

Conserving water for sustainable human development

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Almost four years ago when this writer warned against the forthcoming serious water crisis in an article, based on water awareness in Singapore and further study, centring 17 countries including Pakistan, which were identified as the most water scarcity hit countries in future, this issue was not taken up seriously. Now realisation has taken a very crucial turn. Water cries are being heard from every nook and corner of the country.

Singaporeans have developed a national tendency to conserve even a drop of water to save their future. They call this drop of water their national life. Tens of thousands of tourists and other visitors landing in Singapore experience the realisation about the importance of water when they are confronted with notices in their hotel rooms and toilets inscribed with requests to conserve water as the Singaporeans do. Unfortunately, we in Pakistan waste a lot of water at all level despite the fact that we need more conservation of water through a better water management. We have no tradition of water recycling at household level or at broader level. It is manufacturing fault in our construction and town planning that we do not care for water storage and recycling options. There is a dire need that we should include cycling ponds or storage spaces in construction plans do that we can use water to the maximum extent.

Right from the water harvesting, utilization and distribution to its management and new water projects, a number of controversies and new approaches are emerging. New integrated approaches and solutions are being discussed at national, regional and international levels. Though Kashmir is a political conflict in South Asia, its another dimension is linked to water because all water resources for India and Pakistan generate from Kashmir.

Water is crucial to sustainable human development. As the world population tripled in the 20th century, the use of renewable water resources has grown six-fold. The substantial investments in the development of water resources in OECD countries and Asia have made major contributions to food security, to electricity production and economic growth in general. These investments have also succeeded in satisfying the basic needs of much of the world's population. However, this water development has not always been sustainable and many are convinced that there is a world water crisis.

Keeping this in view, all the regional and international conferences are taking up water issues on top of their agendas. The UN Secretary General has appointed twelve persons to serve on a Panel to help him prepare the World Summit on Sustainable Development (WSSD) to be held in Johannesburg during August 26-September 4 with a special focus on water resources development and management. Comments have also been invited

from stakeholders, through the network of the Global Water Partnership, and through other networks and groups on water. The Panel has prepared a draft document to increase the awareness of water-related issues in the preparation for the Johannesburg Summit and to indicate directions that can contribute to overcoming the world water crisis.

According to this concept document for the WSSD, today's world water crisis is defined by insufficient access to safe drinking water for over a billion people, and inadequate sanitation for half the world's population. Population growth, the increase in GNP in most countries and progressing industrialization combine to create a demand for water in the urban areas of developing countries will continue to increase substantially in the coming decades. At the same time, lakes/streams, wetlands and marine waters provide the vast majority of environmental goods and services, including fish. Many of these services depend on the integrity of aquatic ecosystems. This integrity has been affected by (1) decline in surface area of these ecosystems; (2) widely deteriorating water quality; and (3) reduced quantities of water that are needed to sustain these ecosystems. Large-scale development of river and groundwater resources is less acceptable today, for environmental reasons. It is also less cost effective than it was in the 1960-1990 period, when the large majority of the world's 45,000 large dams were built. Set against this is the fact that the lack of access to water is expected to be one of the key constraints to achieving food security for all in coming decades. We will see continued pressure to develop the world's remaining water resources—a challenge, which will have to be met innovatively and sustainably.

The compounding the problem, water infrastructure built in recent decades is becoming obsolete as reservoirs are silting up irrigation networks falling into disrepair. Groundwater levels are falling in important aquifers that have contributed substantially to food security in recent years by providing water-on-demand to millions of farmers that tapped them using tube-wells to grow their crops. All these developments result in an increasing scarcity of water resources. A scarcity that hits the poor and vulnerable—first and hardest. Women and children are among those that suffer the most.

Data available regarding global water situation says nearly one third of the world's population, about 2.7 billion people, would experience severe water shortage within next 25 years. Water scarcity is fast emerging as the single biggest threat to human health, environment and global food security and livelihood of the people. Water is also gaining importance as a peace issue across regions and countries and experts view that now war on oil is being gradually replaced with the war on water. Water shortage seems to be a major destabilizing force within countries as global economy would be more dependent on the already scarce water resources. The major portion of earth (nearly 72 percent) is covered by water, unfortunately just three percent of it represents fresh water of which only 0.8 percent is accessible and potable because rest of the fresh water is stored either in the forms of glaciers or icebergs.

Water scarcity is hitting hard the people in most of the localities in Pakistan amid rising temperature and scorching heat that affecting life both in urban and rural areas. The scarcity is growing in this season because of natural shortage of underground water, misuse and mismanagement of water resources and excessive demand.

Pakistan, unfortunately, would be among the countries to be hit severely by water scarcity during the next 25 years. At one hand, the country is facing a conflict over water with India, while on the other hand, it has political inconsistency over the building of reservoirs. Moreover, people generally do not take care for water spilling over into drains, be it nullah or sea. Despite all alarming indicators, Pakistan has a potential to conserve its water resources right from the glaciers to sea by building atleast ten dams on the natural flow from Skardu to Tarbela. Experts believe if Pakistan did not opt for building these reservoirs, it would be among the largest importers of food grains within in a couple of decades.

The government of Pakistan in collaboration with United Nations' Development Programme (UNDP) is constructing over 50 mini dams in NWFP and undertaking Balochistan Water Conservation Project.

The experts suggest that Pakistani citizens should realize the importance of the growing scarcity of water in the country and should plan extensive conservation strategies to overcome the shortage through better water management. Water is one of the most precious natural resources and lifeblood for sustainable economic development in any country. This is even more in case of Pakistan.

According to data available regarding water situation in Pakistan, the annual per capita water availability based on current population figure of over 140 million in the country is only 0.9 Acre Feet, which is a drop of over 50 percent for the last nine years. The rainfall has generally been showing a decreasing trend all over the country since 1997 and has resulted in reduced river flows. Currently the country faces one of the most severe water crises in its history, which warrant an action plan to develop, conserve and utilize the dwindling water resources judiciously. More over surface and ground water quality issues are also becoming important and needs to be addressed.

This is also an alarming indicator that the storage capacity of the country's three major dams Tarbela, Mangla and Chashma would shed their capacity by 25% by year 2010 due to enormous amounts of sedimentation brought in by feeding rivers. Moreover, the surface water supplies in the irrigated areas have diminished over the past three years to an estimated 47% of the average value.

Amid these realities, only an integrated approach would be an important tool for the assessment and improvement of over all water productivity and introduction of new technologies could be an important way to bridge gap between the demand and supply of water in the country.

A project concept document of the Pakistan Council of Research in Water Resources (PCRWR) said water shortage has caused farmers to rely more on groundwater with serious consequences relating to both quality and quantity. According to a recent study, out of 565,000 tube-wells, 75% are pumping sodic water. The concept document aims at identifying grey areas of low productivity of water and providing evaluation, introduction of appropriate technologies for better use of water resources. A research study would be conducted in farmer fields to document and assess the performance of technologies from hydrological, institutional, sociological and economics perspectives.

The 77 years inflow data of Indus River (1922-23 to 1999-2000) indicate that the watersheds of the Indus River yield about 138.7 MAF of water annually. The River Indus alone provides 65% of the total river flows while share of Jhelum and Chenab is 17 and 19% respectively. At this stage, the country would need more food and fibre to meet the

needs of a growing population while under the present conditions, the Indus River System will not be able to meet the water requirement of domestic, industrial and agricultural sectors. The growing shortage of both surface and ground water in the country has been causing the danger of desertification. The problem is most severe in Balochistan where many river basins are experiencing depletion rates exceeding over one meter per year. Acute shortage of water is to be faced in the days to come due to depletion of water resources and growing demands. As finding new sources of water may not be possible in the current circumstance, it is important that the available water resources should be managed properly and used most efficiently and sensibly for maximum crop production per unit of applied water.

The document further said water productivity is far below its achievable levels due to various reasons. They include: inadequate and untimely availability of water causing stress at critical stage of crop growth, conveyance and field application losses, water consumed by high delta crops, improper irrigation scheduling, groundwater pollution, groundwater mining and social and institutional problems. The coastal areas of the country are also facing severe fresh water availability problems. Seawater intrusion in these areas, low and erratic rainfall, and poor quality groundwater are some of the problems in coastal areas. There is need to assess the nature and extent of the problems, besides finding economically and technically feasible solutions.

The situation requires concerted and integrated approach at the national level to tackle the problems of water shortage and deteriorating water quality. Several options are available to increase the water availability and productivity in the country. They are:

- Construction of new storage, reservoirs at appropriate locations on sustainable basis without causing any damage to communities and environment.
- Improving efficiency of the irrigation systems and farm layouts (lining canal and water course improvement, bed and furrow methods of irrigation, land leveling, zero tillage, scientific design of border and strip irrigation systems)
- Using high efficiency irrigation systems (sprinkler/drip irrigation)
- Zoning of groundwater according to water quality and its mapping
- Installation of skimming wells in the areas where only a thin freshwater layer exists over saline aquifer and using saline groundwater, in conjunction with canal water or independently with salt tolerant crops
- Changing the existing cropping patterns like adoption for less delta crops
- Adopting proper irrigation scheduling
- Rainwater harvesting in barani and desert areas and collection of waters from hill torrents in upland areas
- Developing and promoting appropriate water management technologies for coastal areas
- Introduction of renewable water lifting devices in northern and other areas with favourable topography.

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