

# Water Crisis

◦ Prophet Muhammad (S.A.W) said "if you are performing ablution river."

◦ We forget that water cycle and life cycle are one.

- Jacques Yves Cousteau

◦ When the well is dry we know the worth of water.

- Benjamin Franklin

◦ The two defining issues of this century are both universal but felt locally: the global water crisis and the resources boom.

- Jay Weatherill

"Don't waste water even if you are at running stream."

## UN Data

"An area is experiencing water stress when annual water supply drops below  $1700 \text{ m}^3$  per person."

"Water scarcity can be scarcity in availability due to physical shortage, or scarcity in access due to the failure of institutions to ensure a regular supply or due to lack of inadequate infrastructure."

◦ Water use has been growing globally at more than twice

## Falkenmark Waterstress Indicator

◦ water stressed =  $< 1700 \text{ m}^3 / \text{capita}$

◦ water scarce =  $< 1000 \text{ m}^3 / \text{capita}$

◦ Absolute water scarcity = if falls below  $500 \text{ m}^3 / \text{capita}$

even flowing

the rate of population increase in the last century, and an increasing number of regions are reaching the limit at which water services can be sustainably delivered.

## Facts and Figures

- 72% of all water withdrawals are used by agriculture, 16% by municipalities for households and services and 12% by industries. UN-Water 2021
- Over 2 billion people live in countries experiencing high water stress. UN 2018
- 3.2 billion people live in agricultural areas with high to very high water shortages or scarcity, of whom 1.2 bn people, roughly one sixth of world population live in severely water constrained agricultural areas. FAO-2020
- UN Research

Nearly half of the global population are already living in potential water scarce areas at least one month per year and this could increase to some 4.8-5.7 billion in 2050. About 73% of the affected people live in Asia.

## Opportunities

- Water should be treated as scarce source, with a far stronger focus on managing demand. Integrated water resources management provides a broad framework for governments to align water use patterns with the

needs and demands of different user, including the environment.

## Water Crisis in Pakistan

- The Global Climate Risk Index (CRI) 2020 released on January 15<sup>th</sup>, 2020, ranked Pakistan 5<sup>th</sup> among the countries most vulnerable to climate change. The country suffered economic losses worth \$ 3.8 bn, lost 9,989 lives and witnessed 150 extreme weather events from 1999 to 2018. It further reported that Pakistan's vulnerability to climate change is also increasing.
- Pakistan Council of Research in Water Resources, 2016 Pakistan crossed water "stress line" in 1990 and "water scarce" line in 2005.
- Al-Jazeera Since 1988 the snow line in northern Pakistan has receded by 1.1 km. What scientists thought wasn't possible in 1000 years has happened within 30 years.
- International Monetary Fund has not only ranked Pakistan third in the world among countries who are faced with acute water shortage but also ranked Pakistan fourth in the list of most water consuming countries.

## Development Advocate, Issue 4, UNDP

Water shortage capacity in Pakistan has decreased to less than 30 days against the minimum requirement of 120 days.

## NASA's Gravity Recovery and Climate Experiment (GRACE)

Based upon the data NASA's GRACE satellite collected between 2003 and 2013, the Indus Basin Aquifer in Pakistan and India is the most overstressed in the world, second only to Arabian Aquifer.

- According to Pakistan Council of Research in Water Resources

Pakistan has one of lowest water use efficiency when it comes to a crop yield/hectare. In case of wheat, it stands at 0.5 kg/cubic metre compared with 1 kg/cubic metre in India, despite having similar climate and land characteristic. WUE should be ↑ to atleast 25%.

## IMF Report

in a 2015 projects that reach 274 MAF by 2025 will be unchanged at 191 MAF. Approximate gap will be witnessed as a

## National Annual Plan 2019-2020

The per capita availability of water has decreased from water abundant country with 5,260 cubic meters per year in 1951 to around 1000 cubic meters in 2016, with rapidly growing population, heading towards a situation of water shortage. This quantity is likely to further decline to around 860 cubic meters by 2025, making the country's transition from water stressed to water scarce.

## WIAPDA

Report in 2018 regarding water requirement and water supplied in the year 2018.

Cities	Water required	Water Supplied / Receiving
Islamabad	176 mgallons / day	84 mgallons / day
Lahore	696 mgallons / day	484 mgallons / day
Karachi	1,100 mgallons / day	600 mgallons / day
Peshawar	280 mgallons / day	126 mgallons / day
Quetta	45 mgallons / day	28 mgallons / day

### o RSA letter to Federal Government Feb 2015

Asking for the freeze of country's entire development budget for the next five years, and divert it towards the construction of major water reservoirs on a war footing.

## Causes of Water Crisis in Pakistan

### • Climate Change

The major impacts of climate change are already visible in the country in the form of changing hydrological cycle, changing precipitation pattern, frequency and intensity of heat wave, water availability and water induced natural disasters.

### - The Global Climate Risk Index 2020

### • Population Increase

Pakistan is the fifth largest country in the world with more than 220 million people. By 2025, Pakistan's water demand could reach 274 MAF while the supply of the water could remain 191 MAF. Rapid growth of population has reduced annual water availability per person which is huge challenge for country.

## Urbanization

Urbanization is also a paramount reason behind water crisis, as requirement of water in urban areas is more compare to rural areas owing to commercial and industrial purposes. Therefore in most crowded cities, availability of water has become a grave issue.

## Agriculture

The mostly grown crops in the water like rice, wheat, cotton management in Pakistan is agriculture sector. Pakistan has that causes a 60 percent

- Continued Plantation of water intensive crops.

According to report of Federal Commission on agriculture

- cultivation of water-loving crops ↑
- Rice and sugarcane tops the chart
- It takes 3000l → 1kg rice.
- 1500l → 1kg of Sugarcane

## Low Storage Capacity

The situation of water scarcity has arisen owing to outdated water storage system and mismanagement of water resources by the government. No big dams have been built in the last 50 years to store water. Tarbela Dam and Mangla Dam are the only two big Dams of Pakistan. By 2018, both had reached their "dead levels", meaning that don't have enough water to operate.

Pakistan has one of the lowest per capita storage capacities in the world. Pakistan has the capacity to store only 121 cubic meter which is equal to Ethiopia.

US and China capacity → over 2000 cubic meter.

"Storage of our major national reservoirs cater for only 10% of annual flow, against the world average of 40%." CM WAPDA 2018 at NDU

## • Excessive Use of Underground Water

- The consumption of the total groundwater used for irrigation has increased from 8% in the year 1960 to more than 50% in the year 2010.
- We have witnessed the mushroom growth of Tube well areas the country that are major causes of water (ground) depletion.
- "There were 200,000 Tube wells in Pakistan in 1960 and currently there are 1.2 million tubewells". **study conducted in 2000**
- Presently, the country meets more than half of its overall irrigation water requirements and 70% of its drinking water consumption from groundwater abstractions.
- According to PCRWR Lodhran, Khanewal, Multan and Vehari has lost 90% of its underground water.

## • Intra provincial Disharmony

## • Delay in the construction of Dams

## Impacts of water Crisis on Pakistan

- **Water shortage impact on agricultural sector**
- Pakistan is an agricultural country and 80% of the country's total water is used for agriculture purposes. Agriculture is the backbone of country's economy despite the fact that contributes only 19.3% to GDP (**World Bank Report**)
- Agriculture sector provides 70% of raw material to industries.
- Since agriculture depends on water, any shortage of it could lead to food insecurity, raised production costs

- and contracted productivity growth.
- Agricultural sector offers employment to 44.5% of Pakistan's total labour force, so shortage of water to agricultural sector can also lead to unemployment.
  - Agriculture has 80% contribution in the national export base.

• **Threat to National security and integrity**  
 Declining water availability is one of the severest security challenges just like terrorism and extremism that confront Pakistan. It could translate into political instability and security risk.

• **Food Security at risk**  
 - Can lead to inflation

• **May lead to Health Problems.**

## Suggestions

- Desperate times call for desperate measures, we need to build multipurpose dams in the country, so that we can withstand floods, draughts and store excess water from melting glaciers and runoff from monsoon.
- We need to strengthen the existing reservoirs.
- Federal legal mandate should be clarified for collection and sharing of water information.



- Measures should be taken to strengthen the provincial regulatory frameworks for access of groundwater and for its management and regulation.
- The government should map areas which have enough water to support the cultivation of water-loving crops. And water-loving crops should be replaced with edible crops that need one-tenth of the water than rice and sugarcane. Local production of edible oil will produce our import bill and save water too.
- We need to improve the capacity of the institutions that are responsible for recording, monitoring and analysis of groundwater data. We should employ advance data techniques to record the actual requirement and consumption of water. It would enable the government to charge a consumer in proportion to his actual consumption and would force water conservation.
- A policy should be devised to regulate the installation and operation of tube-wells for minimizing the excessive extraction of ground water.
- Harmony Among Provinces
- Pakistan needs a narrative. Water needs to be reframed as political priority and central to our prosperity
- Awareness Campaigns / water experts on talkshows.