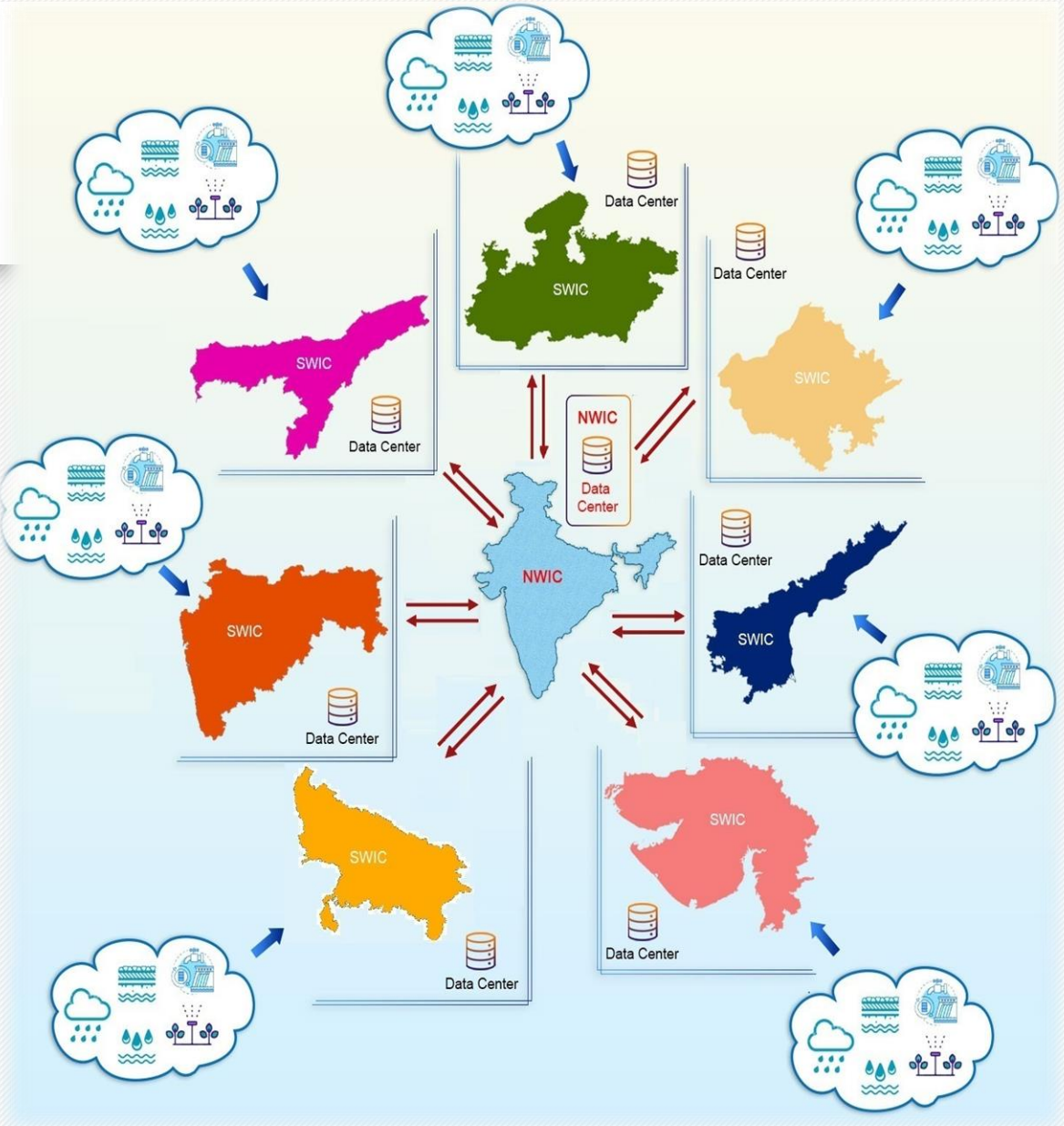
SWIC

Concept Note

on

State Water Informatics Centre (SWIC)



1. Introduction

- National Water Policy (2002 & 2012)

>need of effective and economical management

>by intensifying research efforts in the use of remote sensing technologies

>develop a standardized national information system with a network of data banks and databases

>integrating and strengthening the existing central and state agencies and improving the quality of data and the processing capabilities

>free exchange of data among various agencies

>bring all hydrological data, in the public domain

1.1 NWIC

- Established on 28th March 2018 under the ministry of Jal Shakti
  - To collect, collate and process Hydrologic data regularly from all over the country, conduct the preliminary processing, and maintain in an open and transparent manner on a GIS platform
- NWIC manages and handle
  - India WRIS (www.indiawris.gov.in)
    - single window solution for all water resources data and provides information in a standardized national GIS framework
  - WIMS (https://india-water.gov.in)
    - web enabled water resources data entry system for both surface and ground water resources.

2. Need of SWIC

- States collect enormous micro level data and the data is collected by various departments
- 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.
- To achieve real improvement in water resources management
- Data will be available to all the stakeholders at a single platform

2.1 Challenges in setup of SWIC

- Domain specific bodies collects, monitors, consolidate the data related to their respective jurisdictions
  - lack of coordination among the domain specific bodies
- Data aggregation from different organization is humongous task
  - non-uniformity in data collection, data format, attribute identification, frequency of data collection etc. thus causing difficulties for data conversion, validation, integration and consolidation at one platform.
- Overlapping of data
- Lack in technical expertise since development of IT enabled GIS platforms have not been the core functions of water resources department conventionally
- No defined funding mechanism
- Lack of state level strategy for IWRM and allied themes

2.2 Benefits


Quick Deployment
STANDARDS
Standards & Policy
Reusable & Interoperable
Knowledge Centre
Cost-Effective
Ease of Access

2.3 Proposed Solution

Status of Establishment at States					Time Series		Spatial data		Software Selection		Telemetry Data	Environment	Hosting
	Case	DBMS	GIS	Portal	Parameters in WIMS	Parameters not in WIMS	Layers in NWIC	Layers not in NWIC	Database	GIS	Sensor Integration	Development	Platform
Model 1 (States in the process of developing IT Systems/ State-WRIS)	I	×	×	×	Station management and data entry in NWIC-WIMS.	Station management and data entry in State WIMS on standard and uniform schema prepared by NWIC	Use India-WRIS layers.	NWIC will create new layer with standardize schema	Postgres (Free & open-source software)	ESRI-ArcGIS NWIC shall procure additional ArcGIS Enterprise licenses as per need. However, ArcGIS desktop licenses shall be procured by States	Telemetry sensors shall be integrated with NWIC-WIMS up to Mongo-DB and thereafter, NWIC-WIMS parameter will go to NWIC-WIMS (Postgres) and rest will go to State-WIMS	Shall be provided by NWIC	Same cloud as being used by NWIC for hosting of India-WRIS & NWIC-WIMS
	II	✓	×	×									
	III	✓	×	✓									
	IV	×	✓	×			Integrate State data in India-WRIS layers and use India-WRIS GIS data						
	V	✓	✓	×									
Model 2 (States Online)	VI	✓	✓	✓	Station management and data entry in NWIC-WIMS	Station management and data entry in State platform. Align schema as per National standards	Can use India-WRIS layers through API whenever required	Follow the schema by NWIC.	As per State policy	As per State policy	State can use existing platform or chose NWIC platform	State shall arrange its own	As per State policy

3. Scope of SWIC

- Act as a

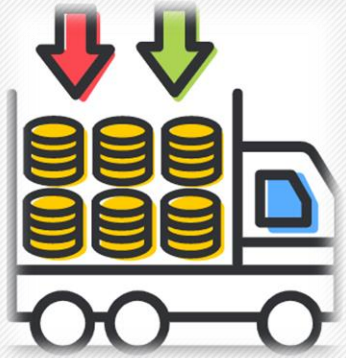
nodal agency for integration of water resources data within the state

repository for state-wide water resources data and will be responsible for maintaining, updating, collation and dissemination of data and information

single-point solution for regional and micro-level water resources data amalgamation and its dissemination

3. Scope of SWIC

- Collection of Water data (Micro level)
  - Consolidation of the existing data
  - Setting up regular mechanism
- Data Validation
- Additional Database & Geo-Spatial data creation as per state specific needs
- State-specific reports, Visualization & Dashboards
- State-specific Application & DSS



4. Role of NWIC

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NWIC

- Support & Standardization of Data and GIS Layers
- Common Validation tools
- Development of generic reports, Visualization/Dashboards 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

5. Information Sharing & Security

Data Sharing Mechanism

Data is shared following the hydro-meteorological data dissemination policy 2018

access of data residing in State-WIMS shall remain under full administrative control of respective states

States may formulate hydro-meteorological data dissemination policy tailored to its specific objectives

Access Control Mechanism

For NWIC – WIMS database (Central DB), access control shall remain fully with NWIC and for State-WIMS Database, it shall be under full control of State.

To access the NWIC-WIMS application by State, a user credential shall be created and shared with the Nodal officer of SWIC. Using this credential, further users shall be created and roles shall be assigned by the state only for their jurisdiction

NWIC shall be able to access the state data

5. Information Sharing & Security

Data Centre	Agency	Roles	Edit	View	Download
NWIC (India-WRIS)	NWIC	Owner	✓	✓	✓
	Concerned State	User	✓	✓	✓
	Other States, Public Institutions & General Public	User	×	✓	✓
State-WRIS	NWIC	User	×	✓	✓
	Concerned State	Owner	✓	✓	✓
	Other States, Public Institutions & General Public	User	×	✓	✓
NWIC-WIMS	NWIC	Owner	✓	✓	✓
	Concerned State	Owner	✓	✓	✓
State-WIMS	NWIC	User	×	✓	✓
	Concerned State	Owner	✓	✓	✓

Note:

1. There is no editing facility for telemetry as the data flows into the system automatically.
2. NWIC-WIMS platform doesn't share the data directly with the public and the data is shared through various modules of India-WRIS. Similarly, State-WIMS data will be shared through respective State-WRIS.
3. Classified data of NWIC-WIMS is shared following the policy defined in Hydrometeorological Data Dissemination Policy 2018 and data sharing policy of classified data of State WIMS shall be decided by the concerned state.

6. Way Forward

- Lead Department - Chief Secretary of the State
- Setup
  - Location of the department, Type of organization, Office Infrastructure etc.
- Organization Composition
  - Recommended organogram is flexible to modify as per state local requirement
- Reporting Relationship
- Cabinet approval for constitution of SWIC
  - Lead Department shall initiate and follow up for the approval of establishment of SWIC.
- Monitoring & maintaining of SWIC for initial few years by lead department
- Works pertaining to development of State WRIS
  - states discuss their requirement and plan of action with NWIC to ensure standardization, seamless integration with India WRIS

Blue Print

NWIC Development Server

ArcGIS Server
Configuration: 64 GB RAM, 3TB Storage, 4 cores CPU
Software: ArcGIS server 10.8.1, Portal, Data Store, ArcGIS Desktop, Window Server

- Common Server for NWIC and States
- States and NWIC will publish the layers by their user credentials

NWIC Centralized Code Directory

India WRIS Code Directory

State Code Directory (Concerned State)

- NWIC will provide SVN developer credentials to the state
- State/ NWIC developers can get/pull/push the code through SVN.

State Data

- One Time Dump
- Daily Data
- Telemetry Data

- For daily data state people will create web forms, and write API to send data in the DB
- One time dump will be received on FTP server , state people will create web forms, and write API to send data in the DB

SWIC Virtual Machines

PostgreSQL Database VM
Configuration: 8GB RAM, 500 GB Storage, 8 cores CPU
Software: PostgreSQL 12.6, Apache, Ubuntu OS
Man Power: 2 GIS Experts, 1 Senior GIS Expert from States. 1 Senior GIS Expert from NWIC

- Database VM will be provided to individual State
- NWIC Expert will create the database, SDE connection, prepare database schema, provide admin, hydrological etc layers in database, create portal user and guide them in the creation of development services)
- State Expert will create their layers and publish the map services

Application VM
Configuration: 8 GB RAM, 200 GB Storage, 4 cores CPU
Software: Apache, Tomcat, Ubuntu OS

- Application VM will be provided to individual State
- State will publish the build in this VM.
- State Software developer will do this activity.
- NWIC H/W expert will help in system maintenance, public IP, mapping of public IP to private IP and domain name

State Developer System

Configuration: 32 GB RAM, 500 GB Storage, 8 cores CPU
Software: Angular JS, ESRI Java Script API, Bootstrap, CSS,HTML, Nodejs, Python, Postman, VS Editor
Man Power: 2 software Developers from state, 1 team lead from NWIC

- NWIC Expert will guide state expert in development
- State Expert will setup the code on their system

After completion of module development, build will be published on application server with state domain name.

NWIC

State

“

Together we make DATA prosper

”

THANK YOU