



S. K. Haldar

Chairman

Message

Continuing with the success of the Dam Rehabilitation and Improvement Project (DRIP), a major milestone was achieved for the DRIP Phase-II. A loan signing ceremony with World Bank for a loan amounting to USD 250 Million was held on 04.08.2021. The Loan Agreement was signed by the Department of Economic Affairs, GoI and World Bank and Project Agreement was signed by 10 partner States with World Bank. Externally aided DRIP Phase II and Phase III were approved by the Government of India in October 2020. The first phase of the DRIP programme, which covered 223 dams in 7 states, has been recently closed in March 2021. The project is coordinated and supervised by Project Directorate set up in CWC.

Shoreline change assessment is one of the important activities as far as planning and prioritization of coastal protection works. Under the aegis of Coastal Protection and Development Advisory Committee (CPDAC), CWC had initiated a project titled, "Shoreline Change Atlas of the Indian Coast" in 2010 in collaboration with Space Applications Centre (SAC), ISRO, Ahmedabad with the major objective to prepare a digital shoreline change atlas in GIS environment on 1:25,000 scale using satellite data (time frame 1989-91 and 2004-06). As per this project, the Shoreline Change Atlas of Indian Coast for the time frame 1989-91 and 2004-06 was published in May, 2014. Recently, the updated Atlas was published based upon the data of 2014-16. The atlas shows that the total area lost due to coastal erosion is around 3680 ha, while 4042 ha has accreted which resulted in a net gain of 362 ha of land during the period 2004-16. I am very hopeful that this updated Atlas would be of great value to the maritime States/UTs.

One of the five goals of the National Water Mission (NWM) is to increase Water Use Efficiency in all sectors of

water use by 20%. Under this goal, one of the strategies identified is to set up a National Bureau of Water Use Efficiency (NBWUE). A brainstorming session was held on 23.08.2021 under the Chairmanship of Secretary (DoWR, RD&GR) regarding the proposal for setting up of National Bureau of Water Use Efficiency (NBWUE). During the brainstorming session, the main objectives of NBWUE were outlined.

India Water Week (IWW) which is one of the biggest events related to the water sector in India has been postponed for the next year. Earlier it was planned to be organized this year along with BRICS Water Ministers meet and BRICS Water Forum.

Last month, I inspected various Hydrological Observation sites across various basins in India. Considering the importance of HO data, I am happy to note that CWC is constantly upgrading its network with the infusion of new technology. Concerned regional offices of CWC have been given direction to include more and more reservoirs under the Inflow forecasting network.

श्रीमति हार्दिक



Commemorating the declaration of the
Provisional Government of Free India
Aarizi Hukumat-e Hind

21 October, 1943

#Netaji125



CONTENTS

- Release of Shoreline Change Atlas of the Indian Coast by SAC, ISRO, Ahmedabad
- Early Flood Warning System including Inundation Forecasting in GangaBasin under NHP
- 68th Meeting of Governing Body of National Water Development Agency (NWDA)
- Inspection of various HO sites in Uttarakhand

- 3rd meeting of Executive Committee for implementation of PMKSY
- 92nd meeting of Narmada Control Authority
- Meetings regarding Ujh Multipurpose Project
- First meeting of the WG for reviewing the calculation of benefit cost ratio and procedure for RCE for MMI, flood control and multipurpose project
- 5th meeting of the Committee for planning BRICS Water Ministers meet and BRICS Water Forum

- Technical Expert Committee meeting for Delhi Drainage Plan
- DRIP
- Brainstorming Session on the proposal for setting up of NBWUE
- Flood Situation in the Country
- Financial Progress of Schemes
- Data Corner
- Gallery
- History- Bhadra Reservoir Project

Release of Shoreline Change Atlas of the Indian Coast by SAC, ISRO, Ahmedabad

Under the aegis of Coastal Protection and Development Advisory Committee (CPDAC), CWC has initiated a project titled, "Shoreline Change Atlas of the Indian Coast" in 2010 in collaboration with Space Applications Centre (SAC), ISRO, Ahmedabad with the major objective to prepare a digital shoreline change atlas in GIS environment on 1:25,000 scale using satellite data (time frame 1989-91 and 2004-06). As per this project, the Shoreline Change Atlas of Indian Coast for the time frame 1989-91 and 2004-06 was published in May, 2014. Later on, in the 14th CPDAC meeting, it was decided that the Shoreline Change Atlas of Indian Coast will be updated at regular intervals and accordingly SAC initiated the first update based upon the data of 2014-16.

The major objective of this work is to prepare a digital shoreline change atlas on 1:25, 000 scale in a GIS environment using the shoreline delineated for the time-frame 2004-06 and 2014-16. The atlas shall depict and quantify shoreline changes as eroding/accreting/stable, show status of shoreline protection measures taken by respective states and generate an A3 size state-wise Coastal Atlas of all the maritime states of India.

The above work for the preparation of shoreline change atlas for the updated time frame 2014-16 has been completed by SAC, ISRO during August, 2021. In this regard, a presentation through video conferencing has been made on 16.08.2021 by SAC, ISRO, Ahmedabad for briefing about the work done by them to Chairman, CWC. This atlas was released and published through online mode on 17.08.2021 in which Dr. R. K. Gupta, Member(D&R), CWC attended.

The link for SLC Atlas page on VEDAS website is - https://vedas.sac.gov.in/en/Shoreline_Change_Atlas.html

Early Flood Warning System including Inundation Forecasting in Ganga Basin under NHP

A Contract was signed between Central Water Commission (CWC) and M/s AECOM Asia Company Ltd in Joint Venture with M/s URS Scott Wilson India Private Ltd & M/s AECOM India Private Ltd on 11.8.2021 for providing consultancy services for Early Flood Warning System including Inundation Forecasting in Ganga Basin under National Hydrology Project (NHP). Scope of consultancy includes development of the system in 2 years and Operation & maintenance of the system for 5 years after development. Director, Flood Control Application-II Directorate, CWC has signed the contract on behalf of CWC. The work of consultancy during

Salient findings from Shore Line Change Atlas

1. Shoreline mapped for 2014-2016 and 2004-2006 timeframes using LISS-IV images at 1:25,000 scale along the Indian Coastal region.
2. The total length of the Indian shoreline as mapped at 1:25,000 using LISS-IV image is 7549 km that excludes river/creek mouths.
3. Around 5321 km of the coast is stable, 1144 km of the coast shows erosion and 1084 km is accreting.
4. The total area lost due to coastal erosion is around 3680 ha, while 4042 ha has accreted which resulted in a net gain of 362 ha of land.
5. The shoreline along the eastern Indian peninsula is observed to be more dynamics and along the west coast, the shoreline changes are more along the Kerala and Karnataka coast.
6. India is subjected to varied coastal processes and the coastal regions are vulnerable to natural disasters, which alter the shoreline position that gets enhanced with the anthropogenic pressure.

Results of Shoreline Change between 2004-06 and 2014-16

State	Erosion Area (in ha)	Erosion Length (in km)	Accretion area (in ha)	Accretion Length (in km)	Stable Length (in km)	Total Length (in km)
Gujarat, Daman & Diu	313.6	109.76	207.75	49.18	1051.44	1210.4
Maharashtra	104.75	75.16	209.94	60.27	588.64	724.07
Goa	28.78	21.7	13.6	7.13	116.73	145.56
Karnataka	72.05	40.19	111.39	47.74	230.86	318.78
Kerala	285.02	137.33	303.3	121.13	327.17	585.63
Tamil Nadu and Puducherry	358.35	128.88	470.68	188.6	531.57	849.07
Andhra Pradesh	795.67	188.95	807.88	208.15	413.33	810.4
Odisha	831.35	143.6	753.5	98.77	208.19	450.53
West Bengal	393.67	56.3	141.18	33.9	67.24	157.45
Lakshadweep Islands	16.59	11.65	18.4	13.15	115.84	140.66
Andaman-Nicobar Islands	480.08	230.77	1004.01	256.31	1669.7	2156.79
Total	3679.91	1144.29	4041.63	1084.33	5320.71	7549.34



development period will be monitored by a Monitoring Committee headed by Chief Engineer(FMO), CWC and members from CWC(HQ & Field), NWIC, NDMA & Basin States.

68th Meeting of Governing Body of National Water Development Agency (NWDA)

The 68th meeting of the Governing Body of National Water Development Agency was held on 17.08.2021 through video conference under the Chairmanship of Shri Pankaj Kumar, Secretary, DoWR, RD&GR, Ministry of Jal Shakti. Chairman, CWC also attended the meeting as one of the members of the Governing Body. The Annual Report and Audited Accounts for the year 2019-20 and Budget Estimate and Actual Expenditure during the financial year 2020-21 and 2021-22 were discussed during the meeting. Programme of works of NWDA for the year 2021-22 were detailed in the meeting. Present status of DPRs, FRs and PFRs for Inter-State and Intra State link projects were informed to the members of the Governing Body.

Governing Body accorded in-principle approval for the proposal of welfare measure as proposed for bearing the part cost of the medical insurance to the willing retired employees and their spouse.

DG, NWDA informed about the latest status of Draft Cabinet Note and draft bill for constitution of setting up of National Interlinking of Rivers Authority (NIRA). The recommendations of the Committee related to the regulation of remuneration in case of contract

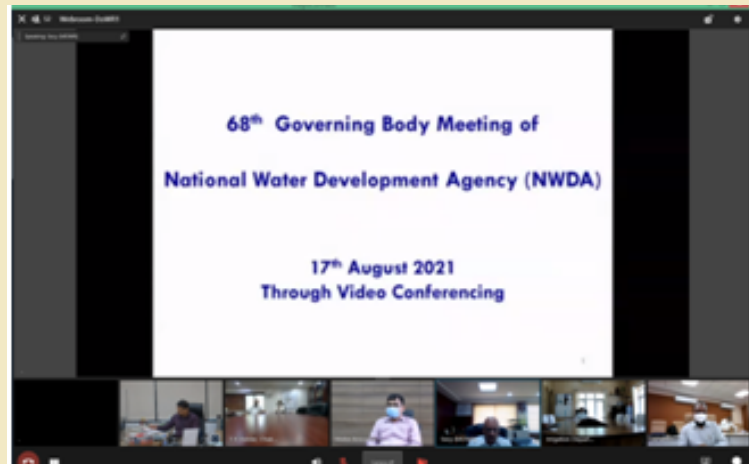
Inspection of various HO sites in Uttarakhand

Chairman, CWC, New Delhi inspected the Haridwar, Rishikesh and Devprayag Hydrological observation sites in Uttarakhand during 19th – 21st August 2021. Director(RDC-1), CWC; Superintending Engineer(HOC), CWC, Dehradun; Executive Engineer(HGD), Haridwar and Deputy Director(RDC-1), CWC accompanied Chairman, CWC during the visit.

Chairman, CWC inspected the sites and suggested that discharge may be taken using ADCP by boat at Chandighat(GDSQ) (Haridwar). A comprehensive analysis of water level observation with bubbler, manual and Lidar data may be carried out at the Site. He also suggested supplying Life Jackets/Life Buoys to each staff who are deployed in taking discharge by boat. He also directed that Discharge Observation through velocity radar installed at Devprayag (Bhagirathi) and Devprayag (Ganga) site may be verified with ADCP observation. Further, IIT-Roorkee may be approached

3rd meeting of Executive Committee for implementation of PMKSY

A meeting of Executive Committee of PMSKY Mission was held on 18.08.2021 under chairmanship of Secretary, DoWR, RD & GR and attended by CE(PMO), Director, Mon(C) & Director, P&P Dte from CWC.



appointment of retired Central Government Employees in NWDA were accepted by Governing Body.

The Governing Body ratified the amendment to the DCRG Rules, 2012 applicable to the employees of NWDA.

It was informed to the members that the proposed 7th India Water Week event is postponed to a later part of the year, 2022. The BRICS Water Forum and BRICS Water Ministers Meet are proposed to be held through virtual mode during 16th-18th November 2021 at Sushma Swaraj Bhawan, New Delhi.



for proper installation of cableways. The direction was also given to prepare a proposal of setting up of early flood warning system in upstream of NTPC dam site, Tapovan including details of equipment and its installation. He also emphasized that the work of Inflow forecast of dams like Tehri, Ramganga and other dams located in upper Himalaya may be taken up by CWC.

Main features of meeting agenda were:

- Review of progress and Plan of action of various components of PMKSY
- Continuation of the Scheme of PMKSY-AIBP for the period 2021-26

92nd meeting of Narmada Control Authority

The 92nd meeting of Narmada Control Authority (NCA) was held under the Chairmanship of Shri Pankaj Kumar, Chairman, NCA & Secretary, DoWR, RD&GR, Ministry of Jal Shakti, through Video conferencing on 24.08.2021. The following important decisions were taken:

-> A committee headed by Executive Member, NCA has been constituted to look into sharing of cost and payment issues among party states regarding various aspects of the Sardar Sarovar Project (SSP). The committee will go into details of:

- Compensation towards power loss due to Operation of Irrigation By-pass Tunnel (IBPT) at Sardar Sarovar Project.
- Sharing cost of Garudeshwar Weir downstream of Sardar Sarovar Dam.
- Compensation towards loss of a generation of power

Meetings regarding Ujh Multipurpose Project

In continuation to series of earlier meetings on Benefit-Cost (BC) aspects of the Ujh Multipurpose Project (J&K) and progress on proposed changes in its design, another meeting was held under the Chairmanship of Shri Kushvinder Vohra, Member(WP&P), CWC on 02.08.2021 through video conferencing. Officials from SPR & Indus Wing(DoWR, RD &GR), MoJS, CWC, Central Electricity Authority, Water Resources Department (WRD), Govt of J&K and WAPCOS attended the meeting. During the meeting, detailed discussions were held on the revised e-flow submitted by WAPCOS along with the discussion on Power Potential Studies. Further in the meeting, crop water requirement based on the revised e-flows was discussed.

Another meeting on the above matter was held on 12.08.2021 through video conferencing. During the meeting, detailed discussions were held on the finalisation of the 10-daily water requirement along

First meeting of the WG for reviewing the calculation of benefit cost ratio and procedure for RCE for MM1, flood control and multipurpose project

The 1st meeting of Working Group for "Reviewing the calculation of Benefit-Cost Ratio and procedure for Revised Cost Estimation for Major and Medium Irrigation, Flood Control and Multipurpose Projects" was held on 12.08.2021 under the Chairmanship of Shri Kushvinder Vohra, Member(WP&P), CWC.

The Working Group was constituted by DoWR, RD & GR for reviewing the methods of Benefit-Cost Ratio assessment and also for suggesting procedure for automatic cost revision of Major and Medium Irrigation, Flood Control and Multipurpose Projects not involving a change in scope. Working Group is headed by Shri

from River Bed Power House (RBPH) of SSP post-Garudeshwar weir construction.

-> A committee headed by Executive Member, NCA has been constituted to look into revised organizational structuring of the NCA Secretariat.

-> Regarding the inadequate release of water to Rajasthan from Narmada Main Canal, a study has been entrusted to CWC and CWPRS wherein CWC will play the lead role.

-> Regarding the request of Govt. of Gujarat to lower down water level below the Minimum Draw Down Level (MDDL) for maintenance and repair work of Sardar Sarovar Dam, the decision regarding timing and schedule has been entrusted to Sardar Sarovar Reservoir Regulation Committee (SSRRC). The SSRRC will submit its recommendation to NCA for appropriate decision/permission in this regard.



with the discussion on Power Potential Studies by CEA and submission of revised EIA report to the Ministry of Environment, Forest and Climate Change (MoEF&CC). Further in the meeting design of the Power House and the Cost of Electro-Mechanical Equipments along with the total cost of Land Acquisition (LA) and Rehabilitation & Resettlement (R & R) was also discussed.

Kushvinder Vohra, Member(WP&P), CWC and has members from NITI Aayog, Ministry of Finance, Ministry of Jal Shakti, Ministry of Agriculture Cooperation & Farmers Welfare and Central Water Commission.

In the meeting, a brief presentation on background and Terms of Reference of the Working Group was made. The works already carried out in this regard by the earlier committees and the approach to be adopted for reviewing the methodology of the B.C. ratio calculations were discussed in the meeting. The Chairman of the Working Group finalized the course of action in this regard.

5th meeting of the Committee for planning BRICS Water Ministers meet and BRICS Water Forum

At the eleventh BRICS Leader's Summit in 2019, the Hon'ble Prime Minister announced that India would organise a BRICS Water Minister's meeting to discuss the challenges of Sustainable water management and sanitation in urban areas. Accordingly, DoWR, RD&GR, MoJS proposed to hold the first BRICS Water Ministers' Meet to be organised by India on 18.11.2021.

Also, a BRICS Water Forum is scheduled to be organised by India during 16th-17th November 2021 in virtual mode. BRICS Water Forum will comprise of following three Technical Sessions to be held on 16th – 17th November 2021:

- Climate Change Impacts – Challenges and Opportunities in Water Sector.
- Technology Innovations in Water Management.
- Addressing the Water, Food and Energy Security.

The main thrust of the Forum will be to discuss the initiatives, interventions, tools and techniques presently in practice as well as innovative practices for the future for ensuring water security in sustainable manner.

For planning/ organizing BRICS Water Ministers Meeting and BRICS Water Forum in India in 2021, the fifth meeting of the committee was held under the

Technical Expert Committee meeting for Delhi Drainage Plan

The 4th meeting of the Technical Expert Committee for the Delhi Drainage Plan was held on 05.08.2021 under the chairmanship of Member (RM), CWC through video conferencing. In the meeting, the following points have emerged:

- The contract between IFCD, Delhi and IIT Delhi was made in September, 2011. Inception report, draft final report and the final report was submitted to IFCD, Delhi by IIT Delhi on 11.02.2013, 21.03.2017 and 13.07.2018 respectively but the matter was brought to TEC in 2019 after submission of the final report. Member(RM), CWC, the current Chairman of TEC, took charge in the second half of February, 2019. After that various measures were taken in this matter and the 1st meeting of TEC was held on 21.05.2019. Therefore, the decision of TEC is broadly based on the various TEC meetings and communications among various departments including IIT Delhi after the 1st TEC meeting.
- During the last three TEC meetings as well as the fourth meetings chaired by ACS/SS, UD, Delhi (which consultant didn't attend) observations of various stakeholders on the final report along with the running



Chairmanship of Shri Kushvinder Vohra, Member(WP&P), CWC and Ex-officio Addl. Secretary to Govt. of India on 19.08.2021 through video conference. Officers of the Ministry of External Affairs, MoEF&CC, CWC, NIH, CGWB and NWDA participated in the meeting.

In the meeting, after detailed discussions, sub-theme wise nodal department and concerned officers were identified for preparation of Country paper for BRICS Water Forum. The outline of the country paper would be discussed in the next meeting to be held in the second week of September, 2021. Action points for holding technical sessions were identified. The programme for various sessions was discussed and suggestions for further changes were made in the meeting. The venue and other logistics arrangements were discussed in detail.

of models/software on 50 hotspots was requested to IIT Delhi but there was not any significant reply from IIT Delhi towards the incorporation of views in the report, capacity building of State officers for running the model etc.

- As per 10-20% data verification exercise by stakeholders, there are still large discrepancies between field data and data used in the model to prepare the final report. IIT Delhi stated that it has trained 150 officers of different departments but every department in the meeting has expressed that they are not able to run the model. GSDL also stated that it has not received the whole model package.
- Considering the above discrepancies in data, incapability of stakeholders to run the model and non-satisfactory response from IIT Delhi to modify the report & capacity building of stakeholders, TEC feels that the final report submitted by the consultant is not worth considering for recommendation and the mentioned report may not be accepted. The State Govt or Nodal Department may take a call in this matter accordingly.

DRIP

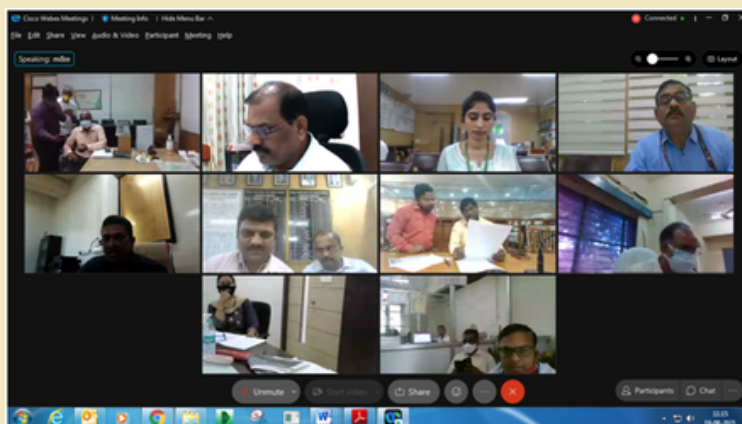
Loan Signing with World Bank for DRIP Phase II

A loan signing ceremony with World Bank for a loan amounting to US \$ 250 Million was held on 04.08.2021. The Loan Agreement was signed by DEA and World Bank and Project Agreement was signed by 10 partner States (Gujarat, Manipur, Meghalaya, Chhattisgarh, Madhya Pradesh, Rajasthan, Odisha, Kerala, Maharashtra and Tamil Nadu) with World Bank. Ministry of Jal Shakti was represented by Smt. Debashree Mukherjee, Additional secretary, DOWR, RD&GR, World Bank by Shri Junaid Kamal Ahmad, Country Director, World Bank and DEA by Shri Rajat Kumar Mishra, Additional Secretary, Ministry of Finance.



Stakeholder Consultation Meeting for the implementation of published EAP for Hidkal dam of Karnataka WRD.

Stakeholder Consultation Meeting to disseminate the published Emergency Action Plan (EAP) for Hidkal dams of Karnataka WRD, as a part of implementation requirement was held virtually on 19.08.2021. This program is a part of risk mitigation strategy to communicate the associated risks to all stakeholders. The meeting was attended by officials of CWC, NDMA, SDMA, IMD, NRSC, GSI, All India Radio, District Authorities and villages in downstream of the dam. Under DRIP, EAPs have been published for 207 no. of dams and Stakeholder Consultation Meetings have been conducted for 102 no. of dams.



Joint Review meeting with Karnataka WRD

A Joint Meeting was held on 26.08.2021 at Bengaluru, Karnataka to review the Project Readiness Criteria of Karnataka WRD for DRIP Phase II, followed by a field visit to KRS dam for inspecting the works being carried under DRIP. The central team was headed by Smt. Debashree Mukherjee, Additional Secretary, DoWR, RD&GR and Karnataka was represented by Shri Rakesh Singh, Additional Chief Secretary, WRD, Govt of Karnataka.



Brainstorming Session on the proposal for setting up of NBWUE

A brainstorming session was held on 23.08.2021 under the Chairmanship of Secretary (DoWR, RD&GR) regarding the proposal for setting up of National Bureau of Water Use Efficiency (NBWUE). Chairman, CWC and Member (RM) participated in the session along with senior officers from other organizations under DoWR, RD&GR.

One of the five goals of the National Water Mission (NWM) is to increase Water Use Efficiency in all sectors of water use by 20%. Under this goal, one of the strategies identified for achieving the overall objective is to set up a National Bureau of Water Use Efficiency

(NBWUE). As per the discussions held during the brainstorming session, the main objectives of NBWUE could be outlined as below:-

- Promotion of Water Use Efficiency, working towards capacity building and mass awareness.
- Efficiency Labelling.
- Standardization of codes of Water Use Efficiency.
- Water footprint and water auditing.
- Research and studies in the field of Water Use Efficiency and water conservation.
- Evolving system of incentivization.
- Creating a resource centre and data bank.
- Undertaking demonstrations and pilot projects.

Flood Situation in the Country

Regular Flood Forecasting Activity by CWC commenced on 01.05.2021 in Brahmaputra and Barak and Jhelum basins. During the period from 1st May to 31st August 2021, 6075 flood forecasts (4219 Level and 1856 Inflow) were issued, out of which 5818 (4141 Level and 1677 Inflow) forecasts were within the limit of accuracy with a percentage accuracy of 95.76%. 145 nos. of Orange Bulletin (for Severe Flood Situation) and 75 number of Red Bulletin for Extreme Flood Situation were issued in August from Central Flood Control Room.

Summary of Flood Situation during 01.05.2021 to 31.08.2021

Extreme Flood Situation

Three No FF station observed Extreme Flood Situation.

Sl.No	State	District	River	Station	Period	
					From	To
1.	Bihar	Patna	Ganga	Hatidah	13/08/2021	19/08/2021
2.		Bhagalpur	Ganga	Bhagalpur	16/08/2021	19/08/2021
3.	Uttar Pradesh	Auraiya	Yamuna	Auraiya	06/08/2021	07/08/2021

14 Flood Monitoring Stations observed Extreme Flood Situation.

Severe Flood Situation for FF Stations

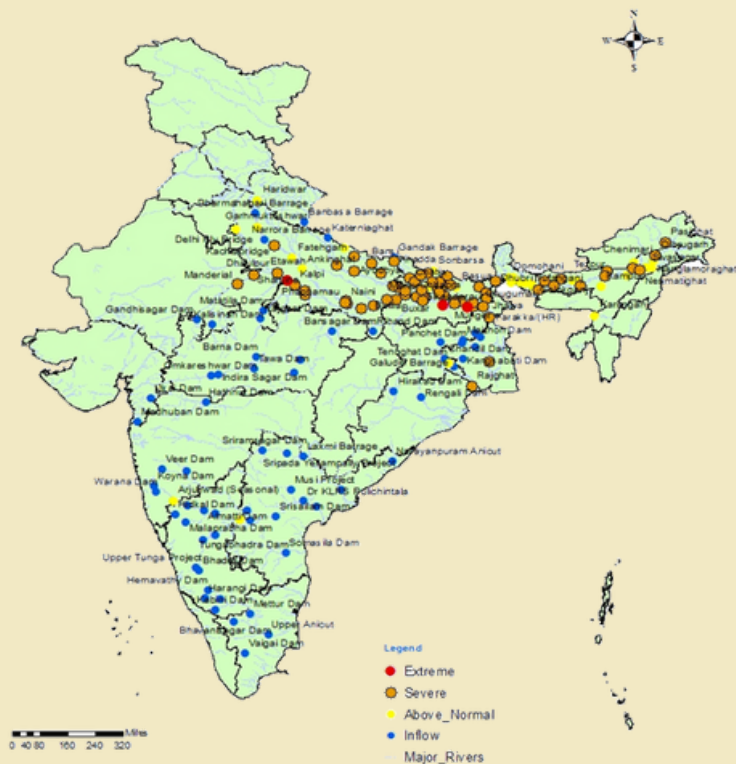
83 FF Stations observed Severe Flood Situation in the States of Assam, Odisha, Bihar, Uttar Pradesh, Uttarakhand, West Bengal, Maharashtra, Rajasthan, NCT Delhi, Andhra Pradesh and Telangana.

Above Normal Flood Situation

29 FF Stations in Assam, Bihar, Jharkhand, Uttar Pradesh, West Bengal, Andhra Pradesh and Telangana observed Above Normal Flood Situation.

Reservoirs having Inflow above threshold limit

66 reservoirs received inflows above their threshold limit in Karnataka, Jharkhand, Odisha, West Bengal, Bihar, Maharashtra, Tamilnadu, Uttarakhand, Uttar Pradesh, Telangana, Rajasthan, Gujarat, Andhra Pradesh and Madhya Pradesh.



Financial Progress of Schemes

(Amount in Crore ₹)

Sl. No.	Scheme/Component Name	BE 2020-21	Expenditure	Expenditure (in %)
1.	Development of Water Resources information System (DWRIS)	175.00	42.703	24.40%
2.	Investigation of Water Resources Development Schemes (IWRD)	12.00	2.809	23.41%
3.	Flood Management & Border Areas Programme (FMBAP)	27.32	3.462	12.67%
4.	Infrastructure Development (ID) Schemes	4.5	1.981	44.02%
5.	National Hydrology Project	23.95	1.923	8.04%

Water Sector-News

- ✦ Puri first city in the country to supply clean drinking water 24x7 (Hindustan Times, 02.08.2021)
- ✦ Dams swamp villages in Kolkata, IAF joins rescue work (The Statesman, 03.08.2021)
- ✦ Rain fury in MP : Over 1,250 villages hit by floods; 6,200 people rescued (Millennium Post, 05.08.2021)
- ✦ Renegotiate Indus treaty with Pak : Parl panel to govt (Times of India, 06.08.2021)
- ✦ Indian Ocean warming rapidly, expect more extreme weather (The Tribune, 10.08.2021)

- ✦ Connecting India by inland waterways: what changes in century-old vessels law (Indian Express, 11.08.2021)
- ✦ The warning is out : Wind, Water, Oceans are spinning out of control (New Indian Express, 15.08.2021)
- ✦ 190 check dams, 12 dams to be built in TN : Min (New Indian Express, 24.08.2021)
- ✦ Rs. 1,813-cr water scheme cleared for Shimla (The Tribune, 25.08.2021)
- ✦ 80% of Mumbai's Nariman point and Mantralaya will go under water by 2050 (Millennium Post, 29.08.2021)

Data Corner

Dam Rehabilitation and Improvement Project (DRIP)							
State wise cost of the project and last three year Expenditure							
S. No.	Implementing Agency	2018-19		2019-20		2020-21	
		RE (Cr.)	Expenditure (Cr.)	RE (Cr.)	Expenditure (Cr.)	RE (Cr.)	Expenditure (Cr.)
1.	Madhya Pradesh WRD	20	14	10	8	2	2
2.	Odisha WRD	181	49	152	89	77	52
3.	Tamil Nadu WRD	109	72	72	56	33	41
4.	Tamil Nadu Electricity Board	58	37	52	26	46	16
5.	Kerala WRD	100	55	88	27	55	37
6.	Kerala State Electricity Board	28	17	21	12	25	20
7.	Karnataka WRD	265	139	100	48	40	15
8.	Uttarakhand Jal Vidyut Nigam Limited	59	30	52	24	75	52
9.	Damodar Valley Corporation	45	18	27	18	17	17
10.	CWC	36	34	30	24	21.76	21.28
		901	465	604	332	392	273

(Source: Answered in Lok Sabha on 05.08.2021)

Gallery



Shri Nitya Nand Rai, Director, CWC visited as a team leader along with NDRF team for advising the Government of Himachal Pradesh regarding remedial measures required for clearing the land slide that took place on Chandrabhaga river partially blocking the river in Keylong District of Himachal Pradesh from 14/08/2021 to 16/08/2021.



Chief Engineer, Designs (E&NE), Directors of CMDD Dtes. E&NE, N&W, NW&S from CWC attended the 19th virtual meeting of WRD 09 DAMS and SPILLWAYS on 13 AUG 2021

Independence Day



Reservoir Monitoring

CWC is monitoring live storage status of 130 reservoirs of the country on weekly basis and is issuing weekly bulletin on every Thursday. Out of these reservoirs, 44 reservoirs have hydropower benefit with installed capacity of more than 60 MW. The total live storage capacity of these 130 reservoirs is 171.958 BCM which is about 67.70% of the live storage capacity of 257.812 BCM which is estimated to have been created in the country.

As per reservoir storage bulletin dated 26.08.2021, the total live storage available in these reservoirs is 108.583 BCM which is 63% of total live storage capacity of these reservoirs. However, last year the total live storage available in these reservoirs for the corresponding period was 130.629 BCM and the average of last 10

History- Bhadra Reservoir Project

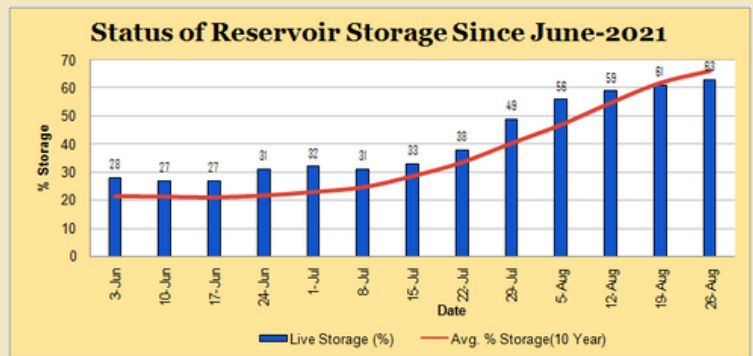
The Bhadra Reservoir Project across the river Bhadra near Lakkavally village in Chickmagalur District of Karnataka State is one of the chains of major river valley projects undertaken to make the State self-sufficient in food.

Bhadra River

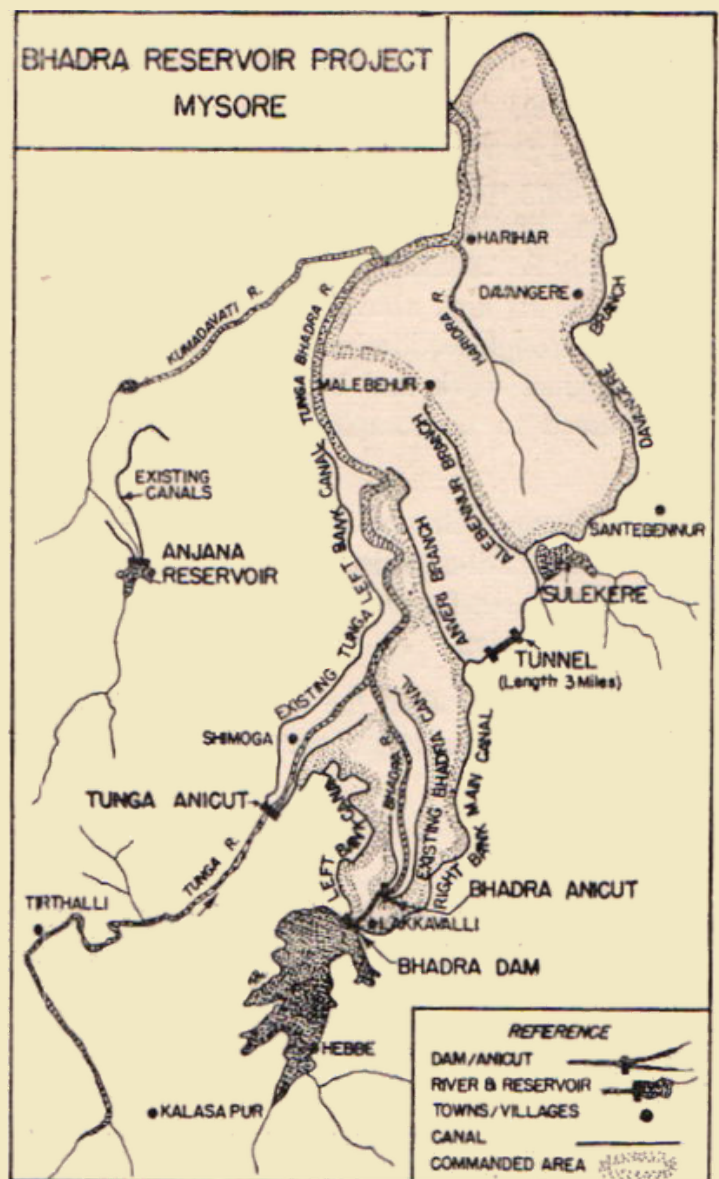
The River Bhadra is the main tributary of Tungabhadra. This name is taken after its two arms Tunga and Bhadra. Both the tributaries take their origin from the same hill VARAHA PARVATHA in Chickmagalur District in the Western Ghats of Karnataka. After its rise in the Western Ghats, the Bhadra flows for nearly 193 km before joining the Tunga near Kudli, 14.5 km East of Shimoga, to form the Tungabhadra river which after running for 644 km drops into the Krishna River at Kurnool.

History

The idea of constructing a large-scale reservoir across the river for affording irrigation facilities to the dry areas of Shimoga, Chickmagalur and Chitaldurg districts was first thought of in 1856. Since then several alternative proposals were examined from time to time, and in 1946 a comprehensive multipurpose project costing Rs. 8.9 crore was drawn up for irrigating 72,843 ha (180,000 acre) and developing 12.682 MW of power. With the proposals for a reservoir across the Tungabhadra river at Mallapuram, which was a joint venture of the erstwhile Madras and Hyderabad States, the question of allocating the Tungabhadra waters for different interests cropped up. Negotiations were then held by the erstwhile States of Mysore, Madras and Hyderabad and in 1944 agreements were reached on certain aspects. The scheme was then finalized and sanctioned in 1946. Further changes were effected in the scheme and the Project as finalized to irrigate 99,011 ha (244,663 acre) and developed 40.4 MW of firm power at an estimated cost of Rs. 33.53 crore.



years live storage was 113.585 BCM. Thus, the live storage available in 130 reservoirs as per the bulletin dated 26.08.2021 is 83% of the live storage of corresponding period of last year and 96% of storage of average of last ten years.



The Scheme

The Bhadra Reservoir Scheme was comprised

- a masonry dam 59 m high above the Bhadra river bed to form a reservoir with 2,025 million cu m storage capacity;
- two canals – one of the Left Bank and the other on the

Right Bank and a tunnel 4.2 km long. To divert the Right Bank Channel Waters into the Shantisagara Valley and

- erection of Power Houses on either flank for generation of 40.4 MW firm power at the Dam site.

Project Details

Location

The site of the dam is situated 1.6 km from Lakkavally village in Tarikere taluk of Chikmagalur District. Here, the river flows over a rocky bed with defined banks which rise in steep hills on either side. The catchment area is 1968 sq km comprising mostly hilly area and forest tracts of the Western Ghats.

Dam

The masonry dam is Surki mortar 1:4 in the river portion and is earthen bunded in the saddles – four in number – three on the left flank and one on the right flank. The first two saddles on the left side are respectively 30 m and 15 m above river bed and the other two saddles are at higher levels. The main dam in the river portion is 440 m in length and 59 m above river bed. An army of over 11,000 labourers including 700 skilled labour and over 100 technicians were busily engaged working over-time to complete the dam. The estimated quantity for the dam was 5.1 lakh cum of earth and 7.75 lakh cum of masonry.

Spillway

The Central Spillway – 82 m long – is of ogee type with a stilling basin in the rear to deaden the energy of the flow. The spillway section together with river sluices is designed for a maximum flood discharge of 3,398 cum per sec which is 25 percent over the computed maximum flood of 2,676 cum per sec that passed through the river at the site in 1924. The discharge over the spillway is controlled by four steel crest gates of 18 m x 7.6 m.

Reservoir

The water spread of the Reservoir at Full Reservoir Level is nearly 109 sq km (42 sq mile), the major portion of which forms forest area which was cleared in stages synchronizing with the progress of the main Dam.

Canals

The Left Bank Canal irrigates the fertile area in between the Bhadra and Tunga Rivers. The channel carries a head discharge of 9.5 cumec and runs for a length of about 80.5 km irrigating 7.41 ha.

The Right Bank Canal is a high level canal and is the main feature of the Project. The channel carries a head discharge of 71 cumec runs for a length of 76.4 km and

then pierces through the Urbani Range of hills by a Tunnel with approach and draft cuts of total length 23.2 km. Just before the channel enters the tunnel a major tributary called the 'Anvery Channel' branches off which runs for 66.8 km to irrigate 6,130 ha.

Tunnel

The tunnel was 4,294 m long. This was the longest irrigation tunnel in this part and was estimated to cost Rs. 2.38 crores. The section of the tunnel was of horse-shoe type with an equivalent diameter of 4.4 m. The bed width of the tunnel was 3.6 m and the sides slope outside in a ratio of 1 in 8. The top was semi-circular with a diameter of 4.4 m.

Davangere Branch Channel

It branches off from the Right Bank Canal beyond the tunnel and carries a head discharge of 33 cum per sec and runs for a length of 93.7 km to provide water for 41,012 ha (101,342 acre). At the start, the channel crosses the Shantisagara Valley by an aqueduct 416 m long with 12 spans of 30 m and three spans of 17 m which was estimated to cost nearly Rs. 28 lakh.

The Davangere Branch Channel tails off into the Harapanahalli tail-end distributary and provides irrigation facilities for about 40,469 ha (10,000 acre) in Bellary district.

With the completion of Bhadra Dam, Its Power houses and canals, the arid lands in Chickmagalur, Chitaldurg, Shimoga and Bellary districts transformed into vast granaries and new industries came in existence and ushered a new era of plenty and prosperity.

Bhadra reservoir project

Feature at a Glance	
Location	Across the river Badra, near Lakkavally village in Chickmagalur district of Karnataka State.
Dam:	
Type:	Masonry-cum-earth
Height	
Masonry	77 m
Earth	30 m
Length	
Masonry	440 m
Earth	1055 m
Spillway	
Length	82 m
Reservoir	
Capacity	2025 MCM
Water Spread	109 sq km
Catchment	
Area	1968 sq km
Canals	80.5 km on the Left Bank 100 km on Right Bank (including approach tunnel and draft)
Tunnel	
Length	4294 m
Benefits	
Irrigation	99011 ha (244663 acre)
Power	40.4 MW
Cost	Rs. 33.53 crore

Source: Bhagirath



Central Water Commission

An attached office of Dept. of Water Resources,
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