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National Water Data Policy

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भारत सरकार
Government of India
जल शक्ति मंत्रालय
Ministry of Jal Shakti
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
Department of Water Resources,
River Development & Ganga Rejuvenation

NATIONAL WATER DATA POLICY 2026

CONTENTS

1.	**VISION, MISSION, OBJECTIVES AND KEY STRATEGIC PILLARS**	**4-5**
1.1.	Introduction	4
1.2.	National Water Data Policy (NWDP), 2026	5
1.3	Vision	5
1.4.	Mission	5
1.5.	Strategic Objectives	5
1.6.	Key Principles for Water Data Management	5
1.7.	Key Strategic Pillars	6
2.	**INSTITUTIONAL GOVERNANCE FOR WATER DATA**	**6-10**
2.1.	Stakeholders Engagement and Capacity Building	6
2.2.	Nodal Departments and Nodal Agencies for Water Data	9
2.3.	National Level Governance	9
2.4.	State Level Governance	10
2.5.	Strengthening NWIC and SWIC	10
3.	**WATER DATA PRODUCERS AND IDENTIFICATION OF WATER DATA**	**10-14**
3.1.	Major Data Groups	10
3.2.	Water Data Producers	12
3.3.	Inventory of Water Data Producers and Data held by them	12
3.4.	Central and State Nodal Agencies to engage with Water Data Producers	12
3.5.	Satellite Data	12
3.6.	Identify Data Gaps and support for new data collection	13
3.7.	Water Data Quality	14
4.	**OPEN WATER DATA THROUGH FEDERATED DATA HUBS**	**14-18**
4.1.	Federated Water Data Hubs	14
4.2.	Data Classification	15
4.3.	Data User Categories	15
4.4.	Procedure for release of unclassified data & pricing	16
4.5.	Procedure for release of classified data & pricing	16
4.6	Review of classified/ unclassified water data and other related aspects	18
4.7	Publish Water Data Catalogues	18
4.8	Create open data standards and protocols for Interoperability	18
5.	**ENSURE WATER DATA IS USED**	**19-20**
5.1.	Articulate the vision and value proposition	19
5.2.	Identification of Anchor Data Users and Engaging with them	19

5.3.	Engaging with Water Community and Public	19
5.4.	User Engagement to guide the development of public facing portal	20
5.5.	Data Hubs to develop data visualization and other tools to enhance the usage	20
5.6.	Sustain the Open Water-Data Platform	20
6.	**ANALYTICAL TOOLS, DSS, MODELS, RESEARCH AND INNOVATION**	**21-22**
6.1.	Whole of Water Community Approach	21
6.2.	Water Data for Analytical Tools, Decision Support Systems (DSS) and Models	21
6.3.	Water Data for Research and Innovation	22
6.4.	Publication of Strategic Reports on Water Management	22
6.5.	Applications based on satellite data	22
7.	**ACTION PLAN**	**23-28**
7.1.	Comprehensive Action Plan	23
7.2.	Initial Action Plan	24
7.3.	Water Data Governance	24
7.4.	Water Data Publishing	25
7.5.	Water Data Visualizations	26
7.6.	Water Data for Analytical Tools, DSS and Models	27
7.7	Water Data for Research and Innovation	28
8.	**OUTCOMES AND CONCLUSION**	**29**
	Annex-I to Annex-VI	**30-42**

Government of India
Ministry of Jal Shakti
Department of Water Resources, RD & GR
National Water Data Policy, 2026

1. VISION, MISSION, OBJECTIVES AND KEY STRATEGIC PILLARS

1.1. Introduction

1.1.1 Major challenges in water sector in the country

Water is a vital natural resource critical to the survival and prosperity of India's people, environment and socio-economic development. India has more than 17% of the world's population, but has only 4% of world's renewable water resources. India's key challenges in water sector are as follows:

(i). **Water Stress** due to rapidly growing and urbanising population, growing demand for energy and industry, increasing demand for irrigated crops among other factors

(ii). **Access to water supply and sanitation** services for all

(iii). **Water Pollution** particularly inadequate wastewater treatment and discharge of untreated water into water streams and bodies, surface and groundwater contamination

(iv). **Water-related disasters** such as floods, droughts and other extreme events

(v). **Ecosystem degradation and biodiversity loss** due to unsustainable models of development activities

(vi). **Impact of Climate Change** on water

(vii). **Fragmented Governance** and lack of regulatory enforcement

(viii). **Groundwater depletion**

1.1.2 Major challenges related to water data:

(i) One of the key challenges in managing India's water resources is the lack of adequate water data.

(ii) Data in the water sector exists in silos, with very little horizontal and vertical data sharing across the value chain.

(iii) Metadata is either missing, or units used and formats applied are different

(iv) There is also lack of standardization in data collection.

(v) Water data governance and management are fragmented.

1.2. National Water Data Policy (NWDP), 2026

National Water Data Policy, 2026 has been formulated in supersession of Hydro-Meteorological Data Dissemination Policy, 2018. The new policy advocates a joint national effort of the Central and State Governments, Research and Academic institutions, Private Sector and not for profit Institutions and civil society to promote open, integrated and shared water data management. The Policy is a whole of society approach covering all water and allied sectors, which produce or use water data towards addressing the challenges of water sector, thereby contributing to water security for all.

1.3. Vision

Promoting open, integrated and shared water data as key enabler of sustainable management of water resources to achieve water security for all.

1.4. Mission

Set up institutional governance and public digital infrastructure for water sector including public water data hubs for integrated, open and shared water data in partnership with Public, Private and Not for Profit Sector.

1.5. Strategic Objectives

The key strategic objectives of National Water Data Policy, 2026 are:

(i) Data to enable IWRM to make India a water secure nation, providing reliable and adequate supply of clean water to citizens, agriculture, industry, environment and other needs;

(ii) Data and advance computing technologies to minimize the impact of floods, droughts and other extreme events;

(iii) Data sharing to encourage research, development and innovation in water sector;

(iv) Data to develop water as an economic driver;

(v) Data to enable public participation in water sector decision making.

1.6. Key Principles for Water Data Management

The Policy adopts the following principles towards Integrated, open and shared water data management in the country:

(i) Water data are essential for efficient, equitable, sustainable, and resilient water planning, management, and stewardship;

(ii) Modern data infrastructure increases the usefulness of water data and enables its broadest possible application;

(iii) Data equity is necessary for water equity; modern data infrastructure should be implemented and governed so that data are usable by and for overburdened communities;

(iv) All water data produced for the public good should, by default, be findable, accessible, interoperable, and reusable (FAIR) for public use or authorized users;

(v) Security and privacy risks associated with sharing data can be mitigated using mechanisms for tiered access for authorized users;

(vi) Commonly accepted data, metadata, and exchange standards should be adopted by water data producers to promote interoperability, efficiency, sharing, equity, and secondary uses of data;

(vii) Control and responsibility over data are best maintained by water data producers;

(viii) Water data producers are responsible for sharing data of known quality and documenting essential metadata; data users are responsible for determining whether data are appropriate for specific purposes and uses;

(ix) Federated, distributed systems of interoperable public water data generally provide scalability and flexibility to meet the diverse needs of data producers and users.

1.7. Key Strategic Pillars

The National Water Data Policy, 2026 is based on following five key strategic pillars:

(i) Establish Institutional Governance for Water Data

(ii) Engage with Water Data Producers and Identify Water Data

(iii) Enable Open Water Data through federated Water Data Hubs

(iv) Ensure Appropriate Use of Water Data

(v) Enable Analytical Tools, DSS, Models, Research and Innovation

2. <u>INSTITUTIONAL GOVERNANCE FOR WATER DATA</u>

2.1. Stakeholders Engagement and Capacity Building

2.1.1. Key Stakeholders

Key Stakeholders in Water Sector Data management are:

(i). **Central Government Ministries/ Departments**

Some of the key Central Government Ministries/ Departments involved in water data and key stakeholders of water data policy are:

(a). Department of Water Resources, River Development & Ganga Rejuvenation
(b). Department of Drinking Water and Sanitation
(c). Ministry of Environment Forest & Climate Change
(d). Department of Agriculture and Farmer's Welfare
(e). Ministry of Housing and Urban Affairs
(f). Department of Rural Development
(g). Department of Land Resources
(h). Department of Space
(i). Ministry of Ports, Shipping and Waterways
(j). Ministry of Health and Family Welfare
(k). Ministry of Statistics and Program Implementation
(l). Department of Fisheries
(m). NITI Aayog
(n). Ministry of Power (Independent Power Producers who are collecting data of river for hydro-power operations).

(ii). **Central Government Organizations**

Some of the key central government organizations involved in water data and key stakeholders in the water data policy are:

(a). Central Water Commission
(b). Central Ground Water Board
(c). National Mission on Clean Ganga
(d). National Water Mission
(e). National Water Development Agency
(f). National Remote Sensing Centre (NRSC)
(g). Survey of India (SOI)
(h). India Meteorological Department (IMD)
(i). Central Pollution Control Board (CPCB)
(j). Mahalanobis National Crop Forecast Centre (MNCFC)
(k). Soil & Land Use Survey of India (SLUSI)
(l). National Bureau of Soil Survey & Land Use planning
(m). Indian Council for Agricultural Research (ICAR)
(n). National Centre for Medium Range Weather forecast (NCMRWF)
(o). Border Roads Organisation

The list of Stakeholders is indicative. The same will be reviewed from time to time and new stakeholders may be included during course of implementation and operationalization of the Policy.

(iii). **State Governments**

Various State Government Departments and Organizations are responsible for water resources, water distribution, water quality and water uses to different sectors in their respective States and would be key stakeholders at the State level. The States will be key stakeholders in the policy for open, integrated and shared water data and contributing to integrated water resource management.

(iv). **Academic and Research Institutions**

Academic and Research Institutions use water data for various research studies, projects and other purposes. They are a key user of water data and need to be involved fully in Water Data Management policies. They also generate data from different sponsored projects by the Government.

(v). **Private Sector**

Private Sector is responsible for execution and implementation of various water related infrastructure and services and needs data for project development, operation and management. Private sector will be a key stakeholder.

(vi). **Civil Society Organization**

Civil Society Organizations working on various aspects of water need to be involved in water data management policies.

(vii). **Community**

Water data is useful to involve communities in water planning, infrastructure and services.

2.1.2. Stakeholders engagement

All stakeholders will be engaged in the course of implementation of the Policy to promote open, integrated and shared water data through national and state level governance mechanism. Progress on various aspects of the policy will be regularly shared with all the stakeholders, and their suggestions and feedback will be sought regularly.

2.1.3. Capacity Building of Stakeholders

In order to ensure the effective support and contribution of various stakeholders in promoting open, integrated and shared water data, it is important that they are sensitized

and made aware of various aspects of water data. Suitable capacity building programs will be developed for technical, managerial and behavioural aspects for different levels of participants.

2.2. Nodal Departments and Nodal Agencies for Water Data

Government of India has set up **National Water Informatics Centre (NWIC)** and **State Water Informatics Centres (SWICs)** under National Hydrology Project. These organizations will be designated Central and State **Nodal Agencies** at Centre and States respectively to ensure effective implementation of the policy. Department of Water Resources at the Central and State level will be the Nodal Departments for coordinating the implementation of the Policy.

The Nodal Agencies will be responsible to provide necessary support to Central and State Governments to ensure effective institutional governance for coordination, monitoring and implementation of the Policy.

2.3. National Level Governance

At the national level, Department of Water Resources will coordinate the effective implementation of the Policy with technical and professional support from NWIC.

(i) National Steering Committee

A Steering Committee under Secretary, Department of Water Resources, River Development and Ganga Rejuvenation and comprising of the representatives from the line Ministries, water related Organizations, Research and Industry and key States will be set up for effective coordination and providing overall guidance to Water Data Management. The National Steering Committee will have the power to decide the modalities regarding classification, procedure for release and other related aspects of water data.

(ii) National Technical Committee

A National Technical Committee under the Chairmanship of Chairman, CWC will be set up to guide development of data standards, help evaluate technical needs, help complete data inventory, share and maintain data and other technical matters. The Committee will verify towards quality assurance of data and DSS operations and outputs.

(iii) National Implementation Committee

A National Implementation Committee will be set up to coordinate operational aspects of the policy and provide necessary resolution of issues during implementation.

(iv) National Water Data Users Committee

A Water Data Users Committee will be set up comprising of various data users including water planners, water managers, policy makers, researchers, innovators and industry users. The Committee will articulate users' needs, provide recommendations and feedback on various issues pertaining to water data and suggest use cases.

2.4. State Level Governance

(i) State Steering Committee

A State Steering Committee under Chief Secretary will be set up for overall coordination and guidance for open, integrated and shared water data from across the Government departments and organizations.

(ii) State Technical Committee

A State level Technical Committee for coordination and review of technical issues in line with the national standards and guidelines.

(iii) State Implementation Committee

A State Implementation Committee at the State level will be set up headed by Administrative Secretary of the concerned State, Department of Water Resources for day-to-day coordination and implementation of the Policy.

(iv) State Water Data Users Committee

Water Data Users Committee comprising of stakeholders and water data users will provide valuable feedback and suggestions, which will help improve Water Data management.

2.5. Strengthening NWIC and SWIC

NWIC will act as the National Project Management Unit (NPMU) for operationalization of National Water Data Policy, 2026. For this purpose, National Water Informatics Centre and State Water Informatics Centre would need to be considerably strengthened to fulfil their role as the key backbone nodal organizations to support nation-wide water sector data management and promoting a regime of open, integrated and shared water data. These organizations will be positioned to support all water data producers and users.

3. WATER DATA PRODUCERS AND IDENTIFICATION OF WATER DATA

3.1. Major Data Groups

In order to meet the requirement of integrated water resources management, water data must be available at sufficient spatial and temporal resolution while meeting minimum

standards of quality. The Policy aims to cover all data relevant for water and allied sector management with key data groups indicative in nature given below:

(i) Water Quantity

Data describing how much water is available, such as measurements of groundwater levels, reservoir levels, aquifer properties, stream flow, rural and urban water bodies such as lakes, ponds, tanks and springs.

(ii) Water Quality

Data related to the chemical or biological condition of the water, such as chemistry measurements, field parameters or ecological data of surface water as well as groundwater including wastewater domestic and industrial.

(iii) Water Use

Data related to water uses for various purposes, such as agriculture, rural drinking water, municipal, or industrial purposes.

(iv) Water Planning

Essential data related to developing national, basin, state, district, municipal and village water plans.

(v) Ecosystems & Wildlife

Water data within the scope of ecosystems and wildlife, such as aquatic life, watershed health, or land use.

(vi) Infrastructure

Data that helps to manage or describe various water management structures, such as dams and reservoirs, flood control structures, acequias and ditches, or pipelines.

(vii) Climate

Data describing long-term weather conditions such as precipitation, drought conditions, evaporation data, soil moisture of surface and root zone.

(viii) Natural Hazards

Data related to hazards like drought, flood, storm water and public health factors.

(ix) Energy

Data related to energy development, such as produced water, mining, water reuse, or hydroelectric power, for example.

3.2. Water Data Producers

Water data producers are various public agencies, which collect water data in discharge of their designated functions. They are responsible for data collection processes and quality of data being collected. There are several public agencies involved in the planning, development, distribution and regulation of water related activities at the national, state and local level. These agencies collect water related data for discharge of their functions and objectives, which is valuable for water sector as a whole. There could be some private water data producers also, which can contribute to water data.

3.3. Inventory of Water Data Producers and Data held by them

Central and State Nodal Agencies for water data will compile and maintain an inventory of all water data producers and data produced by them as per major data groupings. It should capture the current status of data e.g. paper based or digital and its discoverability, accessibility, and usability. Data inventory will be an ongoing process as the agencies keep generating new data and also upgrade their water data practices.

3.4. Central and State Nodal Agencies to engage with Water Data Producers

Central and State Nodal Agencies for water data should engage with water data producers towards making the data open and public. It should include all public sector organizations whether regulating, planning, development, research, operation and whether national, state and local levels. A memorandum of understanding for the engagement and sharing of data between Nodal Agencies and water data producers may be signed to ensure clear roles and responsibilities and engagement.

3.5. Satellite Data

3.5.1. Open access Satellite Data

Satellites increasingly offer a reliable source of spatially distributed information on a variety of environmental variables. By using the reflective properties of the earth's surface and atmosphere, it is possible to monitor (among others) vegetative cover, rainfall, snow cover, land surface temperature and actual evapotranspiration through time. It offers a range of options on different spatial and temporal scales. Open-access datasets may be used for operational decision support systems, and for feeding, calibrating and validating hydrological models.

3.5.2. Archival Satellite data covering multiple decades

Satellites now provide an archive of imagery that covers multiple decades. These historical records allow us to identify trends and spatial patterns in different factors associated with

water resource management, such as water supply, water consumption and crop growth. Land cover changes, such as deforestation and agricultural expansion, can be mapped and quantified in assessments of ecosystem services and land degradation.

3.5.3. National and State Nodal Agencies to coordinate for Satellite data for Water

National and State Nodal Agencies, namely NWIC and SWIC, will coordinate with NRSC, ISRO and other organizations to access the satellite data and applications for water sector. Other open water satellite data sources should also be accessed and also various tools developed on the same. The satellite data is getting richer with time both in terms of spatial resolution as well as frequency of data, which makes it an important source for water management.

3.6. Identify Data Gaps and support for new data collection

3.6.1. Data and process gaps

Based on the identified requirements for water data, there may be certain data, which is not collected or not as per the parameters required or not of requisite quality. These data gaps need to be identified and documented. The gaps in standardized data collection protocols and procedures followed by water data producers need to be identified.

3.6.2. New Data Collection and Standardization of protocols and procedures

The water data producers will have to address the data gaps by developing new, or expanding existing, data collection efforts. There has to be effective coordination among all agencies to improve data coordination. Protocols will need to be developed for creating or expanding data collection programs. Efforts need to be prioritized to standardize data collection protocols and procedures.

3.6.3. Data transfer between Data Producer and Nodal Agencies

Water data collection and its quality is the responsibility of water data producers. Water data producers will then transfer data to Nodal Agency through API or other automated means. Nodal Agencies will coordinate and provide necessary support for API based data transfers from water data producers.

3.6.4. Automate data collection and reporting of critical water datasets

Water data producers should automate data collection and reporting systems for critical water datasets, including groundwater elevation data, diversion data, and stream gauge data.

3.7. Water Data Quality

Water data producers are responsible for water data quality, validation and documenting essential metadata; end users bear final responsibility for determining whether the data is fit for use. Data user's feedback may be useful in improving the data.

While water data quality and validation are the responsibility of water data producers, the nodal agencies may also take necessary steps to assess the quality processes of the water data producers and overall quality of the data being shared and published.

4. OPEN WATER DATA THROUGH FEDERATED DATA HUBS

4.1. Federated Water Data Hubs

4.1.1. Federated architecture will provide scalability and stability

In order to make public water data open from disparate sources in a standardized format, water data hubs will be set up at central level, state level and other important organizations. These water data hubs will follow a federated architecture, which will provide scalability and financial stability to better meet the diverse needs of data users.

4.1.2. Components of water data hubs

There are four necessary components of water data hub: water data producers, data wrappers, a data store, and a metadata catalogue. Water data producers share their data through water data hubs where data users can find and access them. Users then transform data into information that decision-makers can use to improve water planning, management, and stewardship. Data Hubs will connect water data producers, users, and decision-makers to enable information sharing and informed decision-making.

4.1.3. NWIC to be central backbone organization to facilitate governance

NWIC will link Central, State and other water data hubs and facilitate governance of the system. NWIC will lay-down necessary guidelines, protocols and architecture for federated water data hubs across the country. In long term, these data hubs will form an Internet of Water for the country. State Water Informatics Centres will support the governance at the State level as per the guidelines laid down by NWIC.

4.1.4. Data Security Policies

NWIC will ensure adequate data security policies and security audit of the systems to manage the risk of any security breach.

4.1.5. Data Archival Policies

NWIC will ensure suitable data archival and retrieval policies to manage the increasing volume of data.

4.1.6. Central Water Data Hub

NWIC will set up central water data hub for publishing data from various water data producers in central government. Apart from the central water data hub set up by NWIC, there could also be other water data hubs set up by other organizations, which will have to follow the guidelines and governance mechanism laid down by NWIC.

4.1.7. State Water Data Hubs

SWIC will set up state water data hubs for publishing data from various water data producers in the State. Apart from the State data hub set up by SWIC, there could also be other water data hubs set up by other organizations. All water data hubs will have to follow the guidelines and governance mechanism laid down by NWIC.

4.2. Data Classification

4.2.1 From the point of view of data dissemination, the country is divided into following three regions;

(i) Region-I: Indus basin & other rivers and their tributaries discharging into Pakistan;

(ii) Region-II: Ganga-Brahmaputra-Meghna basin & other rivers and their tributaries discharging into Bangladesh/Myanmar; and

(iii) Region-III: Remaining other rivers and their tributaries.

4.2.2 The hydrological data of Region-I and II is **classifie**d except hydrological data mentioned under Para 4.2.3 whereas the data of Region-III is **unclassified.**

4.2.3 The reservoir water level, live storage position of reservoirs, water quality, groundwater, satellite and meteorological data for all regions are unclassified. Similarly, all metadata (information about data, sites, OWs, etc.) for all Hydrological Observation (HO) sites and Observation Wells (OWs) including yearly average data and historical important data (such as highest flood level, yearly flood peak, flood data, highest water levels etc.) are also unclassified for all regions.

4.3. Data User Categories

4.3.1 For the purpose of hydrological data dissemination, users are grouped in following categories:

(i) **Indian Users** – Agencies / entities owned fully by Indian citizens. These are further categorized into commercial and non-commercial organizations, as under:

(a) Indian Commercial Users - (i) Private
(ii) Public Sector Companies
(iii) Consultants including Non-Governmental Organizations / Educational/Research Institutes undertaking consultancies / studies / works for fees, and

(b) Indian Non-commercial Users -(i) Central Government Departments/ organizations
(ii) State Government Departments/ organizations
(iii) Non-profit companies/ non-governmental organizations/ Educational/Research Institutes for academic/ professional research/ studies purposes.

Note: As individuals may use hydrological data for commercial purposes, they are treated as commercial users. Students / Researchers, etc., should obtain the necessary data through their Institutes / Universities.

(ii) **Foreign Users** – Agencies / entities owned partially or fully by foreign citizens including individuals employed by such agencies/entities.

4.4. Procedure for release of unclassified data & pricing

4.4.1 All unclassified data shall be hosted by NWIC which can be downloaded by users free of cost.

4.4.2 The use of unclassified data downloaded from NWIC data dissemination platform shall be duly acknowledged in the DPR/report/ publication by mentioning the name of respective data producer. NWIC, CWC, CGWB, DoWR, RD & GR, Ministry of Jal Shakti, State Government or other data producer shall not be held responsible and liable for any inference drawn based on these data.

4.5. Procedure for release of classified data & pricing

4.5.1 Classified data will be released for specific purpose/ study only and will be non-transferable.

4.5.2 All users desirous to obtain classified data may send their request to the Director (NWIC) in the prescribed format given at **Annex-I** along with a 'Secrecy Undertaking' (format given at the **Annex-II**) using CDRC portal (https://cdrc.cwc.gov.in)

4.5.3 Director (NWIC) would forward the request to concerned Chief Engineer of CWC **(Annex – III)** who would verify the authenticity of the user, the purpose of data request and reasonableness of data required for the stated purpose / study and forward the requests with his/her recommendations (**Annex-IV**), within thirty days of the receipt of such requests to the Director (NWIC).

4.5.4 The Director (NWIC) shall place all such requests along with the recommendations of

concerned Chief Engineer of CWC, received in a month by 10th of the following month before a Classified Data Release Committee with the following composition:

(i)	Chairman, Central Water Commission (CWC)	- Chairman
(ii)	Member (RM), Central Water Commission (CWC)	- Member
(iii)	Representative of Ministry of External Affairs	- Member
(iv)	Representative of the Intelligence Bureau	- Member
(v)	Representative of the Research & Analysis Wing	- Member
(vi)	Representative of Ministry of Defence	- Member
(vii)	Concerned Regional Chief Engineers of CWC (case to case basis)	- Member
(viii)	Concerned Commissioner (Indus/FM/B&B), DoWR, RD&GR (case to case basis)	- Member
(ix)	Director General, National Water Development Agency	- Member
(x)	Representatives of concerned States / data producers forwarding the classified data requests (case to case basis)	- Member
(xi)	Director, National Water Informatics Centre (NWIC)	Member - Secretary

4.5.5 The Classified Data Release Committee shall decide on the requests for release of classified data by 20th of every month, which shall be communicated to the indenting user with copy to the concerned Chief Engineer, CWC by the end of that month.

4.5.6 Indian non-commercial users would be supplied classified data free of cost through electronic media/digitally.

4.5.7 Release of classified data to foreign entities shall be undertaken in accordance with decisions taken in bilateral mechanisms or relevant bilateral arrangements.

4.5.8 Indian commercial and foreign users would be supplied the minimum classified data, considering the requirement of the user on payment of Rs. 75000/- per site per annum. The year for calculation of data charges will be water year (from 1st June to 31st May of following year). The dissemination of data for part of any year shall also be charged at rate of Rs.75000/-. The cost of classified data will be reviewed and thus decided by National Technical Committee periodically or whenever need arises.

4.5.9 In the event that a user specifically requests hard copies of documents or materials, the user shall be responsible for bearing the applicable printing and/or digital media charges, calculated based on the actual cost incurred by the organization.

4.5.10 On the basis of authorization from the Classified Data Release Committee, the data would be released to the indenting user after collection of due charges within 15 days of the receipt of such authorization and the payment.

4.5.11 The released classified data shall not be reproduced in any report/ publication/ Detailed Project Report (DPR), etc. Only result of analysis and inferences drawn thereof should be published. The contribution of CWC/Data Producer(s) shall be duly acknowledged in the

DPR/report/ publication.

4.5.12 NWIC/CWC/State Government Agencies/other data producer and/or DoWR, RD&GR, Ministry of Jal Shakti shall not be held responsible for any inference drawn based on these data.

4.5.13 All classified data producers shall be free to utilise the classified data for their own purposes. However, the classified data cannot be published in any condition. All classified data producers shall strictly adhere to the procedures outlined in Clauses 4.5.2 to 4.5.11 above for classified data requests received by them. Each data producer shall forward the classified data requests to Classified Data Release Committee (CDRC) through Director (NWIC) as detailed above.

4.5.14 Hydrological data among various agencies and bodies under the Ministry of Jal Shakti, excluding Public Sector Undertakings (PSUs), shall be shared free of cost through NWIC, based on authorized User ID and password access.

4.5.15 The Classified Data Release Committee shall submit its annual returns to the Ministry. The Ministry may conduct annual audit of the data released by the Classified Data Release Committee.

4.5.16 During the implementation of the National Hydrology Project (NHP), the Ministry granted specific relaxations to implementing agencies of NHP regarding classified data-sharing provisions (of Classified Region-II). These relaxations shall continue to remain in force in accordance with **Annexure - V**.

4.6. Review of classified/ unclassified water data and other related aspects

The detailed modalities regarding classification, mechanism for release of classified data and other related aspects of water data would, whenever felt necessary, be reviewed by the National Technical Committee and recommend for amendment to National Steering Committee constituted under the chairpersonship of Secretary, DoWR, RD & GR for taking final decision.

4.7. Publish Water Data Catalogues

NWIC will develop and publish water data catalogues that identify all existing public water data maintained by state and central agencies. It will enhance discovery of data and seamless data sharing. Data catalogue should be robust enough to meet complex and wide-ranging needs while still remaining user-friendly. Data catalogues should provide metadata and allow for multiple formats to make it usable.

4.8. Create open data standards and protocols for Interoperability

Central Nodal Agency, through the institutional mechanism, will create open and common data standards and protocols to promote interoperability and facilitate the adoption of

open data standards and protocols. Following measures will be taken to make data discoverable and interoperable:

(i). Enhance metadata documentation to improve discoverability of datasets;
(ii). Adopt subject-matter-controlled vocabulary to enhance dataset integration;
(iii). Adopt best practices for geo-referencing data to enhance interoperability;
(iv). Maintain a master list of keywords and categories of water data;
(v). Feedback from stakeholders on improvements in the data.
(vi). Global protocols like WMO information system for open and interoperable data access.

5. ENSURE WATER DATA IS USED

5.1. Articulate the vision and value proposition

NWIC and SWIC will articulate the vision and value proposition of sustainable water resource management and stewardship enabled by open, shared, and integrated public water data, which should be widely communicated. The Government agencies, in partnership with non-Government partners, should expand public awareness, bolster public engagement, and improve community access to data to promote transparency and support more equitable water stewardship.

5.2. Identification of Anchor Data Users and Engaging with them

Anchor users are the major users of water data. Nodal Agencies should identify anchor users of water data across public and private sectors, organizations and institutions and list of such users to be maintained for close interaction and engagement. Identifying anchor users will help advance data sharing and secure the needed continuation of integration efforts. Anchor users would significantly benefit from the use of shared and integrated water data, and therefore champion an open data initiative.

5.3. Engaging with Water Community and Public

Open Data Platform should be used to inspire improved, sustainable water resource decisions, and foster a water community engaged in decision making at all levels of government. It is important to develop a vibrant water community to support open data efforts. Community engagement is necessary for developing new use cases, recommending improvements to the open data platform, improving the usefulness of the data, using all of this to develop new analytical products.

5.4. User Engagement to guide the development of public facing portal

User engagement should guide the development of public-facing portals including prioritization of the datasets to be published first. The usability of the portal must be part of the initial design to ensure the general public or other identified audiences can use the portal for its intended purpose. Portals with difficult user interfaces result in frustration and dissatisfaction, reducing engagement with the portal. Ensuring that the public can access the information in meaningful ways is a critical metric for success.

5.5. Data Hubs to develop data visualization and other tools to enhance the usage

The open data platform will have limited analytical capability, mostly focused on helping the data users find the right data. Some of the activities, which will transform data into information will include:

(i). Develop visualization tools for the open data platform

(ii). Develop tools for filtering and querying datasets, and support downloading subsets of data on open data platform

(iii). Develop map-based web application enabling users to spatially discover datasets across federated open data platforms.

(iv). Geospatial tools should be used for the visual presentation of data. Analytical tools are needed to evaluate data trends and analyse at different scales e.g. national, regional, basin, state or other administrative units.

(v). Implement pilot use cases to test platform and enhance development of protocols and data standards including federation.

(vi). Create and disseminate a survey to the use case developers, water data producers, data users and stakeholders for feedback.

(vii). Develop annual report on dataset use from open data platforms

5.6. Sustain the Open Water-Data Platform

The open data platform must be able to respond to changing needs and technology trends. To be sustainable, the system must continually adapt and respond to recommendations for improvement. Some of the initiatives, which can be taken are as follows:

(i) Sustainable Governance

Work with the water community to develop a sustainable governance structure.

(ii) Metrics

Platform and dataset usage tracking/ statistics, and "success stories/ case studies" to measure and highlight how the open data platform is being used to support water management decisions.

(iii) Improvements

Recommend open data platform, dataset documentation, analytical tool, and reporting improvements.

(iv) User Feedback

Solicit feedback from water managers, data users and data stewards on platform and data performance.

(v) Analytical Tools

Encourage citizens and government programs to develop decision-support tools and custom web applications using datasets from the open data platform.

(vi) Government Publications

Encourage government publications to source and cite data published in the open data platform.

(vii) Civic Engagement Projects

Support civic engagement activities and events, like data challenges, application or visualization competitions and hackathons where citizens can meet and engage in collaborative computer programming towards developing innovative solutions for management of water resources. This includes challenges for third parties to make use of data on the open data platform to meet the needs of identified use cases with data gaps.

6. ANALYTICAL TOOLS, DSS, MODELS, RESEARCH AND INNOVATION

6.1. Whole of Water Community Approach

Transforming data into useful information is the responsibility of the entire water community. Combining datasets, developing analytical tools, seeking innovative results, and sharing those results will be done by everyone interested in improving water management in the country. Central and State Nodal Agencies will coordinate with government, private and not-for-profit sector organizations to develop applications based on water data for useful information and insights.

6.2. Water Data for Analytical Tools, Decision Support Systems (DSS) and Models

Water data will enable organizations working in water sector to develop analytical tools, decision support systems and models to predict, respond and make decisions and share information. Data will enable advanced forecasting methods to develop better responses to climate and weather events, floods, and droughts. A number of analytical tools have been developed under National Hydrology Project based on spatial and non-spatial data. Central and State Nodal Agencies will coordinate and facilitate replication of these analytical tools across the States and Basins.

6.3. Water Data for Research and Innovation

Availability of water data is a key challenge for research and innovation in water sector. Central and State Nodal Agencies will facilitate water data for research and innovation to find solutions to the challenges being faced by water sector. Water data can stimulate innovation creating opportunities to draw in and leverage new skills, technologies and stakeholders. Innovations can support development of new business models, products and services. Central and State Nodal Agencies will also facilitate collaboration with third parties to develop custom web applications and decision support tools, which may be made available through Public Water Data Hubs. They may also support development of an analytical sandbox for the water community

6.4. Publication of Strategic Reports on Water Management

The publication of strategic reports is designed to fill in the gaps in the water management spectrum. Availability of data and use of various tools will enable strategic insights into various aspects of water resources development and management. Central and State Nodal Agencies in partnership with relevant Government organizations will produce these reports to service end users that include Central and State governments, Water Operators, Research Institutions, Universities, Private Sector, and the public.

6.5. Applications based on satellite data

6.5.1. Satellite based data is increasingly being used for water management

Satellites increasingly offer a reliable source of spatially distributed information on a variety of environmental variables. Open-access datasets may be used for operational decision support systems, and for feeding, calibrating and validating hydrological models. Satellites now provide an archive of imagery that covers multiple decades. These historical records allow us to identify trends and spatial patterns in different factors associated with water resource management.

6.5.2. Nodal Agencies to coordinate satellite data based applications for various uses

NWIC and SWIC will coordinate and facilitate various organizations in water sector for development of applications based on satellite data in their respective domain areas for information, awareness and decision support systems:

DSS	Details
Monitoring water resources	Satellites can monitor water resources by tracking precipitation, evaporation, lake and river levels, and more. They can also be used to map surface water bodies and estimate their volume.
Forecasting water availability	Satellites can be used to create short-term forecasts of water availability by combining satellite images with hydrological models.
Assessing water quality	Satellites can be used to monitor water quality parameters like chlorophyll-a concentration, turbidity, and sediment concentration.
Planning water resources	Satellites can be used to plan water resources by providing information on cropping patterns, crop intensity, and condition.
Assessing water security	Satellites can be used to assess the risk to regional water security by providing information on vegetation state, plant productivity, and health.
Monitoring irrigation water use	Satellites can be used to monitor irrigation water use by providing information on soil moisture.
Prospecting groundwater resources	Satellites can be used to prospect groundwater resources by providing information on geological and hydro-geomorphologic features.

7. ACTION PLAN

7.1. Comprehensive Action Plan

NWIC will prepare a comprehensive action plan along with timelines for the implementation of the Policy under the guidance of National Steering Committee. A Program Management Unit will be set up to support the governance mechanism as well as preparation and implementation of comprehensive action plan. The implementation of the Policy and Action Plan will be monitored in accordance with the governance mechanism laid down in the Policy.

7.2. Initial Action Plan

Without prejudice to the comprehensive action plan to be prepared to fully implement the Policy, an initial action plan is outlined below covering the following aspects with similar action plan to be followed by SWIC in respective States:

(i). Water Data Governance
(ii). Water Data Publishing
(iii). Water Data Visualizations
(iv). Water Data for Analytical tools, DSS, Models
(v). Water Data for Research and Innovation

7.3. Water Data Governance

Department of Water Resource, River Development and Ganga Rejuvenation will put in place an effective Water Data Governance to promote robust Public Digital Infrastructure for water sector to address water sector challenges and ensure water security for all. NWIC will be responsible for providing necessary technical, professional and administrative support to operationalize the same.

S. No.	Activity	Details
1	Central Nodal Agency for Water Data	NWIC under the aegis of Ministry of Jal Shakti will be positioned as Central Nodal Agency for Water Data
2	Apex Committees for Water Data Governance	The Governance will be established by setting up of National Steering, Technical, Implementation and Water Data Users Committees along with their roles and responsibilities for water data governance.
3	Operationalization of Water Data Governance	NWIC will ensure that the Apex Committee meetings are held regularly and all necessary support is provided for their effective functioning.
4	SOP for Central and State Water Data Hubs	NWIC will prepare Standard Operating Procedures (SOPs) for Central Water Data Hub and State Water Data Hub to be set up by State Water Informatics Centre. The SOP will also provide necessary guidelines for federation of water data between Central and State Water Data Hubs.

5	SOP for Data Standardization	NWIC will prepare Standard Operating Procedures for all aspects of Water Data Management including water data definitions, metadata requirements, quality requirements, inter-operability requirements etc.

7.4. Water Data Publishing

7.4.1. NWIC will focus on Water Data Publishing as its core mandate. NWIC will set up open water data platform as per global standards and publish, in a phased manner, various spatial and non-spatial water datasets. The water datasets will be made available through a federated network of Central and State Water Data Hubs.

7.4.2. NWIC will also streamline data entry platform namely Water Information Management System (WIMS), which is used for data entry of various datasets. Effort will be made to ensure that datasets are updated by water data producing organizations through APIs automatically without any manual interventions.

S. No.	Activity	Details
1	Inventory of Water Data Sets and corresponding Organizations	A detailed inventory of water datasets and corresponding water data producing organizations will be prepared and updated regularly. NWIC will work with these organizations to make water data public in a phased manner to be prioritized in consultation with water data users and feasibility of sharing water data.
2	Water Data Portal	A National Water Data Portal will be developed with data catalogue, metadata, data quality etc. as per open data standards. All existing data including GIS data will be published. Thereafter updated regularly with new and updated data.
3	Streamlining of WIMS	NWIC is using WIMS for data entry of various datasets being shared with NWIC. The data from WIMS is not regularly updated on the publishing platform. NWIC will streamline WIMS and the data should be updated on the portal automatically.

4	Development of APIs for sharing water data	Apart from data download from the portal, APIs will also be developed for sharing water datasets published on the portal. This will ensure that other portals and applications can directly access the water data through APIs without any manual intervention for downloading the data and then using it.
5	Satellite Data for Water Applications	NWIC will also be the repository for relevant satellite data, remote sensing data and DEM data for water related applications.
6	Ranking States based on Water Data published	In order to encourage the States to publish more and more water data through Central and State Data Hubs as per SOP, NWIC under the overall guidance of Ministry of Jal Shakti will carry out regular ranking of the States.

7.5. Water Data Visualizations

7.5.1. NWIC will convert water datasets into meaningful and impactful information and insights. NWIC will use data visualizations to distil complex water concepts and datasets into compelling charts, maps, and graphics. NWIC will synthesize and communicate water-related data to public, policy makers, scientific and technical professionals on critical topics of water availability, water use, water-based disasters such as floods, droughts and other extreme events, climate change etc.

7.5.2. Through engaging visuals and captivating stories, NWIC will inform, inspire, and empower people to address water sector's most pressing challenges.

S. No.	Activity	Details
1.	Simple Data Visualization	NWIC will create visualization of all water datasets through charts, maps and graphics. The visualizations will be both GIS based and non-GIS based.
2.	Trend analysis over time and space	NWIC will also create visualizations of trends in water data over a period of time and over different geographic levels namely national, state, district, city, village or other boundaries and locations
3.	Data Analytics and its visualizations	NWIC will create visualizations of various water data analytics to develop insights and disseminate the same to Public and other stakeholders.

4.	Derived and Complex Data Visualization	NWIC will also create complex data visualization combining multiple spatial and non-spatial water datasets, trend analysis and data analytics to generate greater insights into water data.
5.	Data visualizations and models developed under NHP	NWIC will also leverage the data visualizations including satellite data, GIS data and models and applications developed under NHP through respective domain agencies.

7.6. Water Data for Analytical Tools, DSS and Models

7.6.1. Developing decision support systems, new models, applications based on satellite data, AI/ML & Big data analysis from water data sets will be the responsibility of respective domain organizations. NWIC will support domain organizations with open, integrated and shared water data. NWIC will also support the organizations in developing AI, ML, Big Data based analysis and generation of insights for various aspects of water management. NWIC will also work with various domain organizations to develop advance tools and also work on strategic reports on water management.

7.6.2. NWIC will finalize the plans with domain organizations under Advance NHP for development of such DSS, Models, Advance Tools and other applications based on satellite data, AI/ML & Big Data. Indicative areas for different organizations are given below:

S. No.	Activity	Details
1.	Engagement with CWC	NWIC will support CWC in developing DSS, modelling and other applications in relevant areas of surface water development and management including reservoir management, dam health, river basin management, irrigation management, flood and drought analysis, glacial analysis, coastal flood analysis etc.
2.	Engagement with CGWB	NWIC will support CGWB in developing DSS, modelling and other applications for groundwater management, spring management, artificial recharge, groundwater quality, groundwater regulation etc.
3.	Engagement with NMCG	NWIC will support NMCG in river quality management, river basin management, wastewater management, grey water management, industrial water management

4.	Engagement with NWM	NWIC will support NWM in water conservation, water harvesting, water bodies health, water budgeting, climate change
5.	Engagement with NWDA	NWIC will help NWDA in interlinking of rivers, water transfer etc.
6.	Engagement with other Ministries	NWIC will engage with relevant Ministries/ Departments and other stakeholders such as Department of Drinking Water and Sanitation, Ministry of Agriculture and Farmers Welfare, Ministry of Environment, Forest and Climate Change, Ministry of Rural Development etc. and organizations under them for their water data needs
7.	Engagement with the States	NWIC will help the States through SWIC in developing various applications for water management

7.6.3 Various analytical tools developed under NHP

Various analytical tools developed or under development under National Hydrology Project will be showcased and replicated across other States or Basins. Some of these analytical tools are paced as **Annex- VI**

7.7. Water Data for Research and Innovation

7.7.1. Apart from Government organizations involved into development and management of water resources including delivery of water services, there are many research and academic institutions and other non-profit organizations, which are involved in various studies for addressing water sector challenges.

7.7.2. NWIC will support Research and Innovations by forging partnerships with key research and innovation organizations working in water sector. It will facilitate their water data needs, may provide space for their developed models and publish water data generated by them.

S. No.	Activity	Details
1.	Engagement with Key Academic and Research organizations in	NWIC will prepare a list of important research organizations in public, private and non-government sector and regularly engage with them in their water data needs for research to address water sector

	Water Sector	challenges. NWIC may also encourage research in open water data and related aspects for better water data including water data visualizations.
2.	Engagement with Startup in Water Sector	NWIC will engage with startups in water sector to facilitate them with water data access and also to work with them on innovative digital solutions for water sector. NWIC may encourage startups involved in water data visualizations and dissemination to public.

8. OUTCOMES AND CONCLUSION

The National Water Data Policy establishes water data as a strategic enabler of water security, climate resilience and sustainable development. Through integrated and shared data systems, the Policy shall strengthen evidence-based decision-making, enhance resilience to climate variability, promote innovation, foster transparency and public trust, and support sustainable and equitable water management.

Annex - I

GENERAL HYDRO-METEOROLOGICAL DATA REQUEST FORM

1.	Name of the Indenting User	
2.	Address: Office	
3.	Address: Residence	
4.	Category of User (see clause 4.3 for data user categories) (Supporting proof / document to be attached)	
5.	Details of the sites for which data is required:	

S. No.	Name of the site (s)	Name of the river on which the site(s) is located

6.	Type, frequency & period of data required:		
	Type	Frequency	Period of data required:
	(a) Gauge	Hourly/3 times a day/daily/ 10-daily/monthly/yearly average Historical Maximum/Minimum	Non-Monsoon…….. ..to…….. Monsoon……..to…….……
	(b) Discharge	Daily/ 10-daily/monthly/yearly average Historical Maximum/Minimum	Non-Monsoon…….. to…… Monsoon……. to……
	(c) Silt	Daily/ 10-daily/monthly/yearly average Historical Maximum/Minimum	Non-Monsoon…….. to…… Monsoon……. to……

	(d) Water Quality	Monthly/seasonal/ Yearly average	Non-Monsoon…….. to…… Monsoon……. to……
	(e) Meteorological data	Daily/Hourly Historical Maximum/Minimum	
	(f) Other data	River cross-section/ Manning "n"etc.	Non-Monsoon…….. to…… Monsoon……. to……
7.	Purpose for which data is required ***(A justification note to be attached)***		
8. (i)	Whether analysis/ study of hydrological data will be undertaken in house;		Yes/ No
(ii)	If the answer to query at Sl. No. 8 (i) is No, then name & address of the consultant deployed / to be deployed for the study:		
(iii)	Category of the consultant (as per data user categories specified in clause 4.3; supporting proof / documents to be attached)		
9.	Name, designation & address of the person authorized for collection of data		

In case data is approved for release, I abide to provide "Undertaking" in the prescribed format duly signed by me before release of the data.

Signature of the Officer of the Rank of Chief Engineer/General Manager/Head of Department/ Managing Director or equivalent

Name in full with designation:_____

Name of the Department:_____

Address of the Office:

_____

Dated:

_____

ALONG WITH OFFICE SEAL

Annex - II

SECRECY UNDERTAKING

I ---------- (Name in full with designation) do hereby undertake to abide by the following conditions in respect of the Hydro-meteorological Data supplied.

1) The Hydro-meteorological Data pertaining to…… *(Name of Sub Basins for which data is required)* of River Systems collected from ……Organization of Central Water Commission/ Data Producer Agency, with reference to letter No……. dated…….. will be used strictly for the said official purpose for which the data has been asked for.

2) The data will not be supplied to any Governmental / Non Governmental or Public Sector Undertaking without the prior concurrence / fresh permission.

OR

I have already intimated to the Central Water Commission that we have engaged M/s _____ *(Name of the consultant)* a National/ an International consultant for carrying out the studies and data will be handed over to them for the purpose. I understand that I will be held responsible for passing the data to other agencies (Other than Consultants) even if it is passed by our consultants.

3) The data will not be published without the prior permission. The released classified data shall not be reproduced in any report/ publication/ Detailed Project Report (DPR), etc. Only result of analysis and inferences drawn thereof should be published. The contribution of CWC/Data Producer Agency shall be duly acknowledged in the DPR/report/ publication.

4) The data shall be used for the specific purpose only for which the approval of the competent authority has been accorded.

5) NWIC/Central Water Commission/ Data Producer Agency will not be held responsible for any inference drawn based on these data.

6) Subsequent to release of data, if we deploy any other National/ International consultants for carrying out studies referred in my data request form, I will take prior permission from Central Water Commission for transfer of data to them.

7) I understand that any breach of undertaking may invite civil liability.

Signature of the Officer of the Rank of Chief Engineer/General Manager/ Head of Department/Managing Director or equivalent

Name in full with designation:_____

Name of the Department:_____

Address of the Office: _____

Dated: _____

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Annex III

LIST OF RIVER BASINS AND CONCERNED CHIEF ENGINEERS OF CWC

Sl. No	Name of River Basin	Concerned Chief Engineer
1	Indus	The Chief Engineer (Indus Basin), Central Water Commission, Block- 4, 6th Floor, Kendriya Sadan, Sector-9 A, Chandigarh-160017. Tel. No. 0172-2741766 Fax No. 0172-2742465
2	Upper Ganga (Upto Varanasi)	The Chief Engineer (UGB), Central Water Commission, Jahanavi Sadan, 21/496, Indira Nagar, Lucknow -226016 Tel. No. 0522-2715832 Fax No. 0522-2715834
3	Middle Ganga (Downstream of Varanasi)	The Chief Engineer (LGB) Central Water Commission, Amarnath Road, Adalatganj, Patna - 800 001 Tel. No.: 0612-2541087/0612-2541065, Fax No.: 0612-2541065 Email: celgbo-cwc@nic.in
4	Yamuna	The Chief Engineer (YBO), Central Water Commission, Kalindi Bhavan, B-5, Tara Crescent Road, Qutab Institutional Area, New Delhi-16. Tel. No. 011-26526857 Fax No. 011-26526857
5	Brahmaputra	The Chief Engineer (BBO), Central Water Commission, 3rd Floor, CWC Complex, Adabari, Guwahati-781014 Tel No. +91-261-2674268

6	Barak	The Chief Engineer (BOBO), Central Water Commission, Rebeka Ville, Near Barik Point, Temple Road, Lower Lachumiere, Shillong (Meghalaya) Tel. No. 0364-2220568 Fax No. 0364-2220644
7	Krishna and Godavari	The Chief Engineer (KGBO), Central Water Commission, H.No. 11-4-648,Krishna Godavari Bhavan, AC Guards, Hyderabad-500 004 (A.P.) Tel. No. 040-23201605 Fax No. 040-23308642
8	Wainganga	The Chief Engineer (MCO), Central Water Commission, 3rd Floor, Block-C, CGO Complex, Seminary Hills, Nagpur 440006
9	Cauvery	The Chief Engineer (MSO), Central Water Commission, Jalasudha, Near HMT (PM Divn), HMT PO, Bangalore 560 013 Tel. No. +91-80-23376030
10	Lower Cauvery and Southern Rivers	Chief Engineer, Cauvery & Southern Rivers Org., Central Water Commission, Sangamam Gandhimanagar, Peelamedu P.O., Coimbatore-641 004 Tel. No. 0422-2512242 Fax No. 0422-2512243
11	Mahanadi and Eastern Rivers	The Chief Engineer (M&ERO), Central Water Commission, A-13 & 14, Bhoi Nagar, Bhubaneswar-751 022. Tel. No. 0674-2545536 Fax No. 0674-2545537

12	Narmada (except in Gujarat)	The Chief Engineer, Narmada Basin, Central Water Commission, Block-3, Ground Floor, Paryawas Bhavan, Mother Teresa Marg, Arera Hills, Bhopal-462 011 Tel. No. 0755-2574513 Fax No. 0755-2550253
13	Mahi , Narmada (Gujarat) & Tapi	The Chief Engineer, Mahi and Tapi Basin Org Central Water Commission, 101, Narmada Tapi Bhavan, 1st Floor, Sector-10 (A), Gandhi Nagar-382 010 Tel. No. 079-23245427 Fax No. 079-23246115
14	Lower Ganga and Teesta	The Chief Engineer, Teesta and Bhagirathi Damodar Basin Organisation, Central Water Commission, 2nd Mile, Sevoke Road, Silliguri-734401 Tel. No. 0353-2543230 Fax No. 0353-2540262

Annex –IV
(FOR OFFICE USE ONLY)

RECOMMENDATION OF CONCERNED CHIEF ENGINEER OF CWC

1.	Name of the Indenting User	
2.	Address: Office	
3.	Address: Residence	
4.	Letter No. & date vide which request was made for release of data.	
5.	Category of User claimed (see clause 4 for data user categories)	
6.	Agreement with the claim about the category of user on the basis of proof/document submitted	Yes / No
7.	If the answer to query at Sl. No. 6 is No, then whether the indenting user has been informed within 15 days of the receipt of the request about requirement of additional proof / document and letter no. date of such letter.	
8.	Extent of data requested for?	
9.	Whether purpose for which data is required is justified?	
10.	Whether the required data is available? If not the extent of data available and recommended for release.	
11.	Payment to be collected before release of data along with calculation thereof	
12.	Recommendation of the concerned Chief Engineer of CWC with signature, name and designation (office seal)	

Annex- V

Name of States/ Central Implementing Agencies in NHP as per MoU

Hydro-Meteorological data of Region II (Ganga-Brahmaputra - Meghna Basin & other rivers and their tributaries discharging into Bangladesh/ Myanmar) shall be shared freely amongst Implementing Agencies of National Hydrology Project (Ministry of Jal Shakti and co-basin State Government's Ministry/Organization dealing with water resources) through secured login/protocol and one time secrecy statement as per list below:

SL. No.	States/ Agencies	Department
1.	Assam	Water Resources Department, Government of Assam
2.	Andhra Pradesh	Ground Water and Water Audit Department , Government of Andhra Pradesh
3.	Andhra Pradesh (SW)	Water Resources Department, Government of Andhra Pradesh
4.	Bihar	Water Resources Department, Government of Bihar
5.	Bihar	Minor Water Resources Department, Government of Bihar
6.	Chhattisgarh	Water Resources Department, Government of Chhattisgarh
7.	Goa	Water Resources Department, Government of Goa
8.	Gujarat	Water Resources Development Corporation and Narmada & Water Resources, Water Supply & Kalpsar Department
9.	Haryana	Irrigation & Water Resources Department, Government of Haryana
10.	Himachal Pradesh	Irrigation and Public Health Department, Government of Himachal Pradesh
11.	Jharkhand	Water Resources Department, Government of Jharkhand
12.	Karnataka (SW)	Water Resources Department, Government of Karnataka
13.	Kerala	Water Resources Department WRD, Government of Kerala
14.	Madhya Pradesh	Water Resources Department WRD, Government of Madhya Pradesh

15.	Maharashtra (GW)	Groundwater Surveys and Development Agency, Government of Maharashtra
16.	Maharashtra (SW)	Water Resources Department, Government of Maharashtra
17.	Manipur	Irrigation & Flood Control Department, Government of Manipur
18.	Meghalaya	Water Resources Department, Government of Meghalaya
19.	Mizoram	Minor Irrigation Department, Government of Mizoram
20	Odisha	Department of Water Resources, Government of Odisha
21.	Nagaland	Irrigation & Flood Control Department, Government of Nagaland
22.	Puducherry	Puducherry Water Resources Organization, Government of Puducherry
23.	Punjab	Department of Irrigation, Government of Punjab
24.	Rajasthan	Water Resources Department, Government of Rajasthan
25.	Sikkim	Water Resources & River Development Department, Government of Sikkim
26.	SOI	Survey of India (SOI), Department of Science & Technology (DST),
27.	Tamil Nadu	Public Works Department, (PWD) Government of Tamil Nadu
28.	Telangana (GW)	Ground Water Department, Government of Telangana
29.	Telangana (SW)	Irrigation & CAD Department, Government of Telangana
30.	Tripura	PWD (Water Resources), Government of Tripura
31.	Uttarakhand	Irrigation Department, Government of Uttarakhand
32.	Uttar Pradesh	Irrigation and Water Resources Department, Government of Uttar Pradesh
33.	Uttar Pradesh	Ground Water Department, Government of Uttar Pradesh
34.	West Bengal (GW)	Department of Water Resources Investigation & Development, Government of West Bengal

35.	West Bengal (SW)	Irrigation & Waterways Department, Government of West Bengal
36.	BBMB	Bhakra Beas Management Board, Ministry of Power, Government of India
37.	CPCB	Central Pollution Control Board, Government of India
38.	DVC	Damodar Valley Corporation
39.	NIH	National Institute of Hydrology, Roorkee, Government of India
40.	NCT, Delhi	Irrigation & Flood Control Department, Government of NCT of Delhi
41.	NRSC	National Remote Sensing Centre, Indian Space Research Organization, Department of Space

Annexure-VI

Various analytical tools developed under NHP

Sno	Knowledge Product/ Analytical Tool	Agency Name
1	Development of Embankment Asset Management System	Bihar SW
2	Development of Decision Support System for Near Real Time Integrated Reservoir Operation System	CWC
3	Physical based Mathematical modelling for estimation of sediment rate and sediment transport in 7 river basins	CWC
4	Extended Hydrological Prediction (Multi Week Forecast)	CWC
5	Early Flood Warning System including Inundation Forecast in the Ganga Basin	CWC
6	Developing Flood Forecasting and Inundation Model (Decision Support System) from 12 km downstream	DVC
7	Development of Real Time Operation of Reservoirs integrated with Flood Forecasting and Warning System for Periyar Basin	Kerala SW
8	Upgradation of existing RTSF & ROS System for the Krishna Bhima Basin using DSS(PM) with O&M	Maharashtra SW
9	River Basin planning for Water Management for Konkan Basin	Maharashtra SW
10	Development of Flood Forecasting Model in Dhansiri River, Nagaland	Nagaland
11	Water Accounting and Integrated Reservoir Operations for Narmada River Basin	NCA
12	Development and testing of a large-scale conceptual hydrological model	NIH
13	Decision Support System (Planning & Management) including Maintenance and Updating DSS (PM) for a period of 7.5 Years	NIH

14	Development of Water Accounts for different Sub-basins of Brahmaputra and Barak River Basins	NIH
15	Long term hydrological assessment for the development of water security plan	NIH
16	Development of Water Accounts for the selected sub-basins of Brahmaputra, Barak and Irrawaddy Chindwin basin	NIH
17	Development of spatial snowmelt runoff product in the Indian Himalayas	NRSC
18	Satellite data-based inputs for Irrigation Scheduling for a selected Irrigation Project command area - Narayanpur Command in Karnataka	NRSC
19	Real-time Operational Spatial Flood Early Warning System Development for Godavari and Tapi Basins	NRSC
20	Development of Satellite-based Regional Evaporative Flux Monitoring System for India	NRSC
21	Glacial Lake Outburst Flood (GLOF) Risk Assessment	NRSC
22	Operational National Hydrological Modelling System for the entire Country (VIC Model)	NRSC
23	Operational hydrological drought services using remote sensing data	NRSC
24	Development of Web Enabled Hydrological Modelling in SWAT (WEHMS)	NRSC
25	Development of Analytical Tools and Decision Support Systems- Water Allied Resources Information and Management System (WARIMS)	NWIC
26	Development Inflow Forecasting System of Ranjit Sagar Dam and Inundation Forecasting downstream of Ranjit Sagar Dam	Punjab
27	Continuously Operating Reference Stations (CORS) network in UP and part of UK	SOI

28	Generation of Geoid model for UP & UK	SOI
29	Creation/ updating of 1:25k geodatabase from satellite imagery and existing database	SOI
30	Development of Flood Warning System for Agartala & Kailashahar, Tripura	Tripura
31	Development of software for Integrated Embankment Management System (IEMS)	West Bengal SW

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सत्यमेव जयते

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Ministry of Jal Shakti
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