

Water Scarcity in Pakistan is a ticking bomb: From Indus Waters Treaty to Sustainable Development

Outline

1- Introduction

- 1.1- Hook: we only know the worth of water when well is dry.
- 1.2- General Statement
- 1.3- Thesis

2- Water Scarcity in Pakistan is a ticking bomb.

2.1- Reduced water availability

(wild life immigration report- Pakistan's water availability reduced 56000 m^3 from 1947 to 930 m^3 in 2023)

2.2- Pakistan as topmost country to be affected by climate change.

(climate risk Index report- Pakistan is among ten countries to be affected by climate change)

2.3- Glaciers Melting (In year 2024 3,000 glaciers melted)

2.4-Rising temperature (climate change knowledge portal-Pakistan's temperature will rise to 4.9°C by 2090)

3-Water shortage has become national threat for Pakistan due to Indus water Treaty abeyance and poor governance.

3.1-Historical Background of Indus water treaty (signed in 1960)

3.2-Decreased water availability due to suspend of treaty. (New York Times-After Pahalagam Attack due to suspend of Treaty, Pakistan's water availability reduced by 35%.)

3.3-No proper mechanism of flow of hydrological information data in Indus water Treaty (Pakistan cannot take early steps) ISSI

3.4-India's manipulative role (can divert the flow of water) PIDE

3.5-No early planning in the country (No early warning systems)

3.6- Unimplemented policies (National water policy 2018 is just a piece of paper) PIDE

3.7- Production of more water absorbing crops (sugarcane, rice, wheat and cotton are water absorbing crops)

3.8- Lack of resilient infrastructure (In recent floods in Muzaffargarh a river bank destructed and whole city submerged immediately) Dawn

3.9- No dams or reservoirs for water storage (Present reservoirs have reduced water storage capacity by 20 percent) ISSI

3.10- Improper management for water flow (Mangla and Tarbela dams remain dry most of the year when there is no rain)

3.11- Lack of coordination among leadership and respective departments (No coordination among NDMA and provincial authorities)

4-Implications of water scarcity

4.1-Economic implications (Pakistan loses 4 percent of GDP or 12 billion every year due to water scarcity)

4.2-Effects on food security (According to state Bank of Pakistan in 2025 floods production of cotton and wheat has reduced to 41 percent)

4.3-Impacts on human life (During 2022 33 million persons were affected and 8 million persons lost their homes) World bank

4.4-Reduced irrigation capacity of land (Irrigation capacity has lost 39 percent efficiency due to reduced water supply) PTDF 2022

4.5-Water pollution due to no proper disposal of waste (60 million population is at risk for exposure of arsenic)

4.6-No proper Sanitation (60 percent population drinks unhealthy water in Pakistan)

4.7-Bilateral relations were affected after suspend of cooperation (Sindoor) treaty.

5-Measure to tackle water scarcity

5.1- Approach international neutral mediator in case of Indus water Treaty (World Bank, Regional organisations)

5.2- Follow international legal framework (under Article 35 of UN security council Pakistan can take this issue at international forums)

5.3- Peace talks (In the same manner as recent ceasefire agreement between Pakistan and Afghanistan in Doha)

5.4- Reuse waste water (case study: Israel and Singapore)

5.5- Promote ~~research~~ research on water area (with collaboration of national and international institutions)

5.6- Install early warning systems (case study Japan has this early warning systems)

5.7- Use modern irrigation

techniques (Drip and sprinkler systems are being used by china, USA and Egypt).

6: conclusion

The Essay

"We only know the worth of water, when well is dry."

(Thomas Fuller) Water Scarcity

is a issue which has not given much attention. But when it starts disturbing daily life then it becomes a national issue. Same is the case with the Pakistan because country has been facing issue of water shortage for many years. But now this issue has become an immediate existional threat for Pakistan. Since independence Pakistan has been facing

issue of water dispute. So water scarcity is a ticking bomb for Pakistan because it has reduced water amount ^{and caused} harsh weather conditions, ~~the~~ glaciers melting and heat waves. Moreover, water scarcity is also caused by Indus ^{water} treaty dispute which include lack of coordination between Pakistan and India and hypocrisy of India. In the same way, Pakistan has no integrated approach towards water shortage which includes no early warning systems, ^{unimplemented} ~~unimplemented~~ policies and poor water management. Subsequently, water scarcity has some economic, food related and ~~polluted~~ pollution implications.

Water scarcity is a ticking bomb for Pakistan reasons are given below.

Firstly, water scarcity has reduced water availability in

Pakistan. If a country loses its water availability then the country becomes ready for other hazards as well. For example, according to a report by World Wildlife Fund, Pakistan has lost water availability per capita from 5600 m^3 in 1947 to 930 m^3 in 2023.

Another report by the same Institute indicates that the country will become fully water scarce in 2035. Besides these reports, an estimate by Falkenmeier and the Water Poverty Index reveals that Pakistan has ~~lost~~ become fifteen countries to be affected by water scarcity. Hence, these reports and reduced water capacity of the country clearly indicate that water scarcity is a ticking bomb for Pakistan.

Secondly, Pakistan is a country which can be affected by climate change. Because country produces only of fraction of green house gases. But according to recent report by Climate Risk Index, Pakistan is among top ten countries to be affected by severe climate change. Weather patterns occur in unusual manner. For instance Pakistan experienced sixty to seventy percent more monsoon in year 2025. Moreover this extreme rainfall results in only water waste. So climatic effects on Pakistan give a clue that country is dealing with water scarcity.

Thirdly Pakistan has been facing issue of glaciers melting. Glaciers melt and they only result in rivers overflow

and floods. Huge amount of fresh water is being wasted.

Moreover in year 2024 Pakistan has lost near three thousand glaciers. This results in heavy rainfall because water absorbing capacity of soil has been reduced due to non-availability of water. Hence, melting glaciers result in water loss and indicate that water scarcity is a ticking bomb for Pakistan.

Fourthly Pakistan has been facing issue of persistently rising temperature. Due to this high temperature country faces extreme heat waves every year even in months of April and May. This results in evaporation of water.

Moreover, according to climate knowledge portal of state Pakistan tells that temperature

of Pakistan will rise by 4.9 degree celcius in year 2090. Then, earth will experience severe heat waves. So, increasing temperature gives a message that water scarcity is a ticking bomb for Pakistan.

Moreover, in Pakistan water shortage has become a national threat due to Indus water treaty disputes and poor governance in the country.

To begin with, Indus water treaty, it was signed between Pakistan and India in year 1960 due to mediation by world bank. Moreover, basically three rivers of Pakistan and three rivers of India are included in this treaty. India's rivers Beas, Ravi and ~~80~~ Sutlej are included in this treaty. Similarly Chenab, Indus and Jhelum

are Pakistani rivers which are included in Indus water treaty. So, since independence this treaty has been a source of tensions only between two neighbours.

Furthermore, Pakistan's water availability is reduced when Indus water treaty is suspended. Because, Chenab, Indus and Jhelum rivers supply eighty percent water to country specially in Punjab. For instance, according to New York Times due to post phalgam suspension of Indus water Treaty; water's availability in Pakistan was reduced by thirty five percent. Moreover, Pakistan is a lower riparian country it has water storage capacity only of thirty days. On the other hand India has

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water capacity storage of one twenty days. Hence, decreased water availability of Pakistan due to abeyance of Indus water Treaty is a clear indication of water scarcity in Pakistan.

In addition there is no proper mechanism of flow of hydrological data in Indus water Treaty between Pakistan and India. If a country has no access to its water data, then how it is possible that it will take early steps for upcoming disasters? Similar thing was happened in 2025 floods. Even dry river Ravi overflowed. But Pakistan could not get time to tackle this problem. So, due to lack of mechanism of sharing of hydrological

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information water is being wasted in country.

In the same way India has authority to manipulate ^{the direction of} the flow of water. According to study by PIDE India can cease water by constructing kishanganga and Ratle dams. Moreover sometimes without warning India speeds up the flow and stops water flow. Moreover in recent 2025 floods India sent more water in Jehlum and Ravi without warning. It results in deluge due to which Pakistan faces issue of over flowing rivers and lakes but sometimes dry rivers also. Hence, India's manipulative role in Indus water Treaty is the contributing factor in water scarcity in Pakistan. Moreover, Pakistan has no

early warning systems for upcoming natural disasters. Early warning systems are essential tools to prevent outcomes of disasters. For example in year 2025 floods India and china use these early warning systems to save public. Moreover, Nepal and Bangladesh also have these tools for preventive measures. This latest technology enables countries to estimate the hazards of floods. Likewise, these instruments also help in weather monitoring to take some solid steps. Hence, Pakistan has no planning for floods which results in loss of water and water scarcity.

Similarly many policies in the Pakistan remain unimplemented. These policies and plans are just theoretically present. They

are not practicable. These are just a piece of paper. For example, Pakistan National Water Policy 2018 and Punjab Water Act 2017 are only present in files. In the same way Balochistan Water Resources Integrated Management, Khyber Pakhtunkhwa Water Policy and Sindh Water Policy are unimplemented. When no action would be taken for water scarcity, then it would not be possible to deal with this ticking bomb. So, unimplemented policies are a dilemma of Pakistan which lead to water scarcity in the country.

Another major contributing factor of water scarcity in Pakistan is that the country is interested in production of those crops which absorb ~~more~~

more water. These crops result in water shortage for other crops and threaten agricultural production. For example according to an estimate there are four major crops who absorb large amount of water. These include wheat, cotton, rice and sugarcane. Although, these four crops only contribute twenty five percent of GDP but consume huge amount of water. Hence, production of more water absorbing crops is a governance failure of Pakistan which lead to water scarcity.

Furthermore, Pakistan has no planning about resilient infrastructure with regard to water scarcity. Even there is no proper strategy about construction of normal buildings

and river banks. For example in recent floods in 2025 in district Muzaffargarh, the river had not large amount of water, but due to poorly designed construction it's bank devastated. As a result, water entered into nearby areas without any warning and people lost their possessions and livestock as well. Later it has been revealed that no local engineer was involved in planning of construction of river bank. Only foreign engineers were involved in construction. It is a picture of governance failure. So Pakistan has no resilient infrastructure to tackle with water scarcity.

Likewise, there is a topmost issue of water scarcity in Pakistan ~~is~~ lack of ~~small~~ small dams and reservoirs for water

storage. Water ~~is~~ has been wasting for years because country faces heavy monsoon every year. On the otherhand present reservoirs in Pakistan have lost their twenty percent water storage capacity. This study has been given by ISSI. These dams and reservoirs store large amount of water and help in irrigation through underground ^{canals} and tube wells. But Pakistan has no such reservoirs. Hence due to lack of dams and reservoirs water scarcity has become a ticking bomb for Pakistan.

Besides these, there are two emerging problems for Pakistan are improper management of water flow and lack of coordination among leadership

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and respective departments. For example Tarbela and Mangala dams remain dry most of time of a year when there is no rain. They do not have much water for electricity generation. Similarly, there is no coordination among National disaster Management Authority and other provincial ~~res~~ departments respectively. For example during floods 2025 both National disaster management Authority and Punjab disaster management ~~di~~ authority did not coordinate with each other even gave different facts and figures about floods destruction. Hence improper management of water flow and lack of coordination are governance failures which further enhance water scarcity in the Pakistan.

Now there are some consequences

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of water scarcity on Pakistan which are discussed below.

First ramification of water scarcity on Pakistan is economic loss. When economy of any state faces loss then it hampers growth of the country. According to State Bank of Pakistan, country loses four percent of GDP every year or twelve billion rupees due to water scarcity. Because it stresses mainly agricultural production. And Pakistan is an agricultural country, it mostly depends on exports of vegetables and fruits. But water shortage results in exports reduction. Hence water scarcity is a ticking bomb for Pakistan due to its economic implications.

Second most common effect of water scarcity is to threaten

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Food security in Pakistan:
Due to water shortage crops production decreases and their prices increase. Due to poverty people unable to get food for survival which undermines food security. Similarly water loses its huge amount in floods which also induces implications. For instance according to State Bank of Pakistan during 2025 floods production of cotton has been reduced by forty one percent this year. Hence water scarcity affects food security of Pakistan as a ticking bomb.

Thirdly, water scarcity also impacts human life in Pakistan. Because human is the specie which needs water every purpose. But its shortage causes

damage to human life. For example according to world bank during 2022 floods 33 million Pakistani ~~was~~ ^{affected} persons were ~~displaced~~ and 8 million persons lost their homes. Similarly in 2025 floods 4.2 million people have been affected and 3,000 schools have been destroyed. Hence water scarcity is a ticking bomb in Pakistan as it affects human life badly.

Fourthly, there are two major implications of water scarcity are reduced irrigation capacity of land and water pollution. When water scarcity occurs; soil reduces its water absorbing capacity due to which irrigation capacity is also reduced. For

instance according to an estimate by PIDE in 2022 in Pakistan irrigation capacity has reduced its efficiency by thirty nine percent due to water shortage. Similarly PIDE also indicates that sixty million population is at risk to be affected by arsenic due to water pollution. It can lead to severe diseases. Hence, water scarcity is a ticking bomb because it reduces irrigation capacity of soil and causes health hazards.

At last, there are two major implications of water scarcity which include poor sanitation and tensions in bilateral relations with India due to Indus water treaty suspension. At first sanitation is a fundamental right of

every citizen and it is duty of state to provide safe water for drinking. But unfortunately in Pakistan 60 percent population has no access to healthy water for drinking. On the other hand Indus water Treaty disputes affect bilateral relations between neighbours. For example after post Pahalgarh suspension of treaty results in skirmishes between India and Pakistan also known as Operation Sindoor. Moreover, both defense ministers have accused each other in various organisations meetings. In a short, poor sanitation and drift bilateral relations between neighbours are the worst ramifications of water scarcity in Pakistan.

Now there ^{are} some measures by which Pakistan can deal

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it's problem of water scarcity.

Firstly, Pakistan should approach international mediators follow legal frameworks and peace talks as well. For instance Pakistan should approach world bank, ~~shanghai~~ Shanghai cooperation organisation and South Asian regional Cooperation Organisation for Indus water Treaty issue. Likewise, Pakistan should follow international laws because under article 35 of United Nations Pakistan can present this issue at international forums. Similarly peace talks should be engaged for regional water security and to minimize tensions. For example in the same way as Doha ceasefire agreement has been signed between Pakistan and Afghanistan. Hence by adopting these measures Pakistan

can tackle water scarcity to some extent.

Moreover, Pakistan should reuse waste water and promote research about water scarcity.

By reusing waste water Pakistan can save water. For instance

Israel consists of 90 percent desert but it reuses 90 percent of its waste water for

irrigation. Similarly Singapore reuses 40 percent of its waste water and will increase to

60 percent reuse by year

2060. Furthermore Pakistan

should promote research in water field. It should be

done with collaboration of

international and national research institutions which

will enhance capabilities of

local researchers also. This will

help in access to advance

forecast tools and latest instruments. So, by reusing waste water and promoting research on water, country will be able to solve water scarcity issue.

Last but not least, Pakistan should install early warning systems and use modern irrigation methods. For example, Japan has an early warning system which is also known as Japan Metropolitan early warning agency. Pakistan should also adopt this system. Moreover, in Pakistan, old irrigation methods have been used.

~~For~~ Pakistan should use advanced irrigation methods. For instance, drip and sprinkler techniques are the latest techniques which are being used by large economies such as the United States of

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America, China and other countries such as Egypt.

In a nutshell water ~~scarcity~~ scarcity is a ticking bomb for Pakistan. From Indus waters treaty to poor governance in Pakistan. Water shortage is caused when Indus water treaty is suspended by India. Similarly poor governance is also responsible for water scarcity. Moreover water shortage also has consequences on economy, human health, food security, irrigation capacity of land, water pollution, poor sanitation and drift bilateral relation between neighbours. Pakistan needs to take some solid steps to tackle this ticking bomb. Hence, water scarcity is a dangerous problem for Pakistan.

Everywhere
water shortage
In winters, in summers
In seven oceans
In mother's womb
In body, in mind
And in short,
Ahead there is a danger
No use crying
for water.
But all to bear
water, water, water
And for water we live here.
(Gajanan Mishra)