River Brahmaputra in Dhubri District is highly affected for a reach of about 25 km downstream of Dhubri Town. Masalabari Border out post (BOP) of Border Security Force (BSF) in the India-Bangladesh International Border is situated near the erosion affected area. The mighty Brahmaputra has already eroded away many RCC buildings of BSF and remaining are also under threat of erosion The scheme was techno-economically cleared by CWC for an amount of Rs. 5.76 crore and completed during the Year 2018-19.

Bank revetment works at Masalabari India-Bangladesh International Border, Dhubri District, Assam

d. New Schemes taken up during the year

Following two schemes in the State of West Bengal has been taken up for implementation during the year.

- Anti-Erosion measures for bank protection of Bhajaner Charra, Nishiganj area under Cooch Behar Block No. II along the left bank of River Mansai at Cooch Behar district in West Bengal.Execution of work is in progress. 19% physical progress has been achieved up to December 2019 with expenditure of Rs 0.11 crore.
- Bank protection work at Bhogdebri area on the Right Bank of River Mansai in Cooch Behar district in West Bengal execution of work is in progress. 57% physical progress has been achieved up to December 2019 with an expenditure of Rs 1.01 crore.

e. Feasibility Studies for channelization of river Brahmaputra- Mathematical Model Studies of River Brahmaputra with emphasis on climate change:

To assess the efficacy of the proposal, a research project "Mathematical Model Study of River Brahmaputra with emphasis on climate change" to understand the river dynamics, its problem as well as finding out long term sustainable solution to the complex problem of floods and erosion has been taken up and an MoU in this regard has been signed with IIT Guwahati at a cost of Rs.2.80 crore to conduct the Mathematical Model studies. IIT, Guwahati has taken up 2D model in the study after demonstration of 1D model (BRAHMA-ID Model). Validation of 2D model with physical Model at NEHARI is in progress. It is expected to complete the study by March 2020. Up gradation of NEHARI has been taken up.

f. Monitoring of Schemes under Flood Management Program - A State Sector under Central Plan– in Brahmaputra and Barak Velley

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 X Five Year Plan. Details of schemes taken up by Government of India under Flood Management Programme, that is been monitored by Brahmaputra Board is shown below:

Plan	No of schemes	Central Assistance (Rs in crore)	Remarks
X	74	146.20	
XI	201	1063.58	
XII	64	197.27	XI plan scheme=141.8966 crore XII plan scheme=55.37 crore
17-18		266.67	XI plan scheme=21.18 crore XII plan scheme=245.49 crore
2018-19		152.96	
2019-20		17.29	
Total		**1843.97**	

Proposal received during 2019-20:

State	No of Proposal received	Recommended for release of Central Share	Shortfall documents sought	Under Examination
Assam	69	21	48	Nil
Sikkim	1	1	Nil	Nil
Nagaland	3	Nil	3	Nil
Manipur	10	10	Nil	Nil

g. Organising of seminar

Soil Erosion in North Eastern Region: The seminar on "Soil Erosion in North Eastern Region" held on 15.02.2019 was inaugurated by Dr P. K. Misra, Additional Principal Secretary to the Prime Minister of India and a well known domain expert in Disaster Management. It had three technical sessions covering the topics "Soil Erosion and Dynamics of river Brahmaputra", "Dynamics of Soil erosion" and "Inputs for Soil Erosion Study and its Control". 98 participants representing 45 organisations attended the seminar and took part in its deliberations. The Seminar came out with a very important suggestion that eco-friendly system and bio-engineering approach for controlling bank erosion should be adopted. Environmental friendly measures which could be combination of engineering measures and soft (vegetative) measures may be adopted wherever possible.

h. 10th Meeting of High Powered Review Board of Brahmaputra Board

Union Minister of Jal Shakti had reviewed the Activities of Brahmaputra Board in its 10th Meeting of High Powered Review Board of Brahmaputra Board held on 09.11.2019 at Guwahati, Assam.

3.8. BETWA RIVER BOARD (BRB)

3.8.1. ORGANISATION AND ITS COMPOSITION

A decision to harness the available water resources of Betwa River was taken in a meeting held on 22nd July 1972 between Chief Ministers of Uttar Pradesh and Madhya Pradesh. Further Uttar Pradesh and Madhya Pradesh in a meeting held on 9th December 1973 agreed for setting up of a tripartite Control Board for the speedy, smooth and efficient execution of the various inter-state projects of both the States. 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 BRB after promulgation of BRB Act 1976. The benefits and cost of the above projects are being shared equally by both the State Governments.

The Union Minister (Jal Shakti) 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, CWC manages the activities of the Board.

3.8.2. Rajghat Dam Project

The Rajghat Dam with appurtenant structures has been constructed across River Betwa to provide Irrigation facilities to 1.38 lakh ha. In Uttar Pradesh and 1.21 lakh Ha. In Madhya Pradesh with power generation of 45 MW through Rajghat Hydro Electric Project at the toe of dam on left flank. The costs as well as benefits of the project are to be shared equally by both

the States. Construction works of Dam and Power House have been completed.

a. Land Acquisition

The dam submerges 38 villages in U.P. and 31 villages in M.P. State. Compensation in M.P. area is completed. In U.P. the District Administration, Lalitpur had paid the land compensation of 25 villages and Betwa River Board have paid the compensation of 13 villages by mutual negotiation except the property compensation of village Kalapahar between FRL and MWL and the case has already been submitted for its valuation to the concerned Department of Uttar Pradesh.

b. Planning and Present status of Rajghat Power House works

The estimate of Rajghat Hydro Electric Project at 1997 price level was Rs. 131.26 crores which included Rs. 58.41 crores for the civil works. The further revised cost of the civil works of Power House is Rs. 66.89 crores at December, 1999 price level and same has been furnished by BRB to MPPGCL. MPPGCL have contributed Rs. 59.51 crores. The total expenditure incurred on civil works of Rajghat Power House till June, 2008 is Rs. 63.15 crores.

The three unit of Power House have been tested and commissioned during 1999-2000. From 1999-2000 to 2011-2012 (Twelve years) total units of power generation from Rajghat Power House are 12229 lakh units. The power generation during 2019-20 (upto 31.12.2019) is 617 lakh Units.

c. O & M Estimate of Rajghat Dam Project during Transition Period

An amount of Rs. 9.00 Crore per annum towards O&M has been prepared and submitted to both the party states by Chief Engineer, BRB for transition period until the project is taken over by one of the party states. The matter was discussed in Secretary, MOWR level meeting held on 02.02.2006. It was agreed to operate O&M account of the project from October, 2005. Both the states agreed to contribute their due share towards O&M head in addition to pending liabilities under capital cost. The State of U.P. have paid only Rs. 146.50 crores and M.P. has paid only Rs. 86.14 crores against their due share upto December, 2019.

3.9. TUNGABHADRA BOARD

3.9.1. INTRODUCTION

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 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. Board exercises powers of a State Government under various codes, manuals, rules and regulations while discharging the functions on administrative matters of the project.

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 the agreed ratio. 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 reviewed from time to time during the water year. The regulation of water is carried out in accordance with the agreed working table.

3.9.2. Physical and financial achievements and new initiatives

a. Irrigation Wing

The Tungabhadra Reservoir has been filled up to the full reservoir level 497.740 m (1633.00 ft.) in this year. The inflow into the reservoir from April 2019 to December 2019 is 11774.56 Million Cubic Meters (M Cum) (415.827 TMC). The utilization by the Karnataka State, Andhra Pradesh & Telangana till end of December 2019 during the water year 2019-20 is as per the table below:

Sl. No.	Name of the State	Allocation as per KWDT Award (TMC)	Prorata Entitlement on Abstraction (TMC)	Actual Utilization (in TMC) (As on 31.12.2019)	Actual Utilization (in M Cum) (As on 31.12.2019)
1.	Karnataka	138.990	116.044	72.208	2044.640
2.	Andhra Pradesh	66.500	55.521	34.968	990.150
3.	Telangana	6.510	5.435	0.000	0.000
	Grand Total	**212.000**	**177.000**	**107.176**	**3034.790**

The Evaporation losses from April 2019 to December 2019 is 128.84 M Cum (4.550 TMC) to be shared by the State Govts of Karnataka and Andhra Pradesh in the ratio of 12.5 : 5.5 . The water surplussed over spillway is 5912.80 M Cum (208.815 TMC) in addition to 451.16 M Cum (15.933 TMC) of water drawn for extra power generation by the power houses on both the sides without jeopardizing the Irrigation interests during the water year 2019-20.

b. Hydro Electric Scheme

Two Power Houses are being maintained by the Tungabhadra Board with a total installed capacity of 72 MW and a target of 156 million units of power generation is envisaged during the water year 2019-20. Against this, the power generated till end of December 2019 is 118.22 million units shared between Karnataka and Andhra Pradesh in the ratio of 20:80.

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 comprising 3 units of 2.75 MW each generated 23.95 million units upto December 2019. The power generated is purchased by the Transmission Corporations of Karnataka and Andhra Pradesh in the agreed ratio of 20:80.

One more new Mini Hydel plant was implemented at the head of Rayabasavanna canal of Tungabhadra Project under BOOT system through an independent power producer 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., 31.08.2013. The total project capital cost is Rs.11.50 Crores. The Mini Hydel plant comprising single unit of 1.4 MW has generated 4.562 million units upto December 2019. The power generated is purchased by the GESCOM, Gulbarga (Karnataka) at the rate of Rs.2.80 per unit. Anticipated power generation from January 2020 to March 2020 will be 40 million units worth of Rs.12 Crores.

c. Fisheries Wing

The Tungabhadra reservoir has a water spread area of 378 Sq.km at full reservoir level. 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 for the year 2019-20 was awarded to M/s Koppal Fisheries Co-Operative Society, Koppal for Rs.109 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 December 2019 is Rs.23.64 lakhs.

3.9.3. DIAMOND JUBILEE CELEBRATION OF TUNGABHADRA PROJECT (1945-2019)

Tungabhadra Project was taken up for construction with laying of foundation stone on 28th February 1945 by His Highness the Prince of Berar on the left bank and His Excellency Sir Arthur Hope, Government of Madras on the right side as a joint venture of the Governments of Hyderabad and Madras. Tungabhadra Project stepped into 75th year of its foundation day on 28th February 2019.

3.10. POLAVARAM PROJECT AUTHORITY

3.10.1. INTRODUCTION

Polavaram Irrigation Project (PIP) is a multi-purpose irrigation project which is on the river Godavari near Ramayyapeta village of Polavaram mandal, about 42km upstream of Sir Arthur Cotton Barrage, where river emerges out of last range of the Eastern Ghats and enters the plains in West Godavari District of Andhra Pradesh State. It envisages construction of a dam to create ultimate irrigation potential of 2.91 Lakh Ha. The project also envisages generation of 960 MW of hydro power, drinking water supply to a population of 28.50 Lakh in 540 villages, diversion of 80 TMC of water to Krishna river basin.

The Project has been declared as a National Project as per section 90 of AP Reorganisation Act, 2014. Central Government is funding 100% of the

remaining cost of the irrigation component only of the project for the period starting from 01.04.2014. Government of Andhra Pradesh is executing the irrigation component of the project on behalf of Government of India. The Power component of the project is being executed by APGENCO.

In pursuance of the Andhra Pradesh Reorganization Act, 2014, the Central Government constituted a Governing Body for Polavaram Project Authority by the Ministry of Water Resources Notification dated 28th May, 2014. The Authority is playing an important role in executing the project in guiding WRD in all important aspects of the project execution such as designs, monitoring of the progress, quality control, land acquisition & rehabilitation (LA and R&R) of the project affected people etc. M/s WAPCOS Limited has been engaged for Project Monitoring & Coordination Consultancy Services and CSMRS, New Delhi as Quality consultant.

3.10.2. COST OF THE PROJECT

Approved cost of PIP is Rs. 10151.04 Cr at 2005-06 price Level. Thereafter, 1st Revised Cost Estimate of the project was approved by the Planning Commission for Rs. 16,010.45 Cr at 2010-11 PL vide lr dated: 08.05.2017.

The 2nd Revised Cost Estimate at 2017-18 PL has been examined in CWC and was placed before Advisory Committee of MoWR RD&GR in its 141th meeting held on 11.02.2019. The same has been accepted by the TAC for an amount of Rs.55,548.87 Cr.

Subsequent to the approval of Advisory Committee of DoWR, RD&GR, a Revised Cost Committee (RCC) has been formed under the Chairmanship of JS & FA of DoWR, RD & GR on 02.04.2019 to examine the cost escalation of Polavaram Irrigation Project.

3.10.3. STATUS OF LAND ACQUISATION AND RESETTLEMENT & REHABILITATION

A total 371 habitations of 222 revenue villages in 8 mandals are coming under submergence area and working area for Head works in West Godavari and East Godavari districts in Andhra Pradesh. Out of these, 167 Revenue villages in 5 Mandals (1. Chinturu, 2. V R Puram, 3. Yetapaka 4.Kunavaram 5. Devipatnam) are in East Godavari District and 55 Revenue villages in 3 Mandals (1. Polavaram 2. Kukunoor 3. Velairpadu) are in West Godavari District. The Total No. of PDFs (Project Displaced Families) as per 2nd RCE after survey (2017-18) 1,05,601. Out of 1,05,601 PDFs, 34672 PDFs are in West Godavari District and 70929 PDFs from East Godavari District.

Total land requirement of the project due to construction of the project is 1,66,423 Acres. So far, total land acquired for the project is 1,10,095 Acres. Total project displaced families are 1,05,601, out of that total of 3922 nos of PDFs have been shifted to 26 nos of new R&R colonies till date.

3.10.4. PHYSICAL AND FINACIAL ACHIEVEMENTS

The Project is in an advanced stage of progress. The Physical & Financial Progress of Polavaram Irrigation Project as submitted by Water Resources Department, Government of Andhra Pradesh up to November, 2019 is as follows:

S. No	Description	% of Physical progress (up to Nov, 2019)
1	Earthwork	84.20%
2	Concrete	70.76%
3	Structures	53.67%

S. No	Description	% of Financial progress (up to Nov, 2019)
1	Head works	65.16%
2	Right main canal	90.20%
3	Left main canal	71.27%
Overall Project		71.52%

3.10.5. EXPENDITURE ON THE PROJECT

Total an expenditure of Rs.16,538.79 Cr has been incurred on the project till end of November, 2019.

Funds released/ reimbursement by Central Government:

Central Assistance of Rs. 562.47 Cr was provided to the State under AIBP till March, 2014. Central Government 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. An amount of Rs. 6764.16 Cr has been released by Govt. of India so far for execution of project after declaration of project as National project including the expenditure towards establishment charges of PPA.

3.11. KRISHNA AND GODAVARI RIVER MANAGEMENT BOARDS

3.11.1. 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 constituted the Apex Council for supervision of the functioning of the Godavari River Management Board and Krishna River Management Board vide Gazette Notification dated 29th May, 2014, 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.

First meeting of the Apex Council was held on 21.09.2016 under the Chairpersonship of Hon'ble Minister (MoWR, RD&GR) to sort out the issues of the States of Andhra Pradesh and Telangana pertaining to Krishna River Management Board.

3.11.2. KRISHNA RIVER MANAGEMENT BOARD (KRMB)

The KRMB was constituted vide Gazette Notification No: S.O.1391 (E) dated: 28th May, 2014 in accordance with sub-sections (1), (4) and (5) of Section 85 of the Andhra Pradesh Reorganisation Act, 2014.

Subsequent to formation of the Board, various issues related with the functioning of the Board as mandated in the Andhra Pradesh Reorganisation Act, 2014 were discussed in meetings with the senior officers of the States of Telangana and Andhra Pradesh. Besides various technical meetings, 10th and 11th

Board meetings were held on 09.08.2019 and 09.01.2020 to sort out the issues of water sharing for drinking and irrigation water requirements and also power sharing through Nagarjuna Sagar and Srisailam Projects and orders were issued accordingly.

DoWR, RD & GR has constituted a committee under chairmanship of Chairman, KRMB to resolve the issue of Krishna water supply to Chennai. Two meetings of the committee were held on 09.01.2019 and 18.06.2019 at Hyderabad. During 2019-20 water year as on 13.01.2020, a quantity of 5.520 TMC water was released at Srisailam reservoir and the quantity realized at A.P.-T.N. border was 4.416 TMC.

Efforts in the Technological Advances

The Krishna River Management Board (KRMB) took a step towards technological advances by launching its website as "krmb.gov.in" mainly for water accounting. The project authorities have started uploading the data of inflows, outflows and water levels in various reservoirs. This helps KRMB to account for the water utilization in each reservoir/ canal system. This also facilitates in issuing water release orders by the KRMB.

3.11.3. GODAVARI RIVER MANAGEMENT BOARD (GRMB)

The GRMB was constituted vide Gazette Notification No: S.O.1403 (E) dated: 28th May, 2014 in accordance with Section 85 of the Andhra Pradesh Reorganisation Act, 2014. Subsequent to formation of the Board, various issues related with the functioning of the Board as mandated in the Andhra Pradesh Reorganisation Act, 2014 were discussed in 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 Board level.

During 2019-20, 8th meeting of GRMB was held on 09.08.2019. In the meeting, Board approved the budget estimate for FY: 2019-20 amounting to Rs.7.00 Cr, enhanced the financial power to Member Secretary, GRMB to Rs. 20.00 Lakh from the existing limit of Rs. 10.00 Lakh in each case, empowered Chairman, GRMB to delegate financial powers to Member Secretary/ any other officer as per requirement of GRMB Secretariat, discussed GRMB Working Manual and, approved revised Recruitment Rules of GRMB. Besides, Members from the States of Andhra Pradesh and Telangana agreed to provide the list of approved projects in Godavari basin, the matter of re-constitution of committee for power scheduling from Upper and Lower Sileru Hydro-electric projects by APGENCO was decided to be taken up by Ministry of Power. After technical clearance of Middle Kolab Multi Purpose Project of Odisha by GRMB, the issue was discussed again as raised by GoTS. As the project was not cleared by TAC, the Chairman suggested to take up the matter with CWC for consideration of their concerns before clearance of the project by TAC.

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CHAPTER-8

PUBLIC SECTOR ENTERPRISES

DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

8. Public Sector Enterprises

1.0 Water And Power Consultancy Services Limited (WAPCOS)

1.1. INTRODUCTION

WAPCOS Limited is a "MINI RATNA-I" Public Sector Enterprise under the aegis of the MoJS, DoWR, RD & GR, Govt. of India with a Vision "A Global Leader in Consultancy and Engineering, Procurement & Construction (EPC) providing Integrated & Customized Solutions for Sustainable Development of Water, Power and Infrastructure Projects". The Mission is "Sustained Profitable Growth, Excellence in Performance, Use of State-of-the-art Technical Expertise, Innovativeness and Capacity Building to Meet Society's Needs Globally". The quality management systems of WAPCOS comply with the Quality Assurance requirements of ISO 9001:2015 for Consultancy Services in Water Resources, Power and Infrastructure Development Projects.

1.2. FIELDS OF SPECIALIZATION

Water Resources	Power	Infrastructure
• Irrigation, Drainage and Water Management • Ground Water Exploration and Minor Irrigation • Flood Control and River Morphology • Dam and Reservoir Engineering • Water Bodies & Lake Conservation • Agriculture • Watershed Management • Natural Resources Management	• Hydro Power • Thermal Power • Pumped Storage Projects • Transmission & Distribution • Rural Electrification • Non-conventional Sources of Energy • Smart Grids	• Water Supply, Sanitation and Drainage • Environment • Ports & Harbours and Inland Waterways • Urban and Rural Areas Development • Roads and Highway Engineering • Buildings & Townships • Ropeways

The Company provides Concept to Commissioning Engineering services for developmental projects in India and Abroad.

1.3 RANGE OF CONSULTANCY SERVICES

WAPCOS spectrum of services covers a wide range of activities e.g.

• 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 USP of WAPCOS include Survey & Investigation/Pre-Feasibility/DPRs for more than 550 Projects in Irrigation, Water Resources & Agricultural etc. contributing to development of over 17 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 300 Projects in the fields of Irrigation, Hydro/ Thermal Power, Ports & Harbours in India and Abroad. Similarly, in Hydro-Power Sector; WAPCOS has completed more than 52 Hydro-Power Projects in 19 Countries with an installed capacity of more than 21,600 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.

1.4. REGISTRATION WITH INTERNATIONAL ORGANIZATIONS

WAPCOS is registered with various International Financial Institutions like World Bank, Asian Development Bank, African Development Bank, JICA, United Nations Office for Project Services, French Development Agency, German Development Bank, New Development Bank, Asian Infrastructure Investment Bank, European Investment Bank and European Bank for Reconstruction and Development.

1.5. OPERATIONS ABROAD

In the year 2008-2009, WAPCOS had presence in 8 countries that has expanded to 51 countries by year 2019-2020. Apart from India, WAPCOS has successfully completed/on-going consultancy assignments in countries covering Asia, Africa, Eurasia CIS, South America, North America, Pacific Islands & Europe providing consultancy services in different countries including Angola, Afghanistan, Austria, Benin, Bhutan, Burundi, Botswana, Cambodia, Cameroon, Central African Republic, Chad, Czech Republic, DR Congo, Eswatini, Ethiopia, Fiji, Georgia, Ghana, Guinea Conakry, Indonesia, Jordan, Kenya, Lao PDR, Lesotho, Liberia, Malawi, Maldives, Madagascar, Mongolia, Mozambique, Myanmar, Nepal, Niger, Nigeria, Poland, Papua New Guinea, Rwanda, Senegal, Sierra Leone, Sri Lanka, Suriname, Tanzania, Tajikistan, Togo, Timor

Leste, Uganda, Uzbekistan, USA, Vietnam, Zambia, Zimbabwe. WAPCOS comprising of highly qualified professionals, vibrant management and excellent infrastructural facilities is poised to meet the challenges of the 21st century very effectively. WAPCOS operates in all the states of India through 103 project offices spanning across all Government and Private sectors, with the pride of having involved in almost all the premier Government of India schemes such as Deen Dayal Upadhyay Gram Jyoti Yojana, IPDS, PMGSY, PMKSY, PMAY, Skill India, Namami Gange etc.

1.6. DIVIDEND

During the year 2018-19, a dividend of Rs. 43.00 per Equity Share of Rs.100 each for the year ended 31.03.2019 aggregating to Rs. 43.00 Crore, being 43% of the paid up capital of the Company, has been paid. The total outgo on this account comes to Rs. 51.84 Crore, which includes Dividend Tax of Rs. 8.84 Crore. This is the highest ever Dividend paid since the Inception of the Company.

1.7. STRATEGIC INVESTMENT IN NPCC

- A strategic investment of Rs.79.80 Crore was made in March, 2019 by WAPCOS in "National Projects Construction Corporation Limited (NPCC)" – a Mini Ratna Category-I CPSE under MoJS. NPCC is primarily engaged in PMC jobs for building border infrastructure, constructing rural roads and buildings for various Ministries, Government Agencies and PSEs. It is now become a subsidiary of WAPCOS. The additional charge of the post of CMD NPCC has been assigned to CMD WAPCOS.
- WAPCOS-NPCC have been combined to derive synergy from their strengths of Engineering, Procurement and Construction, accelerate water resources, power and infrastructure projects in India and to promote bilateral cooperation with other countries under the guidance of the Government of India.

1.8. AWARDS FOR WAPCOS

CBIP AWARD 2019 – "Best Consultancy Organization in Water Resources Sector"

1.9. 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, Canals, Buildings, Water Treatment Plants, Sewage Treatment Plants, Protection of Archaeology Sites, Tourism Infrastructure, Heritage 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 been able to secure projects under the following Schemes: -

(i) Innauguration of Rafting Expedition (Ganga Aamantran) from Ramkund Bathing Ghat, Devprayag, Uttarakhand - under Namami Gange Program-

The inauguration of Rafting Expedition (Ganga Aamantran) was organized by WAPCOS Limited as executing agency on behalf of NMCG, Government of India & State Program Management Group, Government of Uttarakhand at Ramkund Bathing Ghat, Devprayag on 10-10-2019 under Namami Gange Program. The expedition was originated from Ramkund Bathing Ghat, Devprayag in the presence of Shri Gajendra Singh Shekhawat, Hon'ble Cabinet Minister, MoJS, Government of India, Shri Teerath Singh Rawat, Hon'ble Member of Parliament, Pauri Garhwal, Uttarakhand, Shri Dhan Singh Rawat, Hon'ble State Minister, Uttarakhand, Shri Vinod Kandari, Hon'ble Member of Legislative Assembly, Devprayag, Shri Mukesh Kohli, Hon'ble Member of Legislative Assembly, Pauri and other eminent guests.

(ii) Atal Mission for Rejuvenation and Urban Transformation (AMRUT) -WAPCOS is the Project Development and Management Consultant (PDMC) for this Scheme in Bihar, Madhya Pradesh, Haryana and Meghalaya. WAPCOS has also been appointed for the preparation of DPRs for AMRUT projects in Rajasthan.

(iii) Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) - WAPCOS is the Quality Monitor on behalf of Rural Electrification Corporation and Project Management Agency and Third Party Inspecting Agency 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.

(iv) Integrated Power Development Scheme (IPDS)– WAPCOS is engaged as Third Party Independent Evaluation Agency – Energy Accounting (TPIEA-EA) and 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, Goa, Maharashtra, Jammu & Kashmir, Ladakh and Himachal Pradesh.

(v) Pradhan Mantri Sahaj Bijli Har Ghar Yojana 'SAUBHAGYA' -WAPCOS is working as REC Quality Monitors (RQM) on behalf of Rural Electrification Corporation, New Delhi for the Projects under SAUBHAGYA in the State(s) of Arunachal Pradesh, Karnataka, Manipur, Meghalaya, Mizoram and Uttar Pradesh.

(vi) Mhara Gaon Jagmag Gaon 'MGJG Scheme' in Haryana State- Dakshin Haryana Bijli Vitran Nigam Ltd. (DHBVN) has engaged WAPCOS as Project Management Agency (PMA) for the works under Mhara Gaon Jagmag Gaon and Feeder Sanitization Program for Urban Feeder Schemes.

(vii) Manual on Storm Water Drainage System- Realizing the necessity of having a state-of-art Manual of Storm Water Drainage Systems, Ministry of Housing and Urban Affairs (MoHUA) awarded work of preparation of first national 'Manual on Storm Water Drainage System' to WAPCOS Limited.

(viii) Smart City Mission:-Under Smart City Mission, WAPCOS has been assigned the role of Project Management Consultant for two smart cities i.e. Kohima, Nagaland which was selected in second round and was ranked 24th whereas Aizawl, Mizoram was selected in Third round and was ranked 27th.

1.10. CORPORATE SOCIAL RESPONSIBILITY

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 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 programs in backward areas, Swachh Bharat activities including construction of toilets, School Sanitation, Hygiene and Healthcare Programme for under privileged people, Upliftment of deprived society, and Development of infrastructure etc.

Rain Water Harvesting Tank constructed at Tilonia, Rajasthan

1.11. 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 14 years.

Shri Gajendra Singh Shekhawat, Hon'ble Minister, MoJS, in the presence of Shri Rattan Lal Kataria, Hon'ble Minister of State, MoJS and Ministry of Social Justice and Empowerment, Shri U.P. Singh, Secretary and Smt. T. Rajeshwari, Additional Secretary, MoJS, receiving Dividend of Rs. 51.84 Crore (inclusive of Dividend Tax) for the year 2018-2019, from Shri R.K. Gupta, CMD WAPCOS.

Shri U.P. Singh, Secretary, DoWR, RD & GR, MoJS, being presented a Cheque of Rs. 79.80 Crore by Shri R. K. Gupta, CMD WAPCOS towards purchase consideration for acquiring 98.89% shareholding of NPCC, in the presence of Senior Officers of DIPAM and DoWR, RD & GR, MoJS and WAPCOS

Stator Lowering, Punatsangchhu-I, Hydro Electric Project, Bhutan

"Consultancy Services for the construction of the 66/33/22kV transmission and Distribution network in Monrovia and Bomi/Grand Cape Mount Countries" in Liberia.

1.12. COMMENDATIONS

WAPCOS successfully completed/ completing consultancy assignments in countries covering Africa, Asia, CIS, Eurasia, Europe, North America, Oceania, Pacific Islands, South America, USA and is operating in 50 Countries, at present.

Ministers, Ambassadors and Leaders of Delegations from 30 countries attended the Company's Golden

Jubilee Celebrations and presented 39 Commendation Certificates to the Hon'ble Minister, MoJS, Government of India, for the contribution of WAPCOS by developing projects and touching lives of people in these countries.

The visiting delegations conveyed gratitude to the Government of India for partnering in socio-economic development in their countries through the company for projects funded by World Bank, African Development Bank, Asian Development Bank, Japan Bank for International Cooperation, United Nations Office for Project Services, French Development Agency, German Development Bank, New Development Bank, Asian Infrastructure Investment Bank, European Investment Bank, European Bank for Reconstruction and Development and Grants/Lines of Credit of Government of India.

BANGLADESH

Mr. Dipankar Mondal, Leader of the Delegation,
Power Grid Company of Bangladesh

BENIN

Mr. Agnidè Emmanuel LAWIN, Leader of the Delegation,
Ministry of Water and Mines, **Republic of Benin**

BHUTAN

Mr. Dasho Yeshi Wangdi, Secretary, Ministry of Economic Affairs,
Royal Government of Bhutan

BURUNDI

H.E. Mrs. Stella Budiriganya, Ambassador Burundi
Ministry of Hydraulic, Energy and Mines, **Republic of Burundi**

CAMBODIA

Mr. Sok Sophally, Leader of the Delegation,
Ministry of Rural Development, **Kingdom of Cambodia**

FIJI

Mr. Bhavesh Kumar, Chairman, Water Authority, **Republic of Fiji**

2.0 NATIONAL PROJECTS CONSTRUCTION CORPORATION LTD (NPCC)

2.1. INTRODUCTION

NPCC was established on 9th January 1957 as a Premier Construction Company to create necessary infrastructure for economic development of the Country. NPCC Limited is a "**MINI RATNA**" (Category-I) and "**ISO 9001:2015**" accredited Public Sector Enterprise under the aegis of the Union MoJS and is well established in the Country with its Registered Office at New Delhi, Corporate Office at Gurugram and 14 Zonal Offices in the state capital of different states.

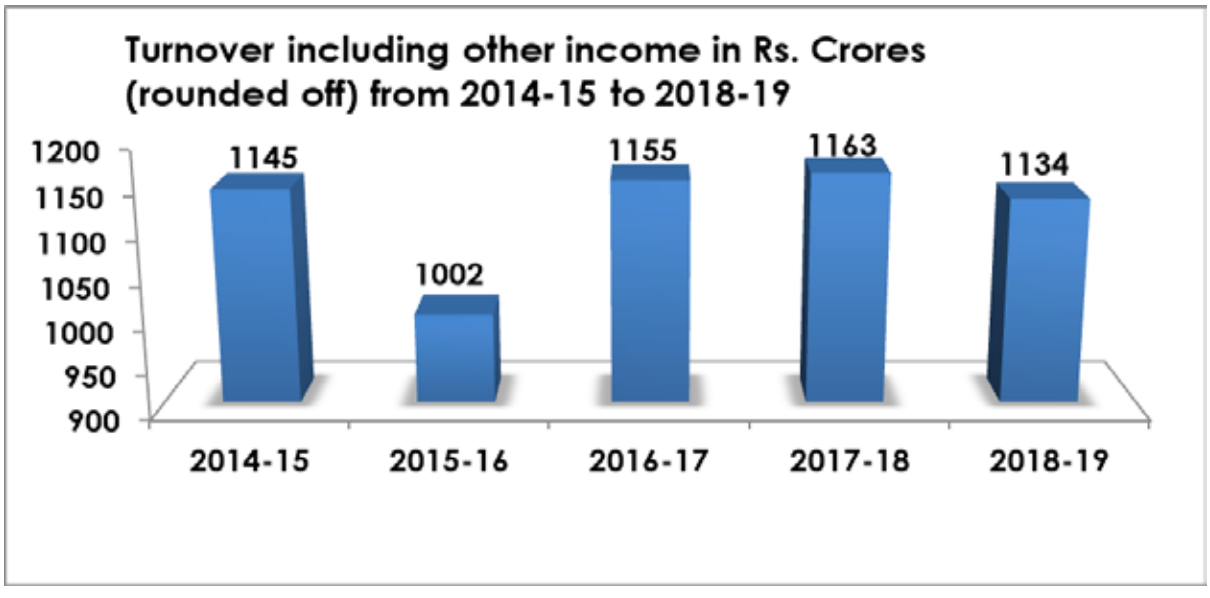
2.2. FIELDS OF SPECIALIZATION

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.

2.3. FINANCIAL STATUS

The authorized capital of the corporation is Rs. 700 Crores and its Paid up Capital is Rs. 94.53 Crores. The Corporation achieved a turnover including other income of Rs. 1134 Crores (rounded off) during 2018-19. The net worth of corporation is Rs 182.96 Crores with profit of Rs 19.37 Crores as on 31.03.2019.

The turnover from 2014-15 to 2018-19 has been indicated in table below:



2.4. MAJOR WORKS SECURED DURING 2019-20

NPCC secured business for executing projects for various Ministries/ Govt. Departments/ Organizations as their "Extended engineering Arm" like MoJS, Ministry of Home Affairs, Ministry of Health, Ministry of Food Processing Industries, Banks, Ministry of Earth Sciences, Ministry of AYUSH,

Assam Rifle, Ministry of Youth Affairs & Sports, Indira Gandhi National Tribal University (IGNTU), SC& ST Development Department of Govt of Odisha, Dr. Rajendra Prasad Central Agricultural University (RAU), Central Agricultural University as well as State Governments. NPCC had added new clients like Kendriya Vidyalaya, Central Excise at Dwarka, Guru Ghasidas Vishwavidyalaya, Hydro Engineering College, Navodaya Vidyalaya Samiti, Karnataka Slum Development Board, National Highways and Infrastructure Development Corporation Limited (NHIDCL), Archaeological Survey of India (ASI), Jharkhand Urban Infrastructure Development Company (JUIDCO), Software Technology Parks of India (STPI) etc. for its value addition for infrastructure development of country. Few projects listed below:

- Construction of Kendriya Vidyalaya at various locations across Country
- Construction for upgradation of ITI at Jabalpur, Rewa, Sagar and Shadol for MP Housing Board.
- Bone & Joint Hospital Srinagar
- Establishment of Industrial Biotech Parks (ITBP) at 02 locations in J&K Region for Council of Scientific and Industrial Research (CSIR).
- Building Works in Ahmedabad, Raipur, Ambala and Jammu for Central Ground Water Board (CGWB).
- Indoor Sports Complex and Food Court of IIT Kharagpur in West Bengal.
- Construction of LS, US Quarter & Site Development of Police Line Campus at Pakur, Jharkhand for Jharkhand Police Housing Corporation Limited(JPHCL).
- Development of Amenities for Archaeological Survey of India (ASI).
- Construction of 1120+4120 dwelling units in 56+206 number of G+3 blocks in Jharkhand under Pradhan Mantri Awas Yojna(PMAY) for Jharkhand Urban Infrastructure Development Company (JUIDCO)
- Construction of 1,00,000 Sq. Ft. Build-up space for Software Technology Parks of India (STPI) Patna, Bihar

2.5. Major Works completed:

- Construction of Border Out-Posts (BOPs), Roads & Fencing Works for Ministry of Home Affairs (MHA) worth Rs. 2258.74 Cr.
- Construction of various buildings for Assam Riffles worth Rs. 1588.52 Cr.
- PMGSY Roads (640 in No.) in 6 districts of Bihar i.e. Bhojpur, Buxar, Rohtas, Kaimur, Patna, Nalanda worth Rs. 1166.29 Cr.
- PMGSY Roads at different locations in Jharkhand worth Rs. 969 Cr.
- PMGSY Road Works in Paschim Medinipur, West Bengal Valuing for 722 Cr.
- Construction of flood lighting works for MHA worth Rs. 572 cr.
- Development and Construction of various buildings for Indira Gandhi National Tribal University Campus

at Amarkantak (M.P) worth Rs. 480 cr.

- Construction of High Altitude Road along Indo-China Border at Leh in the state of J&K (Phobrang to Charste) Valuing for 323.98 Cr.
- Construction of High Altitude Road along Indo-China Border at Leh in the state of J&K (Karzok to Chumar) Valuing for 313.41 Cr.
- Head Race Tunnel from Dharasu Adit from 12.00 Km to 16.00 Km Surge shaft, Expansion Chamber, Ventilation Shaft & Excavation of Penstock & Appuertunances Valuing for 186.85 Cr.
- Dolaithabi Barrage, Manipur Valuing for 141.66 Cr.
- Construction of Toilets Blocks for MCL under Swachh Vidyalaya Abhiyan at schools in different dist. of Odisha Valuing for 92.27 Cr.
- Construction of B.G Single Tunnel T3 on Katra- laole section of Udhampur-Srinagar-Baramulla rail link project Valuing for 79.01 Cr.
- Construction of Regional Staff College for Punjab National Bank (PNB)
- Lucknow Valuing for 36.89 Cr.
- Construction of Office Building of Punjab & Sindh Bank (P&SB) at Gurgaon Valuing for 34.68 Cr.

2.6. STATUS OF MAJOR WORKS UNDER EXECUTION

At present, the corporation is working at more than 370 projects spread all over the country. These includes Indo Bangladesh Border Fencing and flood lights works in Tripura, Mizoram, Assam & Meghalaya, Assam Rifle works in different States of North-East, Irrigation & River Valley Projects, Hydroelectric Projects (Hathiari Power house in Uttarakhand) & other miscellaneous projects. Some of the major projects are:-

a. Building Works

The Corporation has under-taken several construction assignments relating to Buildings, Roads, Hospitals, Bridges, Fly-Overs etc.

- Construction of Kendriya Vidyalayas at various locations across Country
- Construction of 1500+2480 dwelling units in 75+124 number of G+3 blocks in Jharkhand under Pradhan Mantri Awas Yojna (PMAY) for Jharkhand Urban Infrastructure Development Company (JUIDCO)
- Various works of ST & SC Deptt, Odisha
- Indian Agricultural Research Institute (IARI) works in Assam
- Construction for Up- gradation of ITI at Jabalpur, Rewa, Sagar & Shadol for MP Housing Board.
- Bone & Joint Hospital Srinagar.
- Establishment of Industrial Biotech Parks (ITBP) at 02 locations in J&K Region for Council of Scientific and Industrial Research (CSIR).
- Construction of LS , US Quarter & Site Development of Police Line Campus at Jamtara & Pakur for Jharkhand Police Housing Corporation Limited(JPHCL)

- Indoor Sports Complex and Food Court of IIT Kharagpur in West Bengal.
- Construction of College Building Dr. Rajendra Prasad Central Agriculture University (formerly RAU-PUSA) Service for College Building & Construction of Boys Hostel(100 Seats) and Construction of Girls Hostel(100 Seats) Road Works, Samastipur
- Slum Board Dwelling Units in Bellary City, Karnataka.
- AYUSH Institute at Sarita Vihar, Silchar, Shillong and Kolkata.
- Development of Amenities for Archaeological Survey of India (ASI).
- Hydro Engineering College in Himachal Pradesh.
- Construction of Guru Ghasidas University (GGU).
- Central Agricultural University (CAU) Works in North Eastern States.
- Building at Dwarka for Central Excise Deptt.
- Construction of Toilet Blocks for MCL under Swachh Vidyalaya Scheme.
- Construction of Border Out-Posts (BOPs) along Indo-Bangla Border.
- Assam Rifles Building works in North Eastern States- Assam, Tripura, Manipur and Nagaland.
- Post Graduate Institute of Yoga & Naturopathy at Jhajjar, Haryana and Nagamangala, Karnataka
- Indira Gandhi National Tribal University Campus at Amarkantak (M.P).
- Rajiv Gandhi National Institute and Youth Development at Sriperumbudur.
- Construction of new building at National Research Institute of Ayurvedic Drug Development (NRIADD), Salt Lake, Kolkata.
- Silver Jubilee Hall & Academic Block at North Eastern Regional Institute of Science and Technology (NERIST), Itanagar.
- Development of tourist facilities at Mantalai, Sudhmahadev, Patnitop in J&K (Ministry of Tourism Deptt.)
- Seismological Research Lab., Karad for Ministry of Earth Sciences.
- Buildings at Central University of Kashmir at Srinagar.
- Construction of building for Central Ground Water Board, Raipur.
- Construction of Hostel Building for Research Scholars at CSIR-NEIST.
- Farmers Training Hostel and Training Hall with seating Capacity of 500 at NRC-IF, Piprakothi, Motihari Bihar for Indian Council of Agricultural Research (ICAR).

b. Road Works & Other Projects

- Construction/ Upgradation of existing road to 2-lane with paved shoulder from Ranipool to Pakyong of NH-717-A under SARDP-NE Phase 'A' ,(Sikkim) for National Highways and Infrastructure Development Corporation Limited (NHIDCL).
- PMGSY Roads works in Bihar, Jharkhand, Uttar Pradesh and West Bengal.

Staff Quarters for HAL, Bangalore

ITBP Roads at Leh (J&K)

HYDRO ELECTRIC PROJECT AT HATHIARI

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CHAPTER-9

INITIATIVES IN NORTH EAST

DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

9. Initiatives in North East

1.0. National Institute of Hydrology

To cater the hydrological needs of the North Eastern Region, Sikkim and northern part of West Bengal (Teestha Basin), the Centre for Flood Management Studies for the Brahmaputra Basin (NIH-CFMS) has been actively interacting with the State, Central and Academic organizations working in water resources in this region. The thrust areas of research at CFMS-Guwahati are (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, and (vii) Socio-economic aspect of flood disaster.

During the year 2019-20, CFMS-Guwahati worked on following studies:

1. Flood Inundation Mapping of Beki River Basin of Assam
2. Development of regional methods for design flood estimation in North Brahmaputra subzone 2 (a)
3. Linear Hydrological routing using Satellite precipitation datasets for flood forecasting in parts of Brahmaputra Basin
4. Impact of Climate Change on Runoff and Sediment Yield for a major tributary of river Brahmaputra
5. Groundwater Quality Assessment of Morigaon district of Assam with emphasis on Arsenic & Fluoride Contamination
6. Comparison of Hydrological Behaviour of two mid-sized Mountainous Catchments under the influence of Climate and Land use changes

2.0. Central Soil and Material Research Station

Thirty one projects, including four in Bhutan and three in North-East Region of India, were investigated by CSMRS. The investigations comprised field and laboratory investigations in the areas of Soil, Rock, Rockfill, Geosynthetics, Concrete and its constituents. The details of projects in North-East Region of India and in Bhutan are as under:

Projects in North-East India:

(i) Myntdu Leskha Stage-II H E Project, Meghalaya
(ii) Turini H E Project, Mizoram
(iii) Umangot HEP, Meghalaya

International Projects:

(iv) Kholongchhu HE project, Bhutan
(v) Kuri Gongri Project, Bhutan
(vi) Punatsangchhu-I H.E. Project, Bhutan
(vii) Punatsangchhu-II H.E. Project, Bhutan

Umangot H E Project, Meghalaya

Construction Material Survey

Sampling of Coarse Aggregate

Kholongchhu H E Project, Bhutan

In-situ shear test in progress

In-situ plate load test in progress

Kauri Gongri H E Project, Bhutan

In-situ shear test in progress

In-situ plate load test in progress

3.0. 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. During the year 2019-20, five aspirational districts of Assam and two districts of Meghalaya have been taken up to cover an area of 9076 sq. km. under NAQUIM programme. A total of 8 tube wells have been constructed for data generation. Around 2066 ground water samples have been collected and analysed for assessment of ground water quality. Ground water level monitoring has been carried out as per the schedule. In addition to above, 23 number of short term investigations for ground water has been conducted by CGWB in the region. Under PMKSY (HKKP-GW), Central Assistance of Rs. 322.829 crore has been sanctioned for construction of 5745 nos. of tube wells/ dug wells in the states of Assam & Arunachal Pradesh. Except Meghalaya, other NE States have submitted DPRs which are under scrutiny for released of fund.

Sl. No	Activities	Achievements
1.	**Field Activities for Aquifer Mapping:**	Under NAQUIM programme 5 aspirational districts (Baksa, Darrang, Dhubri, Hailakandi & Udalguri) of Assam covering an area of 8524 sq.km. & two districts (North Garo hills & East Garo Hills) of Meghalaya covering an area of 525 sq. km. have been taken up. Upto 31st Dec. 2019, an area of 4700 sq.km. has been covered. Remaining 4376 sq.km. targeted to be covered by 31st March 2020.

Sl. No	Activities	Achievements
	Ground Water Exploration	During financial year 2019 – 20, as on 31.12.19, CGWB has constructed 8 wells (EW- 5, OW- 3).
	Water Quality Analysis	Around 2066 nos. of water samples were analysed for the basic constituents and heavy metals.
2.	**Special study on ground water regime in urban Guwahati in reference to over exploitation, contamination and climatic change**	An area of 170 sq. km. has been covered till 31st December 2019.
3.	**Ground Water Regime Monitoring**	678 nos. of ground water monitoring stations are being regularly monitored four times a year (January, March August & November).
4	**Short Term Water Supply Investigation.**	23 nos. carried out
5.	**Preparation of report**	37 Nos. of district brochure has been prepared.
6.	**Training**	01 No. Tier II & 2 Nos. Tier III training have been organised under the aegis of RGGWTRI.
7.	**PMKSY (HKKP)**	**Arunachal Pradesh:** Phase I: Sanction of Rs.45.30 crore for construction of 473 wells has been accorded. On implementation of the project 473 nos. of farmers will be benefited. Phase II: DPR proposal amounting Rs.50.4834 crore for construction of 519 wells is under process. On implementation of the project 519 nos. of farmers are likely to be benefited. **Assam:** PhaseI: Sanction of Rs.246.069 crore for construction of 4779 wells has been accorded. On implementation of the project 19054 nos. of farmers will be benefited. Phase II: DPR amounting to Rs 2781.45 crore for construction of 59,266 wells is under scrutiny. **Manipur:** DPR amounting to Rs. 63.4811500 crore for construction of 550 wells and 495 dug wells is under process at CHQ/ Ministry. On implementation of the project 550 Nos. of farmers are likely to be benefitted. **Mizoram:** DPR amounting to Rs. 16.0489 crore for construction of 209 nos. of wells is under process at CHQ/ Ministry. On implementation of the project 411 Nos. of farmers are likely to be benefitted. **Nagaland:** Sanction of Rs.18.15 crore for construction of 262 wells has been accorded. On implementation of the project 265 nos. of farmers will be benefited. **Tripura** (Phase I): Sanction of Rs.13.31 crore for construction of 231 wells has been accorded. On implementation of the project 851 nos. of farmers will be benefited.

4.0. 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 up-liftment of socio-economy of the people of North-Eastern states. Assam movement emphasized that a large chunk of Bangladeshi population has come & settled in North-East. In an accord, it was decided to have a barrier in North-Eastern states, which will safe guard the people from illegal entry of the Bangladeshi & insurgent groups. The Indian Government started Border Fencing in Assam and thereafter to other North-Eastern states of Tripura, Meghalaya & Mizoram to check the influx of illegal migrant.

a. Indo-Bangladesh Border Fencing and Road Works

NPCC working for construction of Fencing in mostly in insurgency prone areas of Tripura, Mizoram, Meghalaya and Assam for 640.72 Km. 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 476 Km of fencing works, 268 Km of Road Works in the border areas of Indo Bangladesh Border.

b. 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 & completed Border Flood Light Work of 675 Km in Tripura and 340 Km in Meghalaya. The Border Flood Light is helping to BSF 24hrs vigil over insurgent groups & illegal migrant of Bangladesh.

c. Border out post Works

NPCC has completed the construction of BOP works in extreme difficult area of Tripura-47 No. posts (Total 50 Nos.), Mizoram-4 Nos (Total 21 No. posts), Assam- 5 Nos. (Total 6 No. post), Meghalaya-11 nos. (Total 17 No. post) & West Bengal- 60 Nos.(Total 94 No. posts) for monitoring the border activities by BSF.

BOP IN MIZORAM & MEGHALAYA

d. National Institute of Electronics & Information Technology (NIELIT) Works:-

NPCC is also playing a major role in the creating infrastructure for 10 No. extension centres and a centre of NIELIT in the North-Eastern states of Mizoram, Nagaland, Manipur, Arunachal Pradesh, Meghalaya & Assam for development of the skills of information technology contributes for the better socio-economic development.

e. 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.

TYPE – III (G+III) at LAITKOR, SHILLONG

Assam Rifles Quarters at Mukokchung, Nagaland

f. Central Agricultural University (CAU) Works

Construction of a) College of Veterinary Science and Animal Husbandry, Selesih, Aizwal (Mizoram) and Jalukie (Nagaland), b) Multi Technology Testing Centre (MTTC) & Vocational Testing Centre (VTC) at College of Veterinary Sciences & Animal Husbandry at Selesih, Mizoram , c) College of Horticulture & Forestry, Thenzawal, Mizoram , d) College of Agriculture, Iroisemba, Imphal (Manipur), e) College of Food Technology, Imphal (Manipur) etc.

5.0. Brahmaputra Board (BB)

Brahmaputra Board has taken up for setting up of North East Water Resources Data Sharing Centre and implementation has been assigned to WAPCOS as Project Management Consultant (PMC). Scientific dissemination and improvement of water management practices of Local Tribes and indigenous people of NE region has been taken up in association with NERIWALM. Four areas of NE region have been identified in First Phase. Soft measures for Flood and Erosion Management-Brahmaputra Board has proposed to take up a Pilot project at two sites viz. Right Bank down-stream of Kordoiguri and at Dakhinpat in Majuli Island in collaboration with IIT, Guwahati for "hard & soft measures" termed as Bio-engineering method for Flood and Erosion Management.

For preparation of Detailed Project Report to check flash flood and erosion in BTC area by Pagla/Baitamari, Aie,

Beki, Pagladiya, Sankosh, Gangia and Saralbhanga rivers, work has been allotted to WAPCOS as Project Management Consultant (PMC).

The activities carried out by Brahmaputra Board in North Eastern Region have already been discussed in *Chapter-7.*

6.0. North Eastern Regional Institute of Water and Land Management (NERIWALM)

a. Training Programs

The Institute's service is to cater to the needs of all the states of the North Eastern region. Participation of each state in the capacity building programme was recorded for the year 2019. The state of Assam recorded the highest number of participation. The reason may be proximity to NERIWALM and highest population compared to other states of NE region. Mizoram has no participation while states such as Manipur, Tripura and Sikkim recorded least participation in this year. Participants from India other than NE region consisted of 59 numbers which is given in Table.

State wise participants of training during 2019

Name of state	Total Number of participant	Name of state	Total Number of participant
Assam	1047	Nagaland	14
Arunachal Pradesh	43	Tripura	02
Manipur	10	Sikkim	04
Meghalaya	60	Other states	59
Mizoram	0		
Total: 1239			

b. Outreach Activity:

NERIWALM is documenting the traditional participatory irrigation water management system (Dong) prevalent in Indo Bhutan border of Assam. Another outreach programme on summer rice cultivation in a deep tube well command area is executed in Rangiam Assam.

c. Sponsored Training/Workshop/ Seminars

Out of the **51** programmes conducted during the year, Institute received sponsorship for **03 training/workshops, while 19 conducted as self financed and remaining 29** were conducted from Institute's funds. NERIWALM proposed to organize 01 international programme for

Flood Warning Section of the Royal Government of Bhutan on Hydro-Meteorological Observation sponsored by the National Centre for Hydrology and Meteorology, Royal Government of Bhutan..

d. M.Tech Course in Water Resource Management

M. Tech. course in Water Resource Management was started from July 2019, after getting approval from the All India Council for Technical Education (AICTE) along with affiliation from Assam Science and Technology University, Guwahati. Altogether 10 students are persuing the two years course out of which one is in-service from Government of Assam. The main subjects covered in the course are surface water, ground water, drinking water, participatory irrigation management etc. to highlight the objectives of the institute.

7.0 National River Conservation Plan Works in North-Eastern States:

- **Sikkim:** Eight projects were sanctioned for conservation and pollution abatement of rivers Rani Chu in Sikkim at a cost of Rs.275.75 crore in two towns namely Gangtok and Singtam. The projects pertain to interception & diversion of sewage, sewage treatment plants, rehabilitation of sewer mains, low-cost sanitation, river front development and improved wood crematoria. Sewage treatment capacity of 23.37 mld is envisaged to be created in these towns. Works on seven projects have been completed and 20.12 mld sewage treatment capacity has been created so far.
- **Nagaland:** Rivers Diphu and Dhansiri at Dimapur, Nagaland - works have been sanctioned under NRCP at an estimated cost of Rs.82.80 crore. The project pertain to construction of sewage treatment plant having treatment capacity of 25.43 mld and other allied sewerage works, low-cost sanitation, afforestation, etc.
- **Manipur:** River Nambul at Imphal, Manipur - works have been sanctioned under NRCP at an estimated cost of Rs.97.72 crore. The project pertain to construction of two sewage treatment plants having treatment capacity of 17.00 mld and other allied sewerage works, low-cost sanitation, afforestation, etc.

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CHAPTER-10

ADMINISTRATION, TRAINING AND GOVERNANCE

DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

10. Administration, Training and Governance

1.0. Establishment Matters

The Administration Section of the Department is primarily responsible for the establishment, personnel and administrative matters of the officers and staff of the Department (Proper). The section is the Cadre Controlling Authority of posts borne on CSS/CSSS/CSCS sanctioned in the Department (Proper), CWC 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.

2.0. Implementation of Training Policy of the Department

Administration Division administers the Budget allocated under 'Training of DoWR, RD & GR officers' under HRD & Capacity Building Scheme to train officers/ officials of the Department in reputed Institutes located in India and abroad in different fields, induction training on selection/ recruitment in the Department. Officers are also given induction training on joining. Officials are also deputed on mid-career training at various levels/stages in their career as well as for thematic training like leadership development, stress management, ethics and values, finance, administration, etc.

For the financial year 2019-20 an amount of Rs. 2.00 Crore has been allocated for training of DoWR,RD & GR Officers. However, under RE 2019-20, the amount has been reduced to 1.00 Crore. An expenditure of Rs. 67 lakhs has already been incurred till 31st December, 2019 under Training of Officers of the Department (HRD & CB Scheme). In this year, a total of 100 officers of this Ministry were sent for various training programme till December, 2019.

During the Financial year 2019-20, four Officers were sent for the training programme on Finance for Non-Finance Executive at IIM, Kolkata. 10 officers were sent to the training programme on Modern Office Practices at MGSIPA, Chandigarh. More than 20 officers were sent for Leadership Training Programme at IIM Kolkata, ASCI, Hyderabad & Institute of Management, Government of Kerala. DoWR Officers were also sent for "Management of Water Resources" and Over-view of Water Sector for Non-Technical Officers at NWA. Pune and NERIWALM, Tejpur. Various officers of the cadre of CSS, CSSS and officers of Central Staffing Scheme were sent for the mandatory training programme conducted at ISTM.

3.0. Swachhata Pakhwada

Swachhta Hi Sewa

DoWR, RD & GR alongwith all attached / Subordinate offices, Autonomous Organisations and PSUs under the Department organised Swachhta Hi Sewa campaign from 11th September to 2nd October 2019 across the country.

Swachhta Hi Sewa campaign focused on Plastic Waste Management, given the detrimental effect of uncollected plastic waste on human beings, animals and the environment at large.

During the campaign, more than 65 major events have been organised all over the country by Department (Sectt.), Attached Offices, Subordinate, Autonomous Organisations/ PSUs under the Department. During the campaign, events such as Plogging activities, sensitization of locals, street vendors about Plastic, awareness programmes in schools, shramdaan for cleanliness of public places, cleanliness of Ghats, awareness rallies, organisation of Great Ganga Run, essay writing competitions, tree plantation activities etc. were organised.

Special Yamuna Cleanliness drive was organised on 26th September 2019 and 2nd October 2019 by Department (Sectt.) at Chhath Ghat, Yamuna Bazar Ghat, Nigambodh Ghat through Shramdaan by officers and staff of the Ministry and M/s WAPCOS Ltd to generate mass awareness about the importance of clean rivers. The event was led by Hon'ble Minister for Jal Shakti and other senior officers of the Department.

4.0. Organisation of Yoga Day

DoWR, RD & GR along with all attached/ subordinate offices, Autonomous organisations and PSUs under the Department celebrated the 5th International Yoga Day on 21st June, 2019.

Hon'ble Minister for Jal Shakti along with all senior officers, staff of the Department participated in the event and carried out Mass Yoga Demonstrations based on Common Yoga Protocol and performed different Yoga postures with an objective to keep their mind and body healthy.

Glimpses of Activities carried out under Swachh Bharat Abhiyan






केन्द्रीय भूमि जल बोर्ड

ACTIVITIES ORGANISED ON THE OCCASION OF YOGA DAY

CHAPTER 11,12 & 13

TRANSPARENCY, ROLE OF WOMEN IN WATER RESOURCES MANAGEMENT, PROGRESSIVE USE OF HINDI

DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

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 17 manuals in respect of Department (Sectt.) and its organizations were prepared and have been placed in the Department'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 Department and concerned organizations. The Coordination Section of DoWR, RD & GR, MoJS, Room No. 02, B-wing, Ground Floor, Shastri Bhawan, Dr.Rajendra Prasad Road, 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, DoWR, RD & GR, Ministry of Jal Shakti. 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, Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Jal Shakti or by cash. List of Central Public Information Officers / appellate authorities in the various sections / wings of the Department are at ***Annexure-XI.***

During the period from 01.01.2019 to 31.12.2019, 1609 RTI applications and 45 RTI appeals were received in RTI Cell, DoWR, RD & GR, which were forwarded to concerned CPIO/ First Appellate Authority in the Department/ Other Public Authority for necessary action as per RTI Act, 2005. During the period from 01.01.2018 to 31.12.2018, 1656 RTI applications and 70 RTI appeals were received in RTI Cell, DoWR, 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.

12. Role of Women in Water Resource Management

Like other sectors, women play a vital role in water resource management. The right approach and steps taken towards water conservation, water use in domestic as well as field (agricultural/ industrial) by women makes considerable overall impact. The National Water Policy while emphasizing 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.

The role of women has increased in all fields of agricultural development from production, post-harvest operations, livestock, horticulture, fisheries etc. This has been a result, also, of increasing migration of men to urban areas and has been termed as Feminisation of Agricultural Sector. Rural women are responsible for the integrated management and use of diverse natural resources to meet the daily household needs. This necessitates that women farmers have access to resources like land, water, credit, water, seeds and markets.

In pursuance of the provisions in the National Water Policy (NWP), farmers are to be involved progressively in various aspects of management of irrigation systems, particularly in water distribution and collection of water charges. The DoWR, RD & GR, 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.

The Participatory Irrigation Management (PIM), which envisages involvement of end- users /farmers in all aspects and at all levels of irrigation management, functions through farmers groups generally known as WUAs. The WUAs, the key entity responsible for improving irrigation efficiency in project's command, form the building blocks of the institution of farmers' irrigation management. Appreciating the importance of farmers' participation in irrigation management, the Government of India has included involvement of farmers' organization in management of irrigation infrastructures in its NWP.

Presently, total 65 no. of Women Employees are working in the Ministry (Sectt.), out of which 14 belongs to Group 'A', 37 belongs to Group 'B' and 14 belongs to Group 'C' category.

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 Department during the year. Efforts have also been made to ensure compliance of various orders/ instructions issued by the Department of Official Language, Government of India.

The Second Sub-Committee of Parliamentary Committee on Official Language inspected 03 Offices of the Department viz. (1) Office of the Regional Director, CGWB, Chennai (2) Office of the Director, M&A, CWC, Vadodara (3) Office of the Director, NCA, Vadodara.

Meetings of official language Implementation Committee of the Department were conducted regularly. In these meetings, the Committee reviewed the progress made in the use of Hindi in the Department as well as in its various offices and examined the achievements in relation to targets prescribed by Department of Official Language. Measures to remedy the shortfalls have also been discussed and recommended in the meeting.

Hon'ble Union Minister of Jal Shakti, Hon'ble Minister of State of MoJS, and Secretary, DoWR, RD & GR have issued messages to the officers and staff of the Department for using Hindi in official.

Hindi Fortnight was organized in the Department from 14.09.2019 to 30.09.2019. During the Fortnight, competitions such as Rajbhasha Quiz, Hindi Noting and Drafting, Hindi Essay, Hindi Essay (MTS only), Translation, Hindi Typing, Hindi Essay, Debate and Hindi Poetry Recitation were organized. Employees of the Department participated enthusiastically in these competitions. First, Second and Third prizes of Rs. 4000/-, Rs.2500/- and Rs. 1500/- respectively were given to winners of each of these competitions. Apart from these, four incentive prizes of Rs. 1000/- in each of these competitions had also been provided. The prizes were given away 56 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 Department.

Incentive Schemes like 'Rajbhasha Vaijayanti Puraskar Yojana' and 'Incentive Scheme for doing work in Hindi' are implemented in the Department for promoting the implementation of Offcial language Policy. 'Rajbhasha Vaijayanti Purashkar Yojana' is for promoting the Hindi work in Attached and Subordinate

Organizations of the Department. The 'Rajbhasha Vaijayanti Puraskar Yojana 2018-19' Prize distribution ceremony was held on 05.03.2020 in Conference Hall, Shram Shakti Bhawan. WAPCOS Limited, Gurugram, CGWB, Faridabad and CWC, New Delhi received first, second and third Prizes respectively. Under 'The incentive scheme for doing work in Hindi' provision has been made to give cash award each year to the officers and staff on the basis of the work done by them in Hindi. Besides this "Moulik Pustak Lekhan Yojana" is also being implemented in the Department.

CHAPTER 14, 15 &16

STAFF WELFARE, VIGILANCE, APPOINTMENT OF PERSONS WITH SPECIAL NEEDS

DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

14. Staff Welfare

1.0. 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 Officer for SCs/STs and OBCs in discharging the functions on various matters relating to reservation for SCs/STs/OBCs in Government Services.

This Department is responsible for reservation of various categories in services only for Staff Car Drivers and MTS grade. Implementation of reservation in these posts to Scheduled Castes, Scheduled Tribes, OBCs, Ex-Servicemen and Divyang is followed as per Government rules. The post of MTS is filled through SSC. The Vacancies in MTS grade are intimated to SSC.

Shri Binod Kumar, Director is Liaison Officer for OBC in respect of the Department (Secretariat). Shri Mukesh Kumar, Deputy Secretary is appointed as Liaison Officer for SC/ST in respect of the Department (Secretariat).

2.0. Complaint Committee on Sexual Harassement 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 Department. The composition of the Committee is as below:

S. No.	Name & Designation (Shri/Smt./Ms)	Designated as
1	Shalini Juneja, Under Secretary	Chairperson
2	Rajan Bhasin, Under Secretary	Member
3	Shalini Gupta, Section Officer	Member
4	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), DoWR, RD & GR for further necessary action.

During the year ending 31st December, 2019, no complaint was received by the Committee.

3.0. Redressal of Public/Staff Grievances

Grievances Redress Cell was set up in the DoWR, RD & GR which entertains the grievances of employees/officers working in various organizations under the Department. Shri Inderjit Hadda, 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 Department.

During the period from 1st January, 2019 to 31st December, 2019, a total number of 3623 grievance petitions were received in this Department. Besides, 423 grievance petitions were carried forward which were pending at the end of 31st December, 2018. Out of total 4046 grievance petitions, 3350 were settled during the above period. A list of postal addresses of Public/Staff Grievance officers in the Department and its various organizations is at ***Annexure-XII.***

15. Vigilance

The Vigilance matters relating to this Department 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 and above assisted by a Deputy Secretary/ Director and the Vigilance Section. Various aspects pertaining to Vigilance cases of all the employees of the Department (Proper) and all Group A and retired officers of the attached/subordinate offices as well as Group-A Officers of other Organizations under the Department, including Board level officers of PSUs are dealt with by the Division.

The Vigilance Division functions as a link between the Department and the Central Vigilance Commission (CVC) and other Authorities in the matters pertaining to Vigilance. The Division tenders advice, wherever required, on vigilance matters, to the Attached and Subordinate Offices, PSUs, Statutory Bodies/Autonomous Bodies etc. under the administrative control of the Department, in consultation with CVC and other Agencies/Departments. It monitors the disciplinary cases and related matters of the organizations under the Ministry through periodical returns prescribed by CVC, DoPT, etc. The Division prepares the "List of officers of Doubtful Integrity" and the "Agreed List" in consultation with CBI.

Vigilance Awareness Week was observed from 28th October, 2019 to 2nd November, 2019. During the Week, an essay competition among the employees of the Department was held.

Four Preventive Vigilance Inspections (PVI) of organisations under the purview of the Department are to be carried out and so far Three PVI during the year 2019-20 have been completed with a view to check various irregularities and identify corruption prone areas. The Vigilance Division is also responsible for calling for the Annual Immovable Property Returns of all Group 'A','B' and 'C' Staff and monitoring them.

16. Appointments of Personal of Special Needs

Monitoring of the recruitment of persons with Special Needs is being done to ensure fulfillment of prescribed percentage of reservation for the category by the Ministry as well as various organizations under it. Periodic reports on the progress made are being sent regulary to the Ministry of Social Justice & Empowerment. 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.

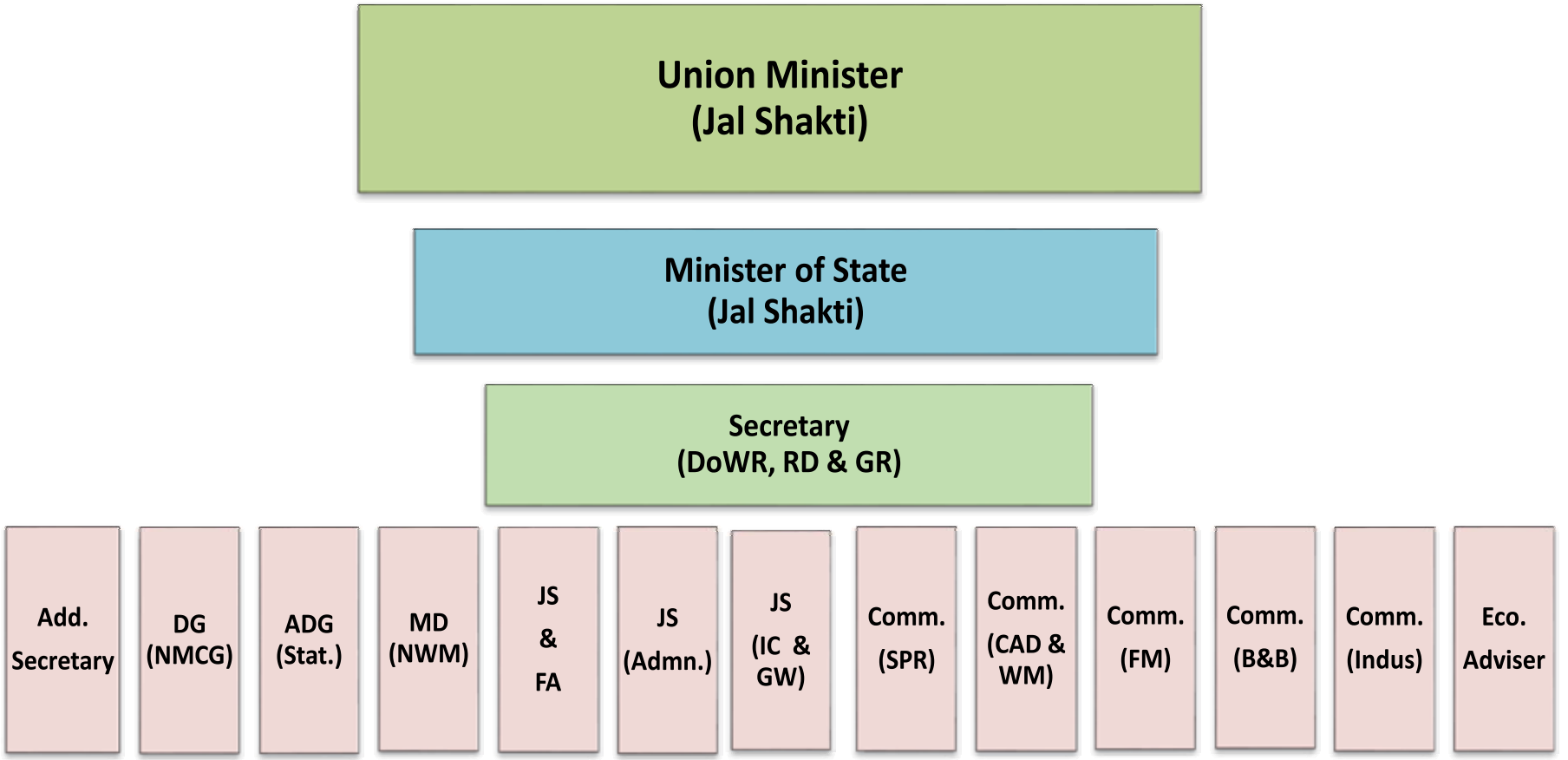
Administration Section is dealing with reservation of Persons with Disabilities (Divyangjan) in MTS Post. The vacancies in MTS grade are filled through SSC. As on 31.12.2019 the total strength in MTS grade was 63 out of which one Person is Persons with Disabilities.

The relevant reservation rosters as prescribed by the Government are also maintained for planning the reservation of Persons with Special Needs. Shri Mukesh Kumar, DS is as Liaison Officer for Persons with Disabilities (Divyangjan) i.r.o. the Department (Secretariat).

ANNEXURES

ANNEXURE – I

ORGANIZATION CHART OF DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION



ANNEXURE –II

STAFF IN POSITION IN THE DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

Group	Total Employees in position	Representation of SC/ST/OBC				PH
		SC	ST	OBC	Others	
A	115	18	08	11	78	--
B	161	20	07	37	97	3
C	125	36	08	28	53	3
Total	**401**	**74**	**23**	**76**	**228**	**6**

ANNEXURE – III

LIST OF NAMES & ADDRESSES OF SENIOR OFFICERS & HEADS OF ORGANISATIONS UNDER THE DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

S. No.	Name of the Organisation	Head of the Organisation / Senior Officer
1.	Department of Water Resources, RD & GR, Room No. 412, 4th Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri U.P. Singh, Secretary, Tel No. 23710305, 23715919, Fax. 23731553.
2.	Department of Water Resources, RD & GR, Room No. 404, 4th Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Smt. Debashree Mukherjee, Additional Secretary, Tel No. 23714609, Fax. 23716894.
3.	Department of Water Resources, RD & GR, Room No. 6, 2nd Floor, B wing, Lok Nayak Bhawan, Khan Market, New Delhi.	Smt. Gopa Chattapadhyay (relived on 7.2.2020) Additional Director General (Stat.) Tel No. 24691080 Fax. 24691080
4.	Department of Water Resources, RD & GR, Room No. 406, 4th Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri Nitishwar Kumar, Joint Secretary (Admn.), Tel No. 23725477, 23710619.
5.	Department of Water Resources, RD & GR, Room No. 403, 4th Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri Sobodh Yadav Joint Secretary (IC & GW), Tel No. 23710343, Fax. 23730719.
6.	Department of Water Resources, RD & GR, Room No. 401, 4th Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri Jag Mohan Gupta, Joint Secretary & Financial Adviser, Tel No. 23710297 Fax. 23710297
7.	Department of Water Resources, RD & GR, Room No. 411, 4th Floor, Shram Shakti Bhavan, Rafi Marg, New Delhi.	Shri K. Vohra, Commissioner (SPR), Tel No. 23710107.
8.	Department of Water Resources, RD & GR, Room No. 236, 2nd Floor, 'B' wing, Krishi Bhavan, Rafi Marg, New Delhi-110 001	Dr. B.R. K. Pillai, Commissioner (CADWM) Telefax No. 23382256
9.	Department of Water Resources, RD & GR, Room No. 827, 8th Floor, CGO Complex, Lodi Road, New Delhi-110 001	Shri Atul Jain Commissioner (Flood Management) Tel No. 24368238 Fax. 24362780

S. No.	Name of the Organisation	Head of the Organisation / Senior Officer
10.	Department of Water Resources, RD & GR, Room No. 204, 2nd Floor, CGO Complex, Lodi Road, New Delhi-110 001	Shri T.S. Mehra, Commissioner (B&B). Tel No. 24364724.
11.	Department of Water Resources, RD & GR, Room No. 814, 8th Floor, CGO Complex, Lodi Road, New Delhi-110 001	Shri P.K. Saxena, Commissioner (Indus) Tel No. 24361540 Fax. 24361540
12.	Department of Water Resources, RD & GR, Room No. 815, 8th Floor, Block -11, CGO Complex New Delhi-110 003	Dr. Kamkhenthang Guite Economic Adviser, Tel No. 23388941 Fax. 23381895
13.	National River Conservation Directorate, Antyodaya Bhawan, CGO Complex, Lodhi Road, New Delhi- 110003	Shri B. B. Burman, Advisor, Tel No. 011-24365020
Attached Offices		
14.	Central Water Commission, Room No. 326, Sewa Bhawan, R.K. Puram, New Delhi	Shri Rajender Kumar Jain, Chairman (CWC), Tel. No.26715351, Fax: 26108614.
15.	Central Soil and Materials Research Station, Room No. 111, Hauz Khas, New Delhi-110016	Shri S.L. Gupta, Director, Tel. No. 26961894, 26967985 Fax: 26967985
Subordinate Offices		
16.	Farakka Barrage Project, P.O. Farakka Barrage, Distt. Murshidabad-742212 , West Bengal.	Shri Saibal Ghosh, General Manager, Tel. No. 03485-253644, Fax: 03485-253608.
17.	Ganga Flood Control Commission, Sinchai Bhawan, 3rd Floor, Patna-800015	Shri M. S. Dhillon, Chairman, Tel. No. 0612-2217294 Fax: 0612-2217960
18.	Central Water and Power Research Station, P.O. Khadakwasla, Pune-411024	Dr.(Mrs). V.V. Bhosekar, Director, Tel. No. 020-24380552, Fax: 020-24381004.

S. No.	Name of the Organisation	Head of the Organisation / Senior Officer
19.	Central Ground Water Board, Bhujal Bhawan, Faridabad-121001.	Shri G. C. Pati, Chairman, Tel. No. 0129-2477101, Fax: 0129-2477200.
20.	Bansagar Control Board, Bansagar Colony, Rewa, Madhya Pradesh, 486001.	Sh. M.W. Paunikar Secretary, Tel. No. 07662-226318 Fax : 07662-242433
21.	Sardar Sarovar Construction Advisory Committee, Narmada Bhawan, 'A' Block, 4th Floor, Vadodara-390001	Shri M.P. Singh, Secretary, Tel. No. 0265-2421438 Fax 0265-2437262
22.	Upper Yamuna River Board 201, "S", Sewa Bhawan, R.K. Puram, New Delhi-110016	Shri S. K. Haldar, Chairman, Addl. Charge Tel. No. 26108590 Fax: 26195289
23.	National Water Informatics Centre Sewa Bhawan, R.K. Puram, New Delhi-110016	Shri Sunil Kumar Garg Director Tel. No. 011-29583273
Public Sector Undertakings		
24.	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
25.	National Projects Construction Corporation Limited, Plot No.148, Sector-44, Gurugram, Haryana-122003.	Shri R.K. Gupta, Chairman & MD, Tel. No. 0124-2385219, Fax : 0124-2385219.
Registered Societies / Autonomous Bodies/ Statutory Bodies etc.		
26.	National Mission for Clean Ganga, Government of India, Department of Water Resources, RD & GR, 1st Floor, MDCNS Building, India Gate, New Delhi-110002	Shri Rajiv Ranjan Mishra, Director General (NMCG) Tel No. 23049528
27.	National Water Mission, 2nd Floor, Block-III,CGO Complex, Lodhi Road, New Delhi-110 003	Shri G Ashok Kumar, Mission Director, Tel No. 011-24365200

S. No.	Name of the Organisation	Head of the Organisation / Senior Officer
28.	National Institute of Hydrology, Jal Vigyan Bhawan, Roorkee, Uttarakhand-247667 .	Sh. J. V. Tyagi Director, Tel. No. 01332-272106 Fax: 01332-272123/273976
29.	National Water Development Agency, 18-20, Community Centre, Saket, New Delhi-110017	Shri Bhopal Singh, Director General Tel. No. 26519164 Fax: 26513846
30.	North Eastern Regional Institute of Water and Land Management, Dolabari, Tezpur, Sonitpur, Assam-784027	Dr. Pankaj Barua, Director (NERIWALM), Tel No. 03712-268107, Fax. 03712-268007
31.	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.
32.	Brahmaputra Board, Basistha, Guwahati, 781029	Shri Rajiv Yadav, Chairman Tel. No. 0361-2301099 Fax 0361-2301099
33.	Betwa River Board, Nandanpura, Shivpuri Highway, Jhansi-284003	Shri M.K. Nigam, Secretary, Telefax. No. 0510-2480183
34.	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt: Bellary, Karntaka -583225	Shri D. Ranga Reddy, Chairman, Tel. No. 040-29808740 Fax 040-29808742
35.	Krishna River Management Board, Jalasoudha, Erra Manzil, Hyderabad, 500 082.	Shri A. Paramesham Chairman, Tel. No. 040-23301659
36.	Godavari River Management Board, 5th Floor, Jalasoudha, Erra Manzil, Hyderabad, 500 082.	Shri J Chandrashekhar Iyer, Chairman, Tel. No. 040-23313163. Fax 040-23313162.

ANNEXURE-IV

BUDGET AT A GLANCE

(Rs. in crore)

Scheme/ Office/ Component	ACTUALS 2018-19	BE 2019-20	RE 2019-20	Exp. up to 31.12.2019
Central Sector Schemes				
Farakka Barrage Project	102.79	120.00	71.00	51.22
Emergent Flood Protection Works in Eastern & Western Sector	0.00	0.01	0.01	0.00
DRIP	49.32	89.37	52.00	21.98
National Ganga Plan	637.50	700.00	353.40	353.40
Ghat works for Beautf. of River Front	50.00	50.00	0.02	0.00
National River Conservation Plan	1620	1220	1200.02	900
River Basin Management	176.33	200.00	161.54	111.54
Interlinking of Rivers	0.00	0.01	0.01	0.00
Development of Water Resources Information System	74.07	100.00	120.00	87.19
Ground Water Management & Regulation	260.20	260.00	243.18	178.18
National Hydrology Project	79.22	150.00	150.00	114.53
Human Resources Development/ Capacity Building	47.72	60.00	33.01	18.01
Infrastructure Development	48.13	50.00	40.00	27.96
R&D and NWM	59.26	50.00	50.00	32.32
Sub Total	**3204.54**	**3049.39**	**2474.19**	**1896.33**
Centrally Sponsored Schemes				
PMKSY-Har Khet Ko Pani	2180.19	3063.55	3022.16	2291.15
Impact Assessment Studies	0.28	1.00	0.60	0.25
Assistance to SYLCP	0.00	0.01	0.01	0.00
FMBAP	706.11	700.00	655.78	480.78
Irrigation Census	52.38	50.00	46.00	42.61
Atal Bhujal Yojana	0.00	1.00	1.00	0.00
Special Package for Maratha-wada, Vidarbha and other drought prone areas of Maharash-tra	500.00	300.00	300.00	300.00
National River Conversation Plan- Other Basins **	0.00	196.00	153.01	135.41

Scheme/ Office/ Component	ACTUALS 2018-19	BE 2019-20	RE 2019-20	Exp. up to 31.12.2019
Sub Total	**3438.96**	**4311.56**	**4178.56**	**3250.2**
Establishment				
Secretariat - Economic Services	79.82	98.83	91.78	62.41
Attached, Subordinate & Other offices				
Central Water Commission	361.63	426.55	402.87	318.28
Central Soil & Material Research Station	14.63	16.36	16.63	12.02
Central Water & Power Research Station	62.27	73.13	73.98	56.47
Sardar Sarovar Construction Ad-visory Committee - SSCAC	0.46	0.58	0.36	0.25
Bansagar Control Board	0.36	0.53	0.53	0.21
Upper Yamuna River Board	9.53	2.30	2.30	1.65
Central Ground Water Board	226.88	229.45	242.82	195.46
National Institute of Hydrology	21.00	26.50	23.78	18.91
NWIC	0.00	2.07	2.41	0.78
CWMA	0.00	8.00	8.00	2.36
Sub Total	**698.76**	**785.47**	**773.68**	**606.39**
Total	**7422.08**	**8245.25**	**7518.21**	**5815.33**

Remarks:

** National River Conversation Plan- Other Basins has been added.

Annexure-V

LIST OF PRIORITY PROJECTS (AIBP WORKS) REPORTED COMPLETE/ ALMOST COMPLETE

S.No.	State	Name of the Project	Ultimate Irrigation Potential (in Th. Ha.)
1	Andhra Pradesh	Maddigedda	1.42
2	Assam	Champamati	25.00
3	Chhattisgarh	Maniyari Tank	14.52
4		Kharung	10.30
5	Jammu & Kashmir	Rajpora Lift	2.43
6	Karnataka	Sri Rameswar Irrigation	13.80
7		Bhima LIS	24.29
8	Madhya Pradesh	Singhpur Project	10.20
9		Mahuar Project	13.78
10		Sagad Project	17.06
11		Sindh Project Phase II	162.10
12		Indira Sagar Project Canal Phase - I & II (km. 0 to km. 142)	62.20
13		Omkareshwar Project Canal Phase-IV (OSP lift)	54.63
14		Indira Sagar Project Canal Phase - V (Khargone Lift)	33.14
15		Bansagar Unit 2	154.54
16		Barriyarpur LBC	43.85
17		Sanjay sagar (Bah) Project	17.81
18		Bargi diversion Project Ph-I	21.19
19	Maharashtra	Bawanthadi (IS)	27.71
20		Lower Panzara	6.79
21		Dongargaon	2.77
22		Warna	54.75
23		Nandur Madhmeshwar Ph-II	20.50
24		Upper Kundalika	2.80
25		Lower Dudhna	44.48
26		Khadakpurna	23.86
27		Dhom Balakwadi	18.10

S.No.	State	Name of the Project	Ultimate Irrigation Potential (in Th. Ha.)
28	Odisha	Upper Indravati(KBK)	85.95
29		Rukura-Tribal	7.65
30		Ret	8.50
31		Telengiri	13.83
32		Lower Indra	35.87
33	Punjab	Kandi Canal Extension (Ph.II)	23.33
34		Rehabilitation of Ist Patiala Feeder and Kotla Branch Project	68.62
35	Rajasthan	Narmada Canal	245.88
36		Mod. of Gang Canal	69.69
37	Telangana	Gollavagu Project	3.85
38		Rallivagu project	2.43
39		Mathadivagu Project	3.44
40	Uttar Pradesh	Bansagar Canal	150.13

ANNEXURE -VI

CENTRAL ASSISTANCE & STATE SHARE RELEASED DURING 2016-20 FOR AIBP WORKS FOR 99 PRIORITY PROJECTS UNDER PMKSY

Sl. No.	STATE	Releases under PMKSY-AIBP (Rs. in Cr)					
		2016-19		2019-20		Total (2016-17 to 2019-2020)	
		CA Released	State Share release through NABARD	CA released	State Share release through NABARD	CA Released	State Share release through NABARD
1	Andhra Pradesh	22.63	489.34	0.00	0.00	22.63	489.34
2	Assam	0.00	0.00	0.00	0.00	0.00	0.00
3	Bihar	84.14	0.00	11.98	0.00	96.12	0.00
4	Chhattisgarh	30.54	0.00	4.09	0.00	34.63	0.00
5	Goa	0.00	0.00			0.00	0.00
6	Gujarat	3419.654	2713.27	485.35	897.76	3905.004	3611.03
7	Jammu & Kashmir	26.49	0.00	5.88	0.00	32.37	0.00
8	Jharkhand	756.73	518.10			756.730	518.10
9	Karnataka	791.98	0.00	163.42	0.00	955.40	0.00
10	Kerala	0.00	0.00	0.00	0.00	0.00	0.00
11	Madhya Pradesh	562.41	661.83	26.45	162.60	588.86	824.43
12	Maharashtra	1270.42	6976.72	291.68	3267.70	1562.10	10244.42
13	Manipur	174.34	186.80	30.50	9.90	204.84	196.70
14	Odisha	1041.83	1924.87	90.65	593.30	1132.48	2518.17
15	Punjab	52.42	0.00	0.00	0.00	52.42	0.00
16	Rajasthan	357.91	196.32	7.04	0.00	364.95	196.32
17	Telangana	560.67	0.00	214.04	0.00	774.71	0.00
18	Uttar Pradesh	598.39	2675.11	407.68	1436.50	1006.07	4111.61
	Total	**9750.55**	**16342.36**	**1738.76**	**6367.76**	**11489.31**	**22710.12**

Annexure –VII

CENTRAL ASSISTANCE & STATE SHARE RELEASED DURING 2016-20 FOR CADWM WORKS FOR 99 PRIORITY PROJECTS UNDER PMKSY

PMKSY- Releases		CADWM (Rs in Cr)							
		2016-17		2017-18		2018-19		2019-20 (Up to December, 2019)	
Sl. No.	STATE	CA Released	State Share release through NABARD	CA released	State Share release through NABARD	CA Released	State Share release through NABARD	CA Released	State Share release through NABARD
1	Andhra Pradesh	0.000	0.000	0.000	0.000	69.180	0.000	0.000	0.000
2	Assam	0.000	0.000	0.000	0.000	3.55	0.000	0.000	0.000
3	Bihar	12.60	0.000	8.760	0.000	14.420	0.000	0.000	0.000
4	Chhattisgarh	0.000	0.000	11.80	0.000	9.930	0.000	0.000	0.000
5	Goa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	Gujarat	681.640	0.000	690.48	0.000	347.040	0.000	0.000	0.000
7	Jammu & Kashmir	0.000	0.000	0.000	0.000	1.700	0.000	0.000	0.000
8	Jharkhand	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	Karnataka	31.420	0.000	15.25	0.000	13.490	0.000	3.79	0.000
10	Kerala	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	Madhya Pradesh	77.740	0.000	102.80	71.520	70.910	0.000	0.000	102.76
12	Maharashtra	15.170	0.000	32.81	0.000	25.790	0.000	0.000	0.000
13	Manipur	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.00
14	Odisha	35.28	10.470	58.57	36.930	3.650	0.000	0.000	144.00
15	Punjab	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	Rajasthan	0.000	0.000	2.48	0.000	7.430	8.250	10.22	26.96
17	Telangana	0.000	0.000	10.220	0.000	26.120	0.000	0.000	0.000
18	Uttar Pradesh	0.000	0.000	0.000	0.000	0.000	0.000	150	0.000
	Total	**853.85**	**10.470**	**933.17**	**108.45**	**593.210**	**8.250**	**164.01**	**288.72**

Annexure-VIII

STATE/UT WISE DETAILS OF CENTRAL ASSISTANCE RELEASED UNDER FMP/ FM COMPONENT OF FMBAP

(Rs. in crore)

Sl. No.	State	Funds Released (XI Plan)	Funds Released (XII Plan)	Funds released (FY:2017-18)	Funds released (FY:2018-19)	Funds released FY:2019-20 (up to 31.12.2019)	Total funds released so far
1	Arunachal Pradesh	81.69	87.91	21.18	0	0	190.78
2	Assam	748.86	64.89	245.49	142.12	28.17	1229.53
3	Bihar	723.18	184.64	0	16.58	0	924.4
4	Chhattisgarh	15.57	3.75	0	0	0	19.32
5	Goa	9.98	2	0	0	0	11.98
6	Gujarat	2	0	0	0	0	2
7	Haryana	46.91	0	0	0	0	46.91
8	Himachal Pra-desh	165.98	221.87	87.5	162.6	176.405	814.355
9	Jammu & Kashmir	252.57	169.95	110.4	52.2	52.355	637.475
10	Jharkhand	18.44	4.27	0	0	0	22.71
11	Karnataka	23.8	0	0	0	0	23.8
12	Kerala	63.68	55.22	19.05	0	0	137.95
13	Manipur	66.34	24.36	0	0	0	90.7
14	Meghalaya	3.81	0	0	0	0	3.81
15	Mizoram	14.48	1.93	0.48	0	0	16.89
16	Nagaland	28.96	54.17	0	10.84	0	93.97
17	Odisha	101.12	0	0	0	0	101.12
18	Puducherry	7.5	0	0	0	0	7.5
19	Punjab	40.43	0	0	0	0	40.43
20	Sikkim	83.69	8.15	0	0	0	91.84
21	Tamilnadu	59.82	0	0	0	0	59.82
22	Tripura	23.62	0	0	0	0	23.62
23	Uttar Pradesh	290.69	111.22	13.55	15.57	24.126	455.156
24	Uttarakhand	49.63	153.98	0	4.63	0	208.24
25	West Bengal	643.26	158.75	65.03	23.65	117.119	1007.809
	Total	**3566.00**	**1307.07**	**562.67**	**428.20**	**398.18**	**6262.12**

Annexure-IX

AREA PROTECTED AND POPULATION BENEFITTED DURING XI & XII PLAN

Sl. No	State	XI Plan		XII Plan		Total (XI &XII 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	Uttarakhand	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**

Annexure –X

'SURVEY & INVESTIGATION' AND PREPARATION OF DETAILED PROJECT REPORTS OF MULTIPURPOSE PROJECTS BY BRAHMPUTRA BOARD

Sl. No.	Name of Project	Basin	Installed Capacity (MW)	Status
A-Completed DPR				
1.	Dihang (Siang) Dam Project	Brahmaputra	20000	Single- stage project DPR was completed in 1983 by the Board. Handed over to NHPC under 3 stage development in 2000
2.	Subansiri Dam Project	Brahmaputra	4800	Single stage project DPR was completed in 1983 by the Board. Handed over to NHPC under 3 stage development in 2000
3.	Tipaimukh Dam Project	Barak	1500	DPR completed in 1995. Handed over to NEEPCO in 1999
4.	Bairabi Dam Pro-ject	Barak	75	Handed over to Govt. of Mizoram in 2000
5.	Pagladiya Dam Project	Brahmaputra	3	Under Implementation of Brahmaputra Board. Field activities halted due to non completion of zirath survey by Government of Assam.
B- DPR Partially completed				
1.	Dibang Dam Project	Brahmaputra	4900	S & I Executed by the Board and DPR partially completed. Handed over to NHPC in 2006 and under execution by NHPC.
2.	Lohit Dam Project	Brahmaputra	3000	S & I completed. Project entrusted to Private Developer by Govt. of Arunachal Pradesh in 2009.
3.	Kynshi Stage-I Dam Project	Others	450	S & I was under final stage of completion. Govt of Meghalaya assigned the Project to private developers in 2011
4.	Kynshi Stage-II Dam Project	Others	450	

Status of Projects currently under S & I and DPR preparation is as under:

Sl. No.	Name of Project	State	Basin	Installed Capacity (MW)	Status
1.	Kulsi Multi-Purpose Project (Identified as National Project)	Assam & Meghalaya	Brahmaputra	55	DPR completed. Decision for ownership for implementation is underway.
2.	Noa-Dehing Dam Project (Identified as National Project)	Arunachal Pradesh	Brahmaputra	71	Government of Arunachal Pradesh offered to execute in joint venture with NHPC and requested to Ministry of Power to allot the work to NHPC.
3.	Simsang Dam Project	Meghalaya	Others	65	Due to shortage of Manpower, remaining works for preparation of DPRs is entrusted to WAPCOS.
4.	Jiadhal Dam Project	Arunachal Pradesh	Brahmaputra	70	
5.	Killing Dam Project	Assam & Meghalaya	Brahmaputra	85	As requested by NEEPCo, process of handing over is underway.

ANNEXURE – XI

LIST OF CENTRAL PUBLIC INFORMATION OFFICERS / APPELLATE AUTHORITIES IN THE VARIOUS SECTIONS / WINGS OF THE DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

S. No.	Name & Designation of CPIO appointed (S/Shri/Smt/Kum)	Name of the Section/ Desk/ work	Name & Designation of the Appellate Authority appointed (S/ Shri/Smt/Kum)
1	Sh. A.K. Kaushik, Under Secretary (Admn), Tel. No. 011-23738126, Email ID: usadmn-mowr@nic.in	Administration Section/Cash Section SC/ST/OBC Cell	Sh.N.P. Joshi Deputy Secretary(Admn), Tel No. 23714734, Email ID-diradmn-mowr@nic.in
2	Sh. A.K. Das, Under Secretary (E-I), Tel. No. 011-23716928, Email id: use1-mowr@nic.in	E-I Section	Sh.Chandan Mukherjee, DS (E-I/E-III), Tel. No. 011-23711459 Email id : chandan@nic.in
3	Sh.S.B. Pandey, Under Secretary (E-III), Tel. No. 011-23714350, Email id: use3-mowr@nic.in	E-III Section	
4	Sh.B.T.H.Vaiphei, Under Secretary (ID,e-Gov& IEC), Tel. No. 011-23710303, Email id: bht.vaiphei@nic.in	ID, e-Governance Cell & IEC	Sh.Girraj Goyal, Director Tel No.-23766369 Email ID – diregov-mowr@gov.in
5	Sh.Rajan Bhasin, Under Secretary (Co-ord.), Tel. No. 011-23074005, Email id: uscoord-mowr@nic.in	Coordination Section	Sh.Inderjit Hadda, Director(Coordination) Tel. No. 011-23074005 Email ID :dircoord-mowr@nic.in
6	Sh. A.K. Kaushik, Under Secretary (GA), Tel. No. 011-23710303, Email id: usga-mowr@nic.in	General Admn.	Sh. N.P. Joshi Deputy Secretary(GA), Tel No. 23714734, Email ID-diradmn-mowr@nic.in
7	Sh. Ahshay Kumar Sahoo, Under Secretary (PSU/ Parliament), Tel. No. 011-23716928, Email id: ak.sahoo38@nic.in	Public Sector Undertakings Section and PPP Cell/& Parliament	Sh.S.K. Garg, Director (PSU/O&M, Parliament), Tel No.-23382256, Email ID-surender.garg@nic.in
8	Sh.Santanu Rakshit, Under Secretary (E-II/Vigilance), Tel No. 011-23710333, Email ID-use2-mowr@nic.in	E-II Section	Sh.Ashok Kumar Director,(E-II) Tel No. 23714734, Email ID-dse2-mowr@nic.in
9	Smt. Pinki Pandey, Under Secretary (GW Desk, ABHY &NHP), Tel No.-01123766907, Email ID-pinki.pandey13@nic.im	GW Desk, ABHY &NHP	Sh.Ashish Kumar, Director Tel No-011-23716747 Email ID- ashish.kumar74@gov.in

S. No.	Name & Designation of CPIO appointed (S/Shri/Smt/Kum)	Name of the Section/ Desk/ work	Name & Designation of the Appellate Authority appointed (S/ Shri/Smt/Kum)
10	Sh.S.K.Kataria, Under Secretary (GWE), Tel No-011-23766907, Email ID-sk.kataria25@nic.in	GWE	Sh. Ashok Kumar, Director(E-II/GWE), Tel No. 23714734, Email ID-ashok.kum@nic.in
11	Smt. Shalini Juneja, Under Secretary (E-IV), Tel No.-011-23716894, Email ID-shalinijuneja88@gov.in	Vigilance/ E-IV	Sh. S.K. Basu, Deputy Secretary, Tel No.-011-23711988, Email ID- dse4-mowr@nic.in
12	Sh. Amit Kumar Singh, Under Secretary (EA&IC), Tel No-011- 23074005, Email ID- usea-mowr@nic.in	EA&IC	Sh. Mukesh Kumar, Deputy Secretary (EA&IC), Tel No.011-23383078, Email ID: dsea-mowr@gov.in
13	Smt.Shraddha Mathur, Assistant Director (OL), Tel. No. 011-24367106, Email id:shraddha.mathur@nic.in	Official language	Joint Director (OL), Tel. No. 011-23711486, Email id:
14	Sh. Rajaram Purohit, Jr. Hydrologist (NHP), Tel. No. 011-21420147, Email id: rr.purohit@nic.in	NHP	Sh. N.K. Manglik, SJC (NHP), Tel. No. 011-24367109, Email id :sic2nhp-mowr@gov.in
15	Sh. B.L. Meena, Under Secretary (B&B), Tel. No. 011-24367116, Email id: bl.meena15@nic.in	Matters of Brahmputra and Barak Wing	Sh. Ajay Kumar Gupta, Sr. Joint Commissioner (B&B), Tel. No. 011-24367590, Email id: ak.gupta28@gov.in
16	Sh. D.K.Jena, Sr. Joint Commissioner (FM), Tel. No. 011-24392095, Email id: sjcfm4@nic.in	Flood Management Wing	Sh. Atul Jain, Commissioner (FM), Tel. No. 011-24368238, Email id: commer-mowr@nic.in
17	Sh. A.J. Soreng, Under Secretary (PP), Tel. No. 011-23714350, Email id: uspp-mowr@nic.in	Policy Section(PP)	Sh. Bhupesh Kumar, Sr. Joint Commissioner (PP), Tel: 011-23719503, Email Id: sjcpp-mowr@nic.in
18	Sh. Vijay Shrivastava, Under Secretary (Finance-I), Tel. No. 011-23711486, Email id: vijayk.srivastava@nic.in	Finance-I	Sh. A.K.Patro, Deputy Secretary (Finance), Tel: 011-23711360, Email id: dirfin-mowr@nic.in
19	Sh. Y.P. Yadav, Under Secretary (Finance-II), Tel. No. 01123719302, Email id: yp.yadav48@gov.in	Finance-II	
20	Sh. Bamane M. J. DD(Planning), Tel: 011-24366683, Email ID: bamane.m@gov.in	Planning Unit	Dr. Ch. David, Joint Director(Planning), Tel. 011-24366683, E mail ID: david.ch63@gov.in

S. No.	Name & Designation of CPIO appointed (S/Shri/Smt/Kum)	Name of the Section/ Desk/ work	Name & Designation of the Appellate Authority appointed (S/ Shri/Smt/Kum)
21	Sh. Saurabh, Deputy Secretary (CADWM), Tel. No. 011-23382481, Email id: saurabh.k01@gov.in	Command Area Development and Water Management related matters	Dr. B.R.K. Pillai, Commissioner (CADWM), Tel. No. 011-23382256, Email: ravi.pillai@nic.in
22	Sh. 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	Sh. T.D. Sharma, Sr. Joint Commissioner (BM), Tel. No. 011- 24367109, Email id: sjcbm-mowr@nic.in
23	Sh. Pramod Kumar Section Officer (Projects), Tel. No. 011-24362129, Email: id: project1-mowr@nic.in	Project Section	Sh. Ashwini Kumar Shukla, Sr. Joint Commissioner (SPR-II), Tel. No. 011-23385186, Email id: sjcpr-mowr@nic.in
24	Sh. A.C. Mallick Under Secretary (Pen. River), Tel No.-011-23383059, Email ID-uspenriv-mowr@nic.in	Pen. River	Sr. Joint Commissioner (Pen. River), Tel. No. 011-23388020 Email id:
25	Sh. Rahul Kumar Singh, Sr. Joint Commissioner (MI), Tel No : 011-23387834, Email id: sjcmi-mowr@nic.in	Minor Irrigation & Water Bodies	Sh. K. Vohra, Commissioner (SPR), Tel No- 011-23710107, Email ID-commpr-mowr@nic.in
26	Sh. M. L. Franklin, Deputy Commissioner (SPR), Tel No : 011-23385186, Email id:dcspr-mowr@nic.in	SPR-I	
27	Sh. Rajveer Singh, Deputy Commissioner (Indus), Tel. No. 011-24360332 Email id: dcindus-mowr@nic.in	Indus Wing	Sh. Manoj Kumar Sr. Joint Commissioner (Indus) Tel. No.011- 24361467 Email id: sjcindus1-mowr@nic.in
28	SEO (MI Stat), Tel. No. 011-24656135	Minor Irrigation Statistics	Director (MI-Stat), Tel. No. 011-24654503 Email id: dirmi-mowr@nic.in
29	Sh. Vinod Kumar, US(NWM), Tel. No. 011-24368343, Email id: usnwm-mowr@nic.in	National Water Mission	Sh. J.P. Singh, Deputy Secretary(NWM), Tel. No.011- 24366614, Email id: jp.singh22@nic.in

S. No.	Name & Designation of CPIO appointed (S/Shri/Smt/Kum)	Name of the Section/ Desk/ work	Name & Designation of the Appellate Authority appointed (S/ Shri/Smt/Kum)
30	Sh. Krishan Lal Ahuja, Under Secretary (NMCG), Tel. No. 011-23049417, Email id: krishanahuja.edu@nic.in	NMCG	Sh. Binod Kumar, Director(NMCG), Tel. No. 011-23049506, Email id: binodkumar.ofb@nic.in
31	Shri Madan Singh, Asst. Controller of Accounts, Tel. No: 011-23384843. Email id: madan.singh7@gov.in	Matters related to Principal Accounts Office	Sh. Ashish Kumar Singh, Controller of Accounts, Tel. No. 011-23386644, Email id: ca-mowr@nic.in
32	Sh. Nafe Singh, Pay & Accounts Officer (FBP), Tel. 03485-253648, Email id: gmfbp@gov.in	Matters related to Pay & Accounts Office (FBP)	Sh. Ashish Kumar Singh, Controller of Accounts, Tel. No. 011-23386644, Email id: ca-mowr@nic.in
33	Smt. Sunita R. Shinde, Sr. Accounts Officer (CWPRS), Tel. 020-24381813, Email id: sunita-robert@yahoo.com	Matters related to Pay Accounts Office (CWPRS)	
34	Sh. Balbir Singh, Sr. Accounts Officer (CGWB), Tel: 0129-2477125, Email id: paro-cgwb@gov.in	Matters related to Pay & Accounts Office (CGWB)	
35	Sh. Krishna Singhal, Sr. Accounts Officer (CWC), Tel No. 011-26711043, Email id: upendermalhotra-cwc@nic.in	Matters related to Pay & Accounts Office (CWC)	
36	Sh. 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-XII

LIST OF POSTAL ADDRESSES OF PUBLIC/ STAFF GRIEVANCE OFFICERS IN THE DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION AND ITS VARIOUS ORGANISATIONS

Sl. No.	Name of the Organization	Address	Name &Designation of P.G./ S.G. Officer
1.	Department of Water Resources, River Development and Ganga Rejuvenation	Room No.2, B Wing, Shastri Bhavan, New Delhi-110001 (Tele No. 011-23074005)	Shri Inderjit Hadda, Director (Coord) &Director (PG &SG) Email Id: dircoord-mowr@nic.in
2.	Narmada Control Authority	Narmada Sadan, Sector-B, Scheme No. 74, Vijay Nagar, Indore - 452010(MP) (Tele No. 0731-2575753)	Smt. Suman Sinha, Secretary and Grievance Redressal Officer
3.	Bansagar Control Board	Bansagar Control Board, Samab Colony, Rewa (MP) (Tele No. 07662-226318), 0755-2762059	Ms. Sonam Dwivedi, Pay & Accounts Officer &Public Grievance Officer
4.	Betwa River Board	O/o Pay &Account Officer, Betwa River Board, Nandanpura, Jhansi-284003 (U.P) (Tele No. 0510-2480279)	Vacant
5.	Central Ground Water Board	CGWB, CHQ, Faridabad, (Tele No. 0129-2477125 &(Fax No. 0129-2412524)	Col. Rajesh Kumar Gaur, Director (Admn) & Public Grievances officer
6.	Central Soil and Materials Research Station	Room No. 316, CSMRS, Ol of Palme Marg, Hauz Khas, New Delhi- 110 016 (Tel No. 26581370) FAX No.-26853108	Shri. Hari Dev, Scientist 'E' (RM-I) &Director (Grievances)
7.	Central Water Commission	Room No. 313(S), Sewa Bhawan, R.K. Puram, New Delhi-110066, (Tele No. 01126187232) (Fax No. 26195516)	Shri. Ashis Banerjee, Secretary &Grievances Officer
8.	Central Water &Power Research Station	Central Water &Power Research Station, P.O. Khadakwasla Research Station, Pune - 411024 (Tele No. 020-24103402)	Dr. J. D. Agrawal, Scientist E and Grievance Redressal Officer Email Id: agrawal_jd@cwprs.gov.in
9.	Farakka Barrage Project	P.O. Farakka Barrage, Distt. Murshidabad, West Bengal- 742212 (Tele No. 03485-253335)	Shri. R.K. Singh, Superintending Engineer (Coord.) & Director (Staff Grievances)

Sl. No.	Name of the Organization	Address	Name &Designation of P.G./ S.G. Officer
10.	Ganga Flood Control Commission	Ganga Flood Control Commission, Sinchai Bhawan, IIIrd Floor, Patna-800015 (Tele No. 0612- 2215222) (Fax No. 0612- 2222294)	Shri. Amitabh Prabhakar, Director (HRM.) & Director (Staff Grievances & Public Grievances)
11.	National Institute of Hydrology	Jal Vigyan Bhawan, Roorkee , Uttarakhand,- 247667 (Tele No. 01332249216)	Dr. R.P. Pandey, Scientist-G, Public Grievance Officer & OIC, Staff Grievances
12.	National Projects Construction Corporation Limited	NPCC Ltd., Plot No. 148, Sector -44, Gurugram, Haryana- 122003	Shri. Nitin Saxena, Senior Manager (Law) Grievances Redressal Officer
13.	National Water Development Agency	18-20, Community Centre, Saket, New Delhi-110017 (Tele No. 26852735)	Shri. R.K. Jain, Chief Engineer (HQ) & Grievance Officer
14.	Sardar Sarovar Construction Advisory Committee	Sardar Sarovar Construction Advisory Committee, Narmada Bhavan, "A" Block 4 Floor, Vadodara - 390001 (Tele No. 02652437262)	Shri. Varshney Baroda, Deputy Secretary (Grievances)
15.	Water & Power Consultancy Services (India) Ltd.	76, C, Sector-18, Gurugram, Haryana-122015, Tel No:- 0124-2399058	Smt. Simmi Wadhwa, Director (Staff /Public Grievances)
16.	Brahmaputra Board	Basistha, Guwahati - 781029 (Tele No. 0361-2300128)	Shri.Shyamal Kumar Deka, Executive Engineer & Director (Staff/Public Grievances)
17.	Upper Yamuna River Board	Upper Yamuna River Board, Wing No. 4, Ground Floor, West Block No. 1, R.K. Puram, New Delhi- 110066 (Tele.011-26174147)	Shri. D.P.Mathuria, Member Secretary & Director of Grievances
18.	Tungabhadra Board	Tungabhadra Board, Tungabhadra Dam, Taluk: Hospet, Distt: Bellary, Karnataka State, PIN: 583225 Phone-08394-259113	Shri. G Naga Mohan, Secretary & Director of Grievances
19.	National Mission for Clean Ganga	1st Floor, Major Dhyanchand National Stadium, New Delhi-110002.	Vacant

Abbreviations

ADB	Asian Development Bank
AfDB	African Development Bank
AGGS	Association of Global Groundwater Scientists
AIBP	Accelerated Irrigation Benefits Programme
AICTE	All India Council for Technical Education
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AMTC	Agriculture Mechanisation and Training Centre
AR	Artificial Recharge
ASCI	Administrative Staff College of India
AWA	Annual Water Account
BB	Brahmaputra Board
BCB	Bansagar Control Board
BCM	Billion Cubic Meter
BRB	Betwa River Board
BOD	Bio-chemical Oxygen Demand
BOP	Border Out Post
BOOT	Build, Operate, Own and Transfer
CA	Central Assistance
CAD&WM	Command Area Development & Water Management
CAU	Central Agricultural University
CCA	Culturable Command Area
CEA	Central Electricity Authority
CGWB	Central Ground Water Board
CLA	Central Loan Assistance
CMC	Cauvery Monitoring Committee
CMIS	Coastal Management Information System
CPCB	Central Pollution Control Board
CPGRAMS	Centralized Public Grievance and Monitoring System
CPIOs	Central Public Information Officers
CPSU	Central Public Sector Units
CRA	Cauvery River Authority
CSMRS	Central Soil & Materials Research Station

CSR	Corporate Social Responsibility
Cumec	Cubic metre per sec
Cusec	Cubic foot per sec
CVC	Central Vigilance Commission
CWC	Central Water Commission
CWES	Central Water Engineering Service
CWPRS	Central Water & Power Research Station
CWDT	Cauvery Water Disputes Tribunal
DBE	Design Basic Earthquake
DDRP	Dam Design Review Panel
DDS	Drainage development Scheme
DDUGJY	Deen Dayal Upadhyaya Gram Jyoti Yojana
DEM	Digital Elevation Models
DHARMA	Dam Health and Rehabilita-tion Monitoring Application
DoDWS	Department of Drinking Water & Sanitation
DoLR	Department of Land Resources
DoNER	Department of North Eastern Region
DoWR,RD & GR	Department of Water Resources, River Development and Ganga Rejuvenation
DPR	Detailed Project Report
DRIP	Dam Rehabilitation and Improvement Project
DSB	Dam Safety Bill
DSO	Dam Safety Organisation
DSRP	Dam Safety Review Panels
DVC	Damodar Valley Corporation
DWRIS	Development of Water Resources Information System
EFC	Expenditure Finance Committee
e-HRMS	Electronic-Human Resource Management System
EISL	Environmental Infrastructure and Services Limited
EPA	Environment Protection Act
EPC	Engineering Procurement and Construction
EPFO	Employees Provident Fund Organisation
ERM	Extension, Renovation and Modernization
ETP	Effluent Treatment plant
ETF	Empowered Task Force
FBP	Farakka Barrage Project
FF	Flood Forecasting
FMBAP	Flood Management and Border Area Programme
FMP	Flood Management Programme

FMIS	Flood Management Information System
GFCC	Ganga Flood Control Commission
GHLSC	Gandak High Level Standing Committee
GPIs	Grossly Polluting Industries
GRA	Grievances Redressal Authority
GTF	Gange Task fiorce
GWM & R	Ground Water Management and Regulation
FR	Feasibility Report
FRL	Full Reservoir Level
GSI	Geological Survey of India
Ha	Hectare
HDPE	High Density Polyethylene
HE	Hydroelectric
HKKP	Har Khet Ko Pani
HP	Hydrology Project
HPC	High Performance Concrete
HRD-CB	Human Resource Development and Capacity Building
HSO	Hydrological Studies Organisation
IAs	Implementing Agencies
IARI	Indian Agricultural Research Institute
ICAR	Indian Council of Agricultural Research
ID	Infrastructure Development
IEC	Information, Education and Communication
IGWC	International Ground Water Conference
IITF	India International Trade Fair
ILR	Inter Linking of Rivers
IHHL	Individual Household Latrine
IMD	India Meteorological Department
INCCC	Indian National Committee on Climate Change
INCGW	Indian National Committee on Ground Water
INCID	Indian National Committee on Irrigation and Drainage
INCWR	Indian National Committee on Water Resources
INCOH	Indian National Committee on Hydrology
INCSW	Indian National Committee on Surface Water
IPC	Irrigation Potential Created
IPDS	Integrated Power Development Scheme

NABARD	National Bank for Agriculture and Rural Development
IPU	Irrigation Potential Utilized
ISRWD	Inter-State River Water Disputes
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
KRMB	Krishna River Management Board
KWDT	Krishna Water Disputes Tribunal
LI	Lift Irrigation
LTIF	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
MLD	Million Liters per Day
MMI	Major & Medium Irrigation
Mha	million hectare
MI	Minor Irrigation
MoEF&CC	Ministry of Environment, Forest and Climate Change
MoES	Ministry of Earth Science
MoFPI	Ministry of Food Processing Industries
MoJS	Ministry of Jal Shakti
MoU	Memorandum of Under-standing
NABARD	National Bank for Agriculture and Rural Development
NAPCC	National Action Plan on Climate Change
NAQUIM	National Project on Aquifer Management
NASC	National Agriculture Science Centre
NBWUE	National Bureau of Water Use Efficiency

NCA	Narmada Control Authority
NCDS	National Committee on Dam Safety
NCSDP	National Committee on Seismic Design Parameters
NDB	New Development Bank
NDSAP	National Data Sharing & Accessibility Policy
NER	North Eastern Region
NEHARI	North Eastern Hydraulic & Allied Research Institute
NERI-WALM	North Eastern Regional Institute of Water and Land Management
NGRBA	National Ganga River Basin Authority
NGWTRI	National Ground Water Training and Research Institute
NHDC	Narmada Hydro-electric Development Corporation
NHP	National Hydrology Project
NIH	National Institute of Hydrology
NIH-CFMS	National Institute of Hydrology- Centre for Flood Management Studies
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
NRCD	National River Conservation Directorate
NRCP	National River Conservation Plan
NRLD	National Register of Large Dams
NRSC	National Remote Sensing Centre
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
OCEMS	Online Continuous Effluent Monitoring Stations
OFD	On Farm Development
O & M	Operation and Maintenance
OW	Observatory Well
PAC	Project Advisory Committee

PAF	Project Affected Families
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
PIC	Permanent Indus Commission
PIM	Participatory Irrigation Management
PIP	Polavaram Irrigation Project
PIRC	Project Implementation Review Committee
PMA	Project Management Agency
PMC	Project Management Consultants
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMP	Pancheshwar Multipurpose Project
PPA	Polavaram Project Authority
PMAY	Pradhan Mantri Awas Yojana
PMKSY	Pradahan Mantri Krishi Sinchayee Yojana
PZ	Piezometer
QPF	Quantitative Precipitation Forecast
R & D	Research and Development
R & R	Rehabilitation and Resettlement
RFD	Results Framework Document
RGNGWTRI	Rajiv Gandhi National Ground Water Training & Research Institute
RMBA	River Management Activities & Works related to Border Areas
RMIS	Rationalisation of Minor Irrigation Statistics
RRR	Repair, Renovation and Restoration
RTDAS	Real Time Data Acquisition System
RTWQMS	Real Time Water Quality Monitoring Station
SCEC	Sub Committee on Embankment Construction
SGWCC	State Ground Water Coordination Committee
SJVN	Satluj Jal Vidyut Nigam Limited
SLWM	Solid Liquid Waste Management
SMD	Subject Matter Division
SMI	Surface Minor Irrigation
SMP	Sediment Management Policy
SOP	Standard Operating Procedure

SPCBs	State Pollution Control Boards
SSCAC	Sardar Sarovar Construction Advisory Committee
SSP	Sardar Sarovar Project
STP	Sewage Treatment Plant
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
ToR	Terms of Reference
TW	Tube Well
ULBs	Urban Local Bodies
UYRB	Upper Yamuna River Board
VWDT	Vansadhara Water Dispute Tribunal
WALMI	Water and Land Management Institute
WAPCOS	Water and Power Consultancy Services Limited
WB	World Bank
WDS	Water Detention Structure
WEGWIS	Web Enabled Ground Water Information System

GOVERNMENT OF INDIA
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RIVER DEVELOPMENT AND GANGA REJUVENATION
NEW DELHI