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Adopting Technical Actions for Sutlej River Revival: A Geographical Approach

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Abstract: River systems have a profound impact on the earth's surface both in positive and negative ways, but the abundance of rivers might bring substantial impacts on physiographic and socioeconomic setting of neighboring areas. Therefore, this research paper emphasizes on the river Sutlej facing serious challenge of abundance with acute shortage of water, climatic irregularities and violation of international water rules committed by a neighboring country India. The data used in the current study mainly rely on secondary sources. In order to save valued Sutlej Valley Civilization and its collegiate benefits to the whole region, this study suggests few technical actions to the possible revival of the Sutlej River. These are included Inter-basins connectivity, flood water and rain water harvesting through construction of lakes or reservoirs along Sutlej River Basin, Barraging or engineered upper Sutlej River and construction of Trimmun-Islam link canal. It is expected that by applying these actions the overall situation of the region can be improved and prosperity anticipated. Hence the government and the concerned authorities are needed to pay due consideration towards severity of the issue.

Keywords: Sutlej River, Technical Actions, Inter Basin Connectivity, Indus Basin Water Treaty, Bahawalpur.

1. INTRODUCTION

River abundance is one of the global phenomenon as many rivers around the world have become abandoned e.g. Hakra and Beas Rivers in Pakistan, Uzboy River, Amu Darya, Syr Darya (river) of Western Central Asia, and Mexican river which irrigated Chihuahua Desert in the past was now an abandoned river. River abandonce was caused by sharing conflicts, fuzzy boundaries, climatic changes (e.g. shift in rainfall), Natural hazards (e.g. Earthquakes that are responsible for river meandering due to faulting etc.).

Sutlej River is one of the mighty and ancient rivers of the Indo-Pak sub-continent. In the past, few agreements were done over the water of the Sutlej River. Two of them were about water allocation between various states or countries. One of them was a tripartite agreement over the sharing of Sutlej River water between the British Government, the Nawab of ex. Bahawalpur State and Maharaja of Bikaner State (India). According to this agreement, the area irrigated by Bahawalpur State was 1,730,000 acres constituting 57%, the area irrigated under British Government was 900,000 acres constituting 26.5% and the area irrigated by Bikaner State water of Sutlej River was about 500,000 acres constituting only 16.5% (CWC, 1995). This agreement demonstrates the dominance of Bahawalpur State over the Sutlej River as compared with the British Government and Bikaner State. Another in 1960. Due to this agreement, the river was exclusively possessed by the India and presently the water of the Sutlej River is being extensively utilized by it through canalization and damming over the river. Therefore, water in the lower reaches of the river in Pakistan gradually being decreased over the years, even down as much as zero level in 2001 (PWG, N.D). Today, the situation is like that 'our rivers become deserts and their deserts become rivers' (Bukhari, 2015).

The revival of Sutlej River is so crucial to compensate and develop ten adjoining and beneficiary districts (Kasur, Okara, Pakpatan, Vehari, Sahiwal, Multan, Lodhran, Bahawalnagar, Bahawalpur and Rahim Yar Khan) of Pakistan. Due to closure of Sutlej River about 25 million people of these districts are suffering with water scarcity, water quality degradation, water born diseases, groundwater depletion, degraded environment and biodiversity, dwindling water resources, shrinking agriculture and weakening of the country's defense. Similarly, the country's economy is suffering loss because according to World Economic Forum (WEF), economy is benefited by one billion dollars with availability of 1 million acre feet (MAF) of water (Durrani, 2015a). Keeping in concern the revival of Sutlej River the main objective of the study is to save riverine water course and thousands of years old Sutlej Valley Civilization (SVC).

2. METHODOLOGY

The current study is descriptive in nature and most of the data used in the study are based on secondary sources (thesis, newspapers, reports etc.). In order to achieve the main objective of the study first the framework of the study was designed and the relevant literature is reviewed regarding the current study.

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Second the essential aspects of the study were set up and finally the attempt was made to achieve the desired goal of devising few technical actions by focusing on ground realities.

3. TECHNICAL ACTIONS

Inter- Basins Connectivity (IBC)

At the time of Indus Water Treaty (IWT), it was necessary for the government to see all the facts and possible impacts on the adjacent dependent areas and country's agricultural background. The government might think about the alternative sources as a result of the closure of (Sutlej as well as Beas) rivers in the region. To develop sustainability and to secure riverine ecosystem it is essential to connect Sutlej Basin with Indus River because of depleting water in the Chenab River.

In this regard, effective awareness campaigns like 'Save Chenab River' should be launched on national and international levels on an emergency basis because Sutlej River largely depends on it through inter basins connectivity. Presently, India is speedily constructing dams over the Chenab River, which is an apparent violation of the United Nations (UN) rules. Apart from this if the Government of Pakistan is able to ensure consensus on the development of Kalabagh Dam, then it will be greatly beneficial towards the success of the inter-basin connectivity and the provision of water almost throughout the year instead of biennial provision of water in the canals previously fed by Sutlej River. Not only the Kalabagh but also other suitable sites should be recognized to plan and the development of the water reservoirs (lakes, barrages, large and small dams). Following sites are worth mentioning to develop the small dams.

Flood Water/ Rain Water Harvesting (in Lakes)

The storage of flood water as well as rain water to improve the water quality and underground water table of the area, development of lakes are essential (Majeed, N.D). A detailed Survey is necessary to be conducted throughout the extent of Sutlej River bed and pin point the most suitable sites for the development of water harvesting lakes. In this context, additionally, the supply of needful drinking water could also be liable to cities adjoining these areas. Furthermore, it could be a source of tourism, greenery, fishing, employment and feeding zone regarding ever extinguishing aquifers of nearby cities.

Barraging/ Engineered Upper Sutlej in Pakistan

It is evident from the past flood history and resulting damages to both countries, especially during the wet monsoon season (**Table1**).

Table 1: Important Temporal Flood Events of Sutlej River

Sr. No.	TIME PERIOD	EVENTS
01	1296	Changed its course and damaged Lal Sohanra Shrine due to flood
02	1744	Flood and erosion of Sutlej River perished Basti Khairpur Tamewali (Now a tehsil of district Bahawalpur)
03	1758	Flood damaged initial settlement of Ahmedpur East (Now a tehsil of Bahawalpur district)
04	1899	Planning of Lower Bari Doab
05	1906	Flood with Reduced Level (R.L.) of 379.80 feet (Hardford, 1916).
06	1908	Flood with R.L. of 377.75 feet (Hardford, 1916).
07	1909	Flood with R.L. of 377.25 feet (Hardford, 1916).
08	1910	Flood with R.L. of 376.85 feet (Hardford, 1916).
09	1912	Flood with R.L. of 376.90 feet (Hardford, 1916).
10	1913	Flood with R.L. of 376.50 feet (Hardford, 1916).
11	1914	Flood had been just two feet below the highest ever recorded and caused the channel silt up for a width of 2,000 feet from the edge of the bank (with R.L. of 378.70 feet on 6th of August 1914) [Hardford, 1916].
12	1915	Low flood (Hardford, 1916).
13	1942	Flood
14	1943	Flood
15	1945	Flood affected Jhangi Wala, Lashkar de Goth and other neighboring areas
16	1955	Severe flood
17	1973	Flood
18	1980	Flood
19	1988	Severe flood, 7 lac cusecs of water released by India, damaged Bahawalpur city and fringing areas; Flood damaged 83.33 hectares (200 acres) of *Rakh Jamlera* Forest at Jamlera near Vehari, Punjab (Shad, 2009).
20	1995	Flood
21	2010	Flood affected 538 km² area of Bahawalpur for more than 2 months (see table 2).
22	2013	Severe flood damaged Basti Yusuf Wala near Jhangi Wala, Bahawalpur also caused damages in Ahmedpur East tehsil (Mohsin, 2013)
23	2014	Flood washed away five more houses of Basti Yusuf Wala
24	2015	Severe and early flood that erode much agricultural land nearby Bahawalpur

Presently, India has built many dams across the border to prevent the massive flooding. India has always released the bulk of surplus water in peak monsoonal periods towards Pakistan. To catch that water for beneficial use and to prevent a large destruction of flood damages Pakistan also desperately needed to construct dams and barrages in the plain areas of Punjab generally and near district Kasur particularly (so that all the water released by India could be trapped and controlled without flooding in Pakistan) at the upper Sutlej to be safe from the vast wreckage of floods and to maximize opportunities and minimize risks. It will not only use as a collector during surplus flood season, but also normal flow if it happens in the future. For this a campaign of '*Dam Banao aur Pani Bachao*' *(*construct dams and save water*)* should be launched to save a life (Lodhi, 2015).

Construction of Trimmun- Islam Link Canal (TILC)

After IBWT, Sutlej River was absolutely stopped by India due to which 329 km long Sutlej wassignificantly diverted and converted into 'River of sand'. India and Consortium provided 36 billion rupees for the construction of alternative sources of water for affected areas of the 'deprived Eastern Rivers'. Out of ten Link Canals, only Trimmun- Islam Link Canal is not constructed till now that would be the only panacea for the Sutlej River Bed revival. This is what Bahawalpur is continuously under the stress of desertification, water scarcity, depleted environment, ruined biodiversity, degraded water quality and diseased people. While another effected River of the IBWT is Ravi which provided water through five link canals, viz; Marala-Ravi Link Canal (MRLC), Upper Chenab Canal (UCC), Qadirabad- Balloki Link Canal (QBLC), Trimmun-Sidhnai Link Canal (TSLC) and Haveli Canal (HC). All these five canals provided water to less than 300 km of river in Pakistan (**Table 2**).

Table 2: Condition of Upper and Lower Areas affected by IBWT- A Comparison

Sr. No.	SUTLEJ- BAHAWALPUR	RAVI- LAHORE
i.	Connected with only two alternative sources	Connected with five alternative sources
ii.	Canals are non- perennials	Canals are perennials
iii.	Minute rainfall (1- 1.5 inches)	Fair amount of rainfall (20 inches)
iv.	Vast land area mainly rural agricultural land	Dominant industrial and commercial economy than agricultural
v.	Dominant agricultural economy	Economy other than agriculture
vi.	Predominantly arid and deserted area	Semi- arid area
vii.	Dry spell, drought and famine prone	Flood prone
viii.	Desertification prevails	Water logging and salinity prevails
ix.	Underground water is brine and misfit for use	Deteriorating water due to domestic and industrial effluents
x.	High water depth- inaccessible	Good accessibility
xi.	Minute greenery	Ample greenery to retain green water
xii.	No water storage capacity- No lakes or recharge body along Sutlej to store water	Many storage lakes

Table 3: Trans- Border Comparison

Sr. No.	BAHAWALPUR-SUTLEJ-CHOLISTAN	INDIA-SUTLEJ-RAJISTHAN
i.	Minute amount of rainfall (1-1.5 inches)	Slightly better rainfall with 6 inches
ii.	Deserted area with large sand dunes except few agricultural pockets	Mostly desert is continuously converting into green agricultural fields
iii.	No right to use the water of Sutlej River	Exclusive right over the water of Sutlej River so constructed many dams and barrages.
iv.	No proper border except rangers kiosks	Proper steel border with high power lighting system
v.	People feel insecurity due to firing so less active agriculture and grazing	No fear due to proper steel border and search lights. Therefore, well developed agricultural activities
vi.	No storage of flood water	Floods can be stored in dams and barrages over Sutlej River
vii.	Hakra inundation canal	Mighty Indira Gandhi Canal
viii.	Most of the canals of Sutlej Valley Project have been closed after IBWT	New canals have been outcropped after IBWT

The ultimate result of which is the "Murder of Sutlej Valley Civilization" in Pakistan. All these links were to be constructed before 1970. The tentative completion date of the Trimmun- Islam Link Canal was 31 March 1968. The details of linking canals and their tentative completion dates are mentioned in Annexure-H of the Indus Basin Water Treaty (Durrani, 2015b).
By the construction of Trimmun- Islam Link Canal, there is possibility of river flow, and water could be provided to canals for irrigating about 55% of waste land of Bahawalpur Division (Durrani, 2015b). Fifty five years passed since the signing of the Indus Basin Water Treaty (IBWT), but Trimmun- Islam Link is still awaiting construction. This was the only link that was used to supply 20,000 cusecs of water to Sutlej River Bed and Sutlej River deprived areas (Durrani, 2015a).

4. CONCLUSION

The revival of river Sutlej is essential for the agricultural, economic, industrial, socio-cultural, ecological, Geo-strategic importance of the Pakistan generally and Bahawalpur region particularly. Therefore, current study concluded on the basis of discussion that if proper measures are not taken and the lessons are not learned from the past vanishing civilizations (Indus and Hakra) there is an enormous threat of losing Sutlej Valley Civilization (SVC). In order to save this civilization certain technical actions are proposed like Inter-Basin Connectivity, Flood, Water/ Rain Water Harvesting (in the Lakes), Barraging or Engineered Upper Sutlej River and Construction of Trimmun-Islam Link Canal (TILC). It is hoped that by applying these actions the overall situation of the region would be improved and prosperity anticipated. So, the government and the concerned authorities are needed to pay due consideration to the severity of the issue. By reviving Sutlej River, irrigation system of the adjacent areas should be extensive, ample water to use and for energy production. It will also strengthen Pakistan's defense and sovereignty and will facilitate further research.

REFERENCES:

Bukhari, S. I., (2015). *Sare-Rah Guzar*. A column Series, Daily Jang, Multan, March 24, 2015. 9Pp.

Central Water Commission (CWC), (1995). *Legal Instruments on Rivers in India (Vol.–3)*, Agreements on Interstate Rivers, Central Water Commission (CWC), Inter State Matters Directorate, New Delhi. 8-14.

Durrani, M. A., (2015a). *Defense of Pakistan Kept Weaker Due To Desolate Cholistan, Bahawalpur is Converting to Desert*. 6-8.

Durrani, M. A., (2015b). *Khushhali se Khushksali tak (From Prosperity to Drought)*. Daily Khabrain, Sunday Newspaper, Editorial page, Multan, August 09 ,2015.

Hardford, J., (1916). River Training Works and diversion of Sutlej near Bahawalpur. 46Pp.

Iqbal, M. J., (2014). *Impact of Sutlej River Abandoncy on the Socio- Economic Shift of the Adjacent Areas, A Case Study of Jhangi Wala, Bahawalpur*. M. Phil. Thesis, Department of Geography, The Islamia University of Bahawalpur, Punjab, Pakistan.

Lodhi, S. H., (2015). *Panni hae Zindagi?... Kaash ye Baat Samajh aa Jai (Water is Life?... Alas it is to be Understood)*. 9Pp.

Majeed, A., (N.D). *Natural and Artificial Recharge Techniques for Balochistan*. Water Programme Document Series, International Union for Conservation of Nature (IUCN) Balochistan Programme, Quetta, Balochistan, Pakistan.

Mohsin, M., (2013). Evaluation of 2013 Flood Damages in Pakistan: A Case Study of Ahmedpur East, Bahawalpur, Pakistan. *International Journal of Asian Social Science, 3*(10), 2204-2220.

PWG. (N.D) Special Section 2: Water Shortages in Pakistan. Retrieved http://waterinfo.net.pk/sites/default/files/knowledge/Water%20Shortage%20in%20Pakistan.pdf on. Nov. 15, 2015, 1.

Shad, M. R., (2009). *Jungle Rakh Jamlera; Sahra Ka Manzar Pesh Karne Laga (Rakh Jamlera Forest, Looking Like a Desert)*. 4Pp.