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Pakistan's Ability to Mitigate Water Shortage by Making Diamer-Bhasha Dam

Introduction

Indus Basin is the major fresh water reserve of Pakistan. Pakistan has serious issue of decrease in ground water quantity as well as quality. Indus basin irrigates about 4 million hectares of land in Pakistan, which is the largest area for which large amount of water is required. The main source for surface water in dry season of Pakistan is the melting snow for River Indus, Jhelum and Chenab. The Indus Basin receives its water from rainfall, snow and glacier melting. Changes in the climate have an impact on the distribution and timing of precipitation (rainfall and snowfall) and on the melting of snow and ice.

There is increase in the demand of water in Pakistan but the supply side is deficient in full filling the resource requirements. It's an alarming situation for Pakistan as the per-capita water availability is 908 cubic meter from 5,260 cubic meter in 1951 and Pakistan can store only 10% of its annual water flows, which would ended only within 30 days (The Nation, October, 7, 2017) Indus Basin is the major fresh water reserve of Pakistan. Pakistan has serious issue of decrease in ground water quantity as well as quality.

The ground water level which used to be a 15 to 20 feet in 1971 from the ground has gone down to 90 feet in 2014. On average 32 million acre feet (MAF) per year of fresh water is flowing down to Arabian Sea and if stored it would fulfill the requirements of water for Pakistan(Ali, Iqbal:2015,126-127).Arsenic contamination of the ground water is reached at a dangerous level. Water related diseases are increasing day by day.

Human Development Report on water scarcity describe scarcity is a policy induced consequences of mismanaged resources (2006:133).This report also define "water wars taking place in the case of trans-boundary water resources, it does concede as competition for water intensifies within countries, the resulting pressures will spill across national borders."(2006:19).Water mismanagement is an intrastate issue as well as interstate between India and Pakistan.

There is increase in the demand of water in Pakistan but the supply side is deficient in full filling the resource requirements. Pakistan's population is rapidly growing as we all know this reality. Pakistan has not built any dam after Terbaela dam and stress is increasing day by day. 95% of Pakistan's water is used in agriculture and irrigation system of Pakistan is already having many defects and this country lost half the water instead of its proper usage in agriculture. According to water aid, Pakistan is one of the 36th most water stressed countries in the world. It is also said that 80% of water is unsafe. Pakistan Council of Research in water resources (PCRWR) announced that Pakistan would run out of water by 2025, which is an alarming situation. (valuewalk.com/2018/06/Pakistan-to build-dams-importance/)

Water experts are warning that, Pakistan will face a famine-like situation, if new water reservoirs are not created and water wastage is not stopped. The authorities will have to take immediate precautionary measures for stopping it. It is clear that water shortage is a major issue in Pakistan, which needs to be addressed on high priority basis.

In past we can see that there were land conflicts for the construction of dams, many times political disagreements come forward in the way of the construction of dam and most importantly disputes with India had stopped Pakistan for constructing any dam. In addition to the water dispute with India, the provinces of Pakistan are also fighting with each other over the distribution of water.

Let us remind that dams are important for multiple purposes for example for domestic usage, industrial work and most importantly for irrigation purposes. Dams store water in reservoirs and at time of need that stored water is used for different requirements. Dams store flood water and produce electricity as well. Dams also provide recreational facilities for boating and picnic areas.

As I have mentioned in my last paper that Kalabagh Dam, Diamer-Bhasha and Dasu Dam, Akhori on tributary of Indus and Rohtas Dam on tributary of Jhelum can be started right away. No planning of water usage of fresh as well as for ground water is a real hurdle from Pakistani side. By not making water reservoirs, Pakistan is fully dependent on flowing water of rivers Chenab, Jhelum and Sind. The focus of this article is to discuss and analyze the construction of Diamer Basha Dam and all the hurdles related to this Dam.

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Keeping in view the above mentioned issues this research addresses the following points:

- To discuss and analyze the problems of national river resources and to explain the system and structural problems related to the mismanagement of water resources and challenges exists within State.
- To analyze the ground realities for the construction of Proposed project of Diamer Bhasha Dam and how this Dam is beneficial for the masses.
- To check the performance of present government regarding the construction of Diamer Bhasha Dam. What hurdles, government is facing for the construction and how these can be resolved.

As the above three points are directly related to the domestic management of hydro resources. Pakistan's failure in management can not only be explained by blaming India, it must be explained where co-operation is lacking, where bad governance is existing domestically, not less than India's bullying, aggressive and irresponsible attitude is existing.

New water reservoirs would store flood water in monsoon season for productive use and save crops from huge damage to overcome the electricity crisis.

Diamer Bhasha Dam Project

Construction of dams has a vital position in the development of a country. Dams provide water for irrigation and enhance electricity generation and control floods. They also provide employment opportunities and contribute huge revenue in the economy. Electricity generation from hydro power is an environment friendly source of electricity generation. Diamer Bhasha Dam has great importance in the economy of Pakistan.

In year 2001, the feasibility study of Diamer Bhasha Dam was started. Water and Power Development Authority WAPDA, was the main agency carrying out this project. (Dawn, April 27, 2006). The estimated cost was too high and Pakistan approached Asian Development Bank and World Bank for their participation as donors of this project. For many years this project was stuck at land acquisition stage. This dam was proposed under projects for friends of democratic Pakistan (FODP) in June 2010 as a large reservoir.

Area profile

This dam project is located on Indus River, about 315 km upstream of Tarbela Dam, 165 km downstream of the capital city Gilgit of Gilgit-Baltistan and 40 km downstream of Chillas. (www.wapda.com)

Diamir is a district in northern Pakistan in Gilgit Baltistan Province and Bhasha is a village in Kohistan in KPK province. Major portion for dam is located in Diamer and very less in Bhasha, where no households are affected due to this project. It shows that it is located on the boundary of Gilgit-Baltistan and Khyber Pakhtoonkhwa. These provinces give diverse climates for different activities of tourism as well as for agriculture. At Diamer, Karakoram highway enters into Gilgit from KPK. Almost 100km length of KKH would be submerged and 31 villages would be affected due to this dam project.

When the government of Pakistan Tehreek-e- Insaaf took the office of Prime Minister in 2018, they have shown great interest in the construction of dam.

Construction of Dam was included in WAPDA's vision 2025. Feasibility of this project was started in 2001. The project prefeasibility was carried out in 1984, Feasibility in 2004 and the Detailed Engineering design was completed in June 2008 and approved in 2012.

PROJECT FEATURES

The project comprises of the following major components as given by Dr. Izhar ul Haq*1* & Syed Tanveer Abbas.

i. Dam: 272 m high roller compacted concrete (RCC) Gravity
ii. Spillway: 14 bays, each 11.5 m wide and 16.24 m high
iii Low Level Outlets: 2 No. 7.2 m dia.
iv. Reservoir Flushing Outlets: 5 No. 9.0 m dia.
v. Power Houses: 2 No. 2250 MW each, underground
vi. Power Units: 12 No. 375 MW each
vii. Power Waterways: 4 No. concrete headrace tunnels (15.3 m dia. each)
12 No. steel penstocks (7.2 m dia. each)
4 No. tailrace tunnels, shotcreted
4 No. surge chambers.
x. Power Intake Flushing Tunnels: 2 No. 1 on each bank
ix. Temporary Works: 1 No. diversion canal
2 No. diversion tunnels
2 No. coffer dams (u/s and d/s)

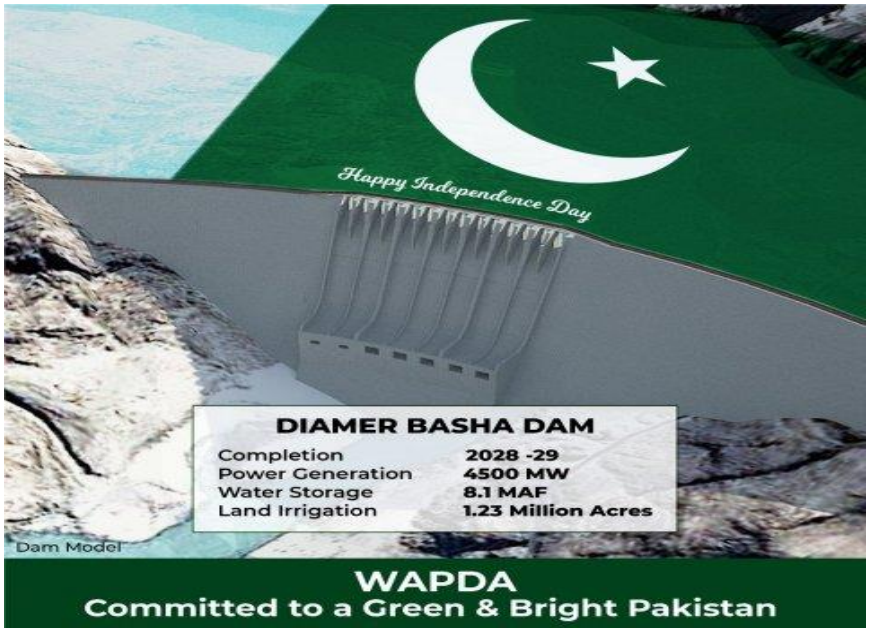
Source: Haq, Izhar, & Abbas, Tanveer. (2011) " Biamer Basha Dam Project" Pakistan Engineering Congress, 71st Annual Session Proceedings, p.50

Project Benefits

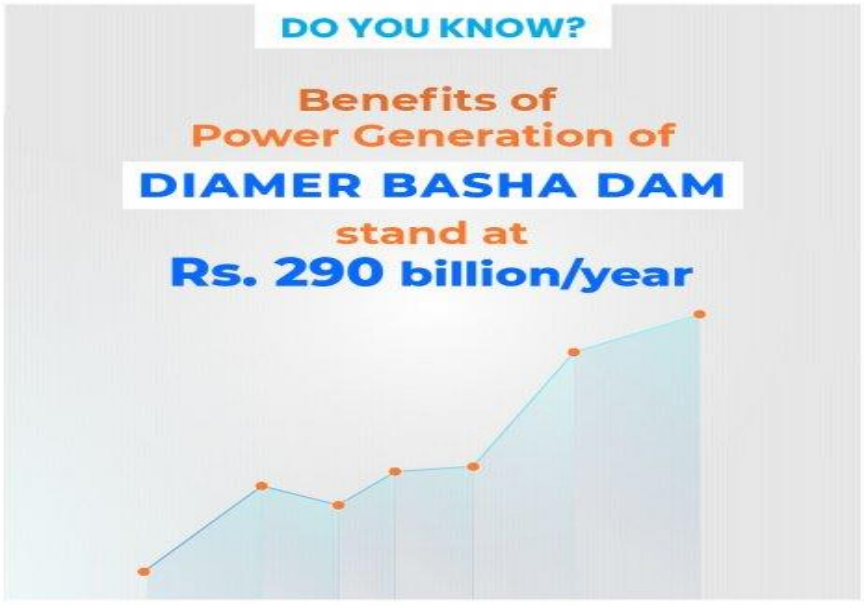
Following are the benefits declared by the government on website of wapda, (www.wapda.gov.pk)

1. Availability of about 6.4 MAF annual surface water storage for supplementing irrigation supplies during low flow periods.

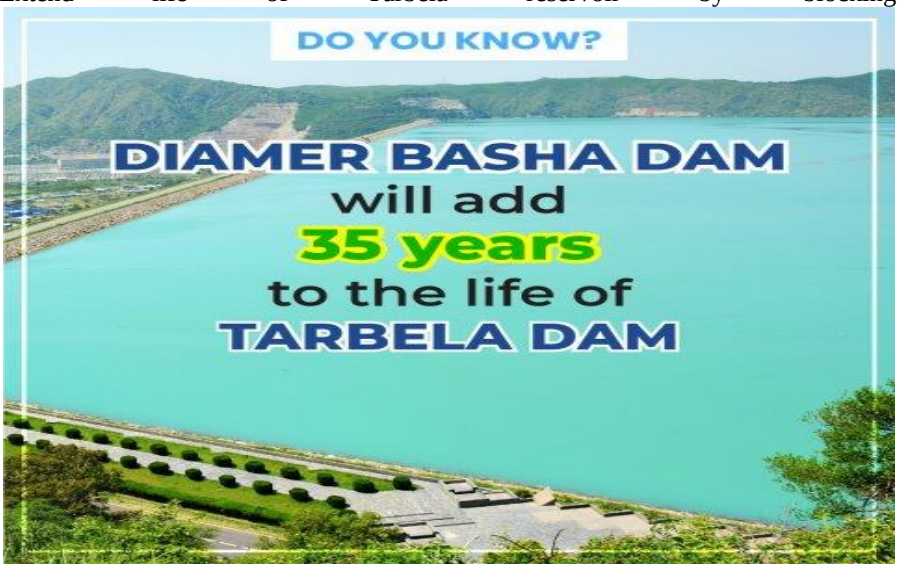
2. Harnessing of renewable source of clean and cheap energy through installed capacity of 4500 MW.



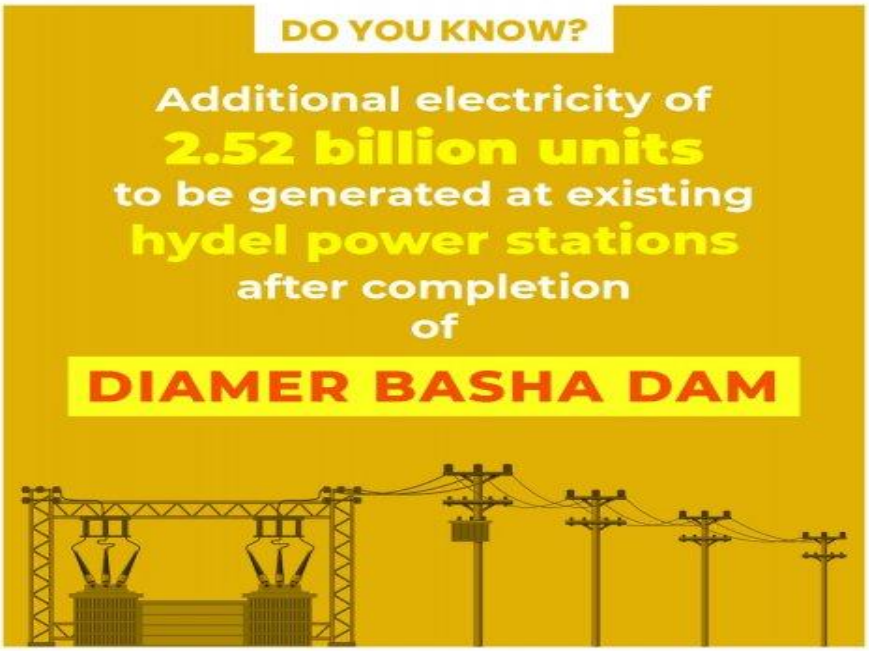
3. Average annual generation 18000 GWh.



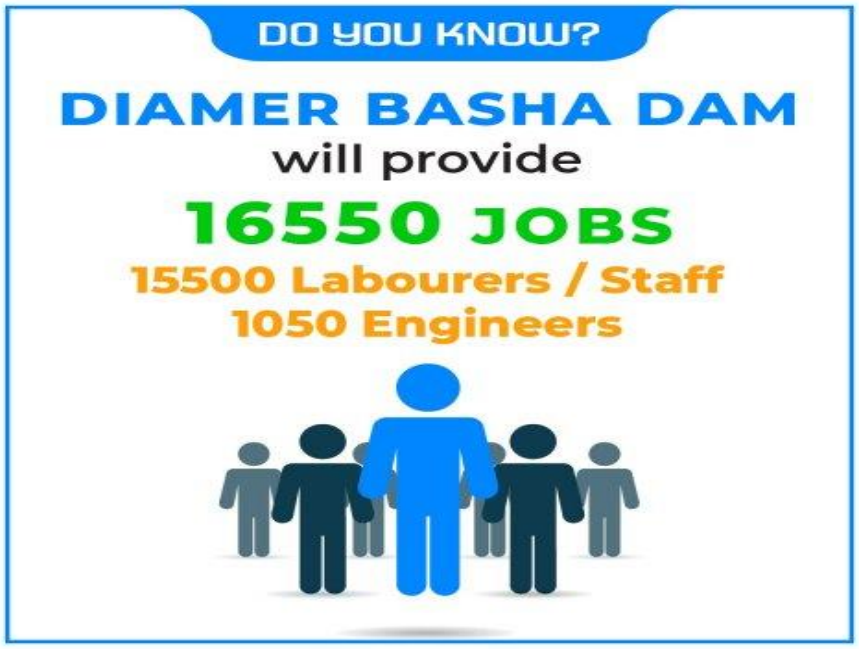
4. Extend life of Tarbela reservoir by blocking the sediments.



5. Additional annual generation at Tarbela 1111 GWh.



6. Reduction of dependence on thermal power, thus saving foreign exchange.
7. Employment opportunities, particularly to the locals, during the construction and operation.
8. Creation of massive infrastructure leading to overall socio-economic uplift of the area and standard of living of



people.
9. The project will pay back its cost in 8 years.

This dam will stop negative impacts of global warming and climate change and it would stop import of fuel for making electricity and would not affect the climate badly.

Progress on Diamer Bhasha Dam

Initially Asian Development Bank and World Bank and western allies were approached for funding but did not get it. In past it was seen that construction of Bhasha Dam had strong local resistance, demonstrations and anti government protests, blockade of Karakuram highway due to low compensation, nonpayment and selected compensation and corruption was made.

The Supreme Court of Pakistan has initiated fund raising campaign among people of Pakistan for Diamer Basha Dam of 4500 MW and Mohmand Dam of 7 to 800MW Construction project in July 2018 and an account was made for collecting donations for the construction of Diamer-Basha Dam from all over the world from Pakistanis. About Rs.12 billion were collected which was far below the estimated cost of US $ 14 billion.

China planned the dam as CPEC project but Pakistan rejected too strict deal of China. Pakistan asked for financial help from China, luckily China stepped forward and signed the construction contract with FWO of Pakistan on 13th May 2020. It is a contract of Rs.442 billion and would be completed in 2028 or 2029. Since July 2020, the activities on the project have been continuing at a good pace despite the fact that covid-19 has slowed down every work world widely. Chairman WAPDA, Lt Gen.(r) Muzammil Hussain and Diamer Basha Dam project manager Amir Bashir Chaudhry, member WAPDA are monitoring the project work. Government has made milestones of the implementation plan, determined to complete the project in time. Minister for water resources, Muhammad Faisal Vawda is supervising the activities.

The Diamer-Bhasha Dam is constructing on River Indus in Gilgit-Baltistan and Khyber Pakhtunkhwa. Under the agreement, China Power will hold 70 per cent of share while the remaining 30 per cent will be with Frontier Works Organization, (FWO) a commercial arm of the Pakistan army.

Prime Minister Imran Khan launched the construction of this dam on 15th July 2020. (Dawn News, 16th July 2020). This dam was 40-50 years ago decided but the project started on 15th July 2020. This would be the biggest dam in the history of Pakistan to be built and it would generate energy for Pakistan. The government of Prime Minister Imran Khan is claiming that this dam would be completed in 2028 or 2029. An agreement worth Rs.442 billion with a joint venture namely Power China-FWO was signed on 13th May 2020.

After this dam construction 4,500 megawatts electricity would be produced 1.23 million acres of land could be used for agriculture. It is expected that around Rs.78.5 billion would be spent on social development around areas of Diamer Bhasha Dam and lot of flood water would be used. The water which the people of Pakistan have polluted does not allow us for a relaxed attitude towards water use in efficiencies in household and in agricultural irrigation.

Hurdles for Pakistan

Poor governance for water management is seeing since the first inauguration of Diamer Bhasha Dam in 2006, Pakistan has only played politics on building up dams. How to engage external sources for loan as well as domestically Pakistan's ability to handle water problem was one of the biggest challenge confronted by Pakistan. Diamer Bhasha Dam construction has become one of the major focuses of Pakistan's government.

Pakistan has started the construction of big infrastructure based Diamer Bhasha Dam. It has social, economic and environmental impacts which are source of conflicts among different actors (Chakravorty, 2016).

Dams play a significant role in fulfilling the energy and irrigation demand of a country, produce a large number of employment opportunities and contribute huge revenue in the economy. Hydropower is also a clean source of electricity which is environmentally important and viable source of energy. But such projects have also negative externalities and significant source of conflicts.

The socio-economic impacts have always been very hard on local affected people in the form of landlessness, loss of economic and livelihood opportunities which appear in many ways and dimensions. Further, negative environmental and ecological impacts of large dams include GHG emission, obstruction to fish migration, loss of diverse ecosystem, loss of architectural heritage, geological hazards and extinction of biodiversity (Sun, 2013; Williams and Porter,2006).

Absence of national resettlement policy, non-availability of employment opportunities and human rights violations lead to landlessness, economic impoverishment and social instability (Magsi and Torre, 2013; Sun, 2013). Indirect impacts of dam construction include unemployment as less than half of the population can keep their original profession. Although such projects create temporary employment opportunities in the form of laborers (Moran, 2004) but such opportunities increase at first but cannot sustain after construction (Huber & Joshi, 2015).

Another source of conflict is lack of information dissemination among the people of that affective areas regarding most of the project activities and limited or no participation of all stakeholders in all project activities is seen in Diamir dam construction case.

Land acquisition is one of the main project activities before start of construction of big projects. Land acquisition and compensation are significant reasons of conflicts in several dimensions and among different stakeholders. Land conflicts in such projects could arise not only between authorities and affected people but also among different groups of affected population. In many countries such projects are brought on tribal, rural or remote areas where local people are illiterate, unaware of their rights and mostly have no legal rights to lands (Moran, 2004; Flood, 1997; Zhu & Simarmata, 2015). Land acquisition act in countries like India, Pakistan and Bangladesh cannot be challenged however affected people can challenge only compensation (Awasthi, 2014).

In case of this dam construction, land acquisition and loyalty disputes are very much active in Pakistan. There is a dispute between Harban tribe of Kohistan and the Thor tribe of Diamer over the loyalty of the land which will be used for the construction of the dam. Government of Pakistan has announced Rs. 78 billion for the welfare of the affected people due to the construction of this dam. Tenure reforms are formed on the bases of biasness and favoritism especially in developing countries which fail to protect the informal land rights (Rigon, 2016). Pakistan is not exceptional to this problem. Further, historical inequalities and local culture also favors specific group of people which is also a significant source of conflict (Marx,2016; Sabir etal.,2017). Political favoritism and mismanagement by land managers are major source of conflicts due to lack of formal allocation of land or unfair allocation of formal land (Admasu, 2015;Campbell et al.,2000).

Such problems open ways for mismanagement, corruption and cronyism which are the main issues in land valuation for compensations and raise conflicts among different stakeholders (Swain and Chee, 2004; Magsi and Torre, 2012).

Property rights loopholes, illiteracy and ignorance about rights encourage the powerful stakeholders to pressurize the local affected people and use force against them in different ways. Like in case of this dam construction in Pakistan, no reliable assessment of compensation was made, only families supported by landlords were offered compensations and people who denied low compensations or took legal action in court ended up without any decision (Magsi, 2012). Moreover, social and emotional attachments to land are also hard to evaluate (Dams & Development, 2000). In the case of Diamer Bhasha project there have been mismanagement and corruption in measurements which led towards conflicts between authorities and affected people.

Another conflict between them is on the basis of manipulation of land category. Three land categories including cultivated, cultivable and barren land are decided on the basis of which compensation will be provided. But local people protested against this decision as they claimed that their cultivable lands are considered as barren in order to reduce the compensation rate. Moreover, conflicts also have grown to historical settlements of affected people which divide them into two major groups over land rights. They were demanding Rs. 15 million against displacement but government refused it. Protests are also seeing there from the fifty villages of the surroundings.

Environment and cultural heritage impact like number of affected villages, houses, population, agricultural land, length of karakuram highway and rocks carving has already assessed by the government of Pakistan. Resettlement plan i.e. executed in which 9 model villages are planned for better living conditions.

In 2020-21years budget, government of Pakistan allocated Rs. 61 billion to this project, which are not enough financial resources to complete this dam. Whether China would give us loan or not, still not decided.

Pakistan's decision to construct Diamer-Bhasha Dam is feared in India as India considered it an infringement of its territorial integrity. India raised objection on Pakistani project of Diamer-Bhasha Dam and Pakistan argued that the area is recognized by United Nations as disputed territory so that it is not violating the terms of Indus Water Treaty. There is a strong possibility that in the near future India would disrupt the project.

Within Pakistan, there is opposition to this dam, as it will submerge sizeable shares of Jammu and Kashmir and province Sind (Pakistan) and water will diverted to Punjab province of Pakistan. Pakistan is facing internal and external politics over its Diamer Bhasha Dam and it has become a political issue instead of water regulation.

Suggestions

This water project would address two serious issues, one is water shortage and two is power generation. Diamer Bhasha Dam will increase Pakistan's water storage capacity from thirty days to forty eight days. Minimum requirement of water storage capacity is 120 days. We are still far away from the minimum storage capacity. It is being said that Pakistan would face severe water shortage in year 2025 when the expected demand would be 338 cubic meters and supply would be only 236 cubic meters. To initiate the step towards Bhasha Dam's construction to full fill demand and supply gap seems wonderful.

To work out a sound and cogent water storage and conservation strategy is the need of the time. Water management ability is the biggest challenge confronted by Pakistan. Construction of dams in Pakistan is imperative, as only two major dams have been construction after 1947 whereas India has constructed more than 24 dams.

Government's ability must be highly judged over the conflict of land acquisition, measurement, its ownership and the boundary conflict between Gilgit Baltistan and KPK. A governance mechanism/strategy is required to facilitate and enhance negotiations among different stake holders. Political efforts and transparency are required to satisfy all stake holders and secure social acceptance avoiding biases, corruption and mismanagement. Model villages must be constructed as early as possible and to give trainings in order to engage more and more local people in the construction plan. There should be a complete information dissemination and public participation in the form of involvement of local leaders, religious leaders, NGO's and other representatives at every step of the project. To work on different ways to save water simultaneously is required for Pakistan.

At this point of time proper planning, calculations of estimated cost, implementation strategies regarding each step must be discussed by the government. In past it was seen that construction of Bhasha Dam had strong local resistance, demonstrations and anti-government protests, blockade of Karakoram highway due to low compensation, non-payment and selected compensation with corruption pointed fingers towards poor performance of the government. Deaths of three people were reported when police opened fire on Protestants in June 2012. Another issue for government handling is with the courts as the people claim from KPK and Gilgit Baltistan about 8- km long area comes under their boundary. It is directly related to government's capability to resolve it. Government efforts and transparency are required to satisfy all the stake holders of this Dam.

If government of Pakistan is serious in addressing the water scarcity issue, it requires new narrative. Most importantly water requirements must be reframed or re designed, as a basic necessity, on the top of political priorities and important to the prosperity of the masses across Pakistan. Talk shows having water experts would be conducted frequently on water scarcity issue, on public awareness campaigns, on up-dates of Diamer Bhasha Dam construction. In schools, colleges and universities curriculums, water conservation guidelines must be added.

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