Volume 5 Issue No. 07 FEBRUARY 2023

# JALANSH

The Monthly Newsletter of Central Water Commission

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Shri Kushvinder Vohra
Chairman, CWC

## Message

A workshop on the Project "Built Water Storage in South Asia" was organised on 30.01.2023. The workshop was organised by the United States Department of State (DoS). The project with duration of 3-years, is proposed to be implemented in the South Asia region by the International Water Management Institute (IWMI) and the South Asia office of the Global Water Partnership (GWP) with an aim to enhance Water Security. CWC is functioning as the focal government organization for the project implementation in India. We have involved a group of young officers of CWC in the project with an objective to enhance capacity in the area.

CWC is involved in design of Polavaram Irrigation Project (National Project) which envisages construction of an earth cum rockfill (ECRF) dam along with saddle earth dams, a spillway, irrigation tunnels, navigation tunnel and channel and two main canals on both flanks to create ultimate irrigation potential of 4.36 Lakh ha and also generation of 960 MW of hydropower, drinking water supply to 540 villages and diversion of 84.7 thousand million cubic feet (TMC) of water (including losses) to Krishna basin. Technical Issues of Polavaram Irrigation Project (PIP) were discussed with concerned states in pursuance of Hon'ble Supreme Court Order dated 06.09.2022 on OS 04 of 2007 and other related matters. The meeting was attended by officers from the States of Odisha, Telangana, Andhra Pradesh, Polavaram Project Authority (PPA), Central Water Commission and Ministry of Jal Shakti. CWC has been doing remarkable contribution to various aspects of the project and has given design solutions for scouring issues that project faced due to floods.

Convey to Jal Jivan Mission, country has achieved remarkable milestone as 11 crore rural households in the country have been connected with water tap connections under Jal Jeevan Mission's Har Ghar Jal campaign. Twenty-three districts and more than 1.53 lakh villages of India have 'Har Ghar Jal' i.e., every household having access to clean drinking water through tap. At the time of launch of the Mission in 2019, out of 19.35 crore rural households, only 3.23 crore (16.72%) had access to tap water. As on date, within a short span of about three years of the life changing mission, over 11 Crore (56.84%) rural households have tap water supply in their homes.

# MEETINGS

## Meeting Regarding National Crises Management Committee on Ground Subsidence around Joshimath, Chamoli Dist., Uttarakhand

Shri Navin Kumar, Member (D&R), Shri Manoj Tiwari, Chief Engineer (HSO), Shri N.N. Rai, Director, Hyd(S) Dte and Shri Goverdhan Prasad, Director, Hydrology (N) Dte attended meeting under the chairmanship of Chairman, CWC to discuss on areas affected around Joshimath town on 10.01.2023.

## The 19th meeting of Sectional Committee

Director and Deputy Director of BCD (E&NE) are members of the BIS Sectional Committee of WRD 22 related to Flood Management, Erosion Management and Diversion Works. Nineteenth meeting of the Sectional Committee held on 18.01.2023 was attended by Shri Sarbjit Kumar Singh, Deputy Director BCD (E&NE).

## The 30th Meeting of Technical Coordination Committee (TCC)

The 30th Meeting of the Technical Coordination Committee (TCC), a special TCC of the Punatsangchhu-I Hydroelectric Project (1200 MW), Bhutan on the agenda "Safety/ stability status and requirement of stability measures for project colony, National Highway & Hill" was held on 23.01.2023 in Sewa Bhawan, New Delhi. The meeting was Chaired by Shri M.A.K.P. Singh, Chairman of the TCC & Member (Hydro), CEA and Shri Navin Kumar, Co-Chairman of the TCC & Member (D&R), CWC. The RGoB Delegation was led by Dasho Chhewang Rinzin, MD, Druk Green Power Corporation (DGPC). Representatives of the Royal Government of Bhutan (RGoB), the Department of Hydropower and Power Systems (DHPS), PHPA-I,

CEA, CWC and WAPCOS also attended the meeting. Director CMDD (E&NE) participated in discussion.

## Meeting to discuss technical issues in respect of Polavaram Irrigation Project taken by Chairman, CWC

Polavaram Irrigation Project (National Project) is being executed on River Godavari near Ramayyapeta village of Polavaram Mandal, West Godavari District, Andhra Pradesh. This multipurpose major project envisages construction of an earth cum rockfill (ECRF) dam along with saddle earth dams, a spillway, irrigation tunnels, navigation tunnel and channel and two main canals on both flanks to create ultimate irrigation potential of 4.36 Lakh Ha. The project also envisages generation of 960 MW of hydropower, drinking water supply to 540 villages and diversion of 84.7 thousand million cubic feet (TMC) of water (including losses) to Krishna basin.

Cost of project as per RCC is Rs. 29027.95 Cr at 2013-14 PL [for quantities as per 1st RCE (2010-11)]. Total Progress of the Project (including Works, LA and R&R) is 48.11 % as on December 2022. Total expenditure incurred on the Project since inception is

Rs. 20766 Cr (16,036 Cr under NP) up to December 2022. Total amount reimbursed by Government of India to GoAP after the project is declared as National Project is Rs. 13226 Cr. up to December 2022.

In pursuance of Hon'ble Supreme Court Order dated 06.09.2022 on OS 04 of 2007 and other related matters, a meeting to discuss Technical Issues of Polavaram Irrigation Project (PIP) was taken by Shri

Kushvinder Vohra, Chairman, CWC and ex-Officio Secretary to the GoI on 25.01.2023. The meeting was attended by officers from the States of Odisha, Telangana, Andhra Pradesh, Polavaram Project Authority (PPA), Central Water Commission and Ministry of Jal Shakti.

In the meeting, technical issues of State of Odisha and Telangana regarding Polavaram Irrigation Project and views of State of Andhra Pradesh on these issues were discussed in detail. It was decided that a report of CWC will be submitted by CWC to DoWR, RD & GR in this regard.

## The 9th Meeting to review issues related to DRIP Phase II and NDSA

A meeting was held on 25.01.2023 at Shram Shakti Bhawan, New Delhi under the chairmanship of Secretary, DoWR, RD & GR to review the decisions taken in the meeting of 19.12.2022 wherein various issues related to DRIP- II scheme and NDSA were discussed. The officials from the Ministry, CWC and World Bank participated in the meeting.

## Meeting to Review progress on draft model bill "State Integrated Water Resources Management-2023"

A meeting under the chairmanship of Secretary (WR, RD&GR) was held on 30.01.2023 to review progress on draft model bill "State Integrated Water Resources Management-2023". Shri P.M. Scott, Member (WP&P) and Shri Rishi Srivastava, CE (BPMO) participated in the meeting. The meeting was also attended by officers from DoWR, RD&GR, CGWB, NWM etc. In the meeting, the draft bill submitted by the Consultant (Vidhi Centre for Legal Policy) was deliberated in detail and in addition to some text corrections in various paras, modifications on water pricing were also suggested to the Consultant and they were requested to refer to the policy of Maharashtra Government in this regard.

# TRAININGS/WORKSHOPS/PRESENTATIONS

## Presentation on the "Study on the issue of Flood and Siltation in River Ganga and its Tributaries due to Farakka Barrage in the state of Bihar"

As desired by Secretary, DoWR, RD & GR, a presentation was made on "Study on the issue of Flood and Siltation in River Ganga and its Tributaries due to Farakka Barrage in the state of Bihar" on 24.01.2023 wherein Chairman, CWC apprised the officers of DoWR, RD & GR about the main findings of the Report. The senior officers of DoWR, RD&GR and Chairman, CWC along with Chief Engineer (HSO) & Director, Hydrology (C) were present during the presentation. The consultant presented the results of different simulation conditions considered in the study.

## Workshop on "Built water storage in South Asia"

Shri Kushvinder Vohra, Chairman, CWC & Ex-officio Secretary to the Government of India delivered opening address at the Inaugural Workshop of the Project "Built Water Storage in South Asia" held on 30.01.2023.

The workshop was organized by United States Department of State in association with International Water Management Institute (IWMI) in partnership with the Global Water Partnership South Asia (GWP SAS) to enhance water security in the region. The workshop underlined the importance of water storage (both natural and built storage) for economic growth, societal development and ecosystem viability. Also, to adapt and mitigate climate change

impacts more built storage will be essential in the future.

CWC is functioning as the focal government organization for the project implementation in India. The inaugural workshop was jointly organized by the CWC, IWMI and GWP with an objective to introduce the project, gain insights into water storage issues in India and discuss modalities for project implementation.

In his opening address, Shri Vohra highlighted the importance of storages in the Country which have immensely helped in attaining food self-sufficiency, energy requirement, flood moderation, drinking water & sanitation needs. However, the combined live storage capacity of 5745 nos. of large dams in India is only about 258 BCM (about 200m3/year/person) which is very less as compared to most countries having similar climatological conditions. Thus, identifying the declining per capita water storage as the major contributor to local and regional water crises, he stressed on the need to create climate resilient water infrastructure and that all stakeholders to collaborate and work seamlessly in a synergized manner in order to meet the future demands.

Shri N.N. Rai, Director, Hyd (S) Dte, Shri Govardhan Prasad, Director, Hydrology (N) Dte and Smt. Payal Goyal, Dy. Director, Hyd (S) Dte Attended inception workshop.

## Workshop on "Estimation of soil erosion potential of free catchments of reservoirs"

A two day workshop on "Estimation of soil erosion potential of free catchments of reservoirs" was held on 19th & 20th January 2023. The Workshop was inaugurated by Shri A.K. Kharya, Chief Engineer, CWC. Shri Alok Paul Kalsi, Director, WS&RS Dte. welcomed the Chief Guest and all the participants and gave a view of the objectives of workshop.

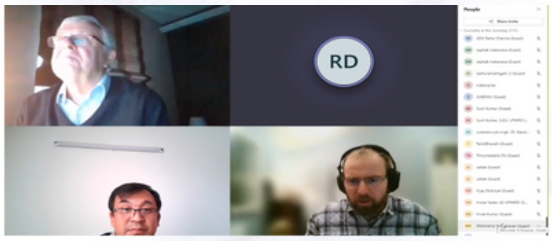
The Inaugural session was followed by Technical sessions. Technical session of Day 1 included presentation on concepts and theoretical background, software required and basics of Arc GIS, SWAT, SAGA tool and its usage. Presentation on step by step process of catchment delineation, IMD gridded data extraction, soil data processing, LULC processing, DEM was explained by team/experts from Tojo Vikas International Pvt. Ltd. (TVIPL). Each presentation was followed by queries and interactive discussions with the participants.

On 20th January, Technical session included hands on

training at TVIPL office in Gurugram, Haryana. Technical session started with content briefing followed by interactive hands on training on catchment delineation and calculation of factors (R, K, LS, C, P) required to calculate soil erosion potential. The participants for the workshop included officers from CWC.

## Training on Rapid Risk Assessment Framework

A three (3) day workshop on rapid risk assessment of dams was conducted from 11th to 13th January 2023 by the World Bank in virtual mode. The participants from CWC and Implementing Agencies of DRIP-2 attended the workshop.




## HIDKAL DAM, KARNATAKA

# VISIT/INSPECTION OF PROJECTS/SITES BY CWC OFFICIALS

## TLAWNG AND TUICHANG HEP MIZORAM

A joint visit of Officers from CMDD (E&NE), HCD (E&NE), Embankment (E&NE) CWC New Delhi along with the officers of NEID-II, CWC, Aizawl to the Project Site of Tlawng Hydro Electric Project, Mizoram & Tuichang Hydro Electric Project, Mizoram was undertaken from 3rd to 8th January 2023.

NEID-II, CWC, Aizawl has been entrusted with S&I and DPR preparation work of Tlawng HEP (120 MW) Project, Mizoram under IWRD scheme of the Ministry. Design directorates of Design (E&NE) Unit, CWC have been entrusted with the preparation of Design Chapters and Drawings for the DPR.

## LAKHWAR MULTIPURPOSE PROJECT

A meeting of UJVNL and CWC officials was held on 17.01.2023 in CWC to discuss various design issues of Lakhwar Multipurpose Project, Uttarakhand including dynamic analysis of Dam, status of numerical analysis of various cavities by NIRM, physical modeling of Energy Dissipater arrangement, Diversion alignment and other issues.

The Lakhwar multipurpose project envisages construction of 204 m high concrete dam across river Yamuna near Lohari village in Dehradun district of Uttarakhand. The total installed capacity of the project is 300 MW (3X100 MW).

## KANHAR IRRIGATION PROJECT

Shri Satish Kamboj, Director, Gates Design (N&W) Dte along with project officials visited Kanhar Irrigation Project during 05.01.2023 to 07.01.2023 to provide suggestions for ongoing fabrication and erection works of hydro-mechanical equipment. Kanhar Irrigation Project is located downstream of the confluence of River Pagan with Kanhar near village Sugawan in Tehsil Dudhi of District Sonbhadra, Uttar Pradesh.

## UPPER SIANG MULTIPURPOSE PROJECT (11200 MW), ARUNACHAL PRADESH

A joint visit by officers of CWC, CSMRS and GSI along with the officers from NHPC to the Project Site of Siang Upper Multipurpose Project (SUMP), Arunachal Pradesh was undertaken from 16th to 20th January 2023.

NHPC Ltd. has been entrusted with preparing the Pre-Feasibility Report (PFR) and Detailed Project Report (DPR) of the Siang Upper Multipurpose Project (SUMP). A PFR with three alternative dam site (Parong, Ditte-Dimme and Uggeng) locations is under examination in CWC.

# 18th Meeting of TAC-BB and visit to the scheme "Protection of Majuli Island from flood and erosion of river Brahmaputra"

Member (RM), CWC headed the 18th visit of Technical Advisory Committee- Brahmaputra Board (TAC-BB) during 09th to 12th January 2023 & visited the erosion prone locations related with scheme "Protection of Majuli Island from flood and erosion of river Brahmaputra" as well as new erosion spots and suggested measures in the form of RCC porcupines/recoupment of spurs at visited locations.

## PROJECT VISIT BY MCO, NAGPUR, CWC

CWC is charged with the general responsibility of initiating, coordinating and furthering, in consultation with the State Governments concerned, schemes for the control, conservation and utilization of water resources in the respective State for the purpose of flood management, irrigation, drinking water supply and water power generation. In connection, the officers of Monitoring Central Organisation, Nagpur visited multiple projects in the state of Maharashtra for monitoring purposes. The details of the projects are as below:-

Shri D.K. Tiwary, CE, MCO, Nagpur Visited Ghosikhurd Project


Aerial View of Vairagad Storage Tank

| Sl. No. | Name of Project | Details of Project | Name of Officers | Period |
|---|---|---|---|---|
| 1 | Gosikhurd National Irrigation Project | GosiKhurd Irrigation Project (National Project) also known as Indira Sagar Irrigation Project is one of the major irrigation projects in Godavari basin in Indian state Maharashtra in the Bhandara district on the river Wainganga. | Shri D.K. Tiwary, CE, Shri Manoj Meena and Shri Harish Umbarje, Director, Shri Ashwani Verma & Shri Karan Raghuvanshi, DD | 30.01.2023 |
| 2 | Satrapotra Storage Tank, (SMI) Project | The Surface Minor Irrigation Project was included in the year 2017-18 in Special Package for completion of Irrigation Projects to address agrarian distress in Vidarbha and Marathwada and other chronically drought prone areas of Rest of Maharashtra Special Package and to provide Central Assistance to facilitate completion of the project. | Shri D. Ganesh Kumar, Deputy Director | 10.01.2023 |
| 3 | Borsuri storage tank, a Surface Minor Irrigation SMI Project | The Surface Minor Irrigation SMI Project was included in the year 2017-18 in Special Package. It is aimed to provide irrigation in drought prone areas of Nilanga Taluka of Latur district in Maharashtra. | Shri D. Ganesh Kumar, Deputy Director | 12.01.2023 |
| 4 | Vairagad storage tank, a Surface Minor Irrigation (SMI) project | The Surface Minor Irrigation (SMI) project was included in the year 2017-18 in Special Package. It is aimed to provide irrigation in drought prone areas of Ahmedpur Taluka of Latur district in Maharashtra. | Shri D. Ganesh Kumar, Deputy Director | 11.01.2023 |

# Financial Progress of Schemes as on 31.01.2023

(Amount rounded-off in ₹ Crore & Specific to CWC's component)

| Sl. No. | Scheme/Component Name | RE 2022-23 | Expenditure | Expenditure (in %) |
|---|---|---|---|---|
| 1. | Development of Water Resources information System (DWRIS) | 140.13 | 129.8588 | 92.67% |
| 2. | Investigation of Water Resources Development Schemes (IWRD) | 11.640 | 7.2875 | 62.61% |
| 3. | Flood Management & Border Areas Programme (FMBAP) | 11.3625 | 7.7441 | 68.15% |
| 4. | Direction & Administration(D&A)-Major Works and OE(SAP) | 8.56 | 7.867 | 91.90% |
| 5. | National Hydrology Project | 31.7086 | 12.5201 | 39.48% |
| 6. | Dam Rehabilitation and Improvement Project | 25.00 | 4.91 | 19.64% |

## Water Sector-News

- PM : Focus on herbal farming along Ganga (Deccan Chronicle, 01.01.2023)
- Godavari water availability issue referred to CWC : GRMB (The Times of India, 04.01.2023)
- PM to address all-India water ministers' meet beginning today (The Indian Express, 05.01.2023)
- PM Urges Public to Participate in Conservation of Water (The Economic Times, 06.01.2023)
- 3,700 dams in India will lose 26% of storage capacity by 2050 (Millennium Post, 10.01.2023)
- No eco-damage by Yettinahole project, says Centre (Deccan Herald, 16.01.2023)
- Yamuna Pollution – 'Just 9 of 35 sewage plants along river in sync with norms'(Hindustan Times, 17.01.2023)
- Ken-Betwa Link Project panel holds third meet (The Indian Express, 19.01.2023)
- Rs. 1 k crore more to clean Yamuna in revised budget (The Times of India, 20.01.2023)
- Withdraw nod give to K'taka-Goa water dispute : Goa to Centre (The Sunday Standard, 22.01.2023)
- Himachal Pradesh Deputy CM Mukesh Agnihotri asserts state's water rights in Bhakra & Pong Dam (Millennium Post, 24.01.2023)
- Punjab has no water to share with others : BJP (The Morning Standard, 24.01.2023)

## Data Corner- Key Stakeholders of Water Sector

**Ministry of Jal Shakti**

**Central Government Organisation**

### Attached Offices

1. Central Water Commission (CWC)
2. Central Soil & Material Research Station (CSMRS)

### Subordinate Offices

3. Central Ground Water Board (CGWB)
4. Central Ground Water Authority (CGWA)
5. Central Water & Power Research Station (CWPRS)
6. Bansagar Control Board (BCB)
7. Ganga Flood Control Commission (GFCC)
8. Farakka Barrage Project (FBP)
9. Upper Yamuna River Board (UYRB)
10. National Water Information Centre (NWIC)

### Statutory Bodies

11. Tungbhadra Board (TB)
12. Betwa River Board (BRB)
13. Brahmaputra Board (BB)
14. Godavari River Management Board (GRMB)
15. Krishna River Management Board (KRMB)

### Corporate Bodies

16. Narmada Control Authority (NCA)
17. Cauvery Water Management Authority

### Registered Societies/ Autonomous Bodies

18. National Water Development Agency (NWDA)
19. National Institute of Hydrology (NIH)
20. North Eastern Regional Institute of Water and Land Management (NERIWALM)
21. National Mission for Clean Ganga (NMCG)
22. National River Conservation Directorate
23. Polavaram Project Authority (PPA)

### Public Sector Understandings

24. National Projects Construction Corporation Limited (NPCC Ltd.)
25. Water & Power Consultancy Services Limited (WAPCOS Ltd.)

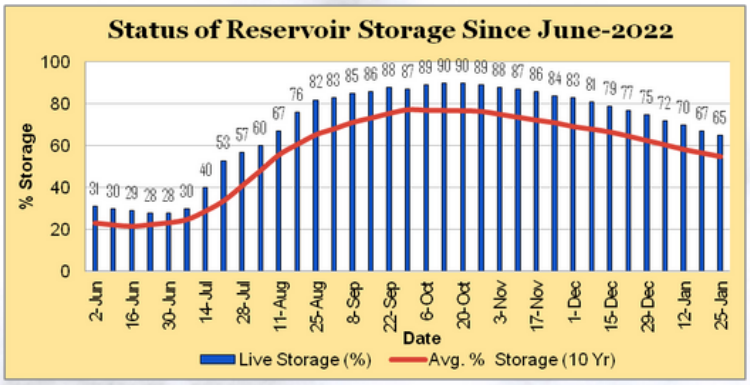
### State Government Departments

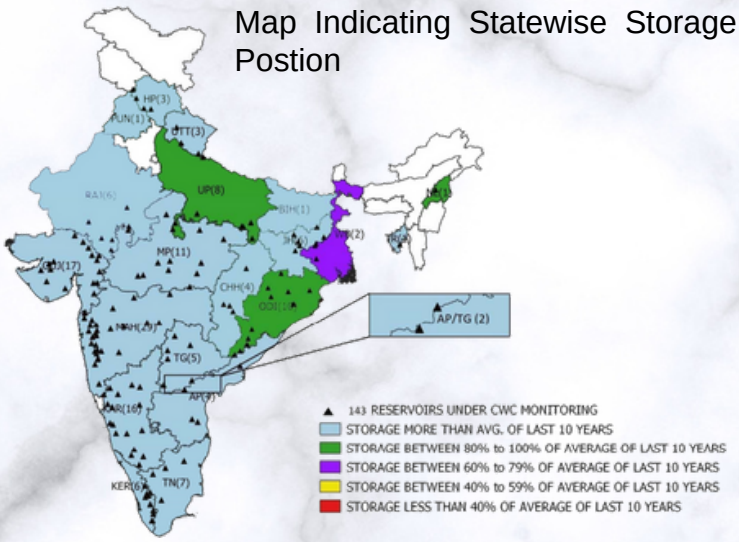
- Irrigation
- Flood Control
- Water Resources
- Watershed Management
- River development
- Water supply
- Urban Local Bodies

### Training and Research Institutes

- NWA
- WALMI
- NERIWALM
- WALAMTARI
- CWRDM
- Rajiv Gandhi National Ground Water Training and Research Institute

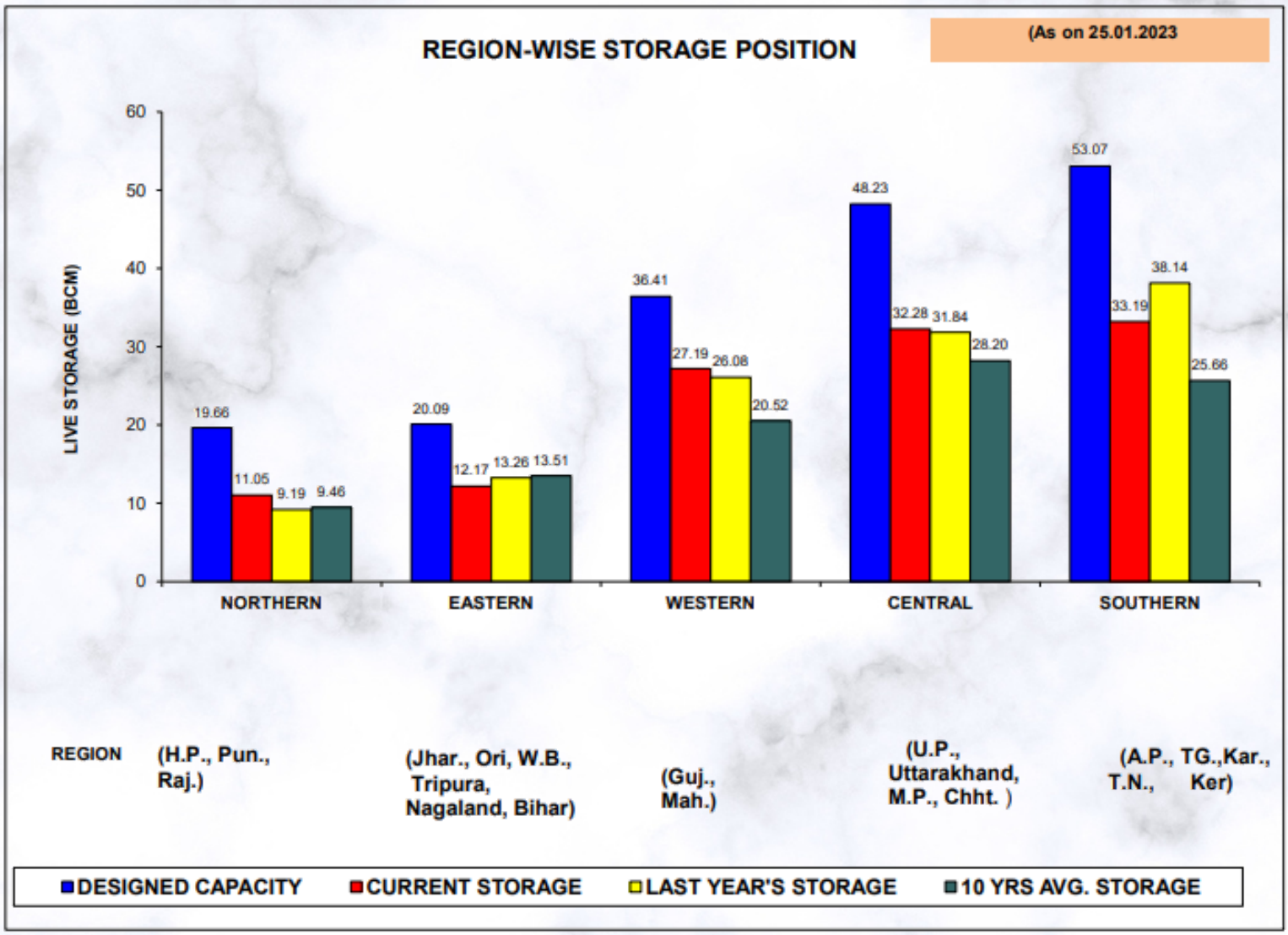
# Reservoir Monitoring




CWC is monitoring live storage status of 143 reservoirs of the country on weekly basis and is issuing weekly bulletin on every Thursday. Out of these reservoirs, 18 reservoirs are of hydro-electric projects having total live storage capacity of 34.960 BCM. The total live storage capacity of these 143 reservoirs is 177.464 BCM which is about 68.83% 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 25.01.2023, the total live storage available in these reservoirs is 115.887 BCM which is 65% of total live storage capacity of these reservoirs. However, last year the total live storage available in these reservoirs for the corresponding period was 118.507 BCM and the average of last 10 years live storage was 97.345 BCM. Thus, the live storage available in 143 reservoirs as per the bulletin dated 25.01.2023 is 98% of the live storage of corresponding period of last year and 119% of storage of average of last ten years.



# Republic Day Celebration


LGBO, Patna


UGBO, Lucknow


MTBO, Gandhinagar


MTBO, Gandhinagar


T&BDBO, Kolkata

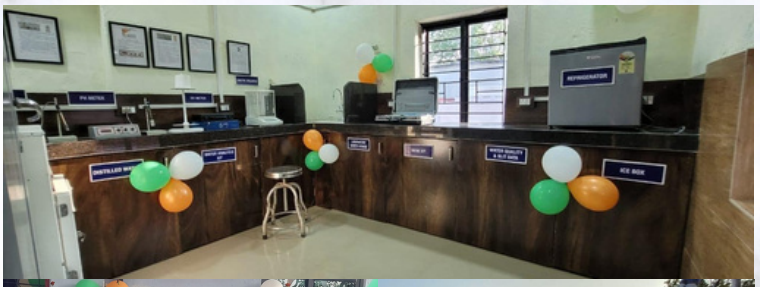
# Gallery


Shri Pankaj Kumar, IAS, Secretary (DoWR, RD &GR) visited Poiya Ghat, GDSQ site on river Yamuna under Lower Yamuna Division, CWC, Agra (YBO) on dated 27.01.2023.


Sh Kushvinder Vohra, Chairman (CWC) and Ex-officio Secretary to the Government of India held a meeting with the Hon'ble Deputy Chief Minister of Himachal Pradesh.

Sh. Kamal Kumar Jangid, Superintending Engineer, IC, CWC, Gangtok, Ministry of Jal Shakti, GOI participated the Inter-Ministerial Central Team (IMCT) for damages assessment due to flood & landslide in Sikkim (during 12.01.2023 to 15.01.2023).


Inspection of GDSQ Sites Pulamanthole and Karathodu Under Chaliyar Sub Division, Kozhikode by Shri T.K. Sivarajan, Chief Engineer, C&SRO.



The renovated Water Quality Lab (Level -1) at CWC site Kumhari on river Wainganga was formally inaugurated by Shri Dhirendra Tiwary, Chief Engineer, MCO, CWC, Nagpur on 28.01.2023.

## History- More Irrigation and Power from the Sarda

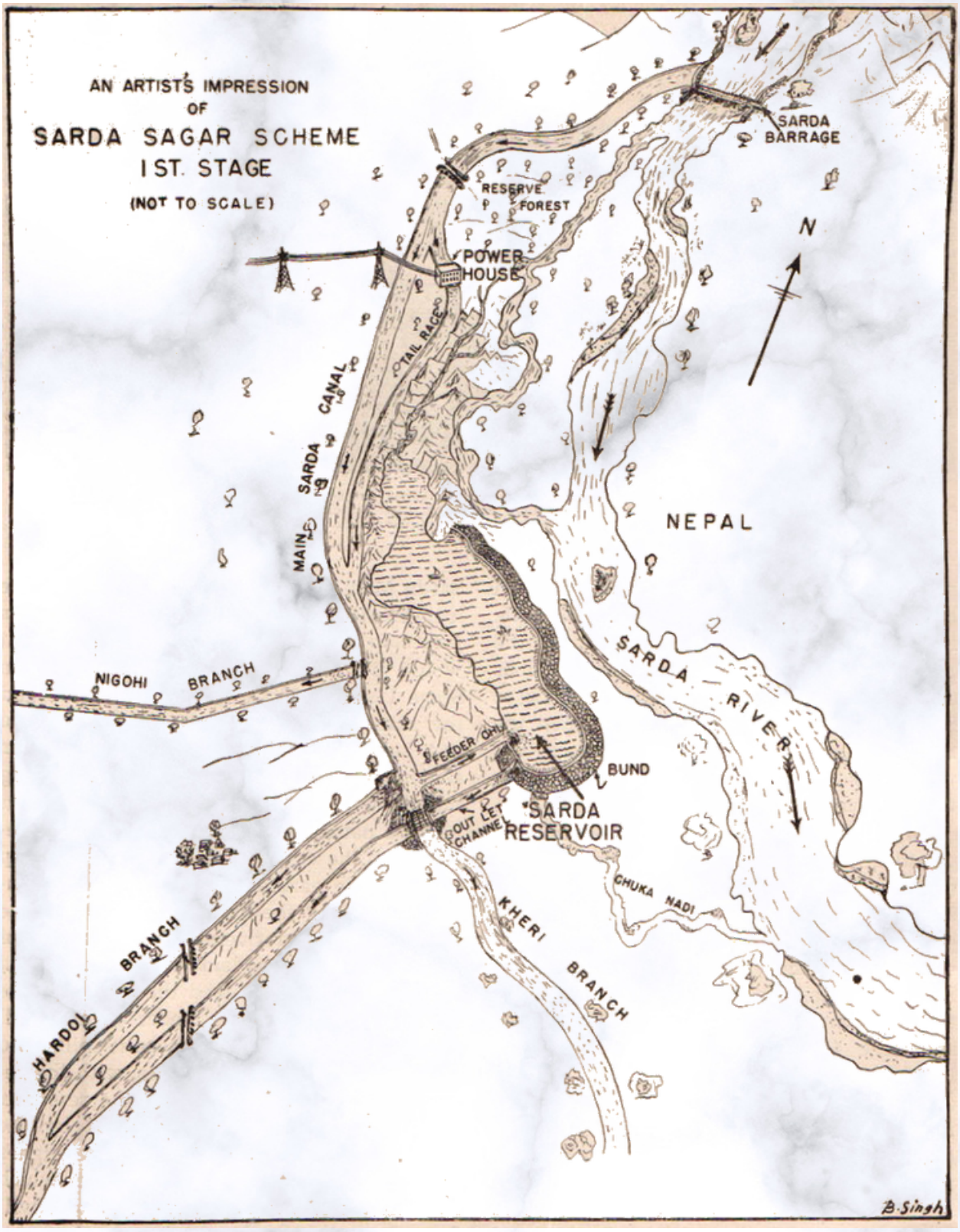
The Sarda is a perennial river of the Himalayan region which, together with the Ghaghra, pays tribute to the great Ganga Rising as the Kali river in the snowy heights of the mountain, it flows on the Indo-Nepal border towards Tanakpur in the Nainital district. It then runs south-east as the Sarda through the Pilibhit, Kheri, and Sitapur districts in Uttar Pradesh, to join the Ghaghra, about 50 miles north-east of Lucknow.)

### The Past

The valley of the Sarda is subject to the same fluctuations of the monsoon supplies like most parts of the country, which need the large though variable, supply of the river Flow for sustained agricultural production. Various schemes were proposed, discussed, modified, abandoned and revived over a length of 60 years, beginning from 1870. In all that interval the area that could have been benefited by the river repeatedly went through near famines and scarcity periods. The Taluqdars, who had once opposed irrigation canals, found that security lay only in providing assured water supplies to their lands. Thus came to be completed the Sarda canal in Uttar Pradesh with the now well known barrage at Banbassa, which heads up the water of the Sarda river and feeds it into the great canal. Today the Canal irrigates nearly 15,00,000 acres and has also begun to develop power which was not envisaged when the canal scheme was initiated.

### Extended Use

In 1950s, After about 30 years of irrigation service, the more water was needed from the Sarda river through the canal for more irrigation and more power. The construction of the Sarda Power House, established in 1956, has made it imperative to divert part of the waters of the Sarda river to run the power units throughout the year And this water has to down the channel willy nilly without further benefit. On the other hand if it could be suitably conserved after power was produced, the water could again be




and Mala Sagar on the right bank of the canal in its head-reaches. These would submerge 44 and 78 sq miles respectively, their capacities being 465 and 70 lakh acre ft. But both the schemes would submerge about 16,000 acres of good sal forest in their very first stage. These sites had therefore abandoned.

Finally an area of 25 sq miles was chosen lower down to the left of the Sarda canal for reservoir extending roughly from the fifth mile of the tail race channel of the Sarda Power House to the 26th mile of the Sarda Main Canal close to the point where it bifurcates into Kheri and Hardoi branches (see map also). Out of the 15,500 acres that would be submerged by this reservoir in Stage I, only 1,200 acres are cultivated and utilised for irrigation or power or both. Further, the irrigation department of the State has been anxiously exploring methods of examining the supplies in the 10,000-cusec Sarda canal in the winter period when the river discharge falls below 5,000 cusec. The water was in great demand particularly for the eastern districts of Uttar Pradesh.

Any storage scheme in the Himalayas would be expensive and would at the same time be a long-term scheme. Efforts were therefore made to find suitable sites in the plains along the canal itself Two storage schemes were investigated, namely the Surai Sagar and Mala Sagar on the right bank of the canal in its head-reaches. the standing forest covers 2,400 acres, the rest being waste land. The site has other advantages too. The high ridge overlooking the Khadars of the Chuka and Sarda river forms a natural flank on the west of the reservoir. The eastern flank made up of a 12-mile earthen bund along the watershed between the Sarda and Chuka rivers. The boundary of the Sarda Sagar is so laid out that the Chuka is contained and feed the artificial lake with all its supplies. A feeder channel links up the Sarda canal, where it splits into the Hardoi and Kheri branches, with the reservoir. This channel fills the reservoir with the surplus waters

collected by the Sarda catchment up to the barrage higher up. The monsoon surplus in the river which is in excess of the Sarda canal system flows down the Sarda canal and the 2,000- cusec Feeder Channel to the reservoir. The water later used for irrigation of the rabi crop of lands downstream through the 1.75-mile outlet channel of 1,500 cusec capacity from the reservoir which take off close to the inlet of the Feeder Channel, but at a lower level. Similarly, the winter rains stored up in the reservoir and made available for the early kharif and sugarcane crops until the Himalayan snow starts melting and feeding the river. Another feature of the Sarda Sagar Scheme worthy of notice is that all the water, as pointed out earlier, coming from the Sarda Power Station through the tail-race channel all round the year will not be lost but diverted for future use Into the Sarda Sagar.

The Feeder Channel has been so positioned that the coarse silt that comes into the reservoir is deposited in a huge hollow of the lake without affecting its utilisable storage capacity. The Sarda Sagar holds 2.6 lakh acre ft of water and spreads over 25 sq miles.

## Project Features

The Sarda project briefly comprises the construction of a 12-mile earthen bund for the reservoir, a 2-mile Inlet Channel of 2,000 cusec capacity, a low level Outlet Channel of 1,500 cusec capacity for 1.75 miles, a Subsidiary Hardoi Branch of the same capacity for about 13.5 miles and remodelling of the main Sarda canal to increase its capacity from 9,300 to 11,000 cusec, raising of the Sarda barrage gates by 2 ft and remodelling of the Sarda and remodelling of the Kheri branches and other works necessary for utilising the Sarda Sagar supplies in the commanded area.

## Construction Progress

The work on the first stage of the Sarda project started in March 1954. The Sarda barrage gates raised to the proposed height and the canal remodelled to take its prescribed 11,000 cusec. About 10,000 labourers, 3,000 donkeys and 400 technicians were engaged on the reservoir in this highly malarious and marshy tarai forest on the Indo-Nepal border. As work in the area was possible only from November to the end of May, it was carried round the clock during this period. For earthmoving work huge scrapers, excavators, dozers and trucks have been utilised and pumping sets, working day and night had lowered the spring level water along the canal works from 10 to 15 ft where masonry works had to be constructed and concrete foundations laid. So far about 220 million cu ft of earthwork 4.5 lakh cu ft of brick masonry and 5 lakh cu ft of cement concrete have been completed since June 1957. The progress of the various features is as follows:

| | |
|---|---|
| Remodelling of Canals | 337 miles |
| Constructing new Channels and Branches | 534 |
| Constructing Feeder Channel | 2 |
| Constructing Sarda Outlet Channel | 1.75 |
| Drains | 15 |
| Cross Drainage works | 20 Nos. |
| Earthwork in Bund & Subsidiary Hardoi Branch | 17.8 crore cu ft |

## Benefits

The completion of the first stage of the Sarda Sagar project enables the irrigation of 190,000 acres, producing about 70,000 tons of food grains per year. The yield of sugar and sugar products was expected to be about 11,000 tons and that of fish about 20,000 tons per year.

The project has been estimated to cost Rs 4.8 crores, giving a useful storage at the rate of Rs 8,000 per million cu ft of water.

The second stage of the project, envisages the raising of the pond level of the reservoir by 12 ft more, and the work on this stage. The scheme has also a firm power potential of 19,700 kW which was developed along the subsidiary Hardoi branch, below the outlet channel of the reservoir.

All these benefits should go a long way in stepping up the economy of the area in Uttar Pradesh commanded by the Sarda Sagar.

**(Source: Bhagirath September 1957)**

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2nd Floor(South), Sewa Bhawan, R K Puram, New Delhi-110 066
E-mail: media-cwc@gov.in