

Pakistan Water Woes: Solution Lies in Constitutional Reforms

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Abstract— Pakistan's water woes determines the flow in the rivers since the sources lie in disputed territory Kashmir, has implications for internal politics vis-à-vis distribution of water within the provinces. There is an abundance of evidence that the River Indus has run out of already implicated as critical food shortages, increased frequency of natural disasters, dislocations of citizens and an increasingly destabilizing conflict between upper and lower riparian regions. Water and energy can be jointly managed as far as the challenges are pushed to the frontline such as constitutional amendment to tackle water force either with diverting it, storing it or both.

Index Terms— Building Dams, Population Growth, Water Crisis, Constitutional Amendment

1 INTRODUCTION

WATER is the reason of life, without it life would not have started and would not exist. There are such a substantial number of purposes behind which the water is of focal significance. Energy and water are intricately connected. All sources of energy (including electricity) require water in their production processes: the extraction of raw materials, cooling thermal processes, in cleaning processes, cultivation of crops for biofuels, and powering turbines. Water and energy problems are connected to each other in such a way that, in spite of some partial and short-term success, partial responses are bound to fail in the long-term [1].

Water being an important part for life is confronting genuine issues in Pakistan, while the Sindh and Punjab are among the mainly influenced regions. River Indus is the heart for Pakistan [2] and it is the only source of freshwater supply. About 60% of water in Indus comes from the glaciers and the high elevation and it irrigates about 45 million acres of land and 190 million human populations [3]. The altitude of river Indus is making it capable of possessing potential energy in northern part of Pakistan and certainly can be converted in kinetic form such as Electricity Production.

Since 1947, Water and its distribution in Pakistan has been an anxiety, during period of shortages and as well as during period of excess water. Since 1975, Pakistan had about 13 major floods caused huge economical loss and water being vital source had out flowed to the sea [4].

Pakistan only stores 25 MAF of water [5]. The fact is to store water, Pakistan needs Dams but there is no consensus between the provinces for building Dam. The reason behind is the constitution of 1973 and its 18th amendment.

Some other Factors are also associated with water in Pakistan & this paper would look in to such issues to carry out a review such as:

- Constitutional mechanism of rights between upper and lower riparian in Pakistan.

- The available policies and institutions.
- Identifying and highlighting the gaps requiring to be filled between water, water resources utilization.
- Flood mitigation, role of storing water in economic development.

2 IMPRESSION OF CALAMITY IN PAKISTAN

2.1 Indus Water Treaty 1960

The treaty allocated upper basin flows of the "eastern rivers" to India (Beas, Sutlej, and Ravi) and upper basin flows of the "western rivers" to Pakistan (Chenab, Jhelum, and Indus).

Pakistan had to forego 25 MAF of fresh waters of eastern rivers, used to receive for irrigation [6].

India can build run off dam with the storage capacity as per Annex D-Part 3, Clause 8c on River Jhelum.

Detailed submission guidelines can be found on the author.

2.2 1991 Accord

The Council of Common Interests (CCI) approved it on March 21, 1991. As per accord following allocations were signed by the provinces.

Table 1: Water Entitlement for Provinces

| Water Allocations (MAF) | | | |
|-------------------------|--------------|--------------|---------------|
| Province | Kharif | Rabi | Total |
| Punjab | 37.07 | 18.87 | 55.94 |
| Sindh | 33.94 | 14.82 | 48.76 |
| KPK | 3.48 | 2.30 | 5.78 |
| Balochistan | 2.85 | 1.02 | 3.87 |
| Total | 77.34 | 37.01 | 114.35 |

- *Sind's Claim*: Sindh always objected that it had received less water than its entitlements under the 1991

accord. At present flow of water is insufficient to meet minimum requirement for Sea intrusion.

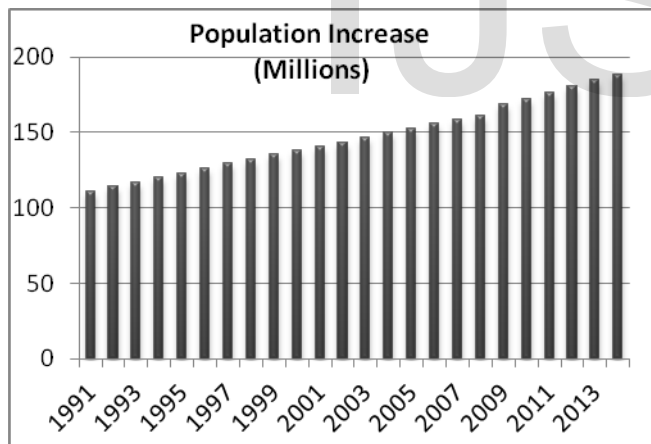
- *Baluchistan's Claim:* Baluchistan accused Sindh that it is using its share. Water Accord allocates only 3.87 MAF water but Only 3.05 MAF had been shared.
- *KPK's Claim:* Punjab's canal system is 150 years old and quite wasteful; its wastage is more than 40% in its conveyance system before reaching the field.
- *Punjab's claim:* The figure of 114.35 MAF of water on the basis of which accord is made was never achieved. The apportionment of actual water i.e 103.73 MAF [7].

.Ever since the 1991 Water Accord, Sindh claimed it never received its fair share of Indus water, the study for outflow to the sea has not been performed, though the accord allocated 10 MAF in the interim for discharge to the sea [8].

2.3 Population Growth

In 1991(Fig 1) up to 2014 there has been the significance growth of the population overall. The highest rate of the population growth in Pakistan was 4.48 % in 2008-2009. The average of the growth per anum is 2.02 % in Pakistan [9].

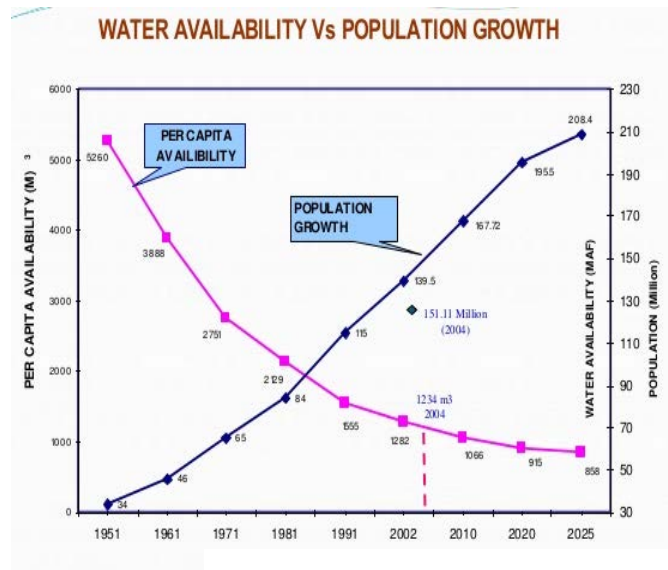
Figure 1: Population Growth In Pakistan



2.4 Water Availability

According to Pakistan economic survey 2014, the water availability in Pakistan is 1000 cubic compared to 5,650 cubic meter at the time of existence of Pakistan which kept on decreasing and making per capita water availability in Pakistan to as low as 850 cubic meter in the year 2013 and by 2025 it will further decline to 659 cubic meter per capita [5].

Figure 2: Water Availability per Capita by 2025



As we know for the fact that this water deficit hampers well-being and at the same time severely affecting future economic development. Now question comes that how water deficiency has occurred in Pakistan?

The possibilities are multidimensional which are

- Less Glacier Melting and Less Rain
- High Evaporation rate
- Losses in Irrigation System

2.5 Water Trends in Neighbourhood

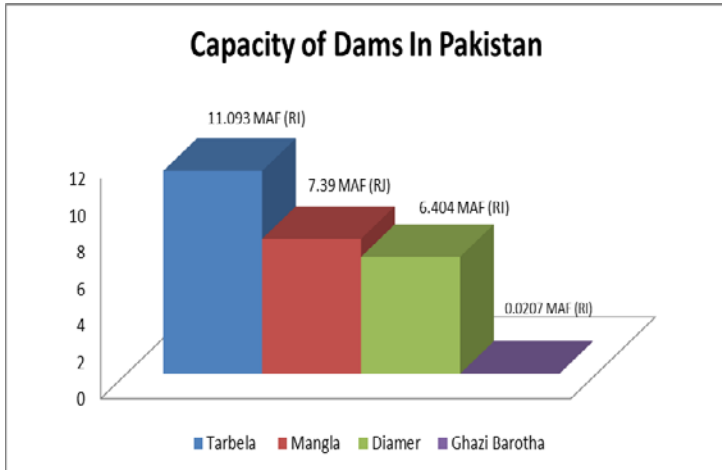
There are immaculate Facts which have also caused water scarcity in Pakistan such as,

- **Indian Occupancy on Water:** About 12 hydropower plants are under construction, in addition to the 155 projects planned on the Western Rivers. India has completed the construction of 6 hydropower plants on River Chenab, Furthermore, India has a plan of an additional 56 hydropower projects on River Chenab. India also finished 15 projects on River Jhelum & also has plans to initiate 74 projects on River Jhelum [10].
- **Afghanistan's Occupancy on Water:** The government of Afghanistan is initiating multi-purpose water projects on the tributaries of the Kabul River with assistance from the international community. Indian experts are extending help to Afghanistan to build 12 dams on the Kabul River with a total water storage capacity of 4.7 MAF [11].

2.6 Storage Capacity

There is no doubt that Pakistan is blessed with ample water resources but could store only 13% of the annual flow of its rivers (Fig 3). The storage is fast depleting due to sedimentation.

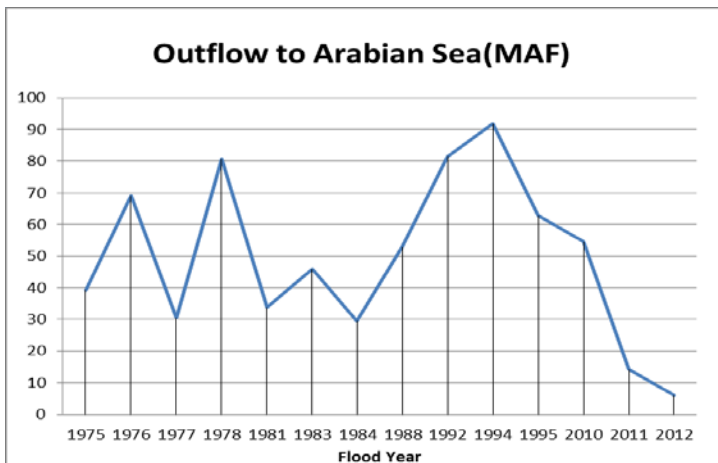
Figure 3: Capacity of DAMS in Pakistan



2.7 Flood Outflow in Sea

Since 1975 there were major incidents of the floods in Pakistan and caused the havoc especially in Punjab and Sindh. From 1991 onwards the flood outflow has been 310.80 MAF in to the sea. It also means that 335.70 MAF water was flowing through the Indus basin and Pakistan stored only just 24.90 MAF though only 10 MAF outflow was required to balance the sea intrusion once in every 5 years [4].

Figure 4: Outflow of Water in Flood Years in to Sea



3 STATESMAN APPROACH: THE WAY FORWARD

The severity of the water crisis cannot be ignored while pursuing economic development as it serves as the backbone of the

economy. The deficit is growing with population growth rates on the rise and coupled with problems such as global warming and climate change.

Water issue has become a serious challenge for those working at the policy-making level. The statesmen approach would be to completely rethink the entire approach on water. For sustainable development, this approach would be to synergize beyond provision of water management services to include productivity and profitability per unit of water applied

3.1 Constitutional Amendment

- The constitution of 1973, Article 167 clause 2, about building reservoirs and generating power: the profit would be paid to the only province in which the facility is installed.
- The 18th Amendment in which power of the decision making given back to the provinces.

The amendments are essential due to the fact that **if the loan being equally shared** for development of Hydro-power project between upper riparian and lower riparian but profit is only for the one where the facility is located as per article 167, **than disagreement is obvious**. This is what has been happening with the case of *Kalabagh dam*. How would the lower riparian be agreed on it? Such as Sindh (35 % of population would also be under loan due to hydro-power project) would suffer the most not in the shortages of water but it also receives the effluent from the upper riparians. Furthermore **lower riparians (Sindh, Punjab and Balochistan) has not got the elevation to build reservoirs** and only this potential is available in northern regions of Pakistan.

Policy makers of Pakistan should have to amend the article 167 and award royalties to other provinces.

Presumably there would not be any opposition from the provinces because this is logical as royalty be shared equally.

3.2 Build DAMS

Pakistan must realize that it is the time to give water a second thought. How? The reasons are,

- There are currently about 50,000 large dams in operation. Most of these dams were built for irrigation. Only 18 % of them have power generation as their main purpose [12].
- U.S has developed 497% storage capacity of annual flow of River Colorado.
- Egypt possesses 281% of River Nile.
- India 35% on Sutlej-Bias Basin.
- China has constructed 84,000 dams since 1949 out of which 24,000 are large dams [1].

Regardless of the method or type of storage, the purpose of the statesmen thinking is to capture water when and where it's fundamental value is low or in the case of floods, reallocate it to times and places where its fundamental value is high [12].

Back in 1975, if the strategy of capturing water foresighted,

than following estimations could not be accounted as **loss of income**.

Table 2: Loss of Income Due to Let Go of Flood Water

| Water (MAF) | Sector | Loss |
|-------------|---|---------------------|
| 260.80 | Agriculture *1MAF=\$100million | Rs.2600 Billion |
| 260.8 | House Hold *1MAF=\$356million | Rs. 9284.48 Billion |
| 260.80 | Power Production *(11400 Million KWH) | Rs.1536.58 Billion |

Pakistan have lost the fortune, that could have been used anywhere in Pakistan and would have had brought the riches specially earthquake and drought stricken regions in Pakistan. Not also this the power production would have had supplied to the small industries in Punjab would have earned government a million in sales tax and also on the other hand gas supplies shortages would have been prevailed.

3.3 Review of Water Accord 1991

Pakistan must realize the limitation of the accord and should look to review and resolve them.

- Accord allowed for a minimum flow of water into the sea, in this way, the Accord allowed for erratic flow of water in the Indus.
- In reality there is 50% probability to divert 105 MAF to the canals. Thus in most of the years, provinces will be receiving less than allocated water. This has created problems among the lower riparian when they have to share shortages because there is general feeling that they are not receiving their due share as per Accord.
- Accord allocations will not be available to the provinces and they should be mentally ready to share the shortages in almost every year [6].

So need of time is to amend the Water Apportionment Accord and maintain the transparency in distribution of water.

3.4 Kashmir to be on Board

Water scarcity represents an existential risk to Pakistan and it likewise jeopardizes the welfare of Kashmiris too. For development of the reservoirs, Pakistan must take Kashmir on board to discuss their issues and develop the policy for water management dedicated for the people of Kashmir.

Another side is that what if the India in future comes on the table for consensus to let go of the Kashmir as an independent state? At that moment the Kashmir would be on the driving seat for water source and could inflate the water money agreements on its own terms with Pakistan. For this reason the statesman approach is to formulate the agreement prior with all foreseen terms and conditions to protect the water

resources emerges from Kashmir.

3.5 Water Treaty with Afghanistan

Pakistan and Afghanistan currently share nine rivers with annual flows of about 18.3 million acres feet (MAF) of which Kabul River accounts for 16.5 MAF [11]. Pakistan provides no financial support for flow control structures or management of the Kabul River. In the absence of a treaty & competition for shared resources and no pre-determined mutually agreed allocation system over water rights to the Kabul River, conflict between the two states cannot be ruled out. India has already influenced to build more dams on river Kabul. Back in 1975, the flow from the Kabul River was which in turn could hamper the flow as already is to 16.5 MAF from 24 MAF [4].

3.6 Losses to Eradicate in Irrigation System

Pakistan has the largest contiguous supply-based canal irrigation system in the world. In Pakistan, the muddy plains of the Indus basin cover approximately 25 % of the land area [13]. The irrigation water losses ranged from 35 % to 52 % and for the unlined these were from 64 % to 68 %. Comparing the average water loss of 43.5 % from lined to the average water loss of 66 % from unlined watercourses, it was concluded that the lining reduced water loss by 22.5 % [9]. The possible solutions could be:

- Precision / laser land levelling that can Curtails irrigation application losses.
- Use of Bed and Furrow Planting that can lower the use of water up to 40 %.
- Flexible gated pipe irrigation system to be used for saving in water up to 25% and also it has a low initial cost [13].

3.7 Water & Food Security Framework

There has been allocation of 3 MAF made in the Accord for areas above the rim stations for KPK but this allocation is not fully utilized [8].

There is a dire need to chalk out a holistic policy that helps conserve and manage the resource effectively to meet food security and energy needs as well. This does not only highlight a need to inculcate water sense among citizens to avoid wastage but also emphasizes the significance of close cooperation with citizens in joint watershed management, increasing the efficiency of water usage and working towards matching goals such as development of efficient technologies, sustainable agriculture practices and safeguarding both peoples against food shortages [14].

Pakistan must gauge framework, precisely assessing how much water streams into the IRS. Team of expert should be incorporated to maintain the gauging framework and also would ensure the process improvement techniques for sustainable measures such as

- Desert areas may be developed following the models of UAE, Sanai (Israel/Egypt), Ghobi (China) and Rajasthan (India) [13].

3.8 Review of Indus Water Treaty

“Current situation is a very uneven playing field. The regional hegemony is the upper riparian and has all the cards in its hands. This asymmetry means that it is India that is driving the train, and that change must start in India [15].

When signing the treaty, why 24 MAF had been awarded to India and what grounds was that decision based? How many experts were incorporated to literature the annexures of the treaty as India took the driving seat once it was signed. This still has no justifications, but to review can be done possibly.

The projects of hydroelectric power made by India are not merely of run of the river structures as allowed under the treaty but their number and structures allow India to acquire the manipulative control that could be used to hamper water flows into Pakistan [16].

The fact for Pakistan remains perpetual to explain why it is an existential issue for Pakistan?

Pakistan must explore ways in which the principles of the Indus Waters Treaty could be respected, while providing a win for Pakistan (assurance on their flows) and a win for India (reducing the chronic legal uncertainty which vexes every Indian project on the Chenab or Jhelum). With good will there are multiple ways in which the Treaty could be maintained but re-interpreted so that the basin states could win [15].

4 CONCLUSION

There are numerous reasons for water clashes however there are likewise numerous approaches to determine them. Consultations on the Indus waters ought to be de-connected from historic grievances and from the other water sharing issues. Once more, it is an indication of statesmanship, not weakness, to recognize the past and move past it. **There's no escape from Building Dams yet once constitution being altered** doubtlessly would bring about preventing the cost of floods, taking care of demand of power, environmental friendly & furthermore this would invalidate the reliance on India which has been cropping up in the past as a fiddle of question about taking of water on eastern rivers.

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