Diamer Basha Dam project

THE project is located on Indus River, about 315 km upstream of Tarbela Dam, 165 km downstream of the Northern Area capital Gilgit and 40 km downstream of Chilas. The proposed dam would have a maximum height of 270 meters, and impound a reservoir of about 7.4 million acre feet (MAF), with live storage of more than 6.4 MAF. Mean annual discharge of Indus River at the site is 50 MAF.

Thus the dam will impound 15% of the annual river flow. The dam project would cover an area of 110 km and extend 100 km upstream of the dam site upto Raikot Bridge on Karakoram Highway (KKH).

Need for the project: Agriculture is the backbone of Pakistan's economy. Pakistan today is among one of the world's fastest growing populations, now estimated at over 150 million. Due to lack of large river regulation capability through sizeable storages, the country is facing serious shortages in food grains. Given the present trend, Pakistan could soon become one of the food deficit countries in the near future. Therefore, there is a dire need to build storages for augmenting agriculture production. Tarbela, Mangla and Chashma reservoirs have already lost about 5 MAF due to sedimentation. It is estimated that by year 2012, this loss would increase to 6 MAF, almost equal to the original combined capacity of Mangla and Chashma reservoirs.

Due to complete stoppage of any sizeable multi-purpose storage development after commissioning of Tarbela Dam in 1976, sustainability of existing irrigated agriculture of Pakistan is in serious jeopardy.

The President has taken a very bold initiative by taking the decision to construct Diamer Basha Dam. The present demand of electricity in the country is above 17,000 MW, which is estimated to cross 22,000 by the year 2010. A large-scale injection of power thus becomes inevitable. Hydropower will provide the required electricity at an affordable price. Contribution of 4500 MW power from Diamer Basha Dam will go a long way in alleviating

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Diamer Basha Dam p

this situation.

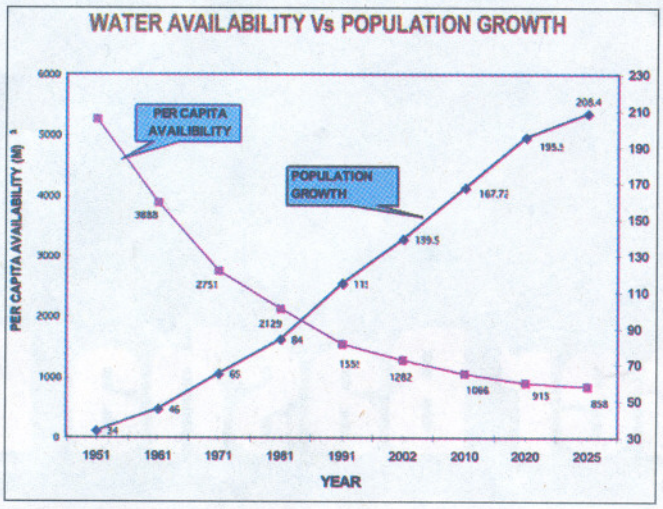
DIAMER BASHA DAM BENEFITS

Availability of about 6.4 MAF annual surface water storage for supplementing irrigation supplies during low flow periods.
Harnessing of renewable source of clean and cheap energy through installed capacity of 4500 MW.
Reduction of dependence on thermal power, thus saving foreign exchange.
Employment opportunity, particularly to the locals, during the construction and operation.
Creation of massive infrastructure leading to overall socio-economic uplift of the area and standard of living of people.
Flood control.

ENVIRONMENT AND RESETTLEMENT

- Number of villages affected 30
- Number of Houses affected 2200
- Population affected 22,000
- Agricultural land submerged 1,500 acres
- Area under reservoir 25,000 acres
- Length of KKH sub merged 100 km
- Proposed new settlements 9

Infrastructure Electricity, roads, water supply, schools, health centres, etc.



DIAMER BASHA DAM SALIENT FEATURES

LOCATION	40 km downstream of Chilas
MAIN DAM	
Maximum Height	270 m
Type	
Roller Compacted Concrete	(RCC)
DIVERSION SYSTEM	2 No. Diversion tunnels 1 No. Diversion canal Upstream and Downstream Cofferdams
MAIN SPILLWAY	
No. of gates	9
Size of gate	16.5 X 15.0 m
RESERVOIR LEVEL	1160 m
Gross capacity	7.3 MAF
Live capacity	6.4 MAF
Min. operation level	El.1060 m
OUTLETS	
Intermediate level	8
Low level	4
POWER HOUSE(S)	2
Total installed capacity	4500 MW
Location and type	2 (One each on the right & left)
No. of units	8, each of 560 MW
Average generation	16,500 Gwh/year
ESTIMATED COST (Year 2005)	US $ 6.5 Billion

NEED FOR MEGA WATER RESERVOIRS- FACTS

Annual availability of surface water in Indus River System	142 MAF
Water channeled through canals	104 MAF
Evaporation/Seepage	42 MAF
Availability of surface water at farm gate	62 MAF
Underground water pumped into irrigation system	44 MAF
Total water available at farm gate	106 MAF
Total requirement of water	115 MAF
Existing shortage of water	9 MAF
Annual average flow of water into sea	35 MAF
Out of 142 MAF, river flows in summer (Kharif)	85%
Out of 142 MAF, river flows in winter (Rabi)	15%
Irrigation requirements in Kharif	60%
Irrigation requirements in Rabi	40%
Mismatch of water requirements	60/40%
Per capita availability of water in Pakistan to reduce in 2025	800 cubic meters
International standard of per capita water availability	1000 cubic meters
Present shortage of availability of water than demand	9 MAF
Water shortage in 2020	20 MAF
Projected water shortage in 2025	30 MAF

HYDROPOWER GENERATION

Need for water reservoirs

- High power tariff burdening consumers can be reduced by correcting hydel-thermal generation ratio of 30-70 which used to be the opposite in 1970.
- Only 14% of Pakistan's total hydropower potential of 50,000 MW being tapped at present.
- Average hydel generation unit costs for new projects is Rs. 1.00/KWH against Rs. 7.00/KWH for new oil based thermal generation.
- Pakistan's electricity demand increasing by 7% per annum.

Benefits of water reservoirs

- Saving import of fuel for the thermal power plants.
- Reduce cost of electricity i.e. Rs. 1 per KWH.
- Electrification of industries/towns/villages.
- Reduced cost of electricity to also help reduce cost of manufactured goods.

AGRICULTURE / FOOD AND FIBRE

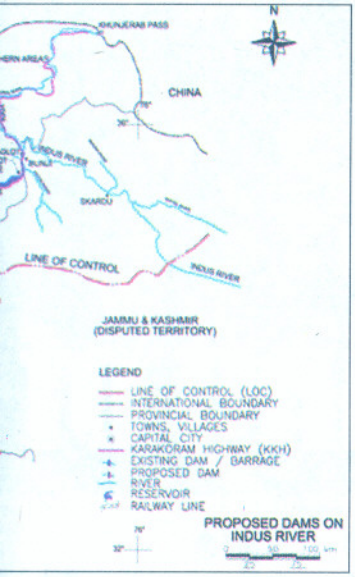
Need for water reservoirs

- Agriculture forms backbone of Pakistan's economy - 23.3% of GDP.
- 64% Pakistanis depend on agriculture.
- 60/70 % of exports depend on it.
- Water is a lifeline for agriculture.
- Annual rainfall of Pakistan below average, needs of water for agriculture.
- Water is a precious resource for Pakistan we should not waste a drop of it.

Benefits of water reservoirs

- Out of Pakistan's total geographical area, only 77.1 million acres is suitable for agri-

project



culture. A total of 44.4 million acres of agriculture land is irrigated besides only 10 million Barani land under cultivation.

•If water is available, the remaining 22.6 million acres of land which is 29% of total suitable area for agriculture can turn productive.

•If no additional water is tapped, 1/3rd of agriculture potential of Pakistan will remain untapped.

•Inaction and indifference to store more water would force the country to import food worth US $ 6 billion per year.

•Agricultural production needs to be increased by over 60% by the year 2005 to meet the food and fibre requirements of the population.

INDUSTRIES

Need for water reservoirs

•Industrial expansion and growth essential for economic development and prosperity.

•Electricity, a must to maintain and increase industrial growth.

Benefits of water reservoirs

•Expansion of Industrial Sector possible only with more and cheap electricity.

•Increase in industrial/value added exports to benefit the common man in generation of employment opportunities and reduction in imports.

•Additional industrial zones and areas to be developed with availability of more cheap power.

DRINKING WATER AND SANITATION

Need for water reservoirs

•Pakistan's population is increasing by over 2% per year requiring availability of more clean drinking water.

•Cities, towns, villages expanding requiring more water for sanitation purposes.

Benefits of water reservoirs

•Implementation of clean drinking water schemes possible with availability of more water.

•Water Supply System could be planned with availability of water.

ENVIRONMENT

Need for water reservoirs

•Better clean environment for human beings.

•Reduction in barren lands.

•Controlled rivers and canals.

Benefits of water reserviors

•More land area under cultivation.

•Greenery and habitation to improve.

•Better Water Management and cleanliness.

FLOOD CONTROL

Need for water reservouirs

•Millions of people affected by floods every year causing loss of life and property.

•To control flooding and manage rivers.

Benefits of water reservoirs

•Saving lives of millions of people.

•Saving billions of Rupees on rehabilitation after floods.

•Check on land erosion near river banks.

WORLD BANK REPORT ON WATER RESOURCES OF PAKISTAN

•Pakistan has exhausted its current water capability and needs to take immediate measures to sustain its water-driven economy.

•Pakistan only stores 30 days of river water. India stores 120 to 220 days. Colorado River in the USA stores 900 days.

•Pakistan's per capita water storage is just 150 cubic meters while that of China is 2200, Australia 5000, USA 5000.

•Pakistan's economy can be propelled into future only through building new water projects and canals.

•Every new mega dam will add 4 to 5% to Pakistan's GDP, that means one dam will take our GDP from 110 billion to 115 billion US dollars, two dams to 125, three dams to 135 billion dollars.

•Tarbela Dam directly benefits 3 billion dollars per year and 40% of total population (60 million benefit from it).

•Pakistan has 50,000 mega watt economically viable hydropower potential of which it harnesses only 14 percent.

•Pakistan has 50,000 MW generation potential against its total requirement of 20,000 MW. Hence Pakistan can meet its energy needs through water.

•China and India produce 30% of their required power through water. Developed countries harness 70 to 80%.

•Unfortunately, instead of generating hydro power, Pakistan produces expensive thermal power then also complain of it being costly.

•In countries around the world it is the lower riparian which often pays for construction of up stream storage.