

Data Clearinghouse (DCH) for Water Resource Management



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02nd – Oct- 2018

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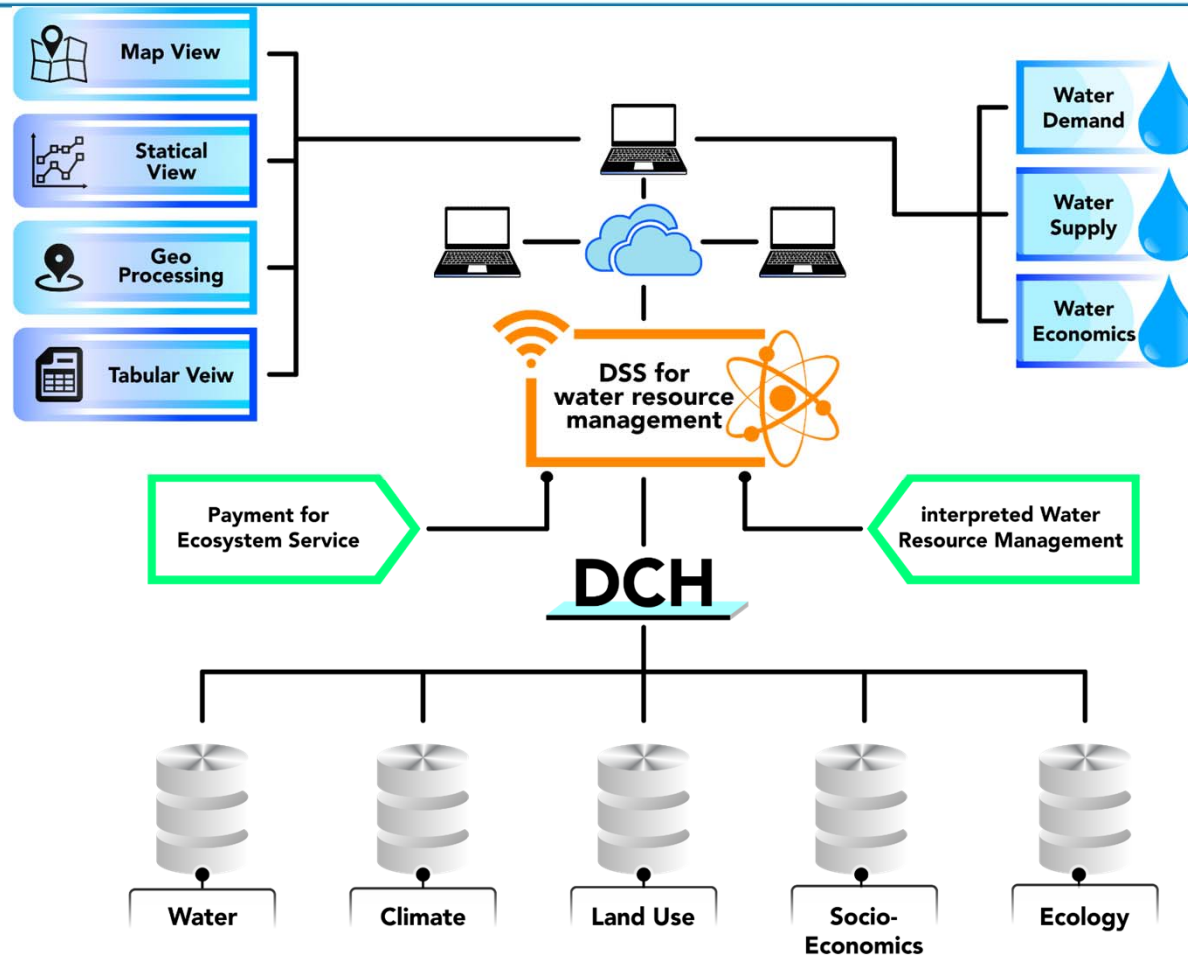


WHY DCH?

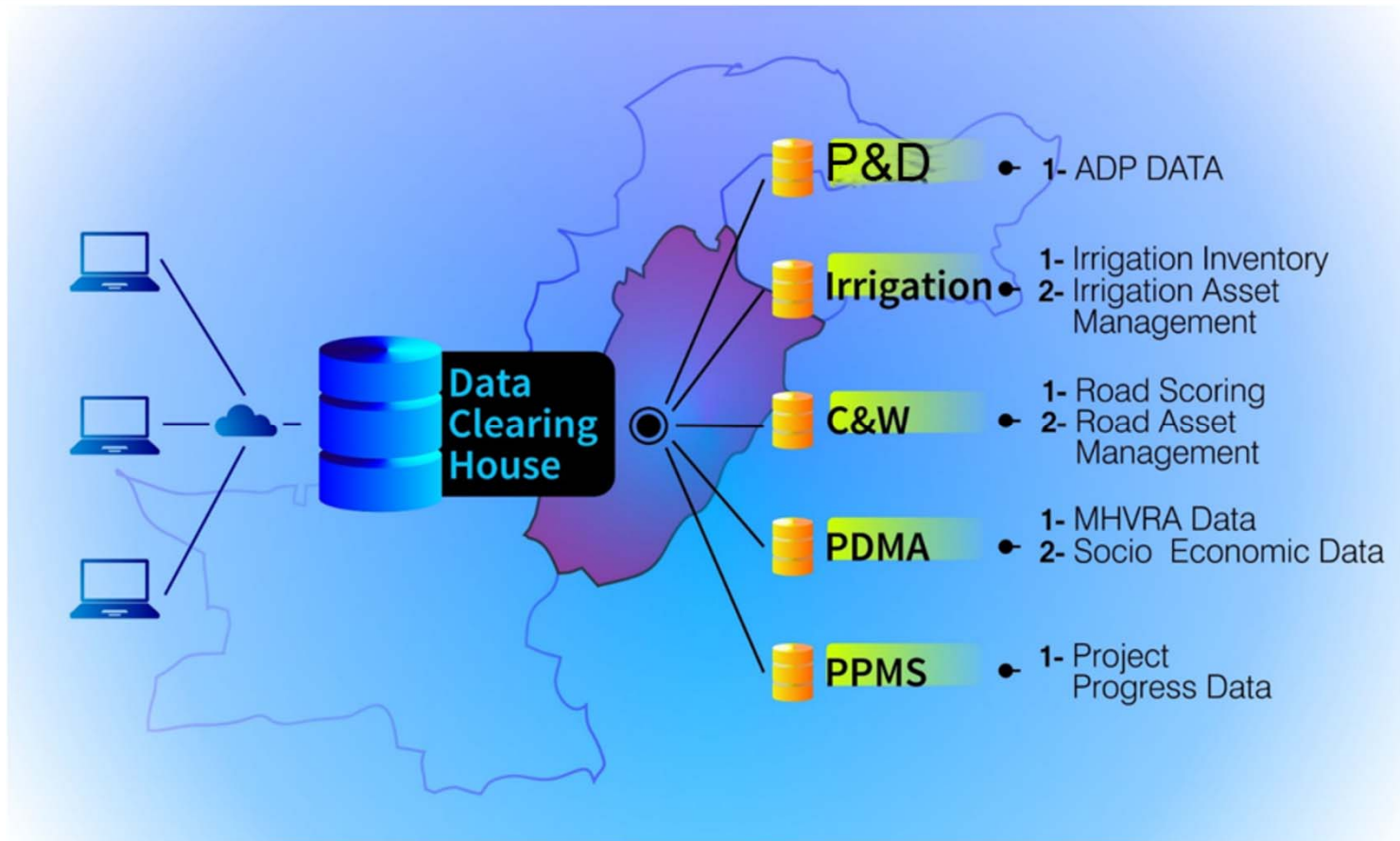
- Collecting and Handling data is called **Data Engineering** and converting into a useful information/ knowledge known as **Data Science**, which is one the emerging and most important challenges of 21st century.
- Due to improvement in GIS and Remote Sensing technology the spatial data is growing very 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

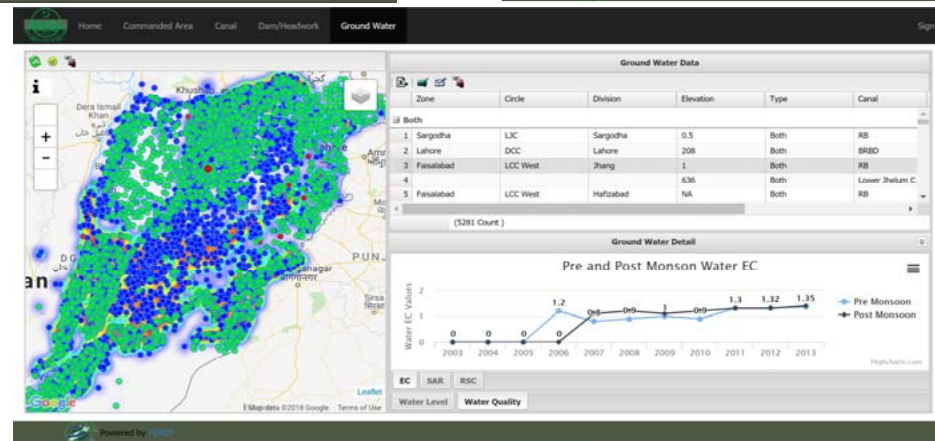
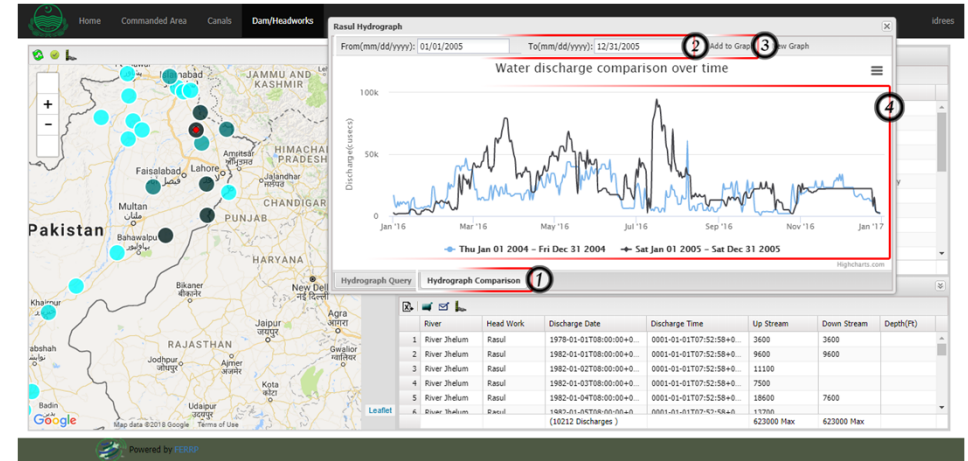
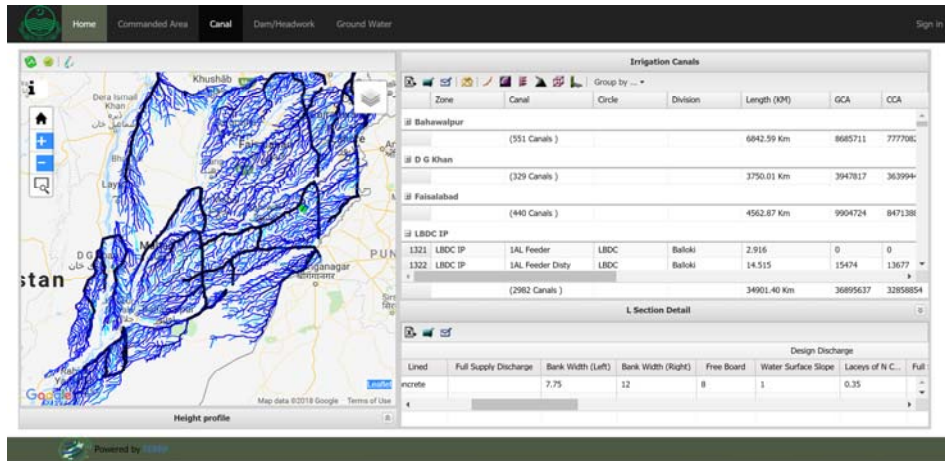
- Commanded Area
 - Zones
 - Circles
 - Division
 - Canal Command
- Canals
 - L- Section
 - Gauge
 - Gates
 - Outlets
- Dam/Headwork
 - Temporal Data of Discharge
 - Hydrograph analysis
 - Hydrograph Comparison
- Ground Water
 - Water Depth (Temporal)
 - Water Quality (Temporal)
 - Heatmap



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



CANAL, HEADWORKS, GROUND WATER INTERFACE



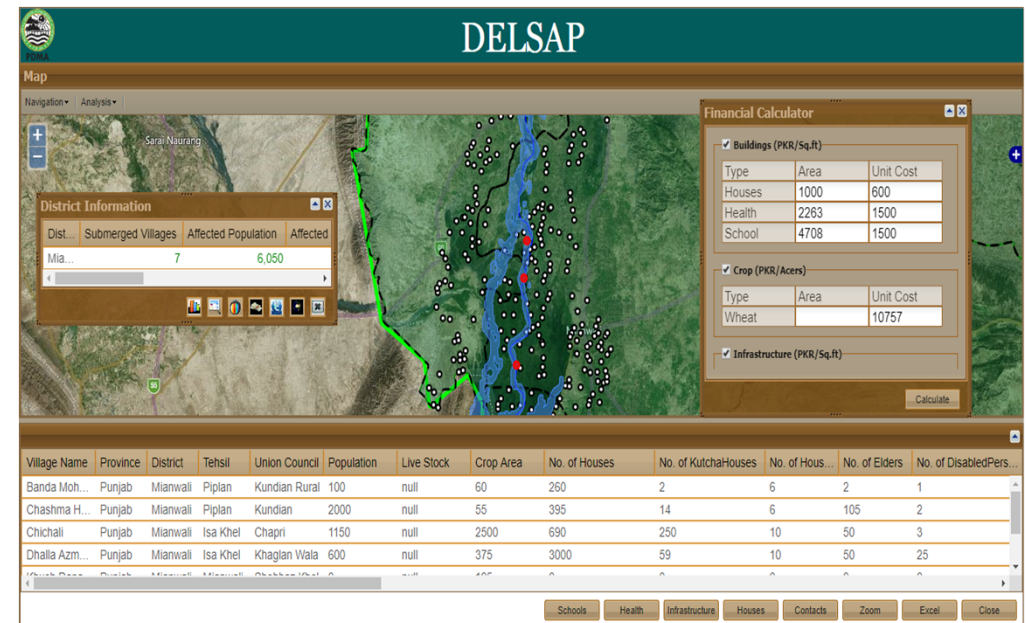
FLOOD HAZARD ANALYSIS

The flood analysis app calculate flood inundation using

**Manning's Equation and
Standard Step Equation
for GVF.**

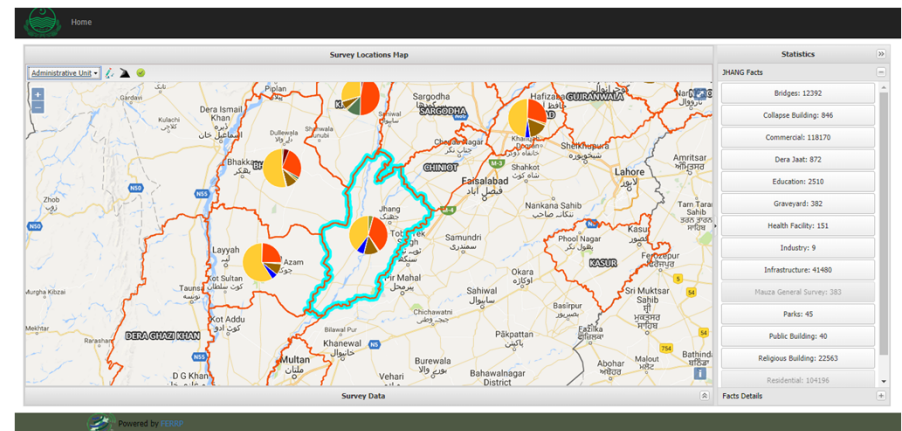
Available at

[http://pnddch.info/ing/
app/?app=flood_analysis](http://pnddch.info/ing/app/?app=flood_analysis)

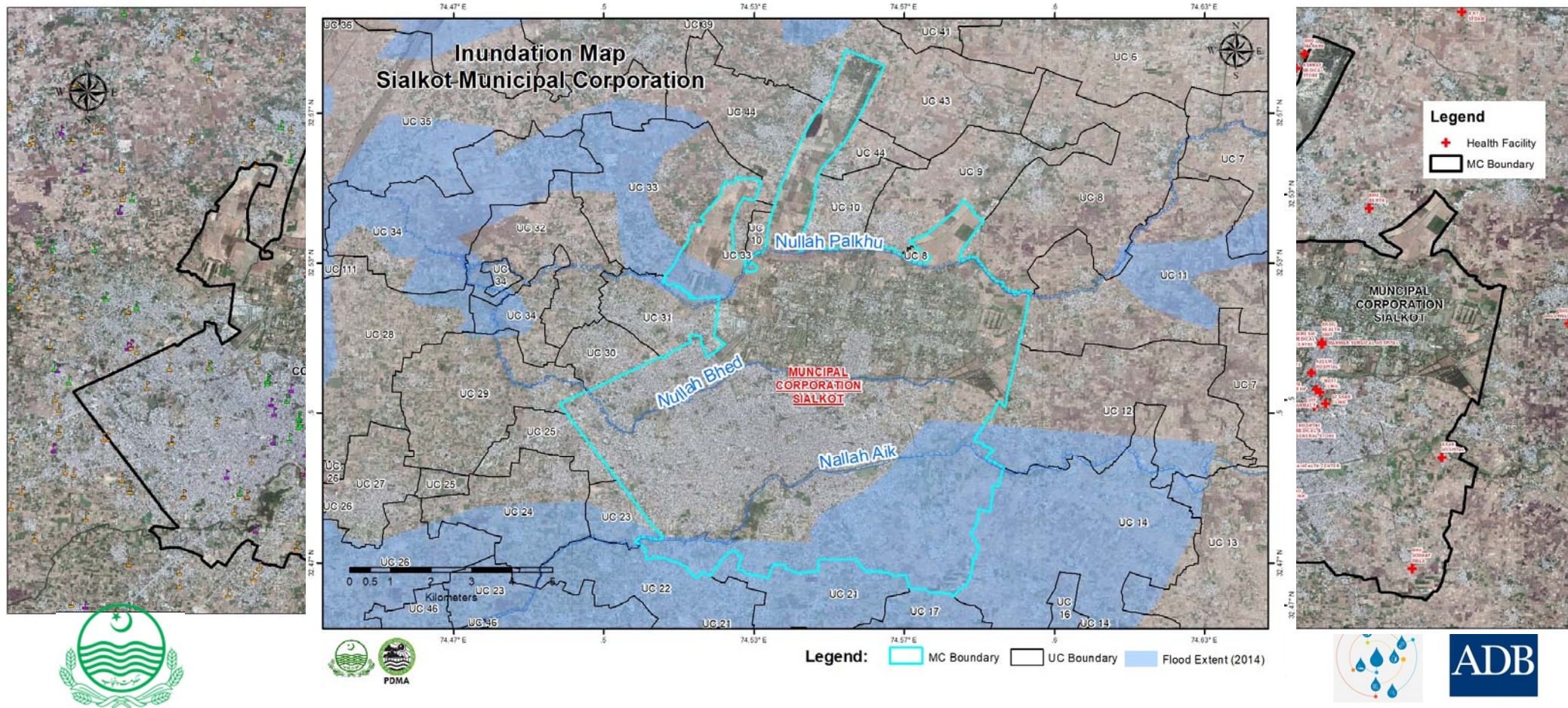


SOCIO-ECONOMIC ANALYSIS – VULNERABILITY ASSESSMENT

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



SPATIAL LAYERS/MAPS GENERATION



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

Home ADP Report ADP MPR ADP Analysis

All Years 2016-17 2017-18 2018-19 2019-20 2020-21 2021-22 2022-23 2023-24 2024-25

1st Schemes Clear Filter Schemes Overview Dimension Model ferrppndsu

All Schemes (Million PKR)	On-Going Schemes (Million PKR)	New Schemes (Million PKR)	Other Development Schemes (Million PKR)	New Inducted Schemes (Million PKR)
Schemes: 26,102	Schemes: 18,030	Schemes: 6,560	Schemes: 82	Schemes: 4,430
Total Cost: 8,366,279.88	Total Cost: 5,831,700.90	Total Cost: 1,837,285.39	Total Cost: 197,602.19	Total Cost: 240,291.48
Foreign Aid: 1,439,963.61	Foreign Aid: 1,239,657.68	Foreign Aid: 209,305.33	Foreign Aid: 0.00	Foreign Aid: 0.00
Allocation: 2,148,812.97	Allocation: 1,231,470.30	Allocation: 724,578.61	Allocation: 157,639.00	Allocation: 35,734.05
Release: 697,382.84	Release: 522,977.22	Release: 127,888.47	Release: 40,113.83	Release: 6,403.31
Utilization: 231,724.48	Utilization: 191,428.91	Utilization: 10,612.89	Utilization: 20,117.19	Utilization: 565.47
Utilization w.r.t. Allocation: 10.78%	Utilization w.r.t. Allocation: 15.54%	Utilization w.r.t. Allocation: 2.70%	Utilization w.r.t. Allocation: 12.81%	Utilization w.r.t. Allocation: 1.58%
Utilization w.r.t. Release: 33.22%	Utilization w.r.t. Release: 36.60%	Utilization w.r.t. Release: 15.33%	Utilization w.r.t. Release: 50.15%	Utilization w.r.t. Release: 8.83%

Scheme List Table

Drag a column and drop it here to group by that column

GS No	Scheme Name	Year	Approval	Sector	Type	District	Monitoring	Total Cost	Allocation	Expense Up to 3..	Local Capital	Local Revenue	Total Capital	Total Revenue
1	Additional Facilities in Girls Guide B.	2016-17	Approved	School Education	QW-Q220G SC	Rawalpindi		86.480003256	6.6919999122	79.788002014	6.6919999122	0	6.6919999122	0
1	Restoration/Renovation of Govt. Co.	2012-14	Approved	School Education	QW-Q220G SC	Lahore		36.458000182	20	36.399999908	11.666000366	8.3999999084	11.666000366	8.3999999084
1	Construction of E-Mosque at Cadet.	2012-13	Approved	School Education	QW-Q220G SC	Chakwal		153.128000548	0	5	20	0	30	0
1	Restoration of Bay Sanaa Build.	2010-11	Approved	School Education	QW-Q220G SC	Rawalpindi		18.402000427	8	3.4170000553	15.984999936	0	15.984999936	0
1	Additional Facilities in Girls Guide B.	2017-18	Approved	School Education	QW-Q220G SC	Rawalpindi		86.480003256	6.6919999122	79.788002014	6.6919999122	0	6.6919999122	0
1	Establishment of Cadet College Ch.	2011-12	Approved	School Education	QW-Q220G SC	Chakwal		381.17899860	0	273.55801391	0	107.59999847	0	107.59999847
1	Additional Facilities in Girls Guide B.	2014-15	Approved	School Education	QW-Q220G SC	Rawalpindi		78.542999816	20	10	25	5	25	5
1	Additional Facilities in Girls Guide B.	2015-16	Approved	Human Rights	QW-Q220G SC	Rawalpindi		79	29	40	29	0	29	0

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Home ADP Report ADP MPR ADP Analysis

All Years Schemes Overview Dimension Model ferrppndsu

ADP Dimension Modeling

Connect Open Save Export Grid Charts

Format Options Fields Fullscreen

	1	2	3	4	5	6	7	8	9	10
1	SECTOR									
2	TYPE	Total Sum of Total_Cost	Total Sum of Allocation	Total Count of GS_No						
3	(blank)	141 041	24 680	308						
4	Access to Justice Programme	5 069.495000839233	834	62						
5	Agriculture	252 384.40077906847	57 542.99016207456	241						
6	Archaeology	33 849.90890574455	3 974	336						
7	Auqaf & Religious Affairs	5 532.154981613159	990.212993438722	62						
8	Commerce & Investment	573.6019926071169	140	7						
9	Cooperatives	1 114.0680007934563	616	10						
10	District Development Packages/SDP	50 012.49199992616	21 156.80004828125	80						
11	District/TMA Development Programme	108 213.47699776527	80 132.62900011906	28						
12	Emergency Service	46 910.627099990816	9 041.774956803833	80						
13	Energy	134 469.06205368042	60 789.99688965112	77						
14	Environment	4 076.579002300372	995.5879696000814	65						
15	Fisheries	42 058.860039412975	30 355.388007581234	85						

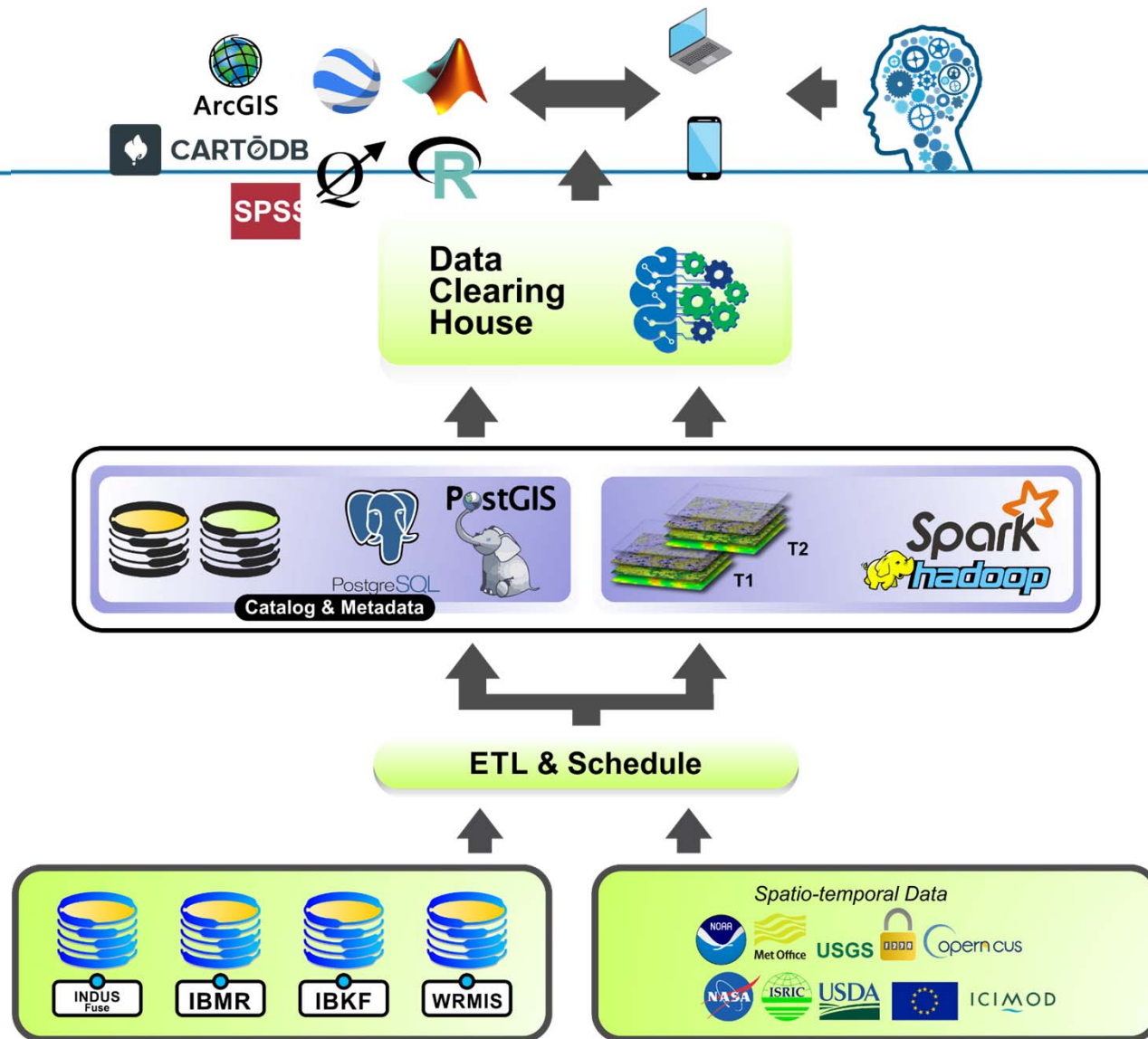
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PLANNED FUTURE EXTENSION

- 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





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.

