



WATER RESOURCES

PUNJAB, Pakistan

Salman Yusuf

Additional Secretary (Technical)

Government of the Punjab

Housing Urban Development and Public Health Engineering Department



18th – 20th September, 2018

6th Global Infrastructure Cooperation Conference

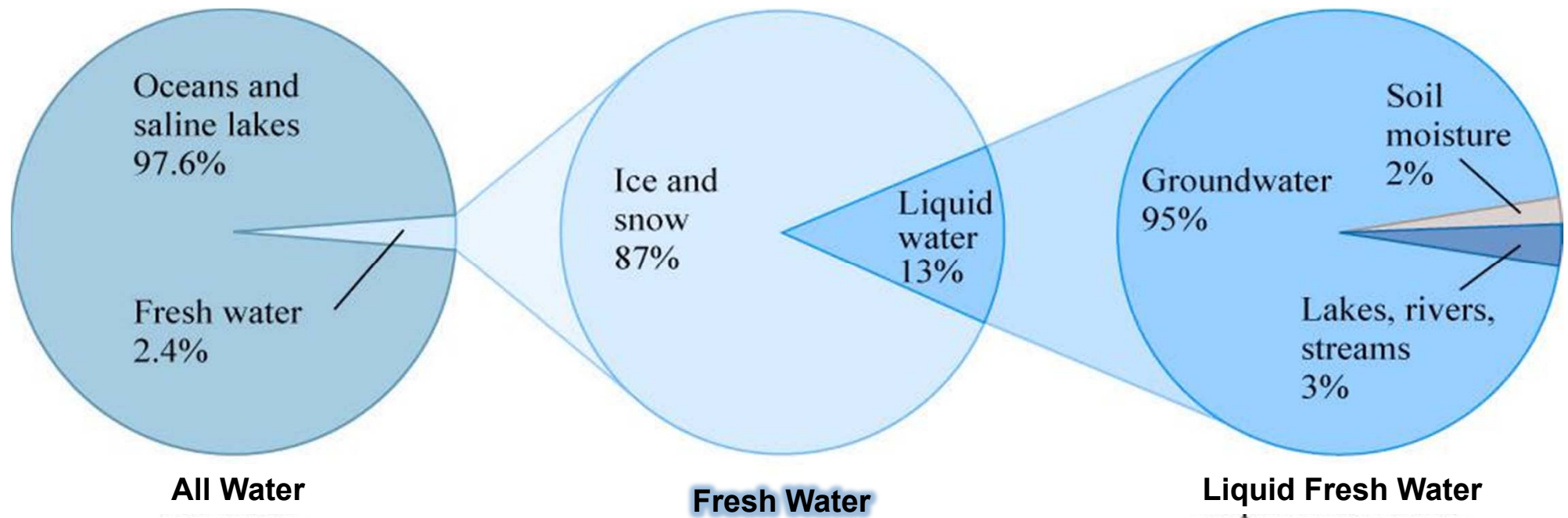
Water

The Basis for Life

We are All
Water Creatures

- 60% of our body
- 70% of our brain
- 80% of our blood

Only 2.4% of global water is freshwater



Less than 1% of all freshwater is readily accessible for human use.

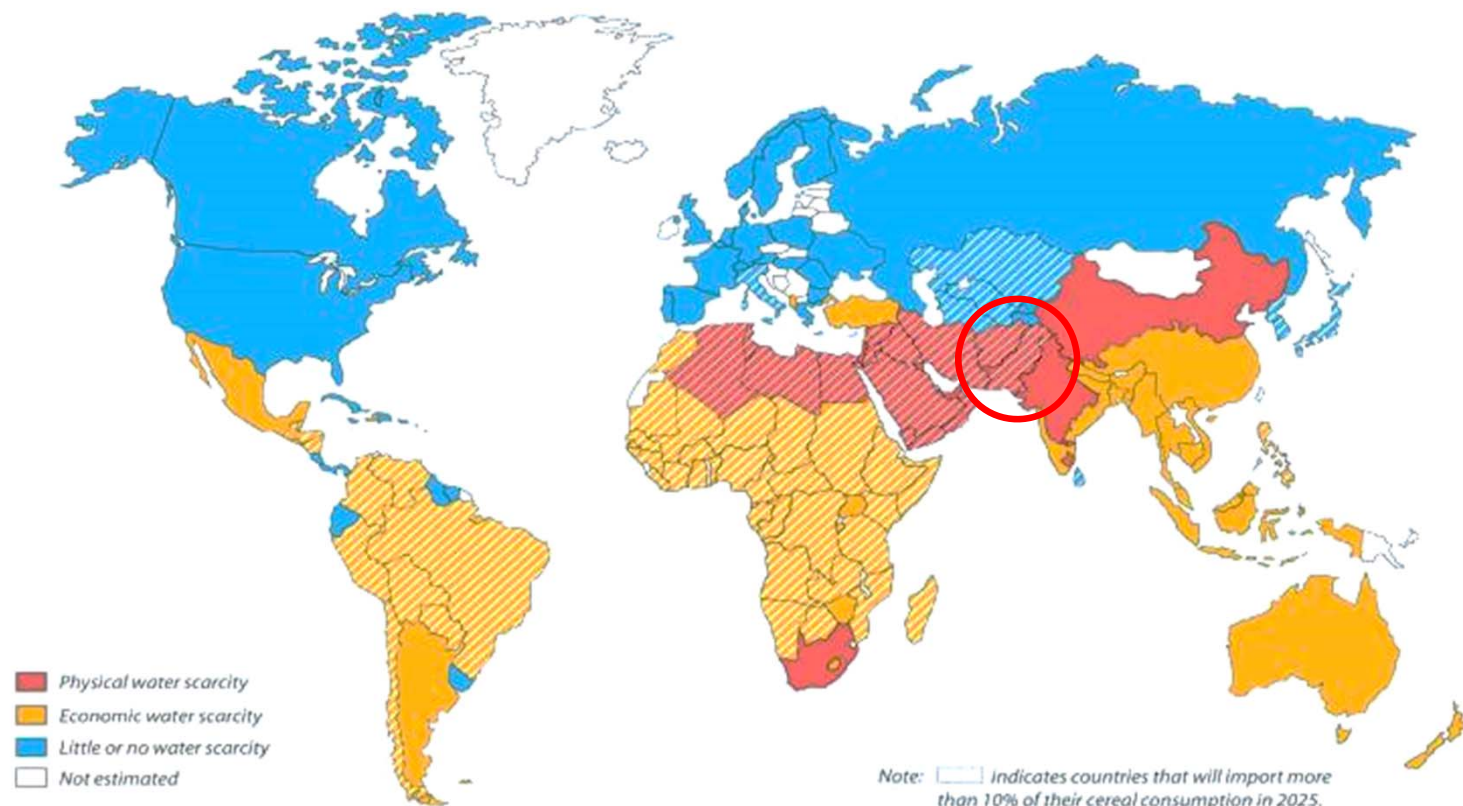
Population

**Increasingly
Scarce
Resource
owing to
change in**

Climate

Consumption
pattern





DTP Unit, IWMI-January, 2000

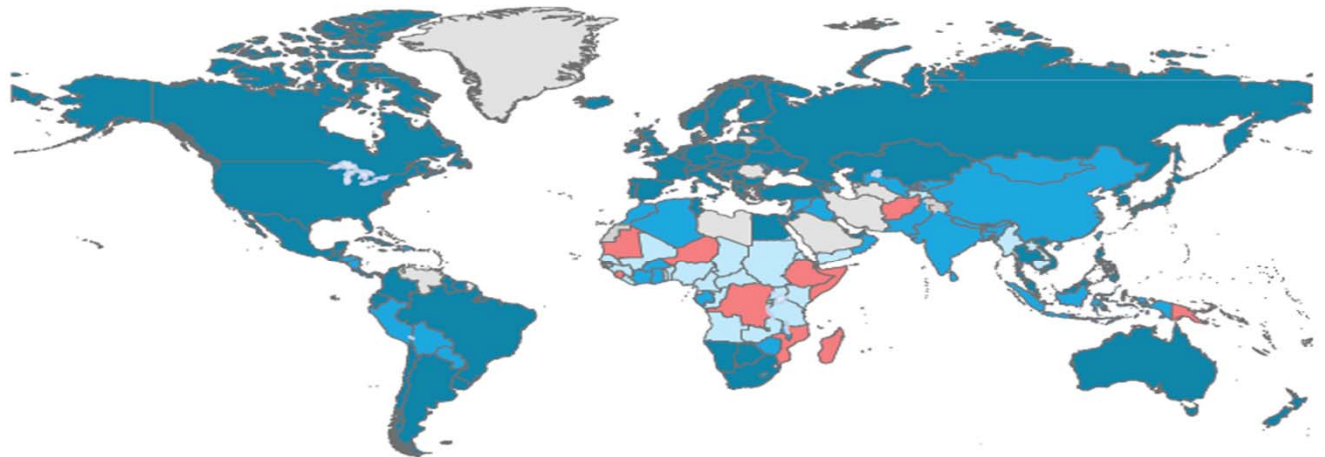


Our water sources are under pressure.

Pakistan, once a water-surplus country, is now a water deficit one... The situation in Pakistan indicates that the country is approaching conditions of chronic water-stress

**Owing to over pumping the
groundwater is depleting**

- ✓ **884 million people in the world do not get their drinking water from improved sources**
- ✓ **73% of the urban population uses piped water from a household connection (developing regions)**
- ✓ **31% of rural inhabitants have access to household piped water supply (developing regions)**



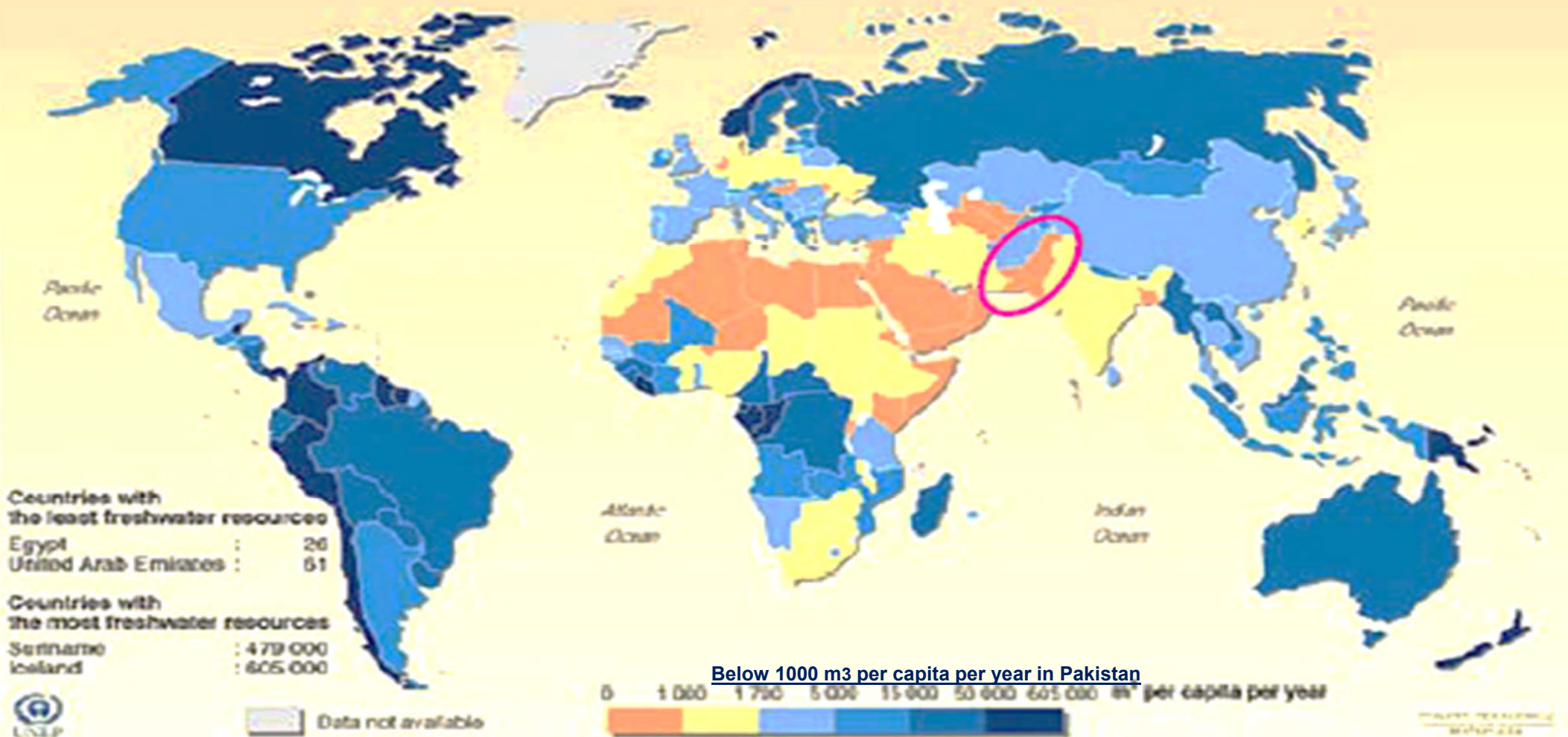


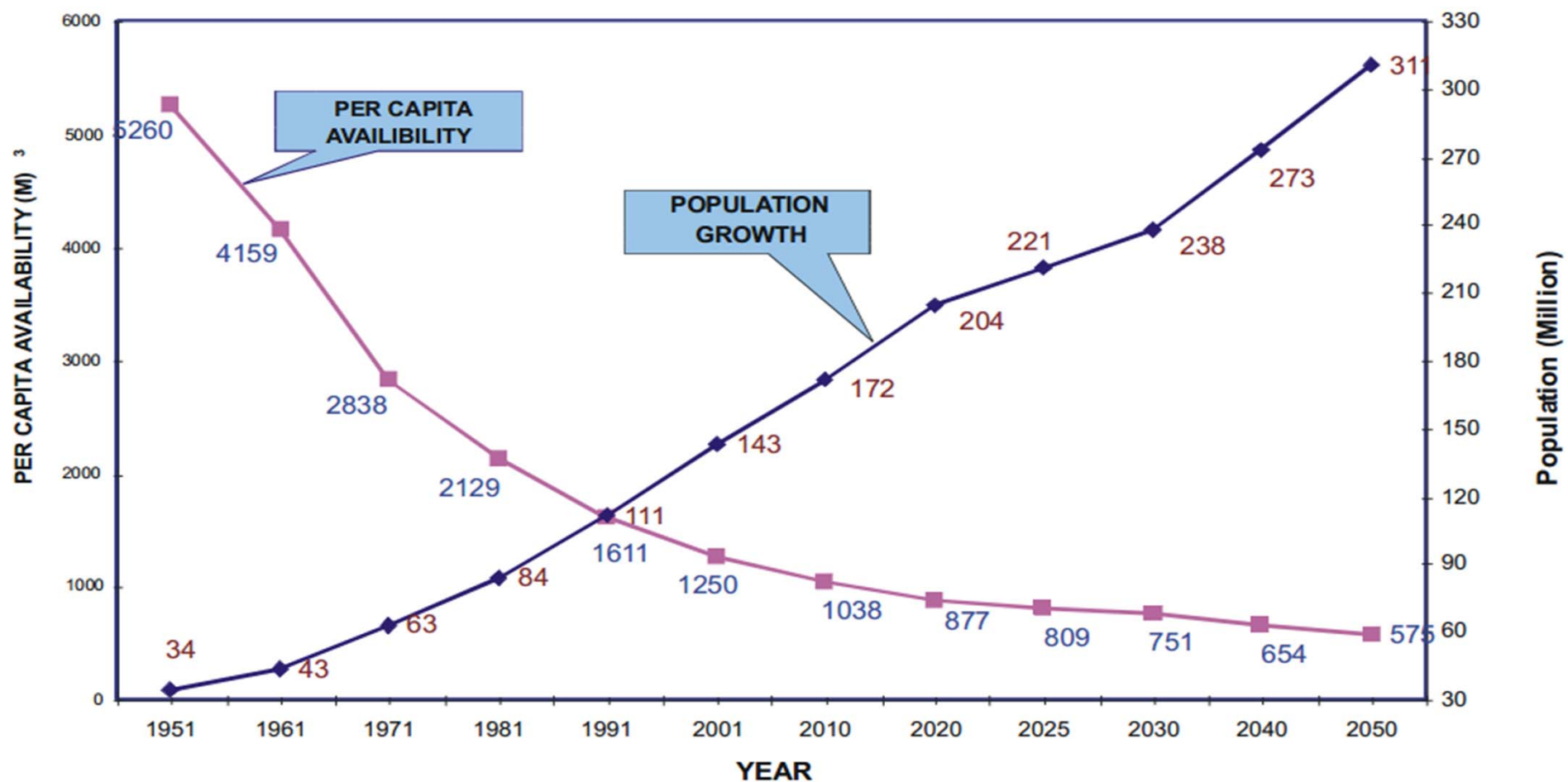
**Provinces
(4)**

**Territories
(2)**

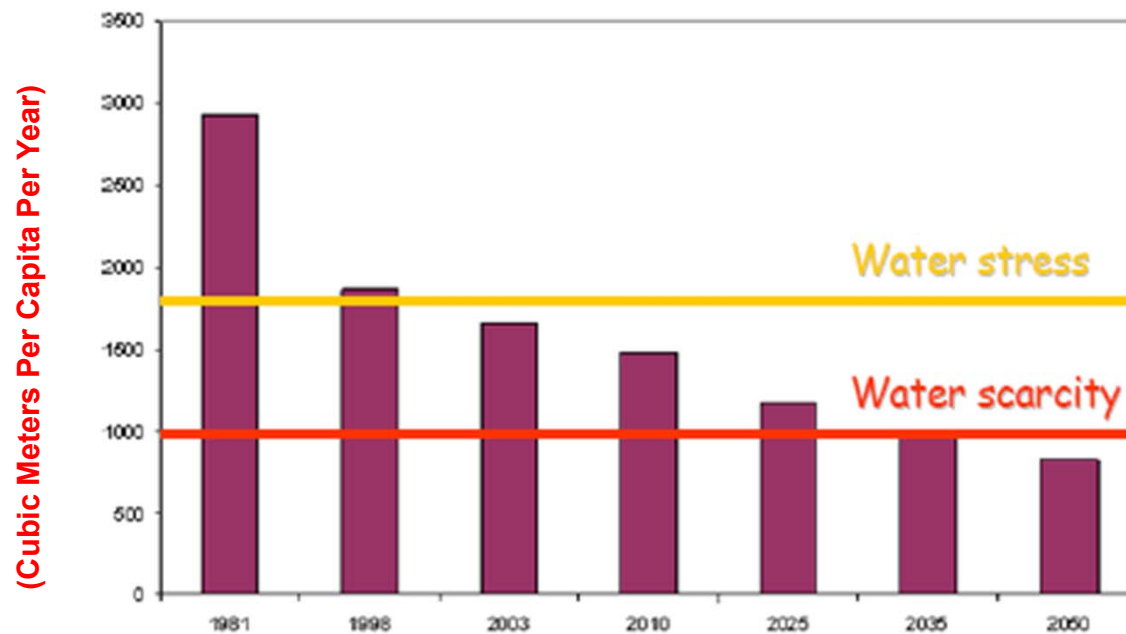
**Area
(881,913 KM²)**

**Total Population
(208 Million)**



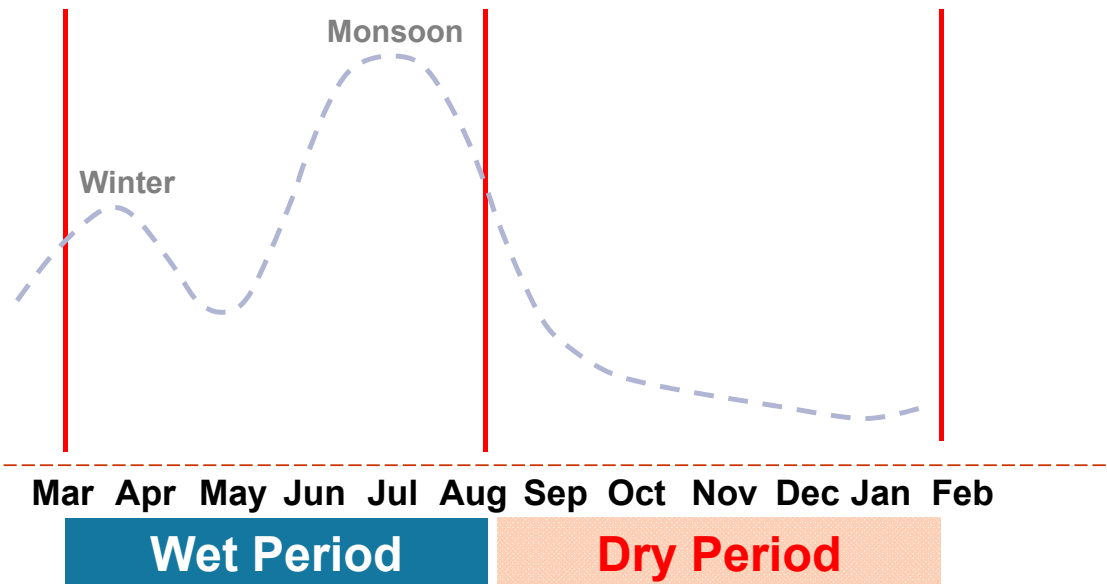


The balance between population and available water already makes Pakistan one of the most water stressed countries of the world



With rapid population growth, it will soon enter a condition of absolute water scarcity

Rainfall



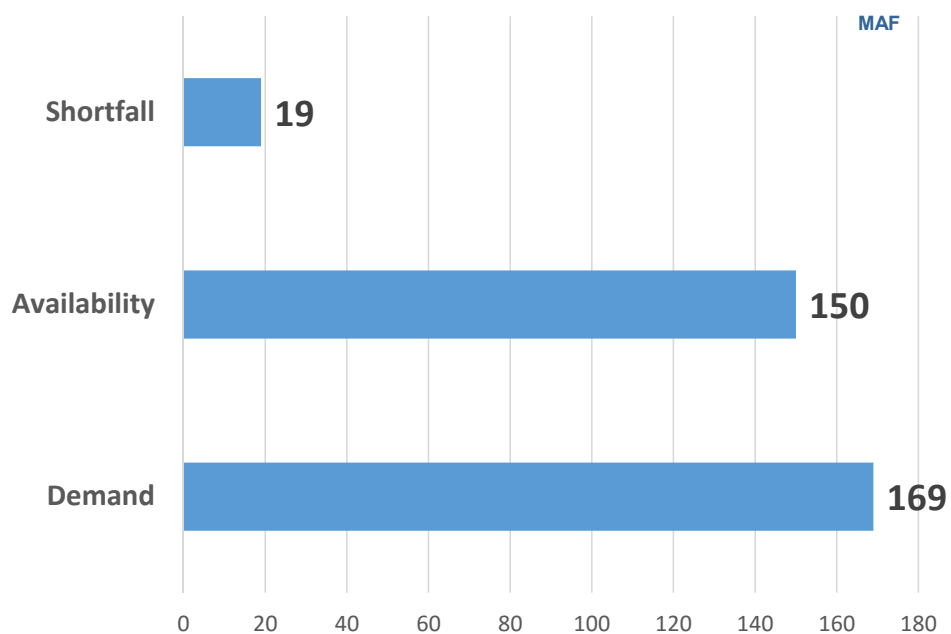
Mostly, rains occur in few months and rest of the year either dry or less rains, then solution is “the storage of water”.

6 Months (Mar – Aug)..... Wet Window

6 Months (Sep – Feb)..... Dry Window

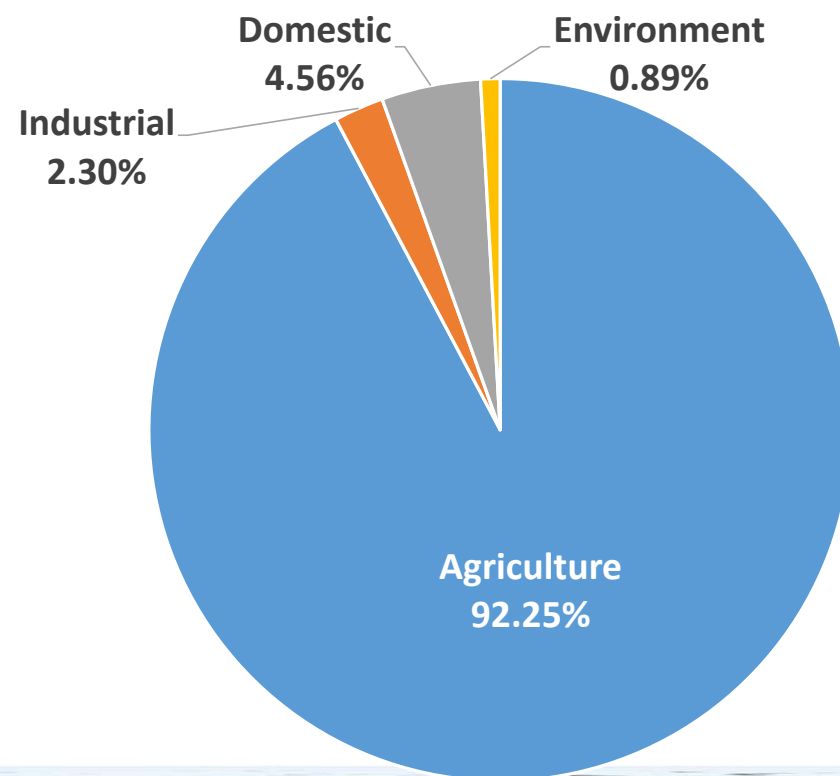
Source: Pakistan Meteorological Department

Water Demand vs Availability



(Availability of Surface Water is 99.73 MAF and Ground Water 50.62)

Water Use by Sectors



Surface Water



- Dams
- Rivers
- Canals
- Lakes
- Ponds
- Streams

Ground Water



- Handpumps
- Motorpumps
- Tubewells
- Wells

Springs



- Gravity
- Artesian

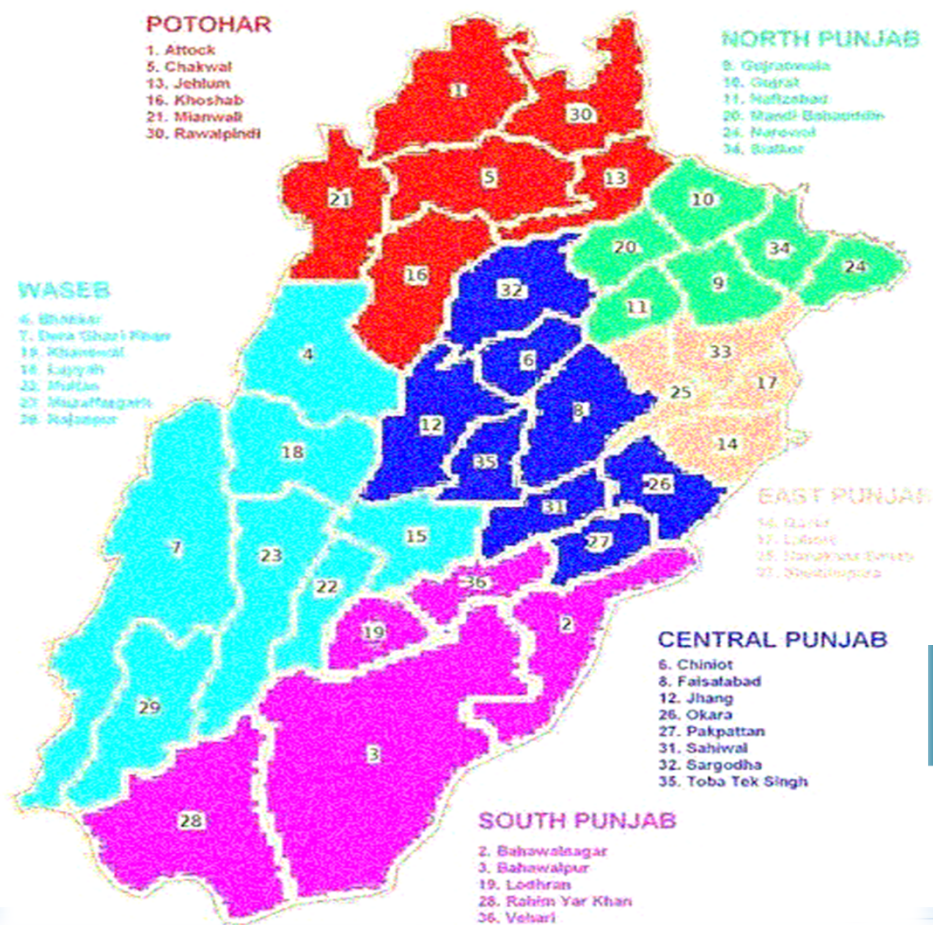
Area: 205,344 km²

Under Weight
Prevalence
33.7%

Stunting
Prevalence
33.5%

Incidence of
Diarrhea
17.4%

Under Five
Mortality Rate
96 per 1000 lives



Civil Divisions
(9)

Districts
(36)

Tehsils
(145)

Villages
(25,914)

Total Population
(110 Million)

- **Most populace province 53%**
- **High Rural Population 68%**

Dam

Mangla



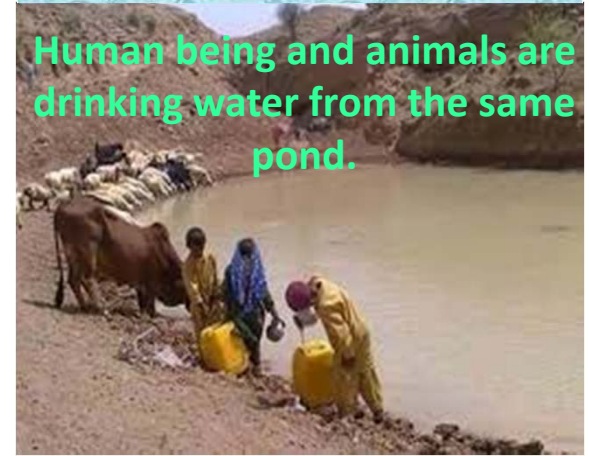
Barrage

Jinnah



Ponds

Human being and animals are drinking water from the same pond.



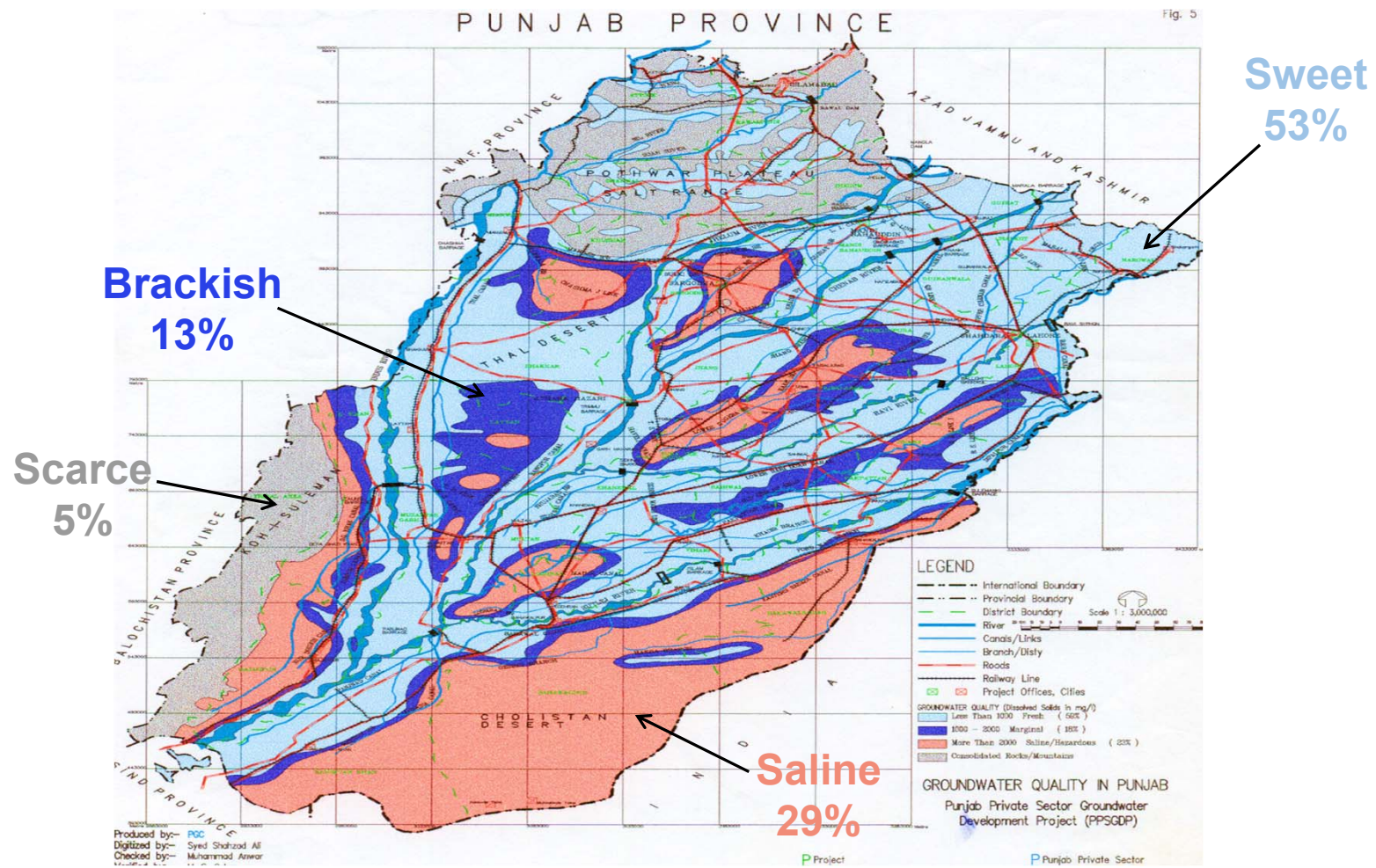
- Dams (55)
- Barrages (13)
- Siphon (2)
- Rivers
- Canals (12 Link & 13 Major)

- Unfortunately no big dam is located within Punjab.
- Mangla Dam (located at the boundary of Punjab and AJK) is the second largest dam. H:147m (482ft), 5.88 MAF, 1120 MW Power capacity

Chashma



- Ponds (South Punjab and Pothohar Region)
- Lakes
- Streams
- Irrigation System 34,500 KM)

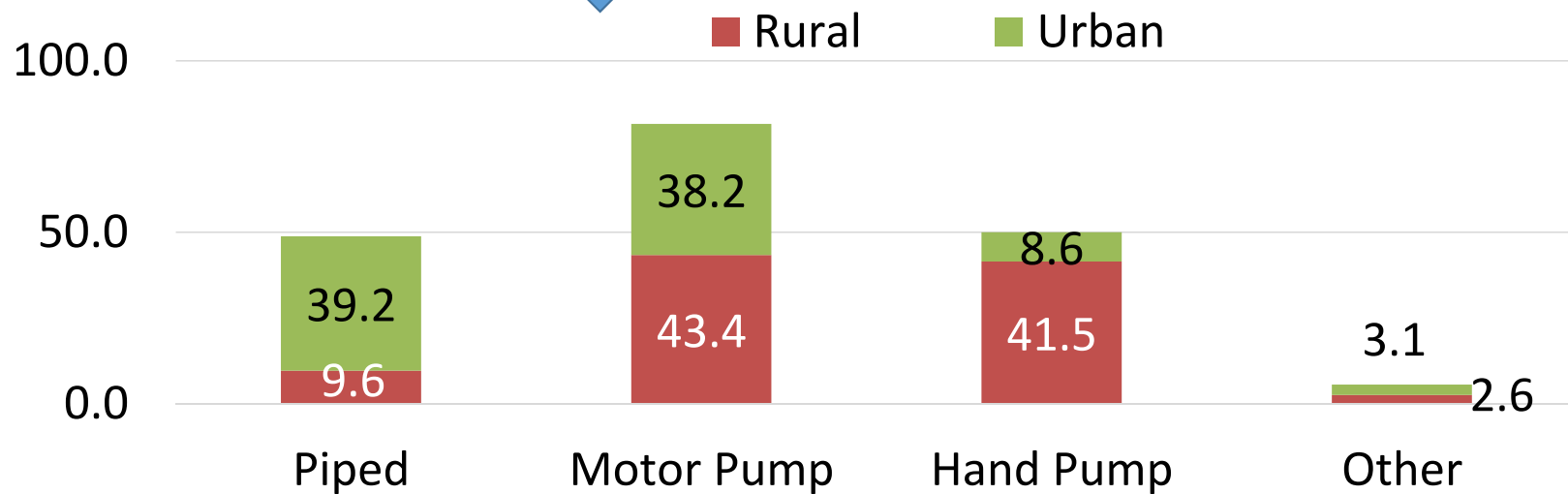




Use of improved
drinking water
source

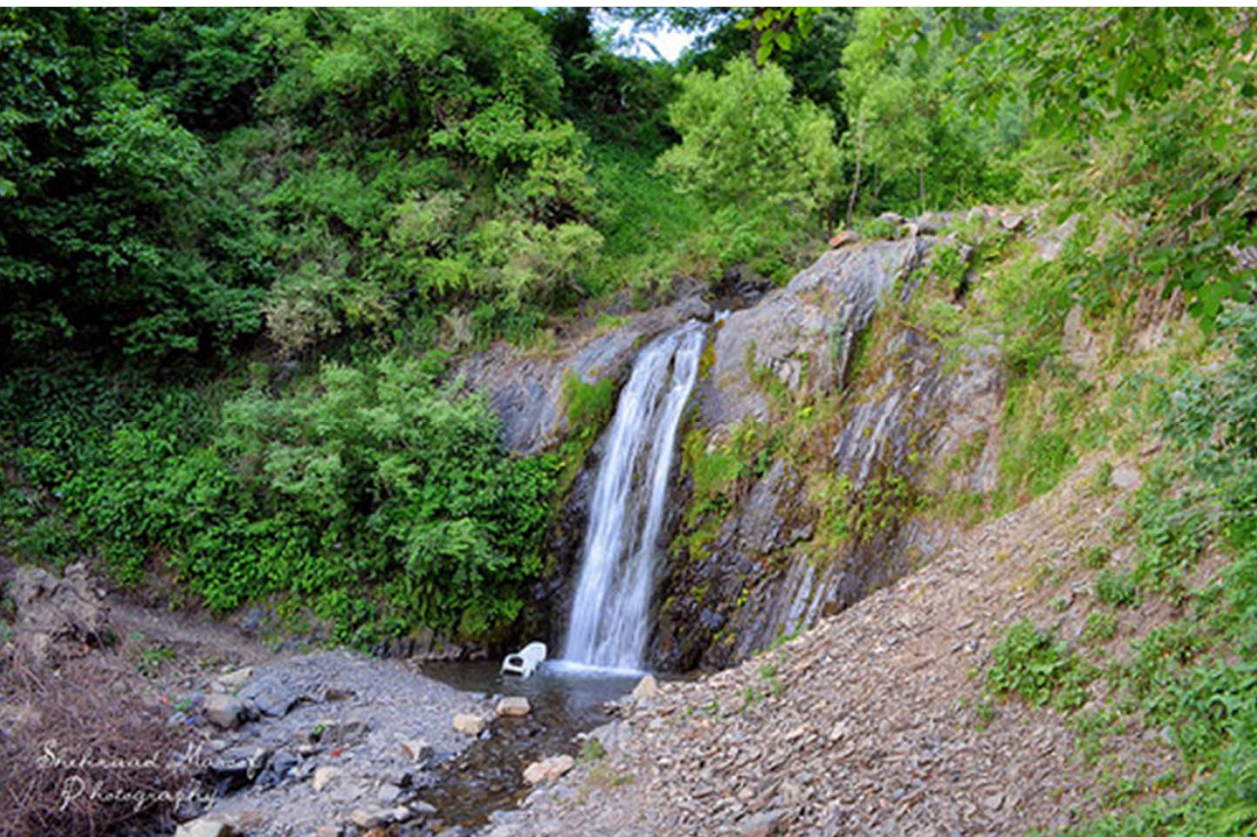
94%

- 81% sources are available within premises
- 35% sources are safe

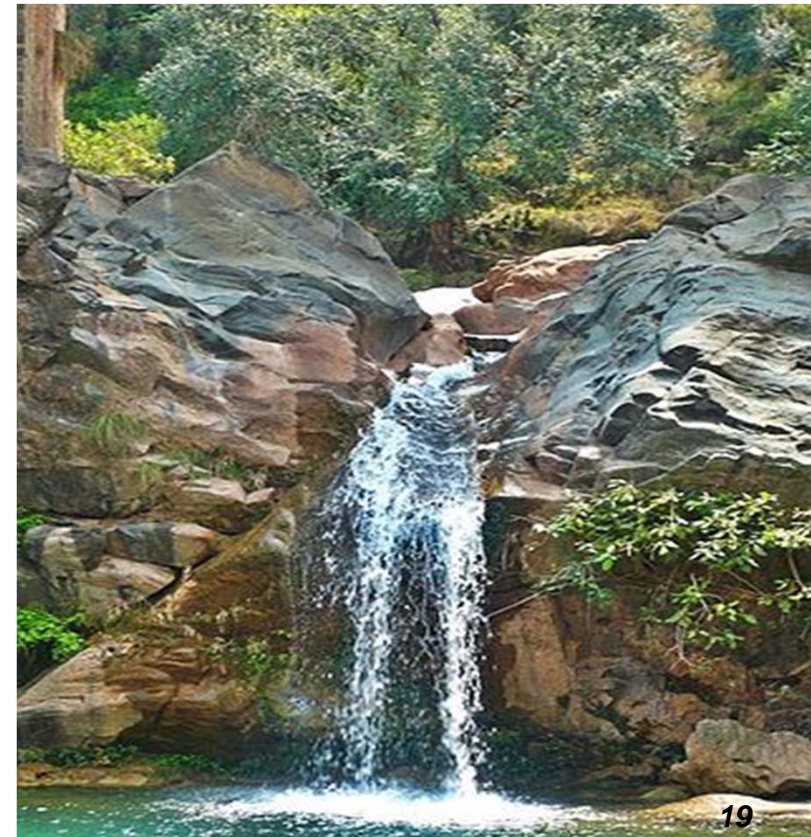


Springs exit in Pothohar Region and other hilly areas of Punjab

Near Murree



Nela Sandh Kotli Sattian





Act

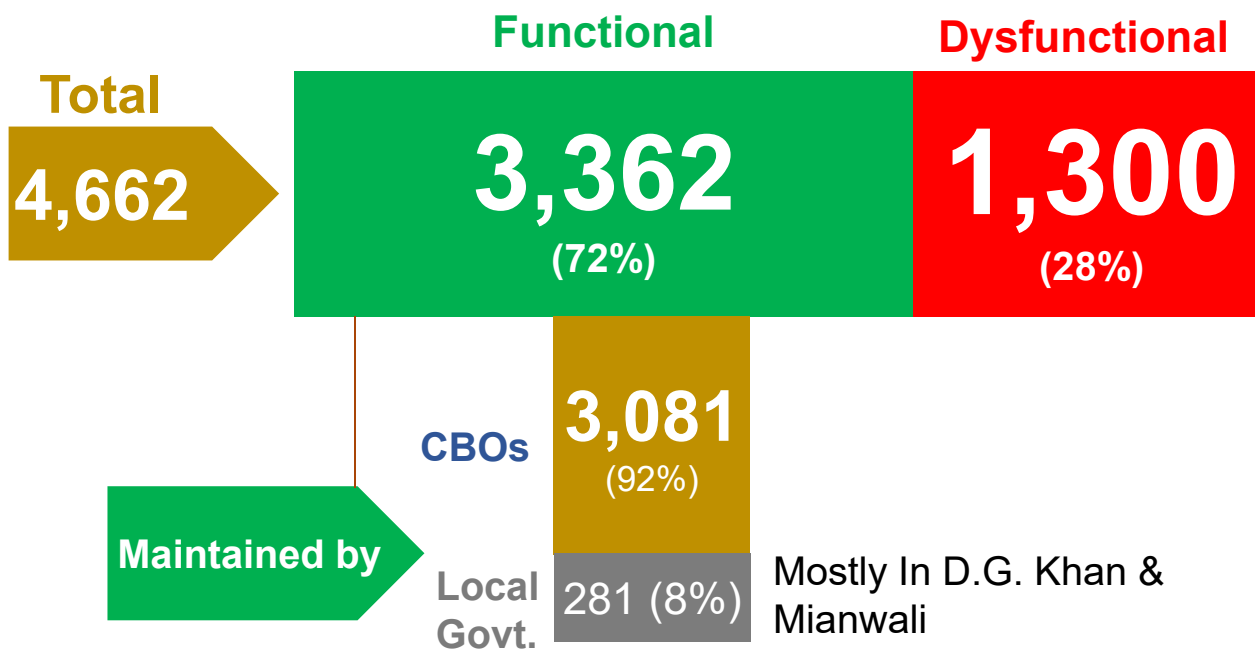
- Punjab Municipal Water Act under process of approval

Policy

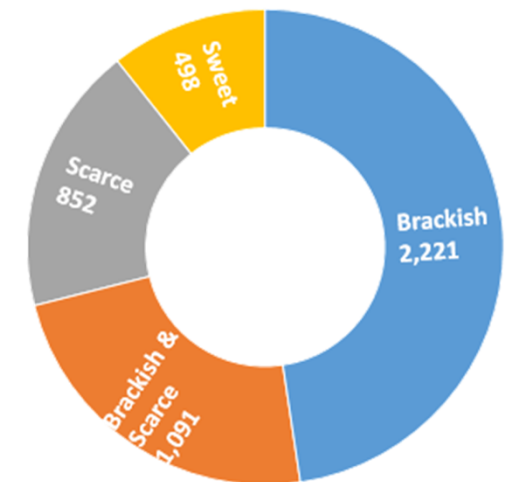
- Pakistan has approved National Water Policy 2017
- Punjab Drinking Water Policy approved in 2011 which is under revision to align with SDGs
- Punjab Sanitation Policy under process of approval

Sector Development Plan

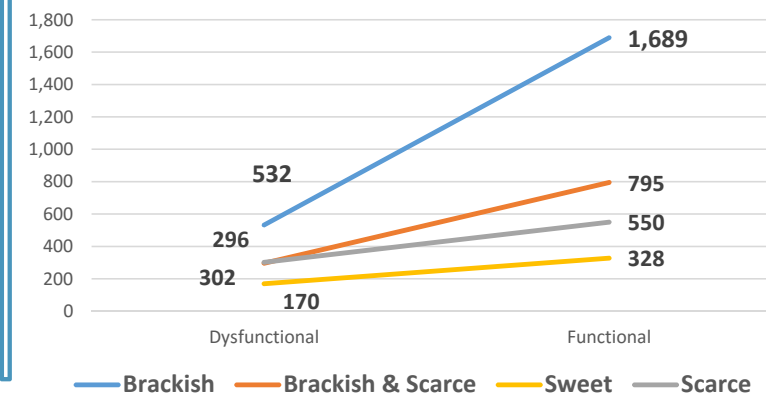
- WASH Sector Development Plan launched in 2015 defining strategies for the period of 2014-24
- Human Resource Development Plan developed in 2017



Water Quality Area Wise Formation of RWSS



Functionality Trend - RWSS



Indicator		Lahore	Faisalabad	Rawalpindi	Gujranwala	Multan
Total Population		8 M	3.20 M	1.5 M	2.03 M	2.2 M
Population Served		7.2 M	2.40 M	1.35 M	0.75 M	1.21 M
Water Demand for the Served Population (MGD)		540	160	60	50	103
Total Water Production (MGD)		540	110	54	49.50	103
Water Production Through Tubewells (MGD)		540	95.5	40	49.50	103
Water Production From Surface Water Source (MGD)		0	14.5	14	0	0
No. of Tubewells		575	86	410	67	102
Water supply system (KMs)		5,826	1,487	1,000	617	1,448
No. of Water Connections		700,000	125,000	128,180	35,875	72,000
Water Filtration Plants	Operational	449	Nil	146	Nil	32
	In Process	Nil	Nil	15	Nil	50
Surface water plants	Operational	Nil	3	1	Nil	Nil

Sr. No.	Agency	Proposed Source of Surface Treatment Plant	Estimated Cost (Rs. Billion)	Source of Funding	Feasibility Study	PC-I Status	Execution
1	WASA Lahore	50 MGD – BRBD / Ravi Syphon	25	AIIB & GoPb	Completed	Under process for approval	Dec 2018 to Dec 2021
2	WASA Faisalabad *	30 MGD - LG Branch	14	AFD & GoPb	Completed	Approved by ECNEC	Sep 2018 to Sep 2021
3	WASA Rawalpindi **	6 MGD - Chahan Dam	5	GoPb	Completed	Under process for approval	
4	WASA Multan	River Chenab	--	GoPb	ADP 2018-19		
5	WASA Gujranwala	Upper Chenab Canal	--	GoPb	ADP 2018-19		

* Surface Water Treatment facility of 10 MGD – RB Canal, Jhal Khanuana, Faisalabad

** Surface Water Treatment facility of 28 MGD – Rawal Dam, Rawalpindi

Sr. No.	Name of Project	Cost (Rs. In Million)	Funded By
1	Rehabilitation of dysfunctional Rural Water Supply Schemes (324)	1,700	ADP
2	Replacement of Outlived water supply lines in Lahore	1,758	ADP
3	Improvement of water supply system in MA Johar town and Tajpura zones including installation of filtration plants, Lahore	1,668	ADP
4	Energy Saving in Water Supply System in Lahore (Energy saving through Replacement of Inefficient & Outlived 105 Tubewells in WASA, Lahore).	2,351	JICA
5	Replacement of outlived water supply pipelines, Rawalpindi.	500	ADP
6	Augmentation of Water Supply for Rawalpindi from Chahan Dam	5,600	ADP

Sr. No.	Name of Project	Cost (Rs. In Million)	Funded By
1	Extension of Water Resources for Faisalabad City Phase-II	13,829	French Republic(AFD) + GoPb
2	Construction of Surface Water Treatment Plant near Ravi Syphon, Lahore cleared by Planning Commission of Pakistan (50mgd)	26,000	AIIB
3	Replacement of water pumping machinery at Inline Booster Pump Station and Terminal Reservoir in Faisalabad (JICA Grant Aid)	1,457	JICA, Japan
4	Performance Based Contract for Reduction of Non-Revenue Water (NRW), Faisalabad	5,000	World Bank
5	Augmentation / Enhancement of Surface Water Treatment Plant Jhal Khanuana Faisalabad, Construction of Overhead Reservoirs in Priority Area and Improvement of Water Supply Network System in Priority Area proposed by JICA	5,800	JICA, Japan

Sr. No.	Plant Name	Capacity (MGD)	Cost (Rs. in Billion)	Source of Funding	Concept Design / PC-I preparation	Start of execution	Completion
1	Mehmood Booti WWTP	68	9.00	AIIB & GoPb	March 23 rd 2018	Dec., 2018	Dec., 2020
2	Shadbagh WWTP	88	10.00				
3	Shahdara WWTP	54	8.00				
4	Babu Sabu WWTP	256	35.00	World Bank & GoPb	March 23 rd 2018	Dec., 2018	Dec., 2021
5	Mohlanwal WWTP	--	--	Feasibility Study to be taken up in ADP 2018-19			
6	Ferozpur Road near Hudiara WWTP	--	--				

Sr. No.	Plant Name	Capacity (MGD) Tentative - JICA	Cost (Rs. in Billion) Tentative – JICA	Source of Funding	Feasibility Conducted	Detail Designing / PC-I Approval	Start of execution	Completion
1	Eastern WWTP at Maduana Drain	150	24.00	DANIDA & GoPb	Under process	Sep 2018	Jan 2019	Jan 2022
2	Extension / Rehabilitation of Chokera WWTP	40	15.00	WB Consent & GoPb	Under process	Sep 2018	Jan 2019	Jan 2022
3	Southern WWTP	100	20.00	GoPb 2019-20	Under process	Mar 2019	Jan 2020	Jan 2023

Sr. No.	Plant Name	Capacity (MGD)	Cost (Rs. in Billion)	Source of Funding	Detail Designing / PC-I Approval	Remarks
1	Gorakhpur / Adyala WWTP	100	20.00	GoPb ADP 2019-20	Apr., 2019	Rs. 80 million (Supplementary grant) allocated in 2017-18 for up-dation of feasibility

Sr. No.	Plant Name	Capacity (MGD) Tentative	Cost (Rs. In Billion) Tentative	Funding	Remarks
1	At Mir Shikaran Drain	110	15.00	ADP 2020-21	Rs. 100 million (Supplementary grant) allocated in 2017-18 for feasibility
2	At Adhorai Drain	52	9.00	ADP 2021-22	

Sr. No.	Plant Name	Capacity (MGD)	Cost (Rs. in Billion)	Source of Funding	Detail Designing / PC-I Approval
1	South West WWTP	238	37.00 (Rs. 7.00 Billion Land Acquisition)	GoPb ADP 2018-19	PC-I prepared

- **More than 500 Small / Mini Dams will be constructed**
- **Near About 2 MAF runoff will be trapped**
- **600,000 acre Land irrigated through small dams**
- **Extension of Water Supply and Sanitation services to 100% population of the region (more than 17 million)**
- **Generation of Hydel Power to meet needs of local as well as other areas**





**36 Water Quality
Laboratories in
Punjab**



**5 Mobile Water
Testing
Laboratories
(Vehicle mounted)**



**36 Mobile Water
Testing
Laboratories
(Motor Bike
mounted)**



**36 Delagua Water
testing Kits on 72
parameters**



Too much water



- Heavy Rainfall
- Floods
- No conservation system / Infrastructure development
- Deforestation

Too little water



- Squeezing rainfall season
- Aquifer Depletion
- Dry rivers
- Regional conflicts
- Wastage of water

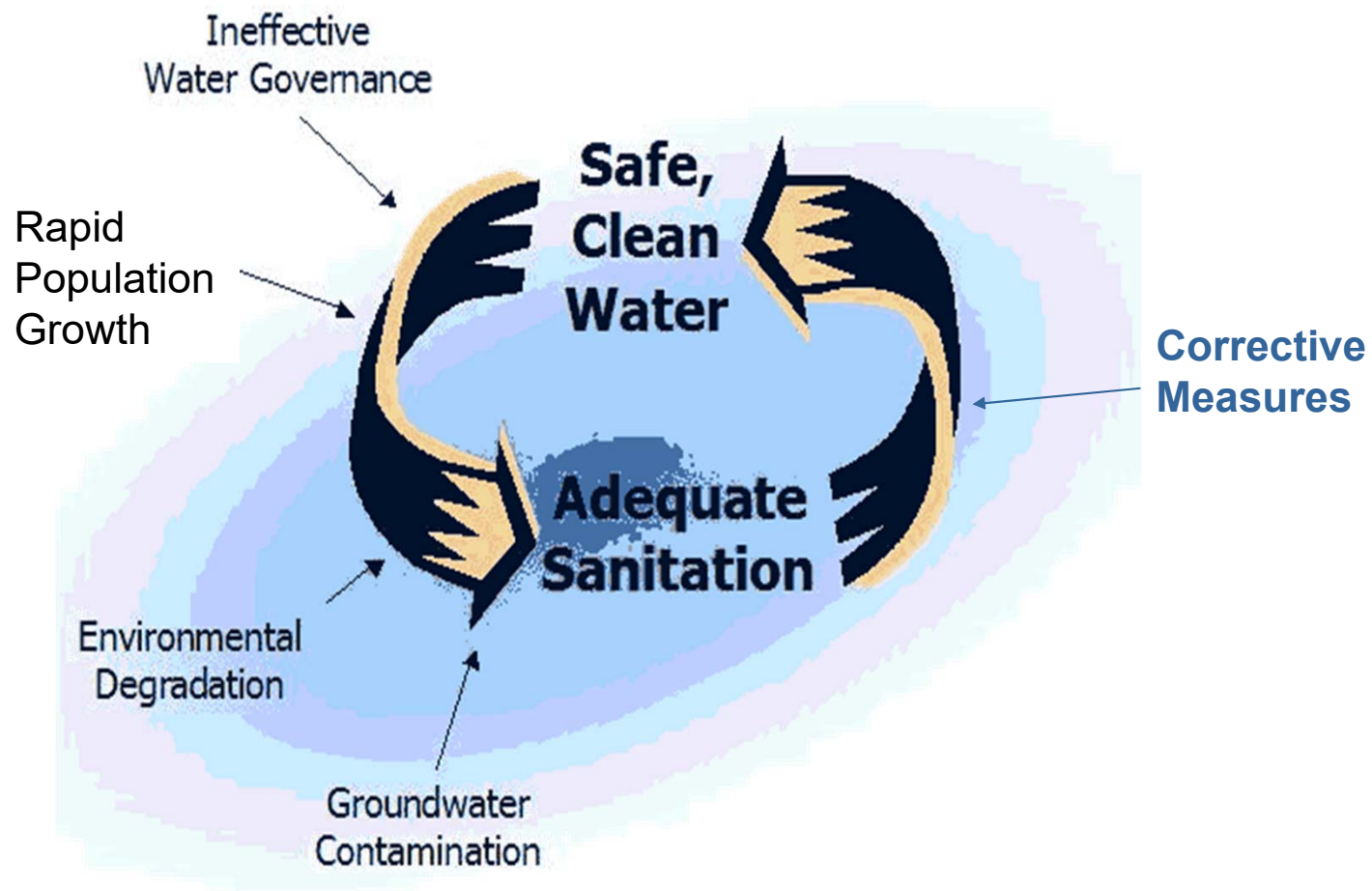
Poor-quality water

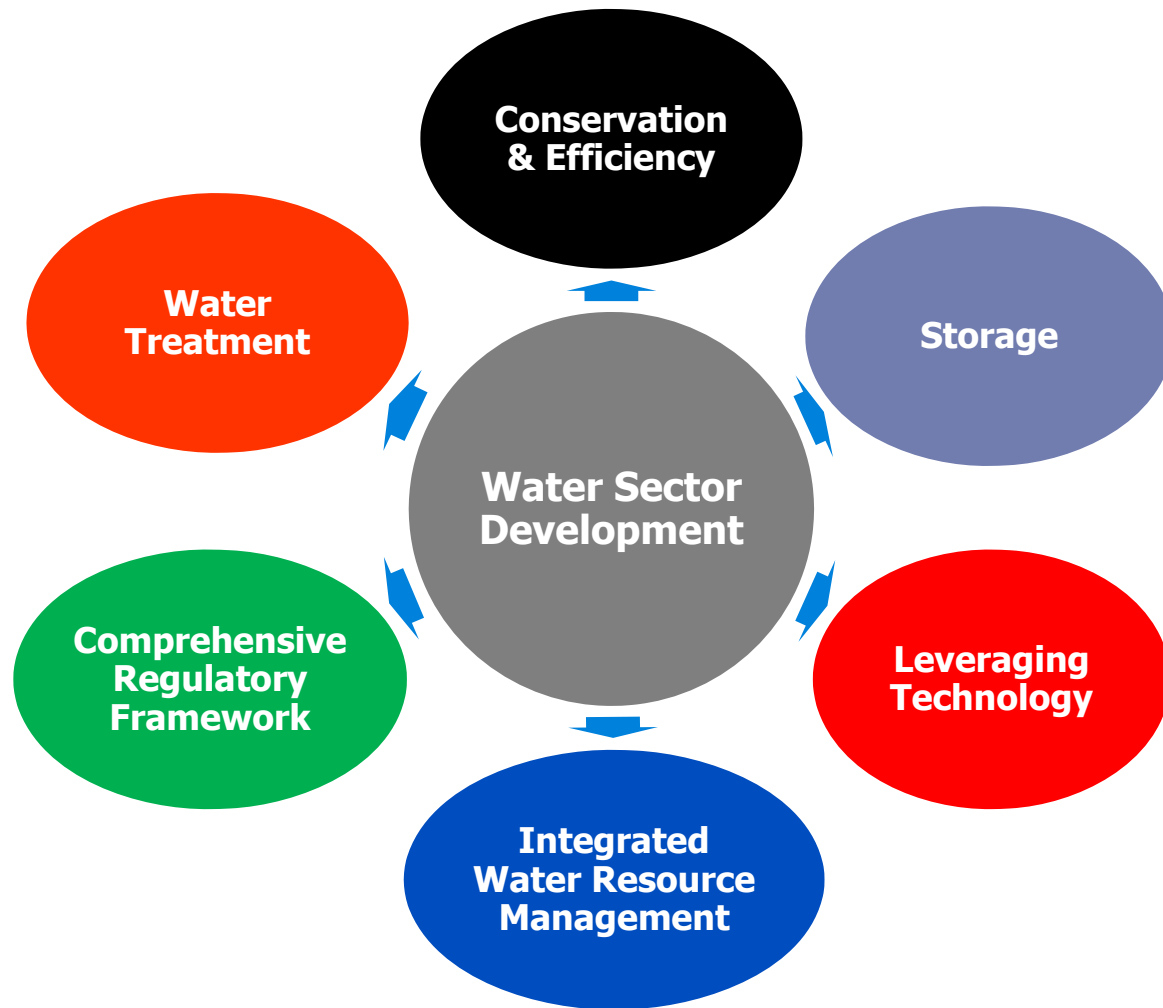


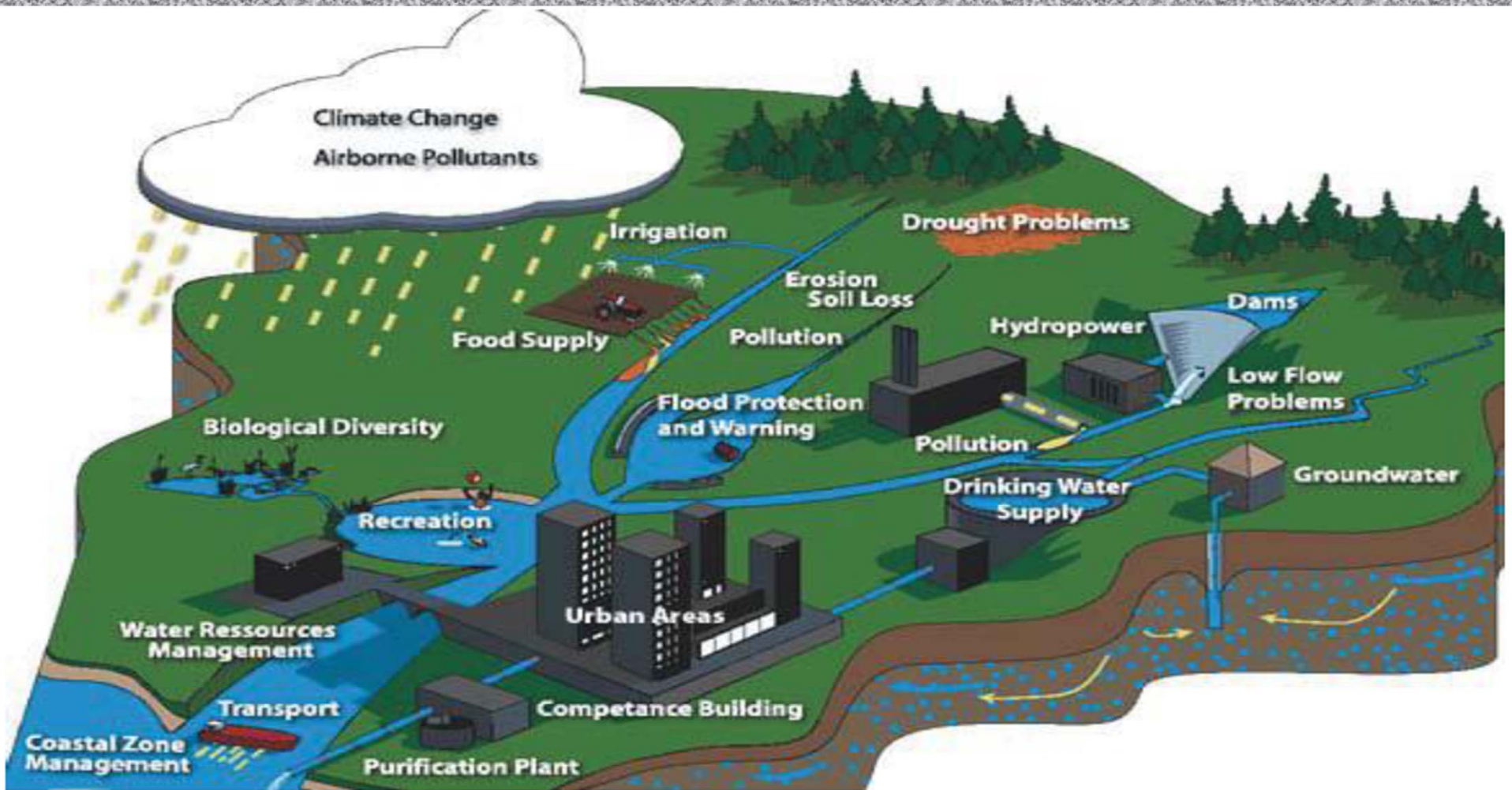
- Discharging untreated Industrial, Agriculture & Domestic wastewater
- Unprotected systems
- High brackish and saline area

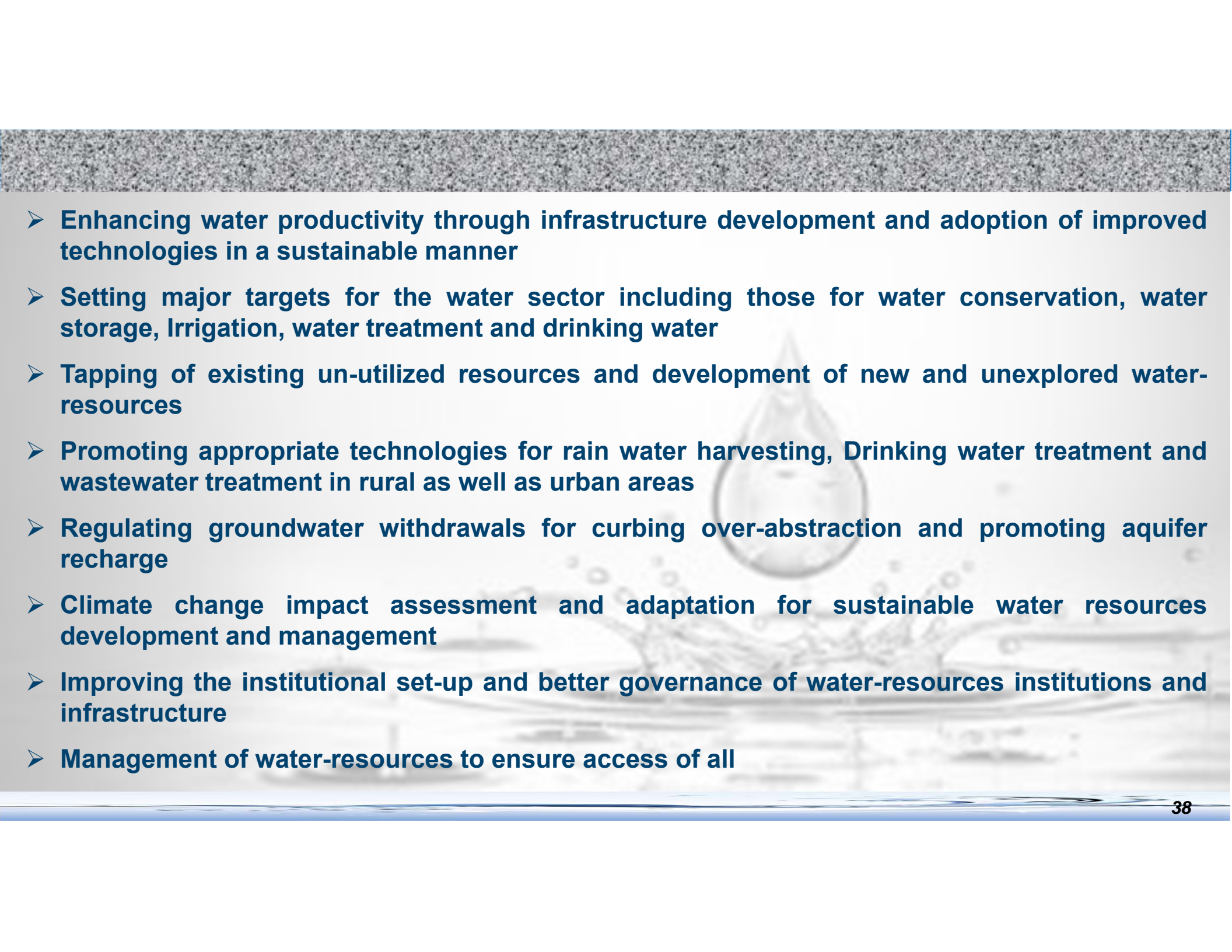
It's time to give water a second thought.

- ❖ **Use less**
- ❖ **Save more**
- ❖ **Advocate always**







- 
- **Enhancing water productivity through infrastructure development and adoption of improved technologies in a sustainable manner**
 - **Setting major targets for the water sector including those for water conservation, water storage, Irrigation, water treatment and drinking water**
 - **Tapping of existing un-utilized resources and development of new and unexplored water-resources**
 - **Promoting appropriate technologies for rain water harvesting, Drinking water treatment and wastewater treatment in rural as well as urban areas**
 - **Regulating groundwater withdrawals for curbing over-abstraction and promoting aquifer recharge**
 - **Climate change impact assessment and adaptation for sustainable water resources development and management**
 - **Improving the institutional set-up and better governance of water-resources institutions and infrastructure**
 - **Management of water-resources to ensure access of all**

A dynamic background image featuring a large, stylized splash of water in shades of blue and white, with numerous bubbles and droplets scattered throughout, creating a sense of movement and freshness.

THANK YOU

고맙습니다