

# Rivers' support services to the economy

By Nasir Ali Panhwar

ON March 14 every year, the international day of action against dams and for rivers, water and life is observed as mandated by the participants of the first international meeting of the people affected by dams in Curitiba, Brazil in 1997.

Since the international day of action was launched in 1998, every year groups around the world have mobilised thousands of people to take action and demand justice for their rivers and their lives.

The importance of rivers to people is undeniable, supplying resources such as irrigation, industrial and household water and fish, waterfowl, mussels as important sources of food. In many places fisheries are the most important source of protein for the poor.

Other services provided are less obvious, but at least as important. Regulating services of freshwater systems include, amongst many others, water purification, flood mitigation and sediment deposition.

Finally, freshwater systems offer numerous cultural services, varying from recreational opportunities to aesthetic and spiritual values. All great civilizations in the world grew up around water, which provided the key not only to supplying freshwater, but also to agriculture, trade, transport and defence.

Such civilizations as the Indus valley civilization, Roman Empire, Egyptian civilization, the Venetian Empire and the Umayyad Dynasty were all founded on their access to water, which provided their population with the means to both survive and expand.

Rivers support many services to society, most crucially the provision of freshwater and food. Freshwater is necessary for drinking, hygiene and agriculture, whilst fish and fishery products are particularly important in developing countries. Many of these provisioning services can be maintained to some extent in modified rivers, and indeed large scale water supply services, particularly for irrigation, rely on dams and other water infrastructure to provide that service.

With most river modifications aimed at water supply, the key provisioning benefit derived from free flowing rivers over dammed rivers is food supply. Fisheries production is dependent on many different factors, such as length of river, the catchments area, physical conditions while lifecycles of many species are heavily influenced by the natural variability in river flows.

Dams alter river ecosystems and in many cases negatively affect fish species native to the river. This directly affects fisheries productivity both upstream and downstream of the dam. Fisheries production of floodplains downstream from the dam is affected by changes in the flow regime. Floodplains are important feeding and spawning ground for fish, but by replacing seasonal flow patterns with a year round steady outflow, floodplains can no longer perform this function.

This situation would affect the livelihood of fisher folk community. There is growing evidence that large water storage projects are the major cause of global wa-

ter crisis, it is interesting to note that the pro dam lobby in Pakistan is pushing hard to convince that the only effective policy response to water crisis is construction of new dams.

The World Commission on Dams (WCD) which is the global forum mandated to assess the development effectiveness of large dams, points towards the poor and questionable financial, technical, social and environmental performance of large dams, especially irrigation projects. According to the WCD report, such projects designed to deliver irrigation services could not achieve physical targets, unable to recover their costs and could not bring profits in economic terms as expected.

Financial and technical performance of large dams becomes horrific when social and environmental costs are made part of overall analysis. For instance, water-logging and salinity is always brought about by surface irrigation. In the case of the Indus basin, about 38 per cent of the irrigation system is classified waterlogged, resulting in 25 per cent less production than the actual potential.

Environmental aspects of large dams, especially storage projects, entail most negative impacts often with an irreversible chain of adverse ecological changes. The Tarbela case study commissioned by the WCD reveals that only 21 per cent of the historical dry season flow of the Indus reach the delta, the rest is diverted for irrigation and water supply by 22 dams and barrages. As the Kotri barrage was commissioned in early 1960s, the average number of days with no river flows downstream in the dry season increased from zero to 85 per cent.

Changes in flow regimes of the Indus have not only played an instrumental role in the unprecedented loss of riparian forests in Sindh and southern Punjab, but also caused substantial financial loss in terms of decrease in fish production. Hence, it is high time to imagine the scale and intensity of environmental impacts if all the proposed upstream water diversion projects are implemented in the near future.

About one quarter of the total water diverted between the canal heads and the watercourses are lost, while another 34 per cent disappear within the watercourses. A further 11.5 per cent is lost within the farmers' fields. Thus only 30 per cent of the total diverted water supplies reach the farm area.

Construction of new dams will not only contribute to the current huge water losses but also aggravate the already severe situation of water logging and salinity. The control of system losses can serve better than new dams. Rain water harvesting, building check dams, and other structures and recharging groundwater should be made an integral part of alternative solutions and arrangements.

There is no regulatory framework for fast depleting groundwater reserves. The current rate of groundwater exploitation is unsustainable and makes the task of recharging the underground water resource almost impossible.

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