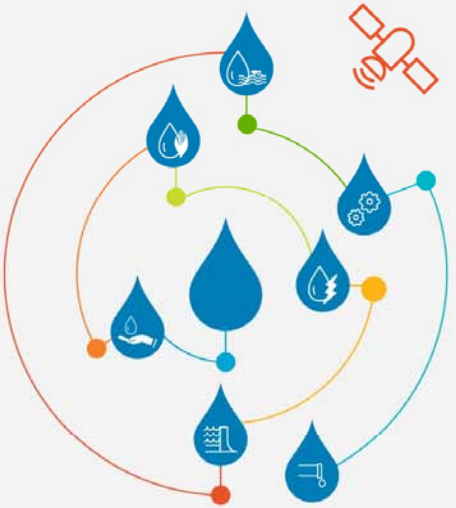
Data Clearinghouse (DCH) for Water Resource Management



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02nd – Oct- 2018

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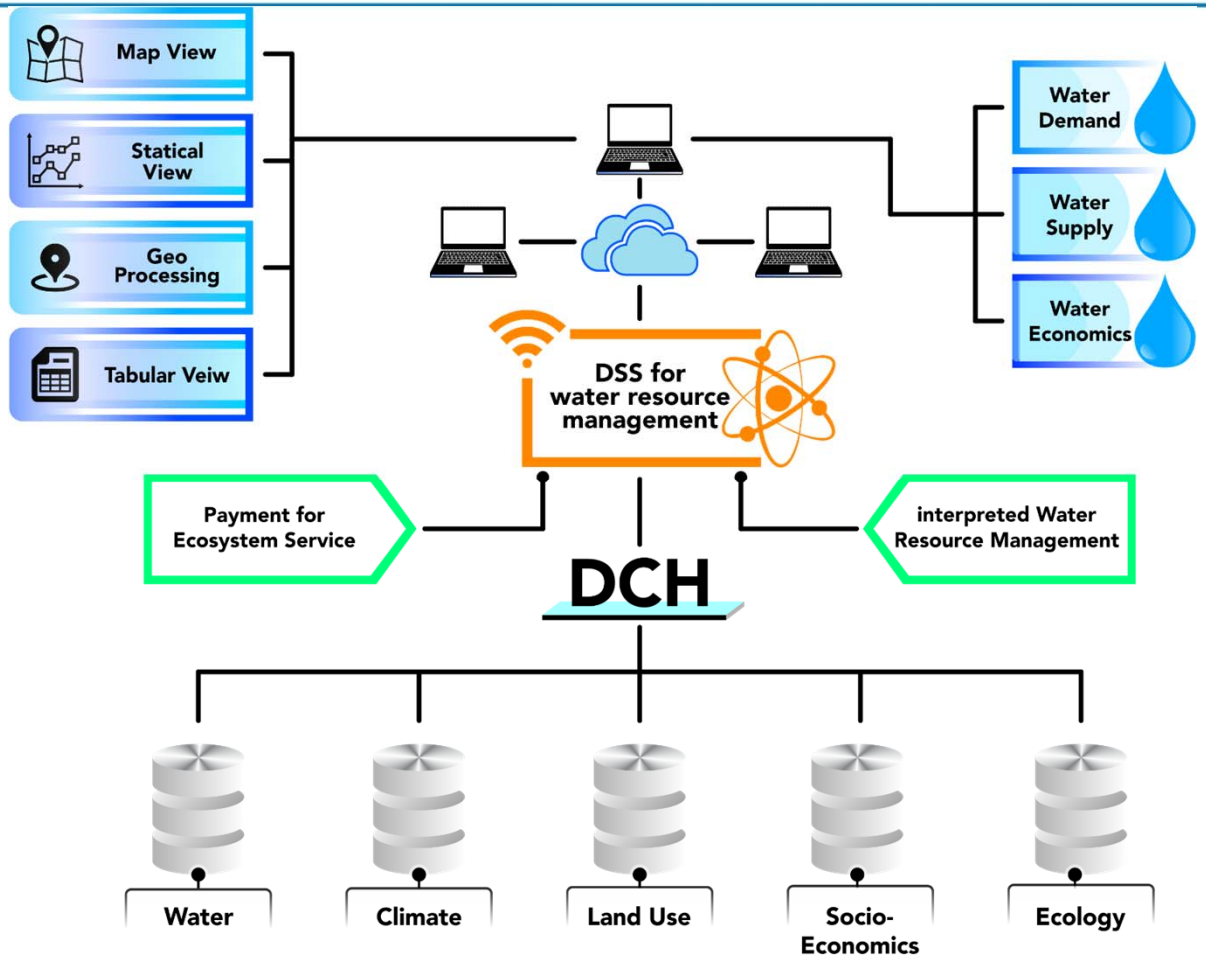
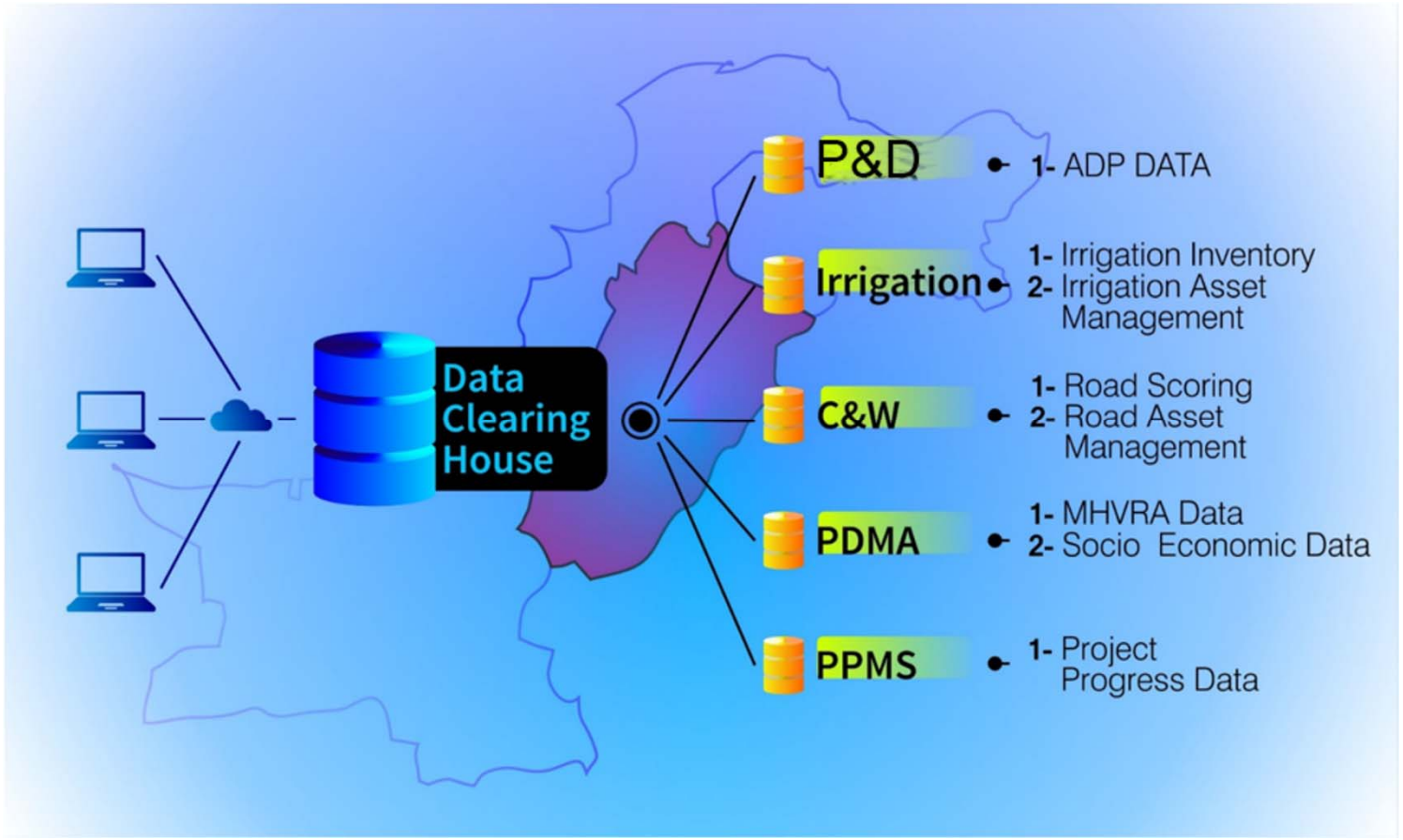
WHY DCH?

- Collecting and Handling data is called **Data Engineering** and converting into a useful information/ knowledge known as **Data Science,** which is one the emerging and most important challenges of 21st century.
- Due to improvement in GIS and Remote Sensing technology the spatial data is growing very fast. The datasets are becoming huge, complex, and wide spread.
- It's a need of time establishing a centralized library or a common platform from which **data especially spatial data** from several sources can be managed and analyzed to identify patterns, trends and associations.
- This could be utilized in many areas including river basin modeling, climate change trends analysis, identification of changes in ecosystem and planning optimum water changes etc etc..

CONCEPT OF DATA CLEARING HOUSE (DCH) FOR WATER RESOURCE MANAGEMENT



Existing Coverage



COMPONENT OF DATA CLEARING HOUSE

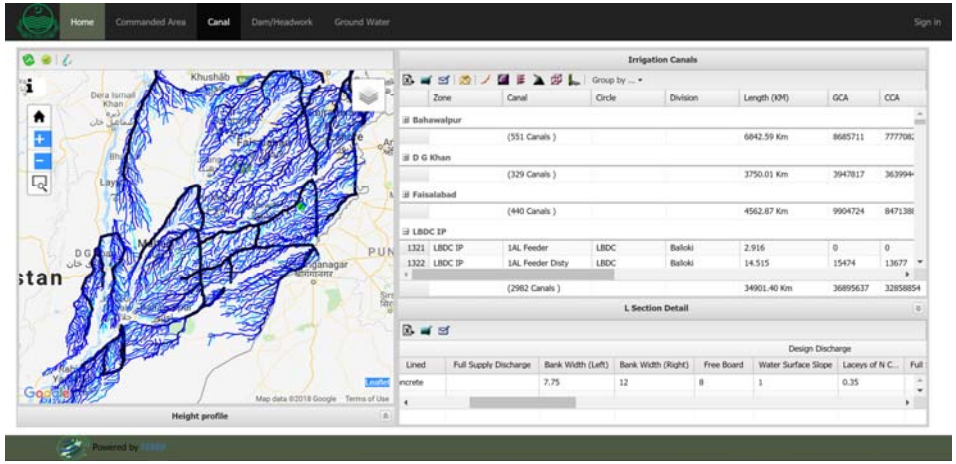
- Sharing of Data in the form of
  - Spatial Layers
  - Maps
  - Documents
- Applications
  - Water Resource Management
    - Commanded Areas
    - Canals
    - DAM/ Headworks
    - Ground Water
  - Disaster Management
    - Flood Hazard Analysis
    - Socio Economic Data and MHVRA Datasets
  - Annual Development Planning Analysis
    - Reporting
    - Temporal Analysis
  - Road Scorecard
  - Site Selection Analysis

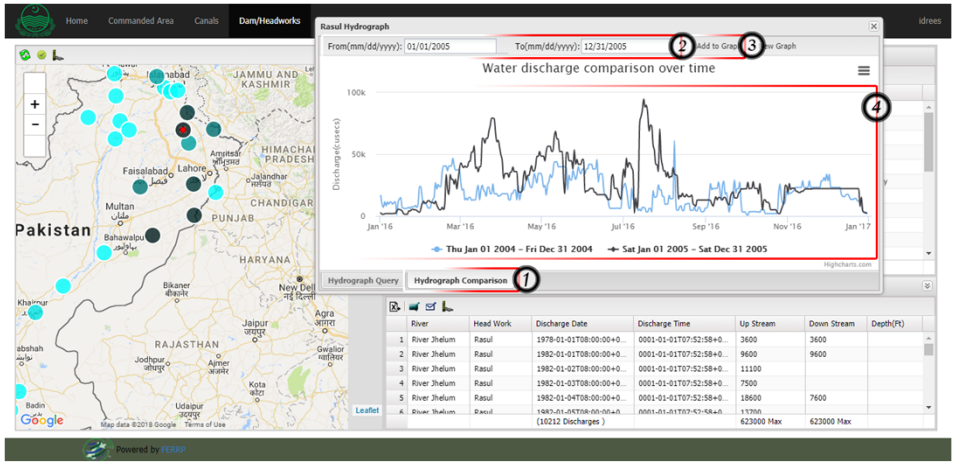
APPLICATION – WATER RESOURCE MANAGEMENT

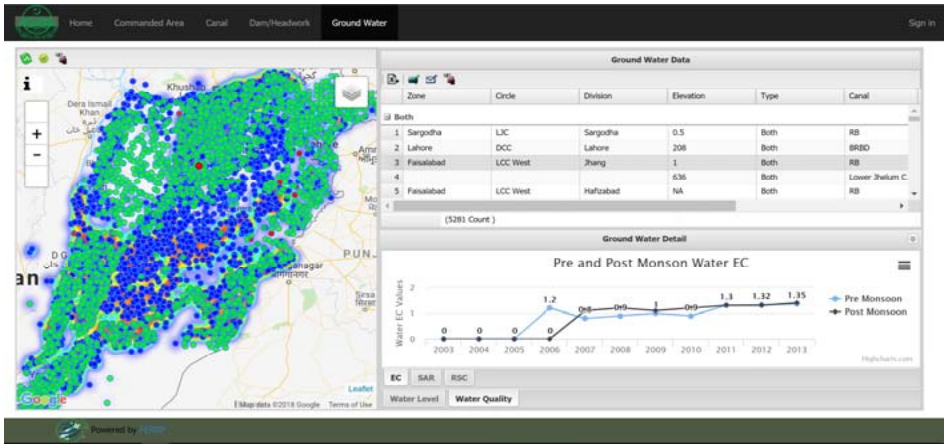
- This system consists of following modules
  - Commanded Area
    - Zones
    - Circles
    - Division
    - Canal Command
  - Canals
    - L- Section
    - Gauge
    - Gates
    - Outlets
  - Dam/Headwork
    - Temporal Data of Discharge
    - Hydrograph analysis
    - Hydrograph Comparison
  - Ground Water
    - Water Depth (Temporal)
    - Water Quality (Temporal)
    - Heatmap

Demo of Application at http://pnddch.info/irrigation/

CANAL, HEADWORKS, GROUND WATER INTERFACE







FLOOD HAZARD ANALYSIS

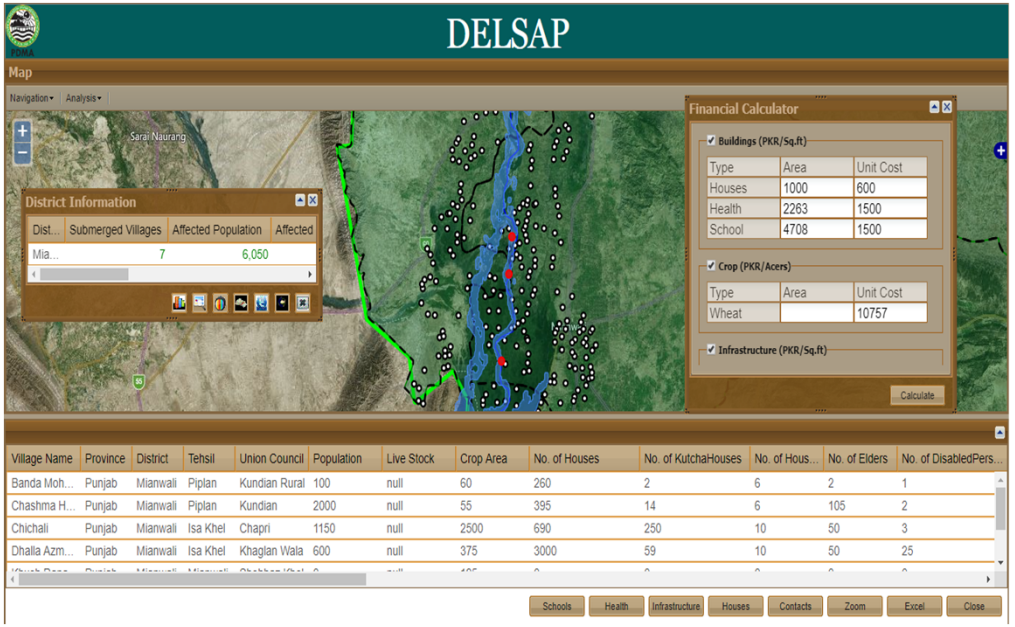
The flood analysis app calculate flood inundation using

Manning's Equation and

Standard Step Equation for GVF.

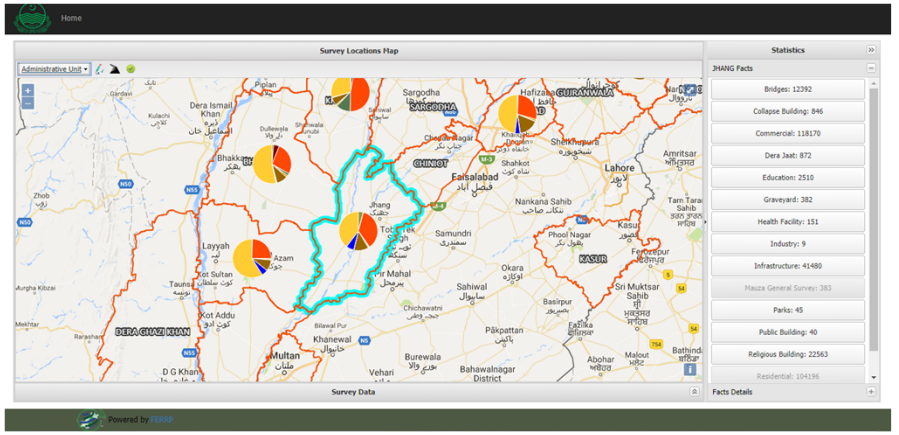
Available at

http://pnddch.info/ing/app/?app=flood_analysis

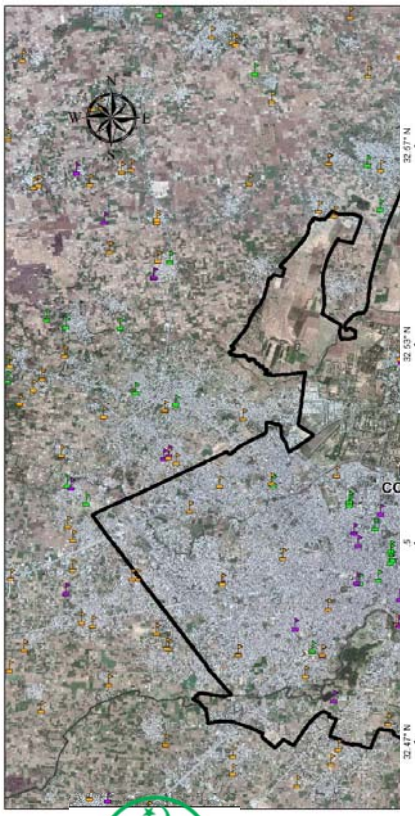


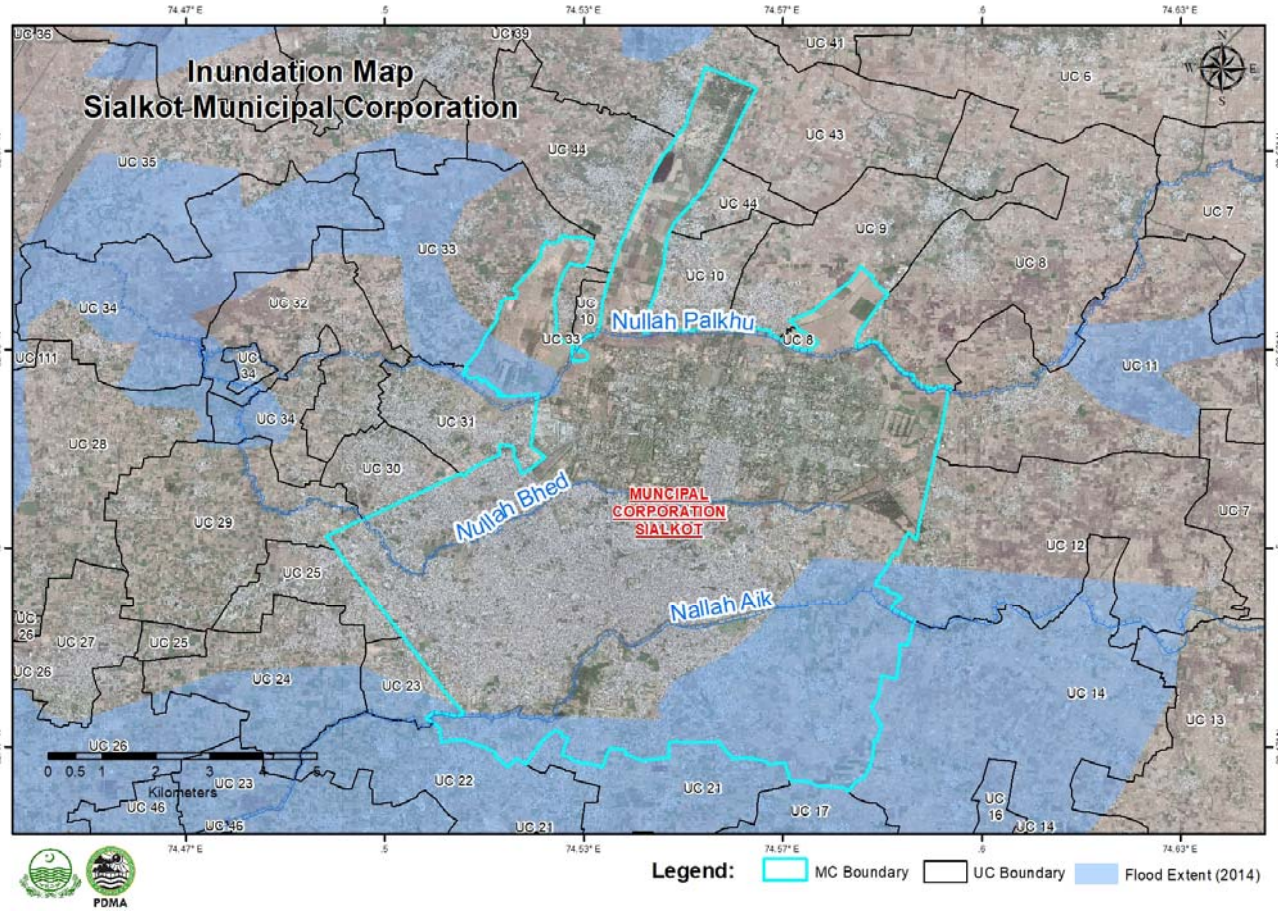
SOCIO-ECONOMIC ANALYSIS – VULNERABILITY ASSESSMENT

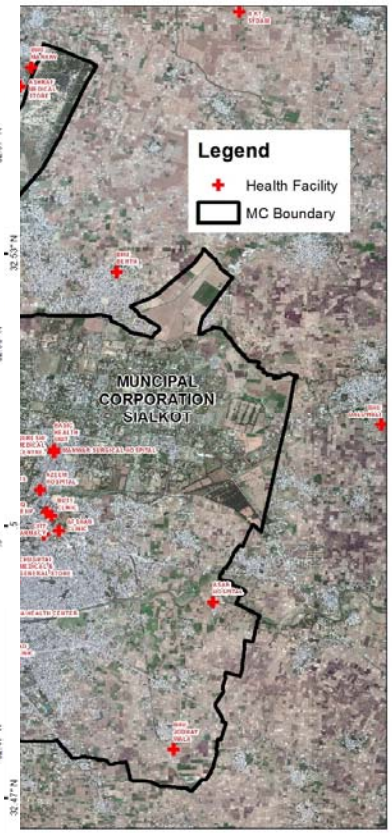
- Socio Economic survey is conducted to collect information along riverine area
  - Household
  - Infrastructure
  - Building
  - Health facility
  - Schools
- Purpose to access vulnerability
- Stats can accessed by
  - Selecting administrative Units
  - Drawing or uploading an area of interest
- Available at http://pnddch.info/survey_stats/



SPATIAL LAYERS/MAPS GENERATION







ADB

ANNUAL DEVELOPMENT PLANS

Statistical Analysis of all development plan especially irrigation and water sector

User can perform dimension modeling on those data sets

Can be accessed in the form of

- ADP Report

  http://172.104.141.250/adp/adpreport/

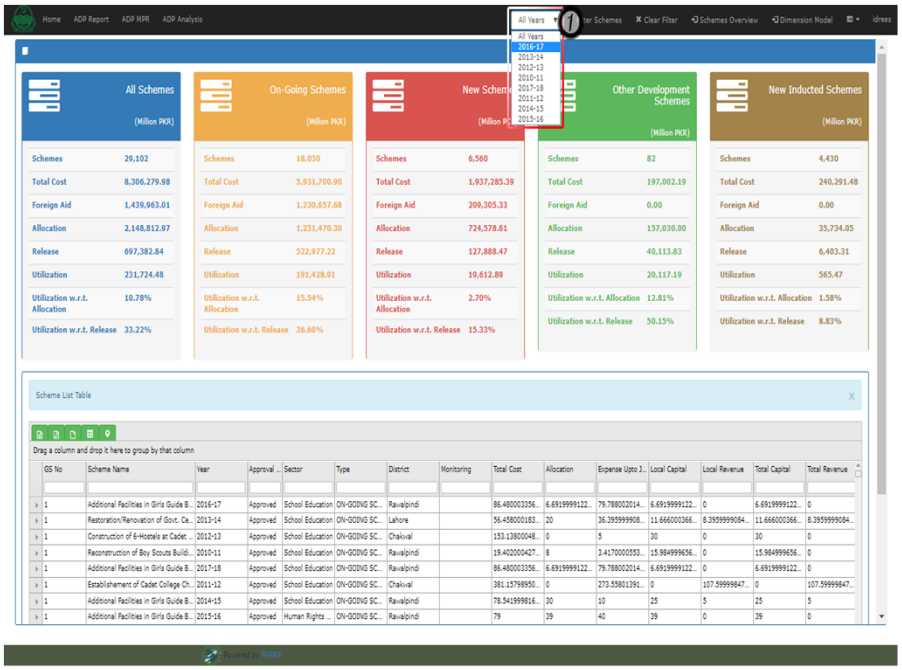
- ADP monthly progress review (MPR)

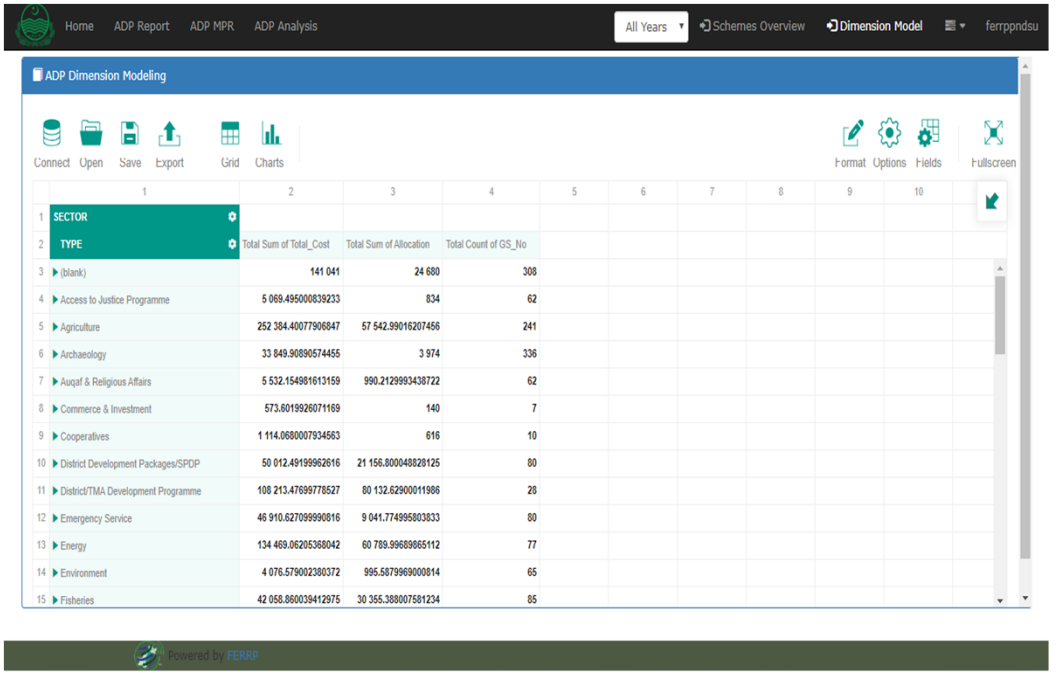
  http://172.104.141.250/adp/adpmpr/

- ADP yearly analysis

  http://172.104.141.250/adp/adpanalysis/

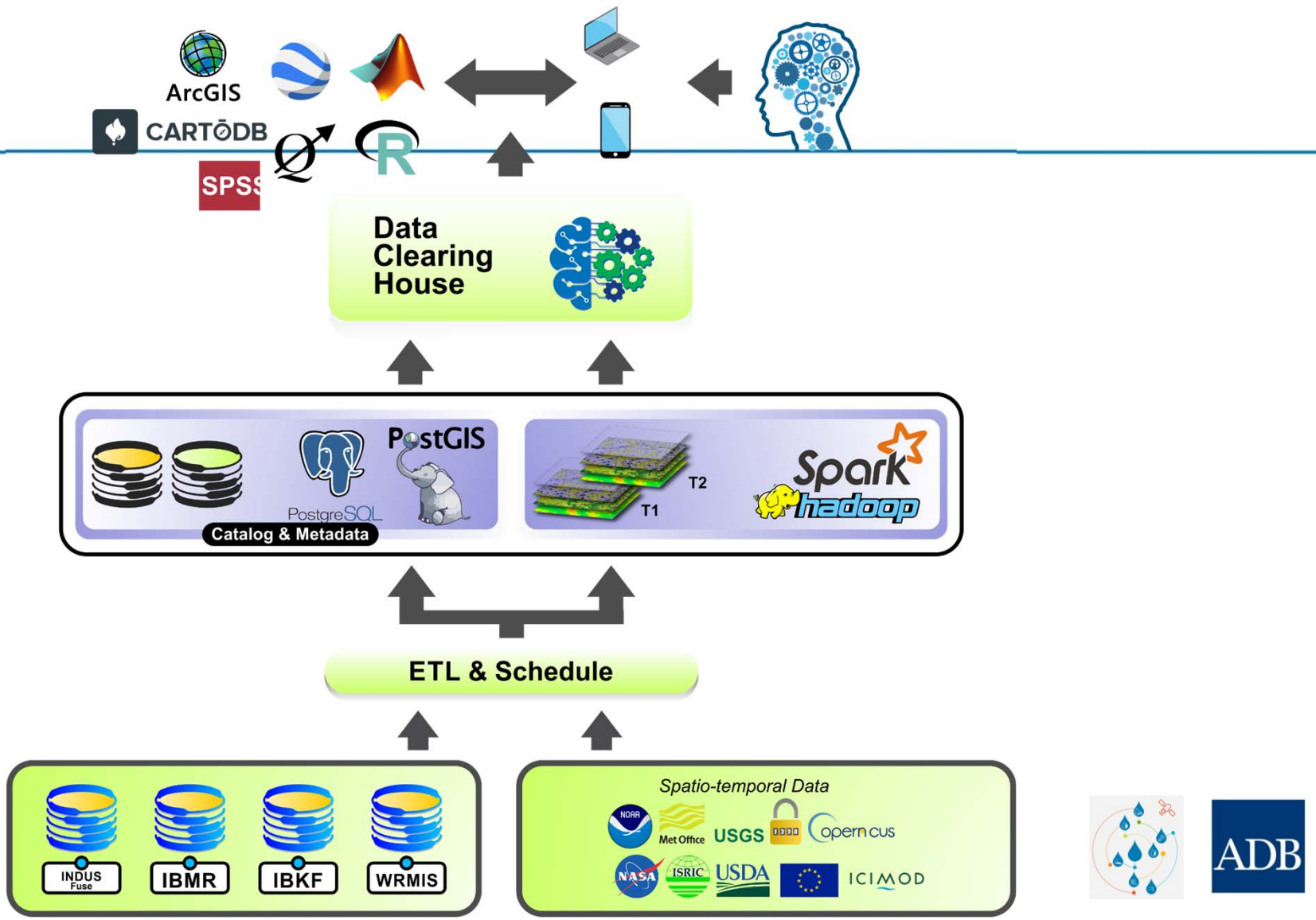
STATISTICAL INFORMATION & DIMENSION MODELING





PLANNED FUTURE EXTENSION

- The following modules are planned to be integrated in future
  - Integration with available Indus basin application like Indus FEWS, IBMR
  - Water economic analysis
  - Integrated planning and development module
  - Integration with Big Data platform like Google Earth Engine, IBM PAIRS,
  - Integration with Weather information and forecasting like darksky, open weathermap, The weather


ArcGIS
CARTODB
SPSS
Data
Clearing
House
PostGIS
PostgreSQL
Catalog & Metadata
T2
T1
Spark
hadoop
ETL & Schedule
INDUS
Fuse
IBMR
IBKF
WRMIS
Spatio-temporal Data
NOAA
Met Office
USGS
opern cus
NASA
ISRIC
USDA
ICIMOD
ADB

ENABLING CONDITIONS AND SCALING UP

- To **enable the applications**, planning and development process both at the level of the line departments and the planning ministries **has to be restructured** in way that **project processing and implementation cycle is linked with the data clearinghouse**.
- Departments require restructuring to acquire capacities and resources to use and maintain such a system.
- Application beside in country usage can also provide a **platform for trans-boundary data sharing** and **Integrated Water Resource Management (IWRM)** to improve the water governance and flood management between different nations.
- To scale up the application on regional level, a **joint implementation team** for **regional initiatives** is proposed to look at options to **replicate this application in other countries of the region and then integrate the system. ADB could be ideal platform** Keeping in view the **territorial policies** of the member countries for **trans-boundary data sharing and water resource management** of common watersheds between countries.