

The dam debate yet again

delivery of water to the crops when most needed.

There is a close link between water availability and agricultural productivity. It is a dire need of Pakistan to ensure its food security for its rapidly expanding population. The obvious question therefore, is as to where from would come additional water needed for sustained agricultural production. Water conservation measures and small scale irrigation projects combined with efficient use of water can help water shortage to an small extent but not eliminate the necessity of large multipurpose dams as is being project by opponents of large dams.

The basic strategy for a sustained agricultural production increase is to bring additional land under cultivation through intensive irrigation practices. For this purpose the only exploitable water resources available to our country is the surpluses flood flow of rivers, which goes unused to sea during two months of July and August. Storage of this water not only can bring vast barren lands under plough but could produce substantial electricity as well as a far cheaper rate then being bought from the Independent power Producers (IPPs).

For an arid country like ours irrigation can mean the realisation of otherwise unimaginable opportunities. Statistics of canal head diversions reveals that it increased from 67 MAF in 1949-50 to 95 MAF in 1967-78 after commissioning of Mangla Dam. It reached its peak at 112 MAF during post Tarbela Period (1977-92). Since then, canal head diversions are stagnating rather reducing due to absence of new storage provision and gradual silting problem.

In this critical scenario of the most worst water shortages of our history, we do not have any option other than to build new multi purpose water reservoirs, what so ever or where so ever it may be. The question before us is not to debate than should we construct new dams or not but it is how to seek agreement between upper and lower riparian for settling the water rights issues among them.

With the release of report "Dams and development" by World Commission on Dams (WCD) recently a debate on large dams have began once again all around the world. The report and the commission has a close association with Pakistan because Tarbela Dam was one of the ten announced case studies under taken by WCD during its two year work programme.

As expected the commission discourage large dams and supports smalls dams and reservoir. Since the establishment of the commission in February 1998, it was believed that it is going to rule out large water reservoir construction all around the world. The mandate of the commission was to review the development effectiveness of dams and to develop standards. Criteria and guidelines to advise future decisions-making. As reported in the press the commission has also sought comments from all four provinces of Pakistan on this report and it seems that we at the cross road right now to decide that should we go with or against the commission recommendations? The most severe water shortage of the history is forcing us to go for the large dams and on the other hand international donor agencies. Like World Bank on whose behalf the commission was set-up are compelling us otherwise.

It will be worthwhile to note that there are more than 800,000 dams in world today out of which 474,50 are classed as large dams by the definition of International Commission On Large Dams (ICOLDs) which defines large dams as dams which has a height of 15 meters or more. If dams between 10-15 meter high have a spillway discharge over 2000 cubic meter or a reservoir volume of more than one million cubic meters, they are also classed as large dams.

However International Journal on Hydropower & Dams uses the term "major dam project" that fulfil one or more of the following criteria: dam height of more than 150 meters; dam volume of more than 15 million cubic meters; reservoir volume of

more than 25 billion cubic meters and installed capacity of more than 10000 MW. There are more than 300 dams of this category worldwide.

Interestingly Pakistan, despite of having world largest contagious irrigation system, stands now where in statistics of large dams world wide and only 40 dams that qualify they definition of ICOLD. Whereas according to definition of journal of hydropower nad dams we have only two large dams i.e. Tarbela and Mangla. Therefore we need not to take care about rulings of such commissions, which have their on interests that do not match our local requirements any way. Worldwide statistics of large dams are being presented in the table.

For an agricultural country like ours water is not the only limiting factor in our agricultural cum economic development. With each passing day we are turning to be an energy deficient country as well and in years to come water shortages will not be the only issue for our development but more appropriately subsistence. In coming future it will be energy issue that will dictate its terms. Broadly speaking there are two main issues confronting in our rural and urban life now a days. Rural people are crying for water shortages where as urban people for regular power break down and inflated electricity cost. (See table)

In these circumstances we need to evolve a strategy that will relieve our rural areas, or in other words, agriculture, from the frequent water shortages and our urban areas, or in other words industry, from the regular power failure and its inflated cost. There is no option other than the hydropower, which suits us best in this current scenario.

Before debating the issue of large dams construction, we ought to distinguish between water development and water management. Majority of developed countries of the world have surpassed the water development course and are now focusing

their attention on water management and conservation. That's why they have turned opponents of water development projects or in other words, large dams in developing countries like ours.

Water resources policy of almost all developed countries was defined in the past by the flow of money to dams and canals. The era, however is ending for three reasons: (1) federal support has dwindled; (2) the general public has shown a strong interest in preserving its rivers for recreation and wildlife; and (3) many best sites for dams have been used and those that remain will be more expensive to develop and are often more environmentally objectionable. Therefore their water policy has shifted from water development to the efficient use of existing facilities and supplies, making water conservation and recycling wave of future.

TABLE

Country	No. of Dams
China	22000
USA	6575
India	4291
Japan	2675
Spain	1196
Canada	783
South Korea	765
Turkey	625
Brazil	594
France	569
Other countries	7347

On the other hand Pakistan has not been able as yet to develop its water resources properly. Designed storage capacity of three storage reservoirs (Mangla, Tarbela and Chasma) is 15.7 MAF, that at present has reduced to 12.5 MAF (approximately) due to siltation. One thing must be borne in mind that reservoir siltation is a natural process which can never be eliminated completely however may be reduced

by proper basin management. No cost effective widely applicable way to un-silt a large reservoir has yet been developed, so useful life of all dams is reduced due to this natural phenomenon. We are fortunate enough that our water reservoirs are not being silted up swiftly as compared to a number of reservoirs all around the world.

It has been estimated that about 15 per cent of world's river flow is now channelled into reservoirs and that in Europe and North America over 40 per cent of stable discharge is regulated by dams. In contrast, Pakistan has been able to channel less than 10 per cent of its water to regular table water reservoirs.

Based on 50-year rim-stations inflow data, it is estimated that Pakistan has a mean annual surface water availability of about 141 MAF. Of this mean annual availability of water only 23.04 MAF (16.3 per cent) is available during six Rabi months (October-March), 44.45 MAF (31.3 per cent) during first three months of Kharif (April-June) and 73.36 MAF (52.1 per cent) during last three Kharif months (July-September). Interestingly, about 42 per cent of the total annual mean flow in available during the two months of July and August.

Our river flows are almost fully utilised, except during the flood period in Kharif. The utility of floodwater is very marginal unless additional storage is provided in the system, enough reservoir capacity in its irrigation system to store seasonal waters. Additional storage would also be necessary for providing the flexibility needed by the shift from a supply based operation system towards a demand based one.

Irrigation, drainage and flood control of agricultural lands are no longer options. They are necessity for feeding millions of people providing employment for millions of the rural poor. Large dams provide large storage capacity to meet the need during the dry period thus following for reliable