South Asian Studies
A Research Journal of South Asian Studies
Vol. 28, No. 1, January – June 2013, pp. 7-23

Hydro Politics in Pakistan: Perceptions and Misperceptions

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ABSTRACT

Water is essential for sustaining the life on earth. Achieving the food supply and improving the quality of life totally depend on the availability of fresh water. The decreasing quantity and increasing demand of fresh water widen the gap between its availability and demand. This gap could be fulfilled by constructing additional water reservoir. There is continuous rift over water among all provinces of Pakistan. The province Punjab is emphasizing in the construction of Kalabagh dam for better use of 38 million acre feet water dropping to sea. The three other provinces, Sindh, K.PK and Baluchistan are opposing the Kalabagh dam for royalty related issues. Sindh also objects that the storage of Indus water would seriously affect her delta ecosystem. Provinces are in fear of losing their share of water, blaming each other without knowing the reality and prefer their own interests over national interest. Furthermore, this study finds that Pakistan has failed to have any comprehensive and consolidated national water policy. The institutional arrangements are fragmented as each institution deals with the specific and narrow dimension of the water sector. The present per capita availability of water in Pakistan is about 1000m3 that clearly depicts water scarcity in Pakistan. This alarming water shortage calls for political vision, pragmatic policies and affective river regulations in Pakistan.

KEY WORDS: Water Scarcity, Eco system, Indus Basin and Kalabagh Dam

Introduction

Although water is available on this earth in large quantity but it is not equally distributed. It occupies 70% of earth surface from which 2.5% is considered fresh water and the remaining 97.5% is highly saline Ocean. Rivers are main source of fresh water and serve humanity in different ways. They provide socio-economic linkages among the riparian. This precious commodity has a political as well as economic significance too. It played vital role in decision making both at regional and international level (Lenine, 1983).

Distribution of water has always been an issue throughout the human history. Distribution is not a problem when commodity like water is available abundant and every co-share gets his satisfactory share. It becomes a problem when water is in short supply that leads to disagreements and disputes. Water has often been a source of conflict among shareholders. When a dispute arises over water resource, peace cannot be achieved without resolving the question of water right. The upper-riparian usually took advantage and want to use maximum quantity of the available water, while the lower-riparian wants equitable distribution of water for the development of its areas (Rajput, 2007).

Water resources are shrinking due to swelling population, industrialization and urbanization. Production of different commodities requires the consumption of water also. The scale of water consumption for producing different commodities at present time is very high, for example in order to produce one litter of petroleum, one cane of vegetables, one kilogram of paper, and one ton of woolen cloth, it is necessary to consume ten litters, forty liters, hundred liters and six hundred liters of water, respectively (Encyclopedia Britannica, pp. 646).

Pakistan has an area of 796,095 km^2 located just to the south of Himalayas, Hindu Kush, Karakoram and its associated ranges. The Indus River System (IRS) has its origin and end in this region. Annual rainfall in the upper catchment is less than 800 millimeter (mm), gradually tapering down to just125mm in the southern parts of Sindh (Arif, 2010). Pakistan has the largest canal irrigation system in the world having 145 million acre feet (maf) annual average of water. About 90% of the Pakistan's food and fiber production depends on this irrigation system. Out of this quantity, 75 maf is being used for agriculture, 35 maf is being mismanaged and another 35 maf is being wasted into the sea during the rainy season every year (Ahmad, 2000). The Indus and its tributaries are from one of the world's largest river systems. At the time of partition of Pakistan and India, its average annual flow was 168.3maf (89.5 maf from Indus at Kalabagh, 22.6 maf from Jhelum at Mangla, 23.5 maf from Chenab at Marala, 6.4 maf from Ravi at Madhopur, 12.7 maf from Beas at Mandi Plain and 13.5 maf from Sutlej at Rupar Head Work (Malik, 2011).

There was no question over water sharing in Sub-Continent till early 20^{th} century. However, the situation changed after World War-I. There were several new projects like Thal, Haveli, Bhakra Dam and Sutlej Valley canals in Punjab and Sukkur Barrage in Sindh were proposed. It was first time in the history that some regions particularly Sindh as lower riparian, felt that their river rights were threatened (Malik, 2011).The dispute of Indus Waters sharing began long before the partition of India and Pakistan in the form of interstate differences between the Punjab, Sindh, Bahawalpur, and Bikaner(Michal,1967).

Government of India acted as neutral third party and facilitated through negotiations. Independent commissions were appointed to arbitrate in case of negotiation failure. "The situation was serious when Upper Bari Doab Canal was

completed in 1858 and started irrigation about one million acres of land between the Ravi and Bias Rivers with the water from Ravi" (Biswas, 1992pp.202).

Water was generally apportioned by the tribal tradition and first farmer on the stream had the right to meet his full water requirements before he let water flow to the next irrigator (Malik, 2005). "Disagreement among provinces arises particularly when the group differ in their socio-economic status, and under these conditions, one claims more of the output on the basis of its greater contribution while the other claims more of the outcome on the basis of its greater needs" (Daneker, 1998).Today, Pakistan is representing a very disappointing depiction of the political, economic and social strife. According to Swedish hydrologist Falkenmark indicator, a person required 1700 cubic meters of water annually.

Water stress occurs when annual supply of water in a country comes down to 1700 cubic meters per person, but below 1000 cubic meters per person shows the scarcity of water resource. Pakistan would be water stressed country in the next few year as the annual per person water availability in Pakistan was about 1234 cubic meter in 2009 (Ghani, 2009). According to Water and Power Development Authority (WAPDA) estimates, the availability of water would be 1000 cubic meter in the year 2012 and 885 cubic meter per person in the year 2020. The prevailing declining situation of water in Pakistan demands urgent counter measures. Government of Pakistan proclamation of water vision of 2025 is an attempt to secure the availability of water for the future generations. Shortage of water is now forcing the provinces to raise the issue of water sharing at the national as well as international levels.

The Government of Pakistan with the help of WAPDA has initiated many programs to build new dams and reservoirs in next 50 years. The projects such as Diamer Basha at Chilas, Kurram Tangi at North Waziristan, Akhori at Attock, and Munda at Mohmand Agency are to be completed by 2016. But unfortunately, the feelings of resentment among provinces are increasing day by day and they are doubtful on the validity of the projects. Provinces are in fear of losing their share of water. They are blaming each other without knowing the reality. The present study is designed to highlight the controversial debate over water distribution among provinces of Pakistan and investigate the truth, reality, biasness and self-centeredness of provinces in this regard.

The controversy over water distribution of Indus River System (IRS) between provinces started in 1921 when British rulers started developing irrigation system with construction of new barrages, canals and dams. Government of India appointed various committees to defuse the water issue between provinces. Following committees and commissions were set up for apportionment of the Waters of the IRS between provinces:

- Tripartite Agreement (1921)
- Indus Discharge Committee (1921)
- SVP Inquiry Committee (1932)
- Anderson Committee (1937)

- Rao Commission (1945)
- Akhtar Hussain Committee (1968)
- Fazle-e-Akbar Committee (1970)
- Chief Justices Commission (1977)
- Haleem Commission (1983)

The Tripartite Agreement (1921)

The first agreement between Punjab province, Bahawalpur and Bikaner States was signed in 1921. It was for sharing waters of the Sutlej and Beas rivers. Bahawalpur State protested against the allocation of water supplies to the non-riparian Bikaner State on the ground that the water was insufficient to meet the needs of the two riparian Punjab and Bahawalpur State. The Government of India persuaded the Punjab, Bahawalpur and Bikaner States to sign the tripartite agreement. The agreement was based on three widely recognized water-right principles as below:

1. Priority of existing use
2. Recognition of claims of riparian owners, and
3. Equitable apportionment regardless of history of use or of geographical location.

The Indus Discharge Committee (1921)

Government of Bombay (Sindh was also part of Bombay presidency till 1935) objected to Punjab's proposals for new projects. States of Bahawalpur and Bikaner were also claiming for more water supplies. Different claims from Punjab and Sindh were referred to the Secretary of State London. He sanctioned construction of Sutlej Valley Project (SVP) and Sukkur Barrage with seven canals. Decision on the other projects was deferred till after more reliable river flow data was available (Federal Planning cell, 1990).

In response to appeals and counter claims by Sindh and Punjab, Government of India appointed the 'Indus Discharge Committee' in 1921. The committee planned to observe daily discharge at various sites on the rivers and canals in the Indus Plains. To improve the availability of hydrological data for these and other projects under consideration, the Government of India recommended to the provincial government a comprehensive network of gauge and discharge observation sites at all important sites along the Indus and its tributaries. Arrangements were also made between Sindh and Punjab to cooperate in discharge observations and in methods of keeping their record. Sindh was also allowed to post resident engineers to monitor river and canal discharge in Punjab.

The committee recommended project of Haveli Canal and pointed out that future projects proposed by Punjab should be considered by taking into account the possible impact on Sindh water rights. A two member 'Nicholson Trench

Committee' was appointed to study the feasibility of Bhakra dam. In 1930, the committee in its report cleared Bhakra for construction.

SVP Inquiry Committee (1932)

Actual operations of SVP canals revealed that there was storage of supplies, especially in early Kharif because actual river flows fell short of requirements. A committee was appointed in 1932 to look into the problem. It recommended exclusion of some areas in Bahawalpur State, construction of new feeder canals and adjustment in the command areas of certain canals (Federal Planning cell, 1990).

Anderson Committee (1935)

By the 1932, all the 11 SVP canals with four barrages and Sukkur Barrage project were completed. A number of problems arose with the operation of these canal networks. Bahawalpur and Khairpur States sought additional supplies. Punjab also asked for more water for Haveli project. In 1935, Government of India formed 'Committee of the Central Board of Irrigation on Distribution of Waters of the Indus and Tributaries'- known as the "Anderson Committee". It comprised representatives of K.PK , Bikaner, Khairpur and Government of India. It had eight experts to look into the matter and find a solution. The committee submitted its report in 1937. It increased irrigation supplies for Haveli and Thal projects. As regards Bhakra Dam, an agreement had already been reached between the governments of Bombay and Punjab in 1934. The report cleared Haveli canal project which was started in 1934 and completed in 1939. Construction of Kalabagh Barrage and Thal canal was started in 1939. But due to outbreak of World War II, it was not commissioned till January, 1947.

Rao Commission (1945)

After the implementation of Government of India Act 1935, the development of river waters became a provincial subject. Provinces were free to plan and undertake any work for development of river waters passing through its territory. The Governor-General could intervene only on receiving complaint by one province against the other.

On receipt of complaint by Government of Sindh against Punjab's proposal for increased withdrawals from the rivers passing through its territory, Government of India appointed a Commission named 'Rao Commission' in September 1941. The commission had two chief engineers namely P.B Hickey and E.H Chave as its members. Terms of reference of the commission were to

"investigate effects of water withdrawals on lowering of water levels in Sindh to result from storing water in Bhakra Reservoir and from withdrawals sanctioned for Haveli, Thal and Sutlej Valley Canals" (Malik,2011 pp. 70).

The Rao Commission submitted its report in July 1942. The commission established priority for the allocation of water for Paharpur canal and also confirmed allocations for the Thal and Sukkur schemes as recommended by the Anderson Committee. The commission found that upstream withdrawals would adversely affect operation of inundation canals in Sindh, especially during September. The best way to counteract this effect was to construct barrages at Guddu and Kotri. The Commission also recommended that "compensation should be paid to the Sindh from Punjab province for damages likely to result from upstream withdrawals" (Malik, 2011, pp.70). Its findings and recommendations however were neither accepted by Punjab nor by Sindh. At this stage negotiation were opened between the two chief engineers of Sindh and Punjab to find a solution and reach an agreement. After prolonged negotiations between Sindh and Punjab, a draft agreement was drawn in September 1945. It was subject to settlement of the financial phase of the dispute with respect to sharing of waters of the Indus and Punjab rivers.

Indus Water Treaty (1960)

On 14 August1947, when Indian Sub-continent was divided in to two independent countries, there existed one of the most highly developed irrigation system in the world. The boundary line between the two countries was drawn without any respect to the irrigation work. Just after the creation of Pakistan, India stopped water on April 1, 1948 in the Pakistan Canals off-taking from rivers Ravi, Beas and Sutlej, who's Headwork, were located in India. (Ali, 1973). This gave rise to a serious first water dispute with India, which was ultimately resolved through the good offices of the World Bank and Indus Water Treaty (IWT) was signed with India in 1960.

The Treaty gave exclusive water rights of the three eastern rivers namely Ravi, Beas and Sutlej to India, while the water rights of the three western rivers namely; Indus, Jhelum and Chenab were allocated to Pakistan except for some specified uses in the occupied State of Jammu & Kashmir. Pakistan was required to meet the needs of eastern river canals from the western rivers by constructing the suitable replacement works comprising storage dams and inter-river transfer links. These works were to be completed by Pakistan in a period of ten years i.e., from 1960 to 1970, then after that period, India was given right to stop water flowing to Pakistan in the three eastern rivers (Ghani, 2009).

Akhtar Hussain Committee (1968)

A Water Allocation and Rates Committee were constituted by the Government of West Pakistan (one unit) in May 1968. It was called Akhtar Hussain Committee after the name of its chairman. Its terms of reference included: review barrage water allocations, reservoir release patterns, drawdown levels and use of ground water in relation to surface water deliveries (Government of the Punjab, 2002). However the committee submitted its report on 30 June, 1970. One Unit was dissolved splitting West Pakistan into four provinces. And this report could not attain any attention.

Justice Fazle Akbar Committee (1970-71)

Pakistan Government set up a committee on October 15, 1970, chaired by former justice Fazle Akbar of the Supreme Court of Pakistan. The Committee was to recommend apportionment of water allocations of groundwater and its coordinate use with flow supplies and reasonable water requirements of the provinces for agriculture, industrial and other uses.

The committee submitted its report to the government in 1971. No decision was taken on the report. In the meanwhile ad hoc distribution of waters stored by Chashma Barrage and later Terbela Reservoir was ordered among the provinces. Seasonal ad hoc distribution of waters stored by the two reservoirs continued till coming into effect of Water Apportionment Accord in 1991 as noted presently.

Chief Justices' Commission (1977)

Government of Pakistan in 1977 constituted a commission to examine the issue of water apportionment. The commission comprised all chief justices of the four provincial High Courts and was chaired by the chief Justice of Supreme Court of Pakistan. Its report however remained pending with the government till the Water Apportionment Accord came into effect in 1991.

Haleem Committee (1983)

This commission conducted the hearing of the case within limited framework and submitted its report to the president of Pakistan in the end of the April 1983(Siddique, 2003). The issue of water distribution could not be resolved and provinces received irrigation supplies through ad hoc distribution of Indus waters notified by Federal Govt. for each period/season of the year.

Water Apportionment Accord (1991)

The government of Pakistan appreciating the urgency of the matter approved the water Apportionment Accord on March 16, 1991**.** It was approved by the council of common interest on March 21, 1991. According to the water Apportionment Accord, share of each province, both for Kharif and Rabi and allocation of balance supplies was allocated in maf as given in Table 1.

The main clauses of Water apportionment Accord (1991) are given as follow:

- It supersedes all previous sharing arrangements and agreements arrived at in this regard.
- It protects the existing uses of canal water in each province.
- It apportions the balance river supplies including flood surpluses and future storage amongst the provinces.
- It recognizes the need for constructing new storages wherever feasible on the Indus and other rivers for planned future agriculture development.
- It also recognizes the need for certain minimum escapage to sea below Kotri to check sea intrusion for which further studies are to be undertaken.
- It lays down the procedures for sharing shortage and surpluses on all Pakistan bases.
- The need to establish an Indus River System Authority for implementation of the Accord was recognized and accepted. It would have representation from all the four Provinces.
- The balance river supplies including flood supplies and future storages are allocated as: 37% for Punjab, 37% for Sindh, 14% for K.PK and 12% for Baluchistan.

Table1
Water share of provinces according to water accord 1991

Province	Water Shares		Total	Balance Supply Shares (%)*
	Kharif	Rabi		
Punjab	37.07	18.87	55.94	37
Sindh	33.94	14.82	48.76	37
K.PK	3.48	2.30	5.78	14
Civil Canals**	1.80	1.20	3.00	
Baluchistan	2.85	1.02	3.87	12
Total	77.34	37.01	114.35	100

Source: Save Water Save Pakistan by B.A Malik.
***Including flood flows & future storage**
**** Ungagged civil canals in K.PK**

Indus River System Authority

Indus River System Authority (IRSA) was established in 1993 through an Act of the Parliament. The authority was established for regulating and monitoring the distribution of water sources of the IRS amongst the provinces in accordance with the provision of the Water Accord. IRS oversees the allocation based on the seasonally available supplies, however the allocation of the water received by a province for different uses remain provincial subject (Rehman, 2002).

Sources of Surface Water

River Indus, Jhelum, Chenab, Ravi, Beas and the Sutlej are main source of surface water in Pakistan having their sources in the Himalayas. ***The Indus*** rises in the north of the Kailash Range in the shadow of Mount Everest-world's highest peak. After flowing through Ladakh and Northern Areas it leaves the hilly terrain and debouches Punjab Plain at Kalabagh. After flowing 1000 miles through Punjab and Sindh, it outfalls into the Arabian Sea, East of Karachi. Its total length is 2,000 miles. It drops 16000 feet from its source to its mouth on the Arabian Sea. Jhelum rises from a spring at verinag situated at the foot of the Pir Punjal in the south-eastern part of the valley of Kashmir in India. The Kishanganga (Neelam) River the largest tributary of the Jhelum joins it at Domal Muzafraabad, and the next largest the kunhar river of the Kaghan Vally. Then it is join by the Poonch River, and flows into the Mangala Dame reservoir in the district of Mirpur. The Jhelum enters the Punjab in Jhelum district. It ends in a confluence with the Chanab at Trimmue in district Jhang. The Chenab merges with the Sutlej to form the Panjnad River, which joins the Indus River at Mithankot (Hoyland, 1975).

The Chenab has its source in Himachal Pradesh in India and formed by the confluence of two streams (Chnadra and Bhaga) in Hamaliyas it flows through Jammu and Kashmir, between the steep cliffs of the Siwalik Hills and the lesser Hamaliyas before entering the Punjab Plain at Marala. It runs south ward till joined by the Jhelum upstream of Trimmu Barrage. Thereafter it continues southward, till its confluence with the Sutlej Panjnad Headwork. It is about 974km and feed several irrigation canals. The Ravi is the smallest of the five main Eastern tributaries of the Indus has its source in Himachal Pradesh. The river leaves the Himalayas at Baseeli and enters the plains at Madhopur in Indian Punjab. After passing through Gurdasspur district, it enters Shakargarh Tehsil of Sialkot. Further down it runs along the border and enters Pak Punjab a short distance above Ravi Siphon northeast of Lahore. Flowing south westward, it joins the Chenab below Sidhnai Headwork. River Beas also rises in Himachal Pradesh and joins the Sutlej at harike in Indian Punjab.

The Sutlej River rises in the Kailash Range from Lake Mansarower in China. It continues south ward till its confluence with Beas River at Harike above

Ferozepore. There from it runs along the Indo-Pak border and enters Pakistan at Sullemanki Barrage. It joins the Chenab River above Panjnad Headwork. All of the five Punjab Rivers ultimately combine into one river at the Punjnad and joins the Indus at Mithankot. There after the Indus flows through Sindh province for 600 miles unto its mouth on the Arabian Sea coast. Aggregate length of the eastern tributaries of the Indus exceeds 28, 00 miles. The western tributaries of the Indus *i.e.*, River Kabul has its source in Afghanistan. It enters Pakistan above Warsak in K.PK. It drops into the Indus above Attok Bridge in the Punjab. River Swat joins the Kabul from the north above the town of Mardan. The Kurram and Gomal Zam are two small tributaries of the Indus. They join from the west below Kalabagh. The Kurram also rises in Afghanistan. But it flows mostly through Pakistan. Total length of the western tributaries of the Indus is 600 miles. The Indus River Basin constitutes 213674sq.miles of which 204, 300sq constitutes the catchments of River Indus System and the rest lies in the desert area of Sindh, Bahawalpur, and Rann of Kutch (Ahmad, 1993).

Overtime Status of Water Distribution

This section presents water distribution in different regimes. A country may have sufficient natural resources, suitable climate conditions and sufficient man power to get maximum output but all these factors become insignificant if political environment is not favorable. Empirical evidences show that there exits bidirectional causality between economic development and political stability. Disagreements among provinces arise when the provinces differ in their socio-economic status.

Management of water resources has become an important issue which needs to resolve at priority bases. Most of the problems in Pakistan relating to water sharing amongst the provinces arisen due to mismanagement of water resources. Water rights are generally based on historical and customary use and sometimes conformed by legislation of the country.

Although water from the Indus basin river is being consumed by all provinces of Pakistan but water distribution has always been a sensitive issue among them. All of the provinces used their allocated share through canal network and always exaggerated their water needs by claiming more share. Provinces adopted uncompromising attitude over water issue most of the time. Politics also made it complicated. Some internal and external factors also involve keeping the issue unresolved. These included the Sino-Indian boarder conflict 1962, Rann of Kutch dispute 1964, the Indo-Pak war 1965, political agitation against Ayub Khan1968-69, Martial law 1969 and the East Pakistan crises 1970-71.

Political government of Bhutto did not take the risk of initiating the solution of this water issue. Water was allotted on ad hoc basis every year in his regime without taking into account its impact on future claim of any province. Zia

government inherited this issue. There was a sense prevailed that without a permanent water agreement the apportionment of waters on ad-hoc basis is uncertain and unsatisfactory. The Zia administration attempted to bypass the bureaucratic hurdles, and military distribution formula (Arif, 2005).Then WAPDA chairman met the governors of all provinces shared full technical data with them and made detail presentation to provincial governments. Nawaz sharif became the prime minister in 1991. He was keen interested to take up the issue of building Kalabagh dam. In order to resolve the issue of Provincial water share, Sharif government succeeded in cobbling together a unanimous water apportionment Accord in 1991. It was a fact that Sindh had gained more water than its due share in the Water Apportionment Accord on the firm understanding given to the then Prime Minister Mr. Sharif that it agreed to the construction of Kalabagh Dam but its construction remained blocked during Benazir government (Malik, 2010).

Kalabagh Dam

Kalabagh dam (3600MW) site is located downstream of Terbela dam. Preliminary feasibility report of Kalabagh dam project was prepared by an American consultant M/s Tipton& Hill in 1956 and revised by M/s Chas T. Main in1966. This project remained part of the development portfolio of WAPDA. Kalabagh dam has successfully crossed all stages of research, investigation, economic viability, and environment appraisal. International expert found it feasible, viable and beneficial (Arif, 2010).

Pakistan's economy depends on agriculture, its 35 million acres land irrigated by canals and tube wells. Since the completion of Tarbela reservoir there is no further development for increase storage capacity. The country needs to enhance its water storage capability by developing every possible reservoir that is technically feasible. Large dams are needed because they contribute to national development. Pakistan built 68 medium and small dams in the last six decades with an average storage capacity of about 8,000 acre feet but their power generating ability is nil (Arif ,2010). According to Shams ul Mulk former chairman WAPDA country would require 750 such small dams to equal the storage capacity of one Kalabagh dam.

Pakistan is confronted with disputes over constructing dams not only at the international but the domestic level also. Sindh opposed the project of Kalabagh dam on the ground that there is no surplus water available for new reservoirs. Government of Pakistan constituted a technical committee to investigate and check the water availability issue. Another committee headed by Senator Nisar A. Momon, proceeded independently, and review hydraulic data prepared by WAPDA, IRSA and provincial irrigation department. The committees reported that 35.2 maf of surplus water is available below Kotri every year.

Pakistan could not sort out the longstanding dispute over the proposed Kalabagh dam. This project has been abandoned by the present coalition government. Former Federal Minister for Water and power, Raja Pervaiz Ashraf termed the project 'impractical' because three provincial assemblies had passed resolution against it. Raja emphasized that the Pakistan People's Party being a federal party could not undertake a project which negates the principles of federalism.

There is considerable opposition to the government's dam construction strategy. It is estimated that construction will take until 2016, and will generate 35,000 jobs as well as 3600 MW of hydro-electric power. Punjab argues that Kalabagh dam will prevent wastage of water flowing to the sea. K. Pk fear is not diminished the water supply, since the dam will be downstream of the environmental and physical impact of 1000 miles cultivable land submerge. There is considerable skepticism about federal promises to recompense to those affected and resettle them. The threat of flooding of the fertile Nowshara valley and Nowshara city is also taken very seriously. After October 2005 earthquake Kalabagh dam site is considered highly risky and dangerous in an active seismic zone. Another issue is royalties of dam because the normal practice of royalties of dams goes to the province where they originated. K.PK are concerns that Punjab will be denied royalties because of the dam's location on the Punjab K.Pk border and plans to position the dam's turbine in Punjab.

Both Punjab and federal governments had given assurance this will not happen. It ought to be realized that Kalabagh dam is not Punjab's but Pakistan project. Punjab's share of stored water will be 37% but its loss of land and property would be for greater than of K. pk. The lack of consensus is not due to technical reason but mainly because of political rivalry and lack of confidence. The lower riparian are of views that upper riparian will take undue advantage of building storage reservoirs in the upper reaches of Indus river and deprive them of their share of water(Haider,2002). It is need of hour to develop national consensus for more large reservoirs that would be key for future progress and prosperity. The Lahore High Court (LHC) ordered the federal government to start construction of the contentious Kalabagh dam. The LHC chief justice observed that the council of common interest (cci) had approved the project twice and maintained that it was the government's duty under article 154 of the constitution to implement the council's decision (*Dawn*, November 30, 2012).

Provincial Point of View on Water Right

The four provinces of Pakistan differ each other and have their own stance regarding the distribution of water. The following section of the paper presents the point of view of each province. Of the four provinces water issue is salient between Indus upstream Province of Punjab and downstream Sindh.

Sindh Point of View

Sindh accused Punjab of "water theft" that 16000 cusecs of water between Taunsa and Guddu had been stolen in one week (IRSA staff report, 2011). Sindh always objected that it had received less water than its entitlements under the 1991 accord. At present flow to water is insufficient to meet minimum requirement for Sea intrusion. Consequently sea water now comes up 100km in land and caused the increased salination of lower Sindh agriculture land, with subsequent adverse effect on ecosystem. Another problem is the shrinking of the Indus basin mangroves forest, which is dependent on fresh water supplies. Once the sixth largest in the world, has reduced in size by 38% during 1977-90.

Two link canals namely Chama-Jhelum and Tonsa-Punjand were constructed from Indus River to provide water in times when there is short supply from Jhelum and Chenab rivers. These canals are operated even during the water shortage in Sindh and when sufficient water is available in Jhelum and Chenab rivers. This is objectionable for Sindh that Baluchistan and K.PK are exempted from sharing shortages of water on the plea that these are small provinces and their shares are already less. There is no provision in Accord 1991to grant exemption to any province. As a result the three provinces *i.e.,* Punjab, K.PK and Baluchistan get more than their authorized share and Sindh gets less water.

The surplus water is not available for storage but only in flood years, that can be store and used in dry years if surplus water is available, for this purpose a potential site of storage is at Katzara/Skardu. If three dams on Indus at Bhasha, Kalabagh and Akhori are built, they will be filled in flood seasons, and in dry season the industry and agriculture depend on this will definite suffer. Sindh will suffer as the lower-riparian as its Kharif supplies will be significantly curtailed due to filling of these dams. According to IWT, three eastern rivers were given to India and Punjab's canals deprived of their natural sources and supplies were made through link canals from western rivers. Sindh gets less water in present arrangements because storage in Mangla Dam and operation of link canals.

Baluchistan Point of View 125187

The main constraint in development of Baluchistan is the scarce water availability. Indus Water Accord allocates only 3.87 maf water which is hardly 3.55 of the total perennial flows in the system. The present canal capacities in Baluchistan are not adequate to utilize. Only 3.05 maf could be utilized rest of the areas depends upon minor perennial and non-perennial flood irrigation system for fulfilling needs of all sub sectors that is domestic, agriculture and mining. As a lower riparian of Sindh, Baluchistan accused that Sindh is using its share of allocated water due to inadequate irrigation canal system. Two of Baluchistan's canals, namely Pat

Feeder and Kirthar, take off from Guddu and Sukur barrages ,Sindh usually released less water in to the two canals than their due share.(Malik,2010).

Khybar Pakhtunkhaw Point of View

Khybar Pakhtunkhaw (K.PK) objected that Punjab's canal system was 150 years old and quite wasteful; its wastage was more than 50 percent in its conveyance system before reaching the field. The major changes in agricultural practices required more water in a demand-base system. So it became more difficult to maintain the condition of rigid regime flow of non-silting in the canal by carrying fixed designed discharge, this silting of canals causes further shortage of water. Drain system is old and now it has blocked. The canal and drainage Act of 1887 was exclusively ignored and drainage of land started seriously creating problems of salinity and water logging.

There is no tendency to alternate the wasteful practices in irrigation system. The quality of local consulting hired by WAPDA is below standard. So corruption and low pay is another serious problem and diverts attention from professionalism. The average annual surface water available in Pakistan is about 142 maf. Out of this, 105 maf on the average is diverted into the traditional and wasteful supply-based canal irrigation system. Out of 105 maf of water, that is diverted into the canal system about 52 maf is lost through the unlined canal irrigation system due to seepage, leakage and because of the wastage of water in the supply-based canal flowing full supply discharge irrespective of the water requirements of crops. Moreover, the one million miles of the traditional watercourses and the uneven irregular shaped field is another major contribution source of the wastage of fresh water. Again, out of 142 maf of water, about 35 maf is the wasted to sea during the flood season. In this way, the total surface water losses are 87 (52+35) maf out of 142 maf. This comes to 61 percent of the available water.

This huge wastage of water should be avoided by implementing water management, so that the country is neither water-stressed nor water-scarce. If this is accomplished, it would then be possible to irrigate a barren area of about 25 million acres of land to feed the growing population.

Indus carries heavy sediment load that rapidly depletes storage capacity of reservoirs. Watershed Management is vital part of the storage project for achieving long life but this has always been ignored. The selection of dam site should be task of Watershed Management to achieve long life of the reservoir. Dam should be on upper reaches. Terbela is on lower reach, an example of rapid silting due to its wrong location. In 2025, Mangla and Terbela would completely silt up. There is a unique and multipurpose dam site at Katzarah on the Indus. Its storage capacity would be 35 maf that is six times greater than of Bhasha or Kalabagh. It would irrigate a new barren area of about 8 million acres. Katzarah dam would also control ruper floods and wet years flow. The life of Katzarah dam is more than

1000 years, due to snow fed and nominal silt, as this region is outside the monsoon range. It is surprising that this unique dam site is ignored in vision 2016. Yet five ineffective dams are proposed. These five ineffective storage dams would be disastrous for the country's irrigated agriculture to produce food for fast growing population. It is suggested to create the Indus Valley Authority for the construction of dam. Kalabagh dam remained under political and technical controversy for the past thirty years. Being the tail end it has poorest capacity- inflow ratio on the Indus and received maximum quantity of silt. The constitution have pointed out that foundation of dam site is very weak. It would block the sub-surface flow of Peshawar valley and whole valley would be destroyed due to water logging.

Punjab Point of View

The Punjab irrigation system provides life line for agricultural economy of province. Punjab accounts for 80% of Pakistan agriculture production. Over 90% of the agricultural output in Punjab comes from irrigated land. The Punjab irrigation system is a part of Indus Basin system with 25 main canal commands system off-taking from 13 barrages over the Indus and its tributaries. Agriculture sector employs more than 50% of the work force and accounts for 70% of export revenues (Nadeem 2010).Some areas of Punjab such as Potohar, Cholistan and DG Khan are water stressed and have to collect drinking water from far areas. There is a half million big and small industrial units in the Punjab generate second highest employment in the country and consume nearly 2.2 maf of water annually.

The apportionment of water was made in the Water Accord 1991 against the existing actual uses of 103.73 maf. The figure of 117.35 maf of water on the basis of which accord is made was never achieved nor is likely to be achieved in near future because of silting up of existing reservoir and reduction in their storage capacities. Water demand is increasing day by day in Punjab on account of growing population, increasing urbanization and industrialization. So, it is high time Pakistan built new reservoirs. The construction of Kalabagh should be top priority. Huge wastage of water should be avoided by improve irrigation efficiencies.

Conclusion and Recommendations

Conclusion

Water is not only essential for any economy but also has serious political and social implications to society. Uncontrolled population, negligence in developing national water strategy and public's careless attitude towards water conservation are major factors behind the water shortage in Pakistan. It is need of hour to create awareness among the people of Pakistan to save every drop of water for the next

generation. Politics of water can be shifted to the politics of national development by removing the provincial objections on wastage of water and water storage. It is the responsibility of State to allocate water according to the each province's population, agricultural and industrial requirements. Present water crises among the provinces of Pakistan are not the result of general water shortage but are also the result of the erratic weather patterns. These crises occur due to the absence of efficient management of the water resources and somehow the unrepresentative attitude and myopic policies of the government.

There is dire need to increase water availability by building new storage and reservoir. Indus the only river which has surplus water and Kalabagh dam is the only large multipurpose project could be built in 6 to 8 years. Unfortunately the urgently needed dam is victim of political wrangling from last three decades. This careless attitude brought the country to brink on internal water war. Emotion base politics and policies are dangerous for the spirit of the federalism. National interest must top priority over local and provincial considerations.

Recommendations

On the basis of the findings, this study recommends that the Federal government should not discriminate against any province on the basis of political affiliation and must provide equal apportionment of water for the development of each province. The role of politicians should be to develop national consensus and strengthen the democratic institutions. The national consensus on the construction of Kalabagh dam should be on top priority. The objections by Sindh and K.PK should be removed by providing substitute development in these provinces. The flow of fresh water to the sea should be minimized. Seepage and evaporation may be controlled through lining of canals and reservoirs. Provincial differences on sharing of water may resolve amicably and speedily.

Huge wastage of water should be avoided and made it possible to irrigate barren areas from getting benefit of this unused water. Canal system should be modify and replace sub-surface tile system to save the wastage of 35 maf. Millions miles traditional water course need replacement under demand based irrigation system. The feeling of Pakistan must prevail upon the feeling of being a Punjabi, Sindhi , Balochi and Pathan. The alarming water shortage in Pakistan calls for political vision, pragmatic policies and affective river regulations.

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