सत्यमेव जयते

Ministry of Jal Shakti

Department of Water Resources, RD & GR

National Water Informatics Centre

India-WRIS & WIMS

स्वीयजलं अवैहि

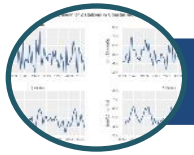
NWIC

NWIC

Sub ordinate office under DoWR RD & GR

Objectives of NWIC

Central repository of Water Resources Data and Allied Themes



Maintaining, Updating, Collating and Disseminating water data and information

Development of DSS for effective water management

Supporting State departments to set up SWIC

Collaboration and technical support to agencies

Data Platforms

India-WRIS

&

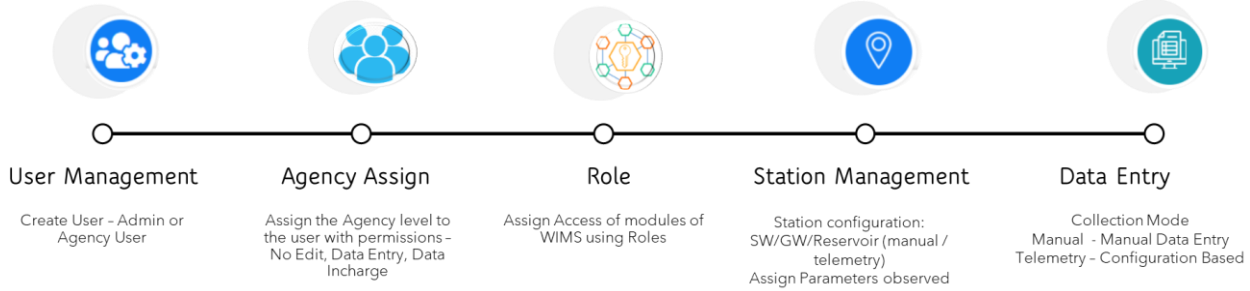
WIMS

Responsibilities of NWIC

NWIC is responsible for the operations & maintenance of the national-level water databases:

- **India Water Resources Information System or India WRIS portal (www.indiawris.gov.in)**, a single window solution for all water resources data and information in a standardized national **GIS** framework.

- **Water Information Management system or WIMS**, a web enabled water resources data entry system for both **surface and ground water** resources. The data is being collected through **web-based data entry** and also in automated method through **telemetric sensors**. The platform offers various module wise applications for **State and Central agencies** for effective database addition, update and sharing.



History of India-WRIS

2009-2017

Old India-WRIS

- Data repository
- WMS, Downloads
- Static Charts and graphs
- Manual data update
- Primary users are state and central agencies, researchers.

CWC/NRSC

2017-2020

Integrated WRIS-WIMS

- Station Entry Management
- Near real time data capture and processing
- Primary users are state and central agencies, researchers.
- Mobile apps for geo-tagged field data collection.

NWIC, Delhi

2020-2027

IWCIMS

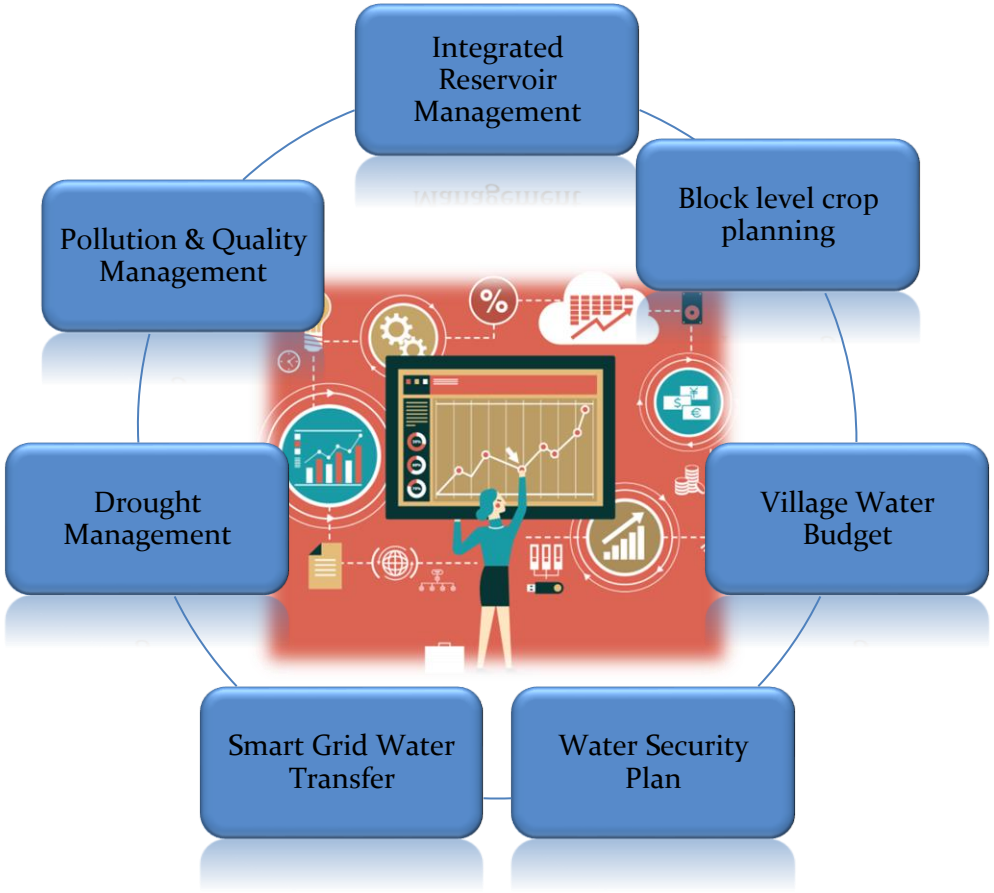
(ongoing)

- Decision support system
- Satellite Image Processing
- Near Real time data acquisition and processing using AI and ML
- Users include local farmers, Panchayat level administrative bodies, NGO's etc.

Integrated Cloud

Turn key project awarded to WAPCOS

7DSS & 1 Information System



Data Agencies

Central Ground Water Board

CGWB

- Ground water observation well metadata and Ground water level time series data
- Ground water quality sites metadata and data
- Litholog well location and survey data
- Ground water resource estimation (2011, 2013, 2017, 2020)
- Aquifer systems – Principal & Major Aquifers
- Basin Boundary-CGWB

Central Water Commission

CWC

- Hydrological Observation Stations, and Time series data for Water level, Discharge, etc.
- Surface Water Quality Stations & Data
- Reservoir level and storage data
- Snow Glacial Lake
- Rainfall stations & data
- Water Resources Projects Irrigation Projects, Hydroelectric Projects, Dams, Barrages Weirs Anicuts, Lifts, Power House, AIBP projects, ERM Projects, etc.)
- Reservoir sedimentation studies
- PMP atlas-major basins
- Storm Surge Studies

National Remote Sensing Centre

NRSC

- Evapotranspiration
- Soil moisture (Gridded Data)
- Rainfall gridded data
- LULC, Wasteland, Land degradation, wetland
- Waterlogged Area and Saline areas
- Ground water prospects maps
- Flood inundation maps
- Water Bodies – Water Spread Area APIs, WMS – Monthly/Fortnightly (Bhuvan WBIS)

Survey of India

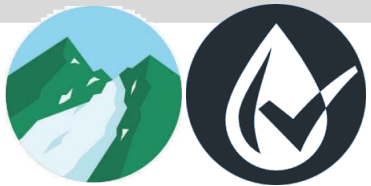
SoI

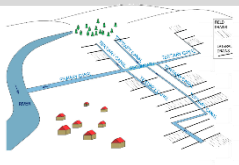
- International Boundary
- State Boundary
- District Boundary
- Block Boundary
- Village Boundary
- Toposheets – Digital & Hardcopy
- WFS for multiple layers
- DEM












Data Agencies

National Water Development Authority

IBTL

- Structure on Links Links (Dams, Barrages, Weirs, Anicuts)
- IBTL Components maps & Salient features-Himalayan & Peninsular
- Peninsular Comp Link – Canal & Tunnel

Indian Meteorological Department

IMD

- Gridded Rainfall Data 0.25*0.25
- Seismic zones
- Extreme Rainfall, Temperature
- District-wise Rainfall Monitoring Station Location (DRMS)
- Earthquake events

Inland Waterways Authority of India

IWAI

- Salient Features
- Chainage points (Km)
- Settlement Location
- Beacon
- Light House
- Terminal
- Jetty
- Important Location
- Spur
- Navigation Canal
- Waterways Limit
- Rail Road Bridge
- Harbour Limit
- NW with Least Available Depth (m)
- River
- Chart
- Waterways
- Waterways Number

Other agencies

Other Agencies

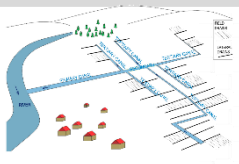
- Forest Survey of India- Forest Cover Data – 2019
- Census of India-2011, 2001
- Minor Irrigation Census (1st - 5th MI Census)
- Minor irrigation tank storage and capacity data – Andhra Pradesh State Agency
- Reservoir Water Level & Storage – Gujarat & Andhra Pradesh
- Drought Prone Area Program & Desertification Development Plan Areas- Department of Land Resources, MoRD
- Soil data (NBSS-LUP)
- Tribal Subplan Area – Ministry of Tribal Affairs
- Agro-ecological Zones by ICAR
- Agro-climatic zones by Planning Commission












Classification of Modules

Dynamic Modules

- Rainfall (mm)
- Reservoir (Level & Storage)
- River Monitoring (Level & Discharge)
- Ground Water Level (BGL Meter)
- Water Quality – Groundwater
- Water Quality – Surface water
- Evapotranspiration (mm)
- Soil Moisture (%)
- Minor Irrigation Tanks

Semi Dynamic Modules

- Groundwater Resources
- Snow-Glacial Lake
- Reservoir- Sediment studies
- Water Resources Project
- Minor Irrigation Census
- LULC
- Wasteland
- Land Degradation
- Extreme Events – Flood Inundation/Drought affected areas/Earthquake-Rainfall-Temperature
- Artificial Recharge Structure Viewer

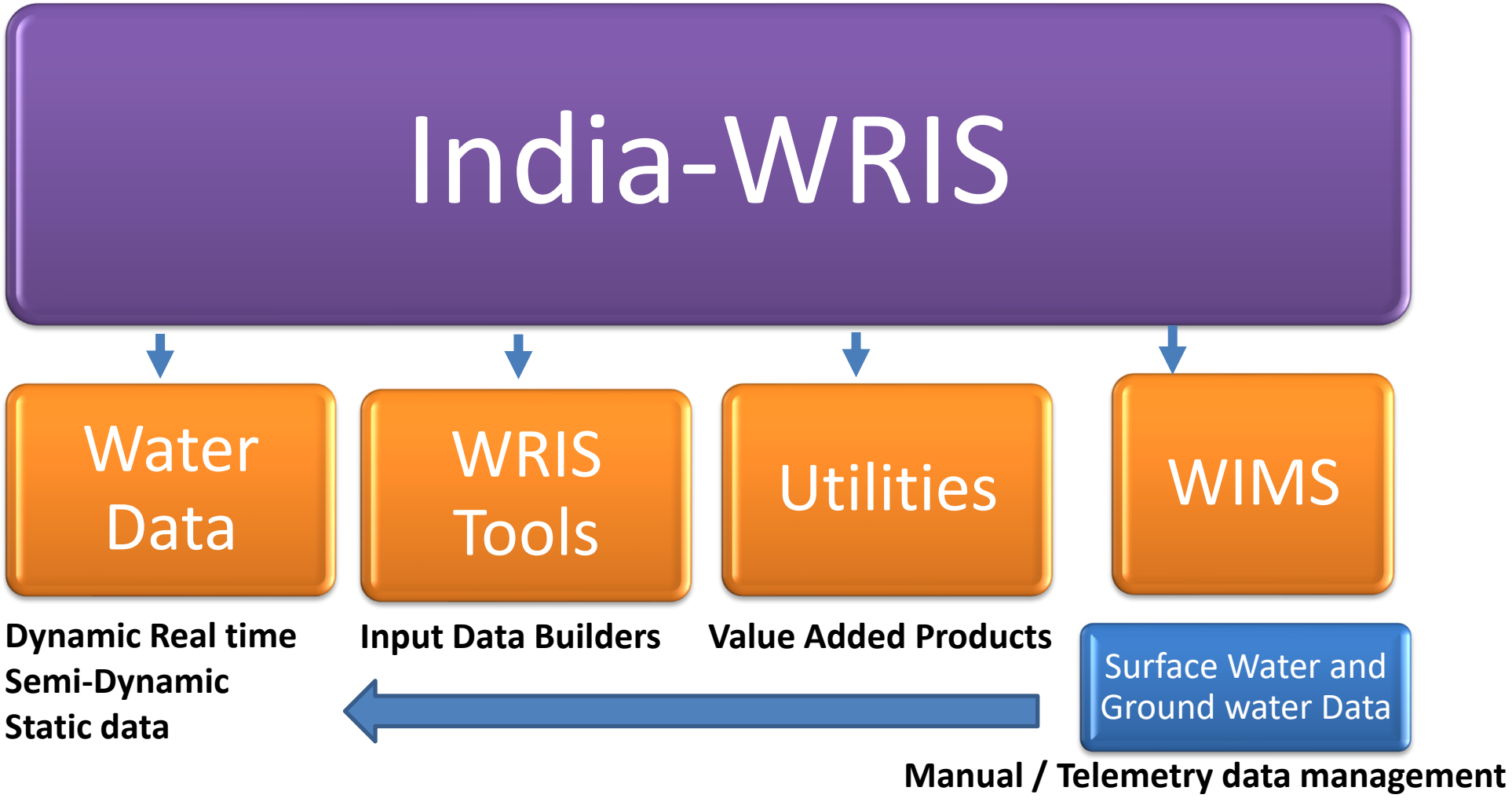
Static Modules

- Litholog
- Aquifer
- Surface Water Bodies
- River Information
- Socio Economic Census
- Groundwater Prospects
- Region-Agro-Climatic / Agro Ecological
- Soil
- Water Logging & Soil Salinity
- Wet Land
- Inland Navigation Waterways
- Inter-Basin Transfer Links
- Storm Surge Study

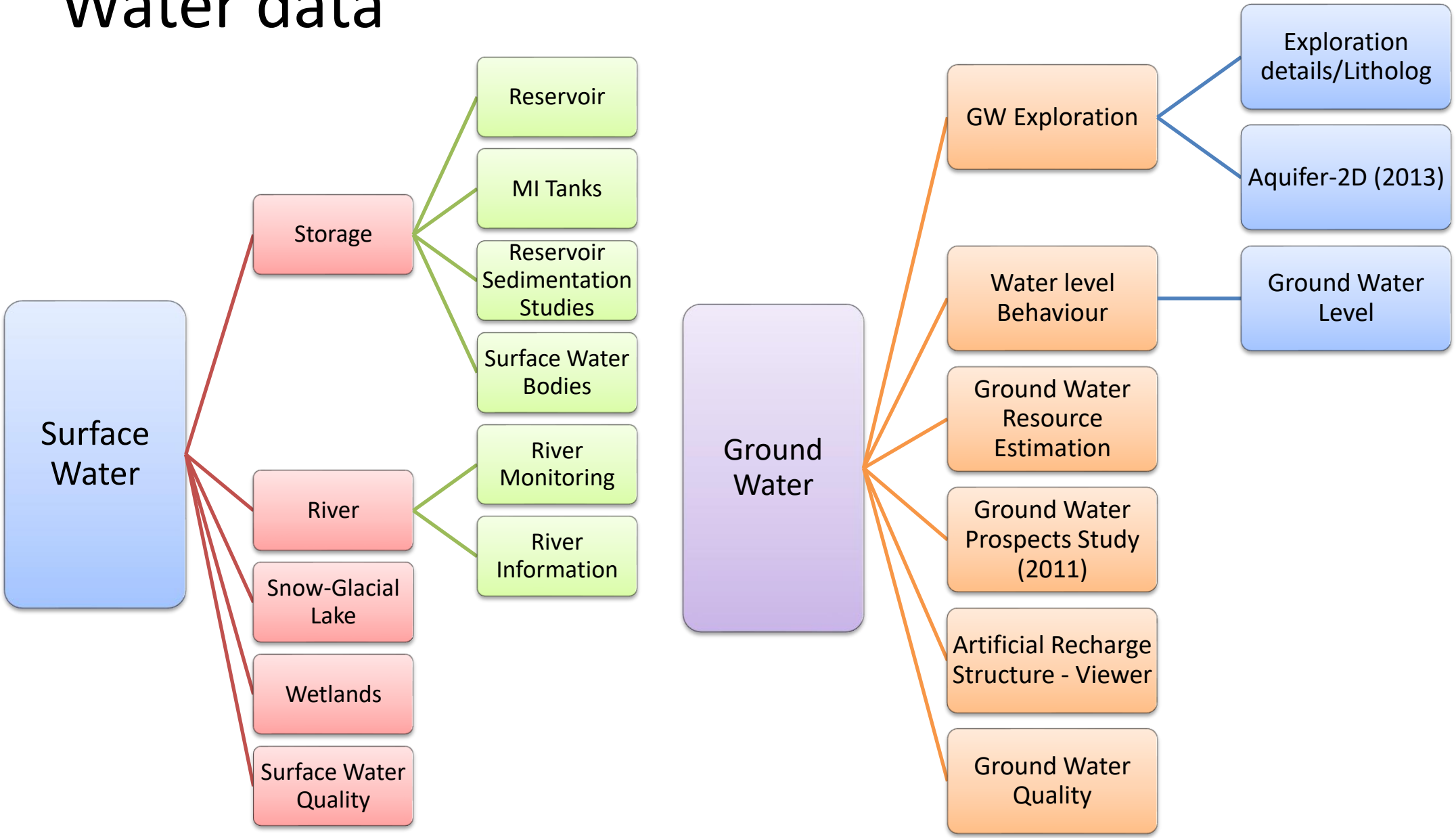
Tools + Utilities

- Online Web Editor
- Artificial Recharge Structure Data Entry
- Data / Report Download Tabular)
- Data Availability
- Geo Viewer
- WRIS WIKI
- Metadata
- District at a glance
- Probable Maximum Precipitation Atlas
- Surface Water Audit

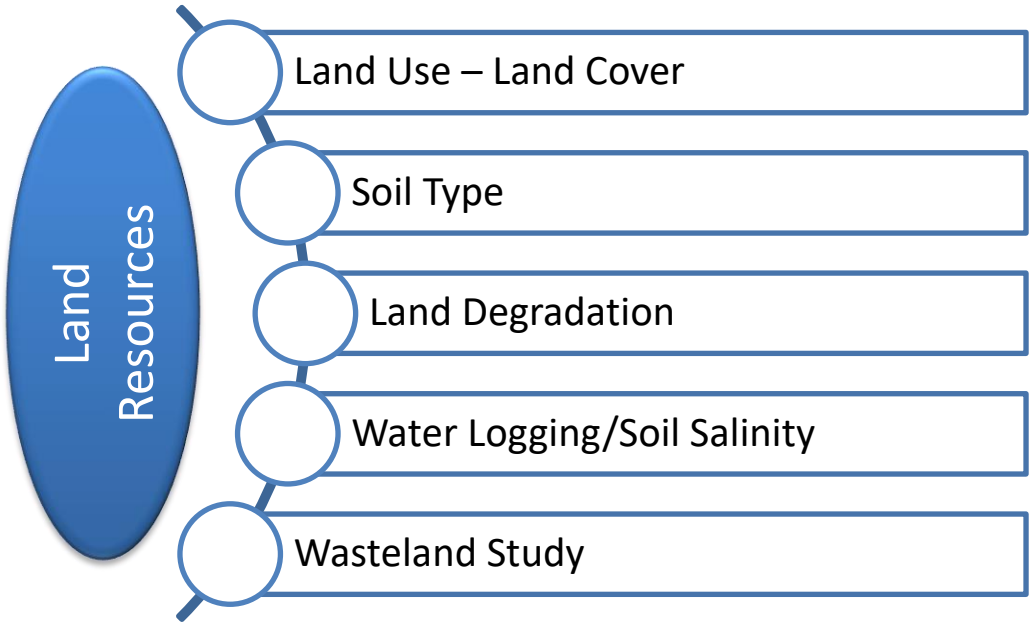
SYSTEM OVERVIEW

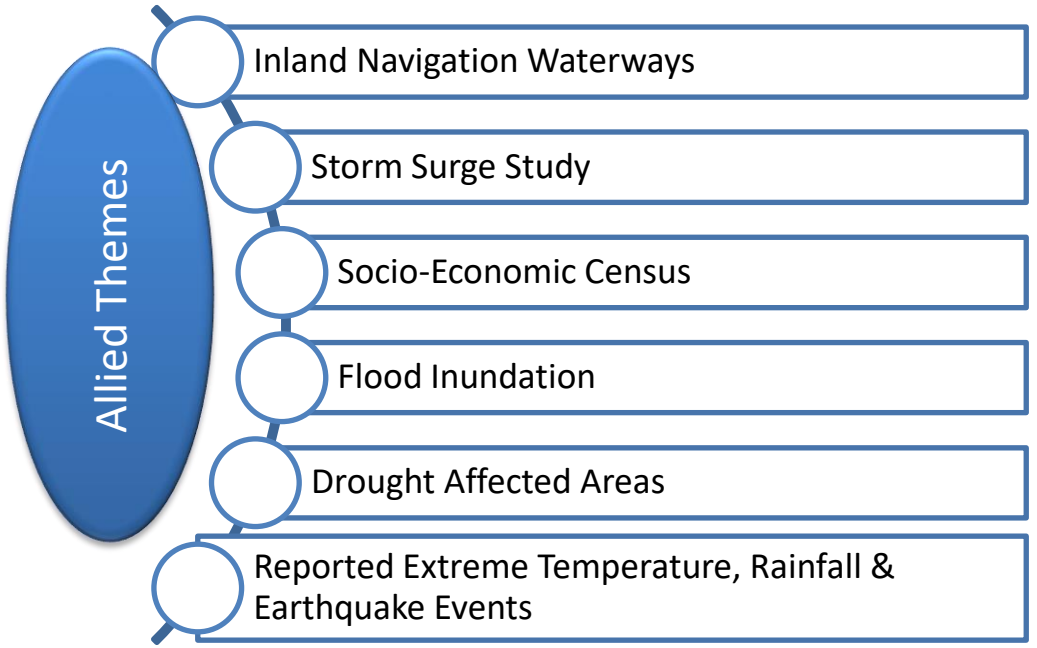


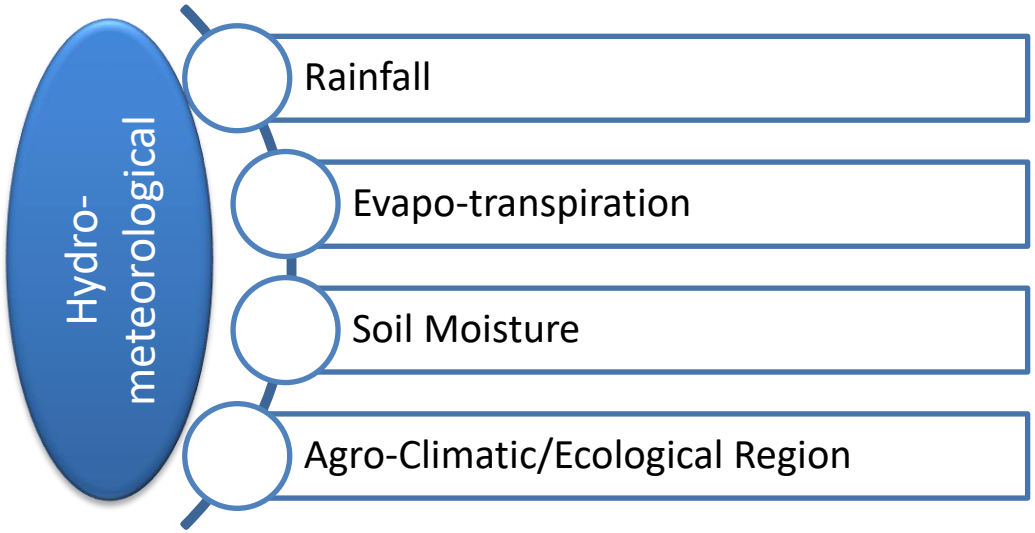
Water data

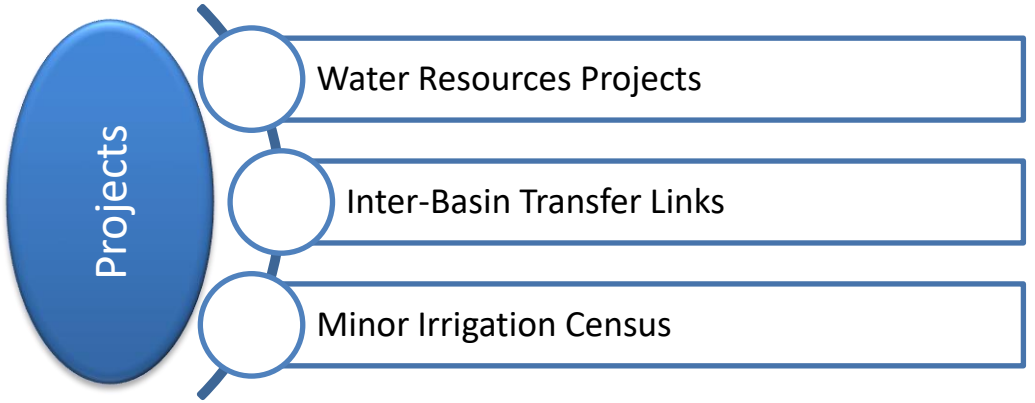

Surface Water
Storage
Reservoir
MI Tanks
Reservoir Sedimentation Studies
Surface Water Bodies
River
River Monitoring
River Information
Snow-Glacial Lake
Wetlands
Surface Water Quality
Ground Water
GW Exploration
Exploration details/Litholog
Aquifer-2D (2013)
Water level Behaviour
Ground Water Level
Ground Water Resource Estimation
Ground Water Prospects Study (2011)
Artificial Recharge Structure - Viewer
Ground Water Quality

Water data


Land Resources
Land Use – Land Cover
Soil Type
Land Degradation
Water Logging/Soil Salinity
Wasteland Study

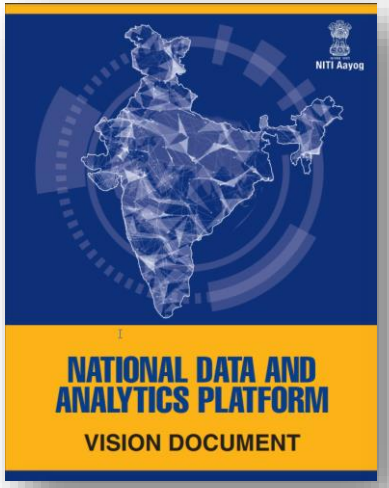

Allied Themes
Inland Navigation Waterways
Storm Surge Study
Socio-Economic Census
Flood Inundation
Drought Affected Areas
Reported Extreme Temperature, Rainfall & Earthquake Events

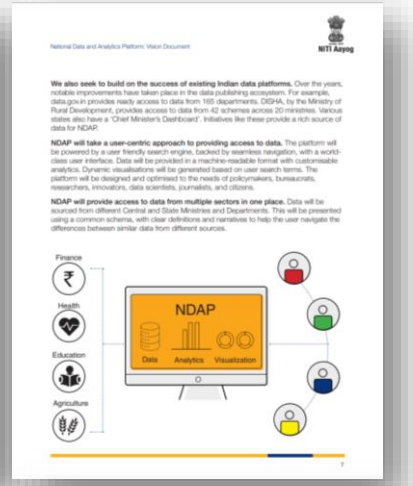

Hydro-meteorological
Rainfall
Evapo-transpiration
Soil Moisture
Agro-Climatic/Ecological Region

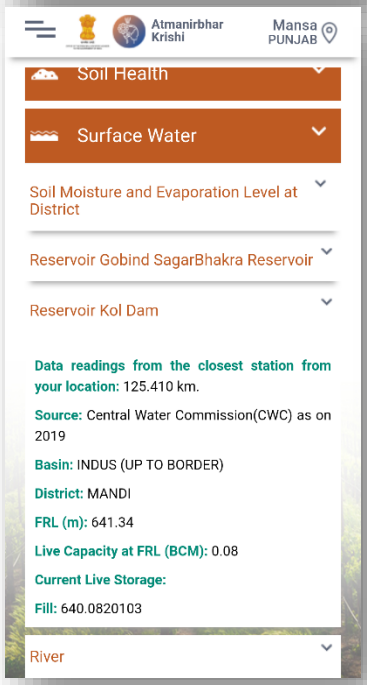

Projects
Water Resources Projects
Inter-Basin Transfer Links
Minor Irrigation Census

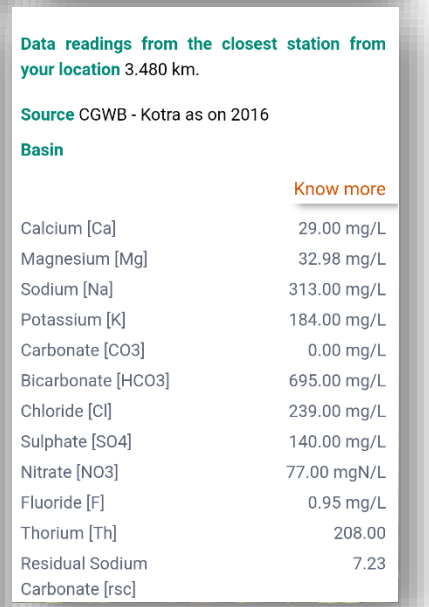
Data Dissemination through API

NITI AAYOG	Ground water level Ground Water Quality Surface Water Quality	National Data Analytics Plan
Office of PSA	Reservoir Ground water level Ground Water Quality Surface Water Quality Rainfall Soil Moisture Evapotranspiration	Kisan Mitr Project
National Institute of Hydrology	Reservoir Soil Moisture Evapotranspiration	Development of web enabled Rainfall-Run off Model
CGWB	Live Ground Water Level	India Groundwater Resource Estimation System (IN-GRES)









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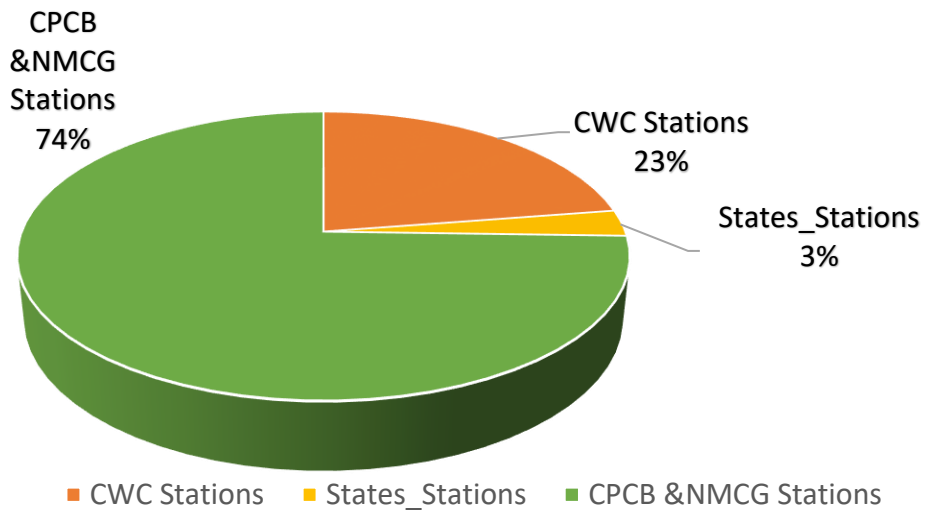
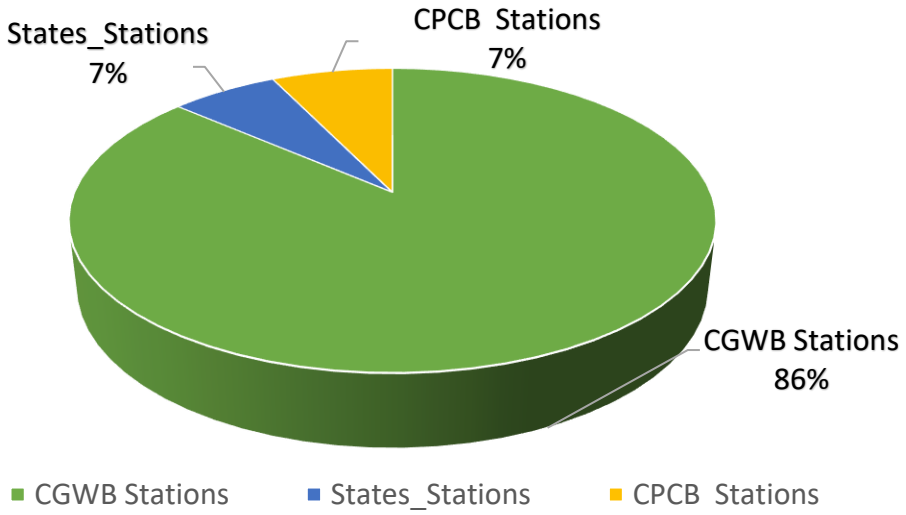
WATER QUALITY DATA DISPLAY IN INDIA-WRIS PORTAL

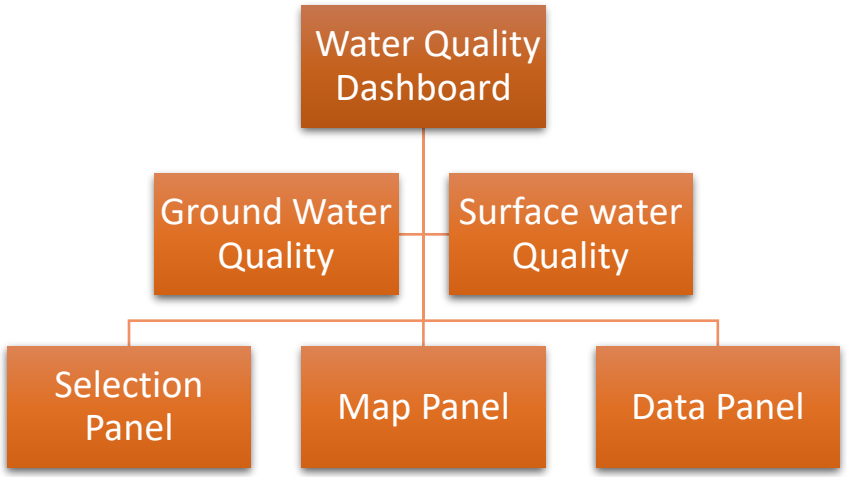
A. Water Quality Modules

SWQ Monitoring Stations



GWQ Monitoring Stations





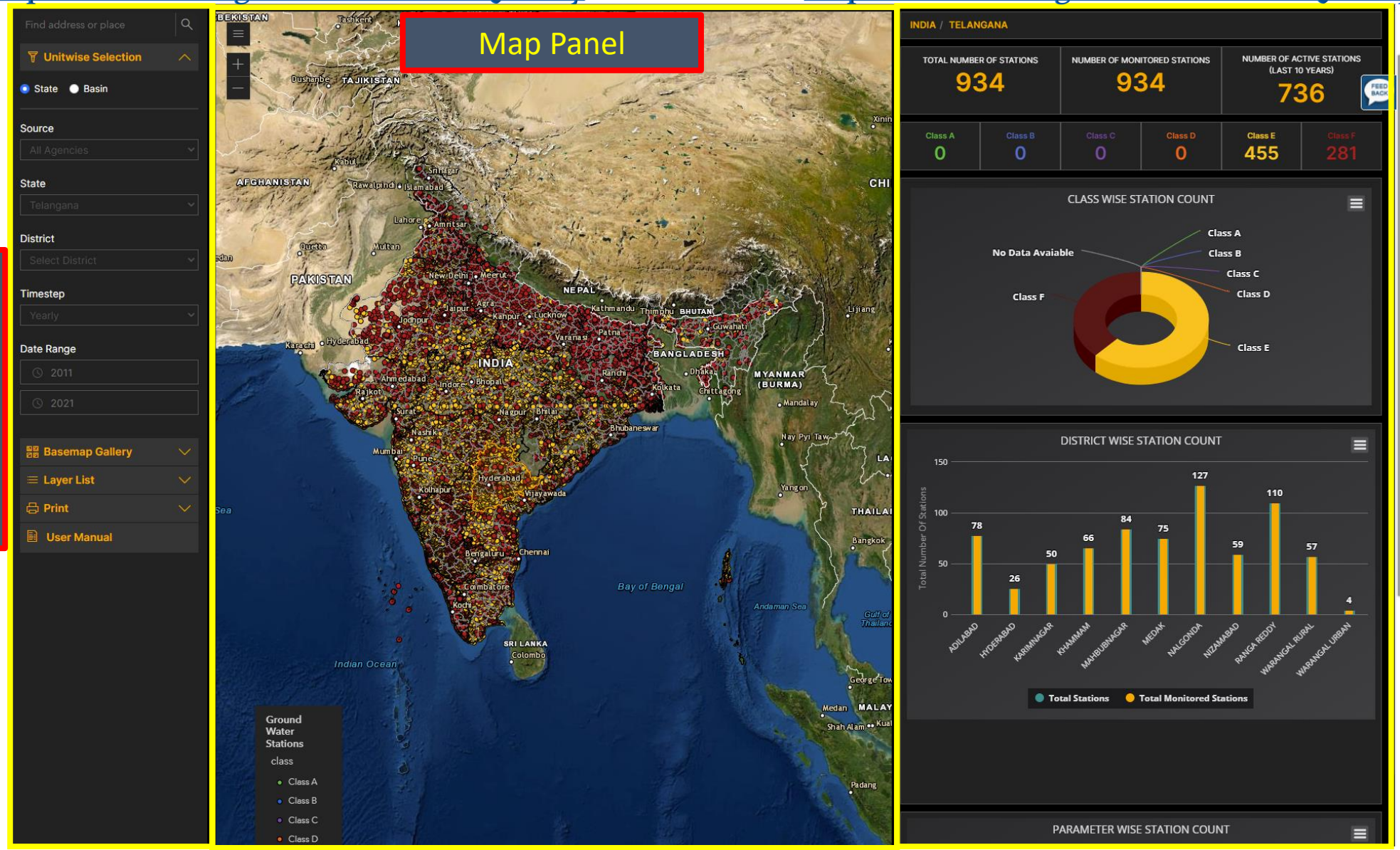
Number of Water Quality Stations

Agency Name	CWC	States	CPCB & NMCG	Total
Surface Water	833	108	2,754	3,695
Ground Water	13,648	1,015	1,143	15,806
Total	14,481	1,123	3,897	19,501

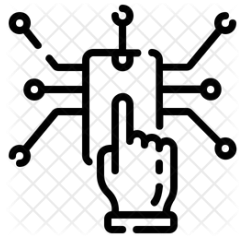
Water Quality Module

https://indiawris.gov.in/wris/#/SWQuality

https://indiawris.gov.in/wris/#/GWQuality



List of Functionalities



Selection Panel

- Area Selection
- Time Selection
- Data Source Selection
- Base map Gallery
- Multiple Geospatial Layers
- Layout Print Tool
- User Guide
- Search option

Map Panel

- Map Visualization
- Zoom In & Zoom Out
- Co-ordinates of pinned location
- Sample Quality Class
- Station information on Hover
- Area selection on Map

Data Panel

- Total number of stations
- Number of Monitored stations
- Number of active stations (10 years)
- Number of stations fall in Class category
- Charts Section (class wise and state wise station count)
- Parameter wise station count
- Station list and available parameters of selected State/District
- Print/Download Tool for charts and table
- Info button
- Search option

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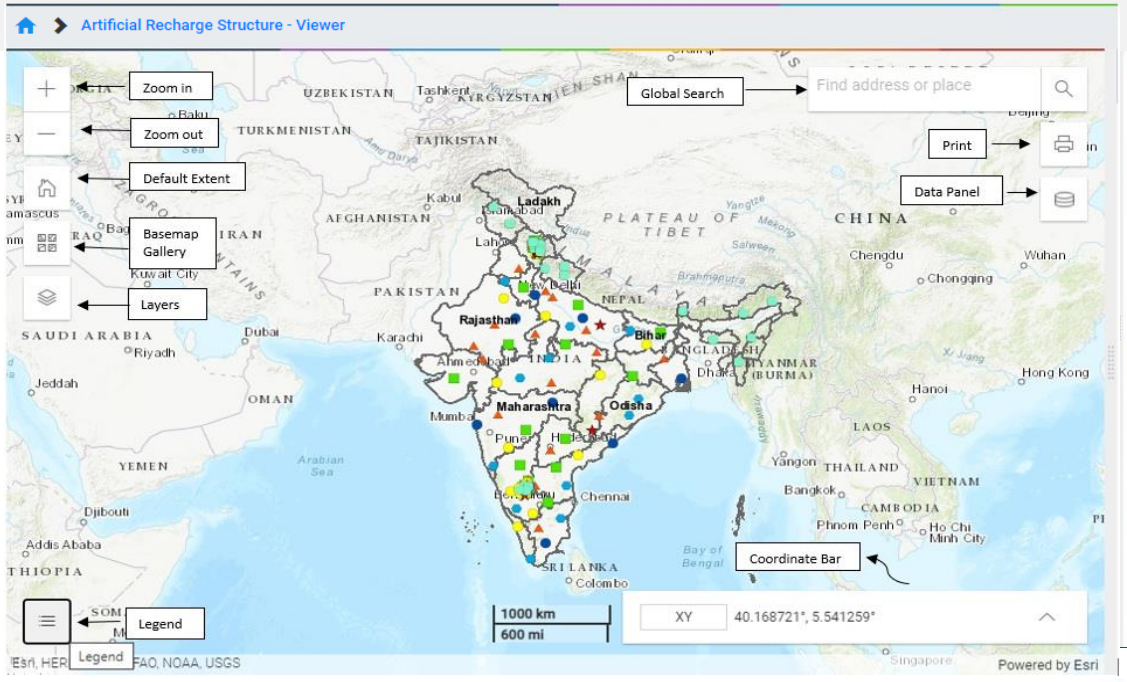
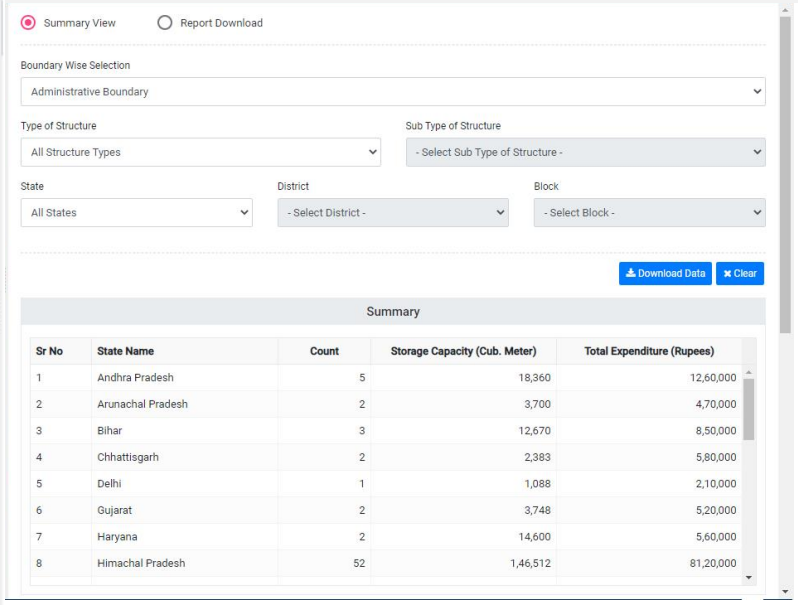
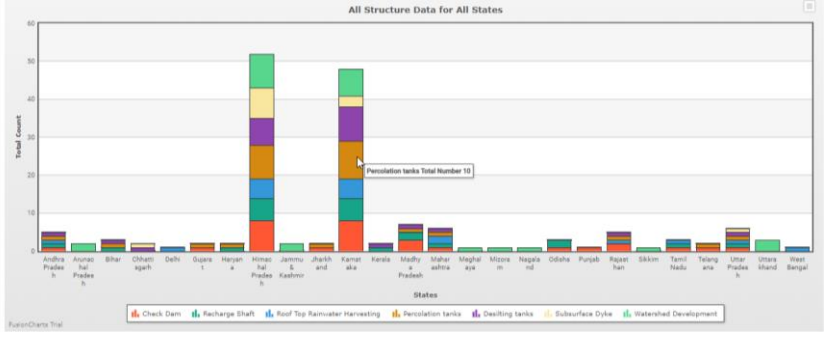
ARTIFICIAL RECHARGE STRUCTURE – VIEWER & EDITOR IN INDIA-WRIS PORTAL

B. Artificial Recharge Viewer

- *Provides holistic picture of the existing artificial recharge structures in a structured manner.*
- *User can view/download the data through map or in the form of tables.*
- *Pre-generated Reports are available for easy and quick access of the information*
- *9 types of reports*



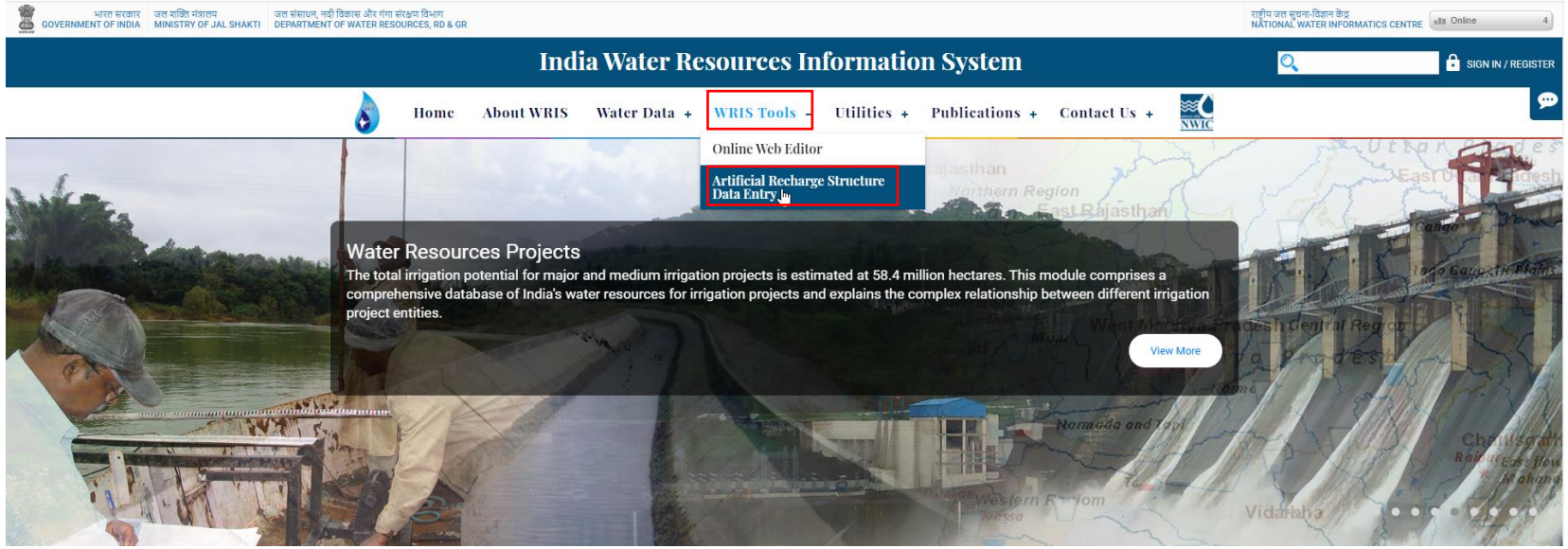




C. Artificial Recharge Editor

Artificial Recharge Structure (ARS) Module

1. Single Point Access & Database
2. Data Entry Dashboard
    1. Authorized user login (State & Agency wise)
    2. User can populate all information pertaining to ARS constructed under various schemes
    3. Generate reports for their data entry


India Water Resources Information System
SIGN IN / REGISTER
Home
About WRIS
Water Data
WRIS Tools
Utilities
Publications
Contact Us
Online Web Editor
Artificial Recharge Structure Data Entry
Water Resources Projects
The total irrigation potential for major and medium irrigation projects is estimated at 58.4 million hectares. This module comprises a comprehensive database of India's water resources for irrigation projects and explains the complex relationship between different irrigation project entities.
View More

Agencies

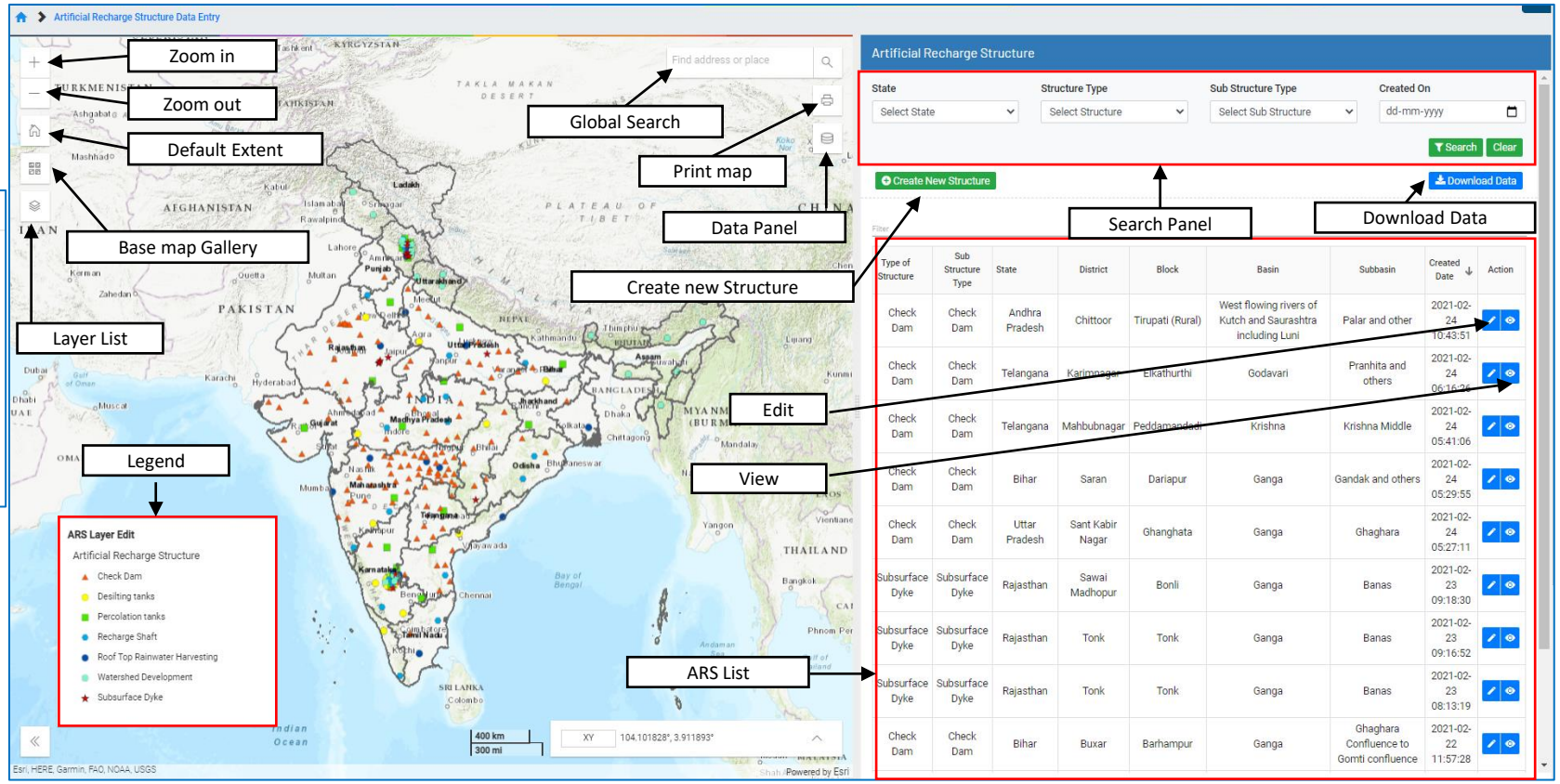
ARS – Data Entry

Data Entry Platform to ingest the attribute data directly into the India WRIS database.

Smart Editor –

- Create features such as
  - Check dams
  - De-silting tanks
  - Percolation tanks
  - Recharge shaft
  - Roof top rainwater harvesting
  - Watershed development and
  - sub-surface dyke
- Edit Existing features
- Download Data

Login Based



ARS – Data Entry

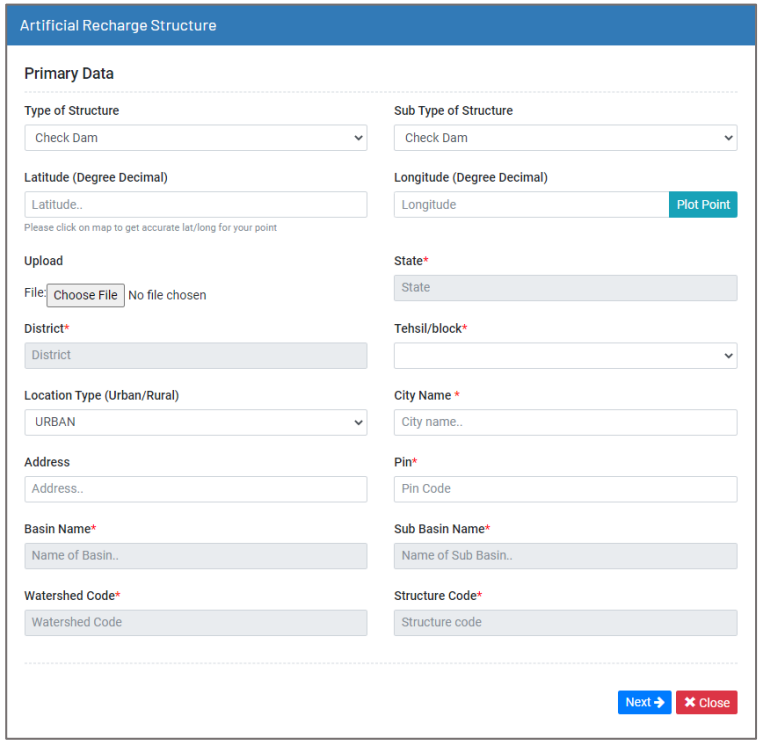
Create new feature–

- Primary and Secondary data form
- Select Structure type & Subtype
- Plot point – Latitude/Longitude
- Autofill of details (grey fields) based on location
- Upload image facility
- Add details for the fields
- Save

2 sections in Data Entry Form:

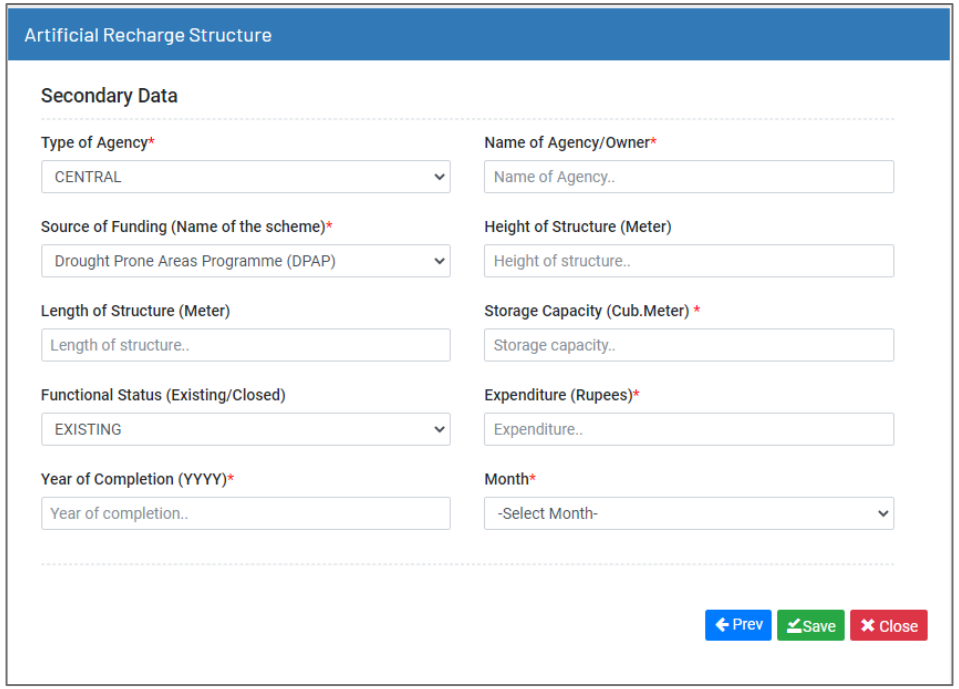
---Part A

Primary Field Related To 'Location Details'



---Part B

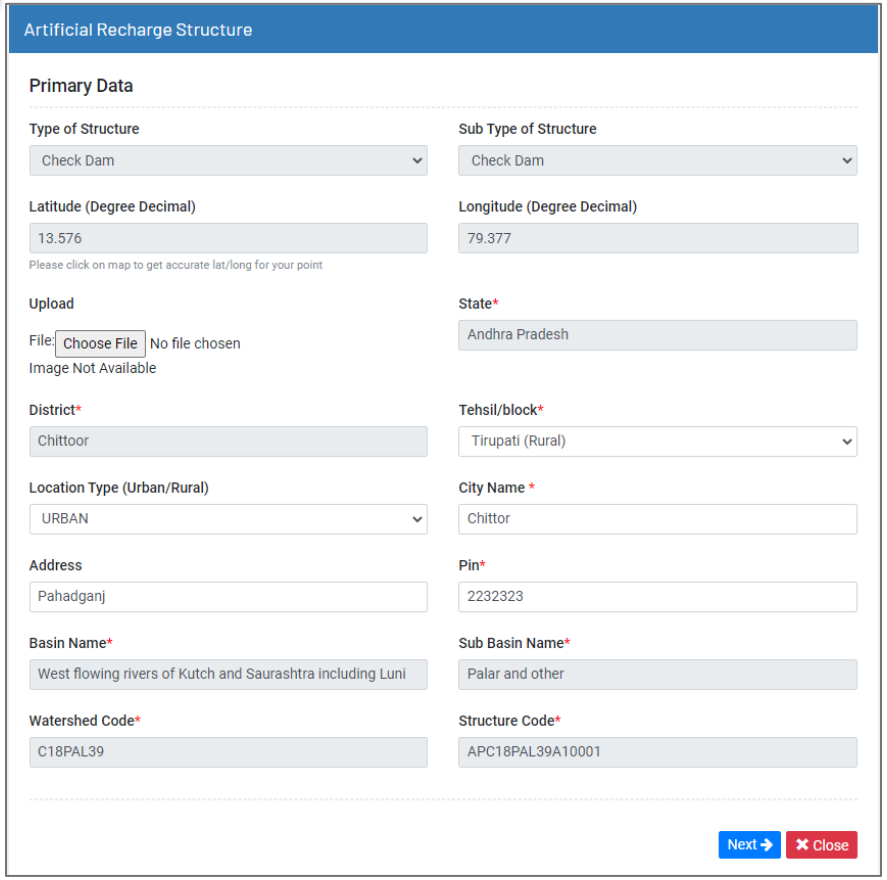
Secondary field are for 'structure details' such as like width, height, storage capacity etc. D:\data collection sheet.xlsx

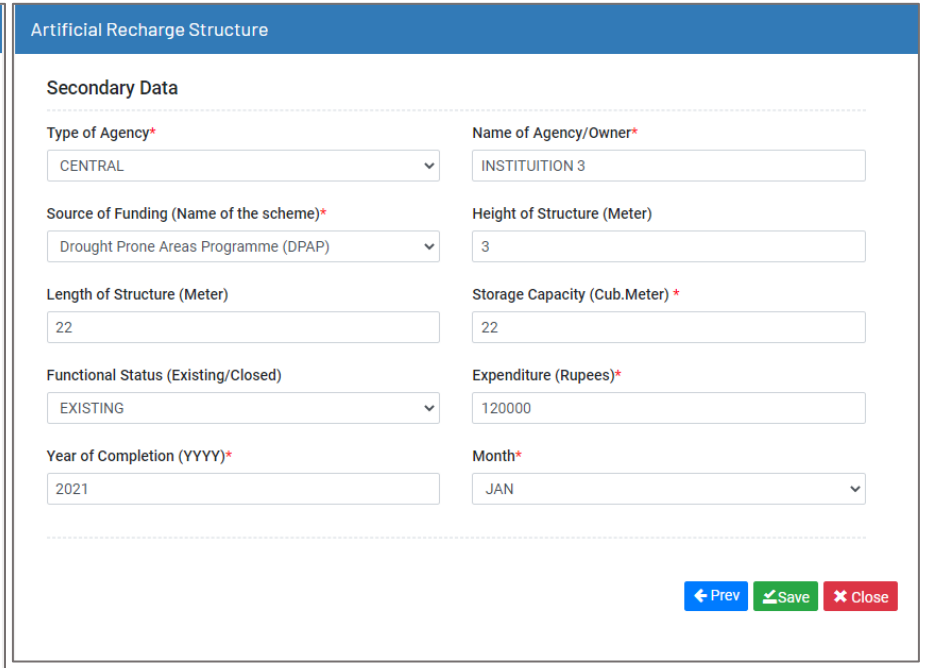


ARS – Data Entry

Edit existing feature–

- Select Structure to edit
- Add/update details for the fields in primary & secondary form
- Upload image facility
- Save





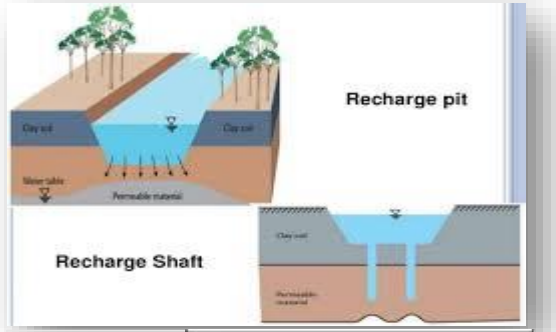
ARS Types and Sub Types

CHECK DAMS
Check Dam
Nala Bund
Cement Plug
Gully Plug
Check Dam with associated structures
Vented Dam

ROOF TOP RAINWATER HARVESTING
RTRWH <50m
RTRWH area 50 to 300 sq. m.
RTRWH area 300 to 1000 sq. m.
RTRWH area > 1000 sq. m.

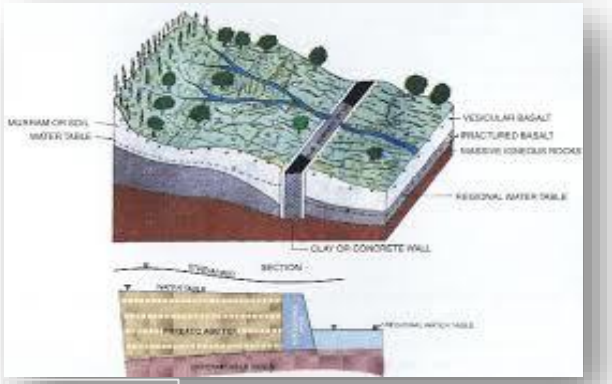
DESILTING TANKS
Desilting of Tanks
Revival of Tank
Revival of Mauns
Revival of Ahar Payne
Modification of Village Pond

Springshed Development/Watershed Development
Springshed Development
Watershed Development
Diversion of flow from Nala & Springs
Contour Bund
Contour Trench
Gabion



RECHARGE SHAFT
Recharge Shaft
Recharge Shaft & Recharge Trench
Recharge well (Bore well)
Recharge well (Dug well)
Recharge well (Tube well)
Injection wells

PERCOLATION TANKS
Percolation Tank
Percolation Pond
Farm Pond
Village Pond
Farm Pond with Recharge Pit
Chal khal (Bawdi)



SUB SURFACE DYKE

Data Entry Form - Template

Artificial Recharge Structure Data Entry Format (Check Dam)

*Mandatory Fields	PRIMARY											SECONDARY									
	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	10
ARS No.	Latitude (Degree Decimal)*	Longitude (Degree Decimal)*	Sub Type of Structure*	State*	District*	Tehsil/ Block*	Village*	Pin*	Location Type (Urban / Rural)*	Address (Required in Urban Location)	City Name* (Required in Urban Location)	Type of Agency*	Name of Agency/ owner*	Source of Funding (Name of the scheme)	Height of Structure (Meter in above ground level)	Length of the Structure (Meter)	Storage capacity (Cub. M)*	Functional Status (Existing/ Closed)	Expenditure (Rupees)*	Year of Completion* (YYYY)	Photograph (Yes/No)*
Structure No.1																					
Structure No.2																					
Structure No.3																					
Structure No.4																					
Structure No.5																					
Structure No.6																					
Structure No.7																					
Structure No.8																					
Structure No.9																					
Structure No.10																					
Structure No.11																					
Structure No.12																					
Structure No.13																					
Structure No.14																					
Structure No.15																					

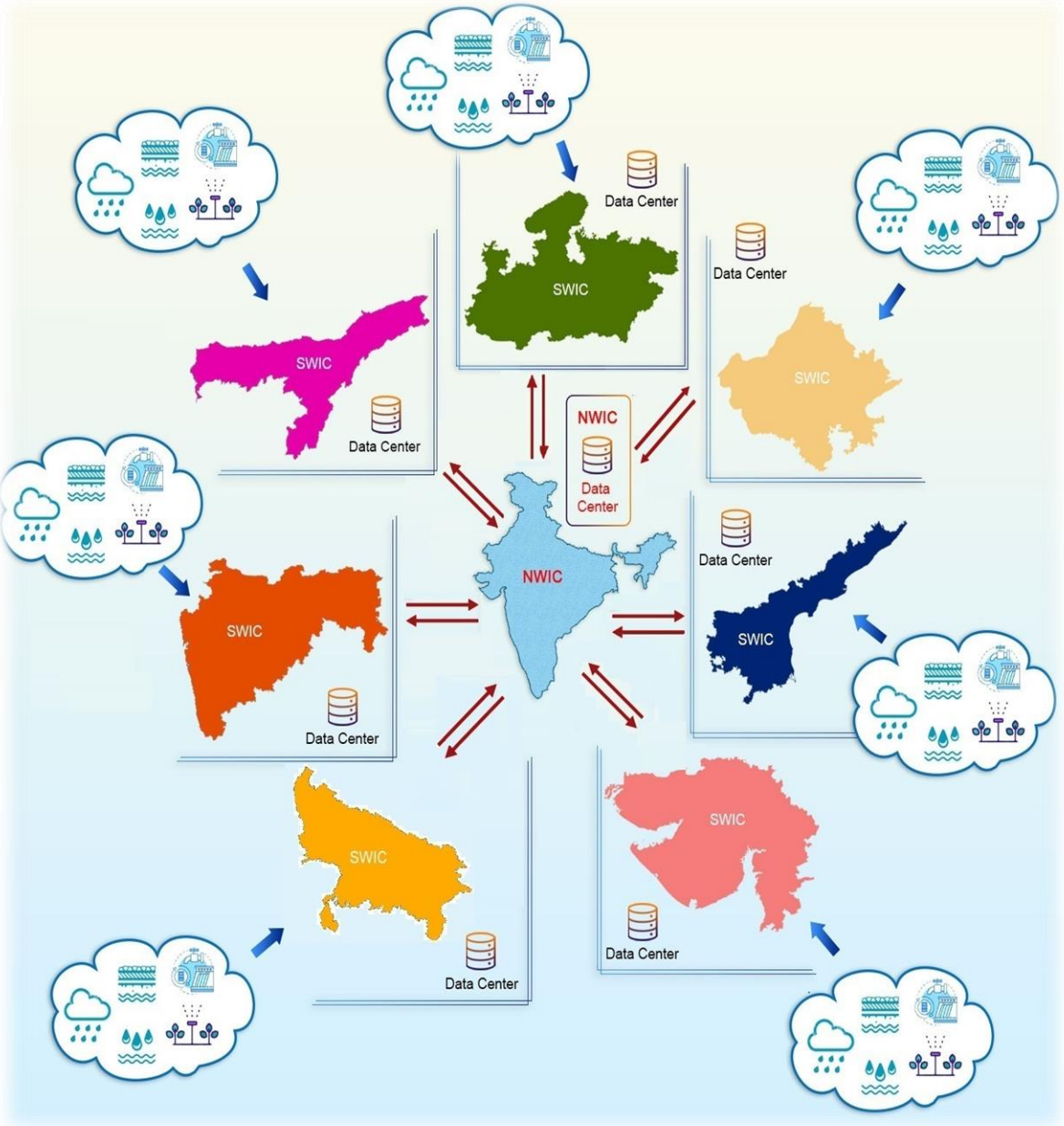
Check Dam | Recharge Shaft | Roof top Rainwater harvesting | Percolation | Desilting tanks | Subsurface Dyke | Watershed Development

SWIC

Framework for

setting up of

State Water Informatics Centre (SWIC)



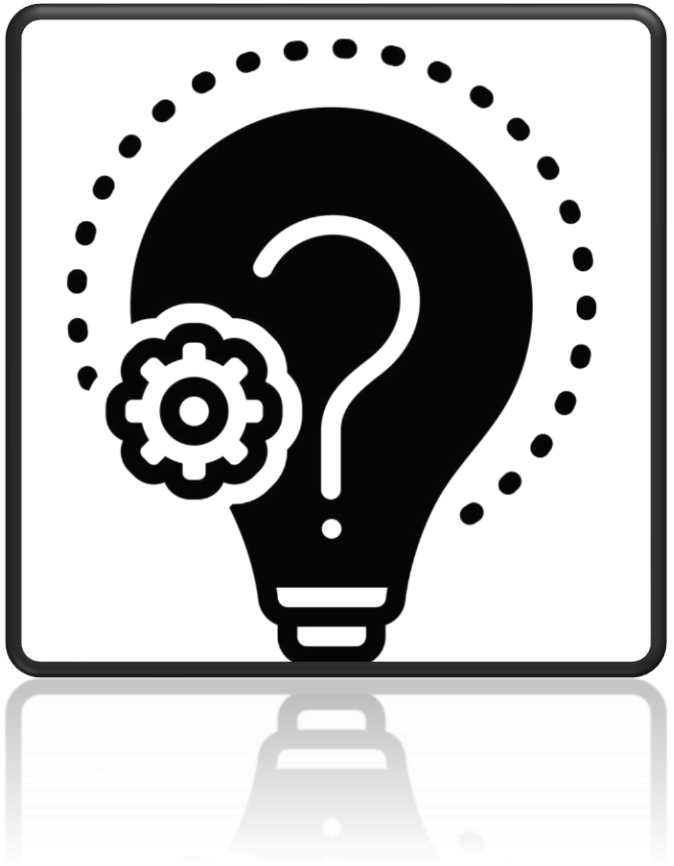
Need of SWIC

- Domain specific bodies of state collects enormous micro level data and there is lack of coordination among these bodies
- Non-uniformity in data collection, data format, attribute identification, frequency of data collection etc. cause difficulties for data conversion, validation, integration and consolidation at one platform
- No dedicated body to

  → act as a single data repository

  → formulate policy towards uniform data acquisition, standardization, validation, analysis and dissemination

  → establish a mechanism for coordination among data generating organizations, users, planners, academicians and all other stake holders



Benefits

Standards & Policy

Policies will be in place for schema, data exchange/ sharing, data quality, validation rules, metadata and reporting

Reusable & Interoperable

Base data, Schema, infrastructure, application architecture, APIs/Webservices licenses will be interoperable and accessible to all states

Ease of Access

User management and access control will ensure data security and easy access of data to all stakeholders/ users through the internet

Categorization of States

- 2 groups
- Based on the set up of centralized geo-spatial IT Platform with integration of database & development of applications

Model 1

States in the process of developing IT Systems/State-WRIS

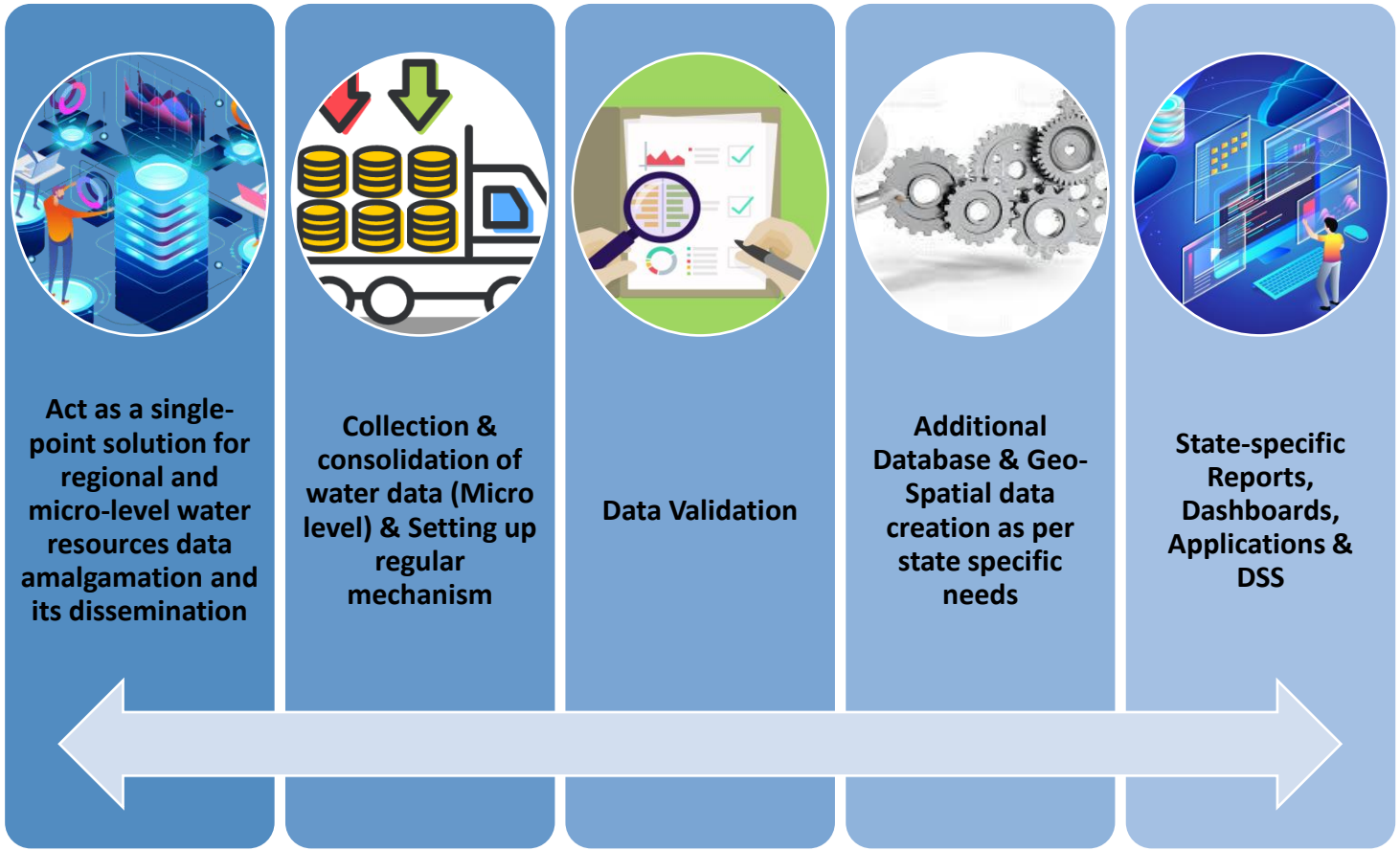
Case	DBMS	GIS	Portal
I	×	×	×
II	✔	×	×
III	✔	×	✔
IV	×	✔	×
V	✔	✔	×

Model 2

States Online

Case	DBMS	GIS	Portal
VI	✔	✔	✔

Scope of SWIC



Role of NWIC

Support & Standardizatio n of Data and GIS Layers

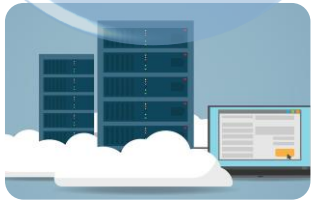
Common Validation tools

Development of generic reports, Visualization/Da shboards and generic applications and DSS

Sharing & Integration of data with states

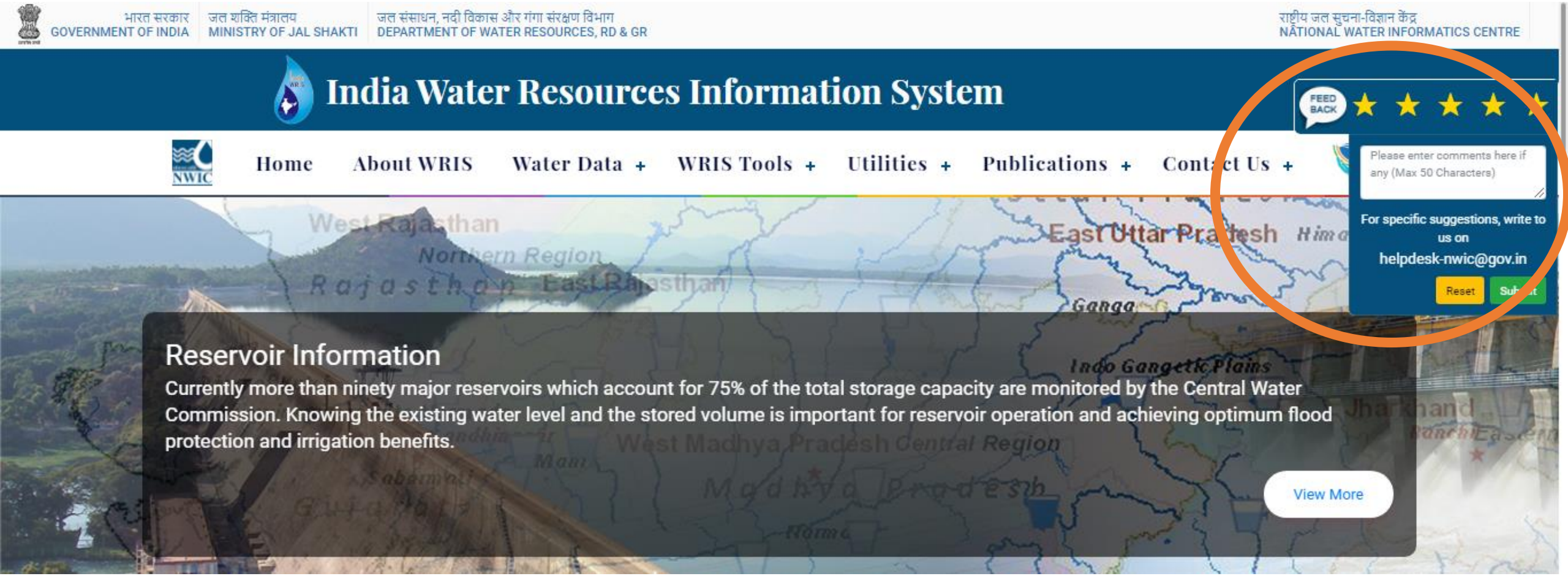
Hosting Platform & Common Licenses, software for GIS and databases

Assistance to States for State-specific reports, applications and DSS



2.4 Proposed Solution-Activity-wise

	Model 1 States	Model 2 States
Database Standards	National Standards	Align with national standards
Database Setup	By NWIC	By Concerned States
Software- Business Data	Postgres	As per State policy
Software-Geospatial data	ESRI-ArcGIS	As per State policy
Telemetry Data	Integration with WIMS	State's own Platform & WIMS
Development Environment	By NWIC	By Concerned States
Production Environment	By NWIC	As per State policy
Local IT Infra management	By Concerned States	By Concerned States
Coordination with Central Agencies	By NWIC	By Concerned States
Coordination with State Agencies	By Concerned States	By Concerned States
Data Integration between NWIC & SWIC	Integrated	Integration through API



Contact Us at helpdesk-nwic@gov.in

Thank you

THANK YOU