Concept Note

National Water Policy Pakistan -- Review and Analysis

Symposium organized by Abdus Salam Research Forum, Nusrat Jahan College, Rabwah
Saturday, December 22, 2018

Introduction:

The most essential elements of the natural resource base of any country are climate, land and water. However, water is the most limiting resource for economic development in the arid environments of the developing country like Pakistan. The pressure exerted by an economic and demographic process on the national resource base is of serious concern. Water is already being used at maximum capacity in Pakistan. There is scarcely any excess capacity to meet the growing demand of water for the expansion of a) irrigation; b) provision of drinking water; c) recharging of groundwater supplies and wetlands; and d) flushing away of municipal and industrial wastes. Therefore, water must be seen in the context of:

- Water for Agriculture;
- Water for People; and
- Water for Nature.

As water is being demanded more and more, a well-crafted water policy is needed to rationalize water use for competing demands. For last few decades, we have not been able to formulate a framework for interventions by the federal and provincial governments to address various issues facing the water sector and now assuming a crisis situation. Under this backdrop after a decade of efforts, finally, a national water policy is in place. Abdus Salam Research Forum is organizing a one-day symposium to discuss its strong and weak points and provide a path for future water discourse.

New National Water Policy

The approval of a water policy represents a historic milestone given the lingering, perennial disputes between Punjab and Sindh provinces which had impeded the formulation of a national water policy. There are mixed views on the document. The critics argue that last government was quite focused on energy and infrastructure projects but did little for addressing water issues, but just before leaving took the credit for giving the country much needed water policy. There are a number of experts who argue that finally it did come out and praised it as a "historic milestone" given the fact that securing approval from all provinces was the achievement rather than the policy itself. It is the contents of NWP that matters the most and be judged on the prioritized topics it covers and their depth and relevance to present water crisis.

The important question is what does the policy document provides the framework for addressing the impact of growing water scarcity would have on the economy of Pakistan which is feared to be one of the most water-stressed countries by 2040. The proposed symposium would critically review if the document measures up to new challenges highlighted below.

The Challenges

Only 25% of the population has access to quality drinking water. The consequential impacts of contaminated drinking water on health is alarming as 40% of the overall deaths and 50% of the diseases in the country are attributed to dirty water intake.
On the supply side, we were unable to manage the country 's water storage capacity through the building of large and smaller dams to cope with seasonal variations in water supply. According to Indus River System Authority, "Pakistan dumps water worth approximately $21 billion into the sea each year due to lack of water conservation system. We are not prepared to face the adverse effects of climate change, in particular, extreme weather events such as floods, prolonged droughts, and heat waves as well as the rising sea level inundating coastal land and aquifers.

Agriculture consumes an approximately 95% of water, in future it would be under extreme pressure to reduce its share for growing water demand for domestic (4%) industrial (2%) and environments use (1%), further in times of water crisis which is happening now, the low use sectors (domestic use) would get higher priority as opposed to agriculture. As part of NWP implementation, there is need to rationalize water use among sectors and also to formulate a set of incentives, regulations and penalties along with proper accountability mechanism and monitoring oversight has to be built for maintenance of water standards, regulation of surface and groundwater use and equitable distribution of water resources.

The argument is simple, agriculture uses the bulk of water and in any water policy discourse would propose to rationalize water use in agriculture. Agriculture has to produce more with less water, but little is talked about on this. Increasing the water productivity in agriculture need to be fully explored and properly understood. As resource scarcity increases, there will be growing pressure on agriculture to release some of the water for high-value use, where willingness to pay is much higher.

On enhancing supply, let it be clear there no additional water available, we can reduce waste, reallocate it, supply enhancement only possible through desalinization, which is still very expensive for a nation that is quite used to almost free natural resources. It is well known that past emphasis on water supply enhancement cannot be maintained as best sites available remain controversial, and now can only be developed at a prohibitive cost, and let's not forget that the environmental records of building megaprojects are not good.

On the other hand, a number of economic and non-economic instruments are available for implementing incentives policy to conserve water resources and protect environments that carry a high rate of return on investments. These are tools that promote water demand management by improving the productive and allocative efficiencies of water use. The productive efficiency can be improved through rehabilitation and modernizing the existing infrastructure, through water control mechanisms, improving on-farm water use efficiency and crop management practices. The allocative efficiency can be improved through public management which is the current practice; administered prices, a tool used in some countries; and decentralization of irrigation management which represents the future vision that will

eventually need to create water rights and water markets. Some of these policy options should have been part of the new water policy.

Objectives of the Symposium

The objectives are to initiate a process to organize a series of symposiums to review the PWP documents by water policy experts that would lead to provide a well-focused approach in addressing the key issues to get country out of the most serious water crisis.

Issues highlighted in NWP context:

Other than reviewing NWP, Symposium will identify key areas that experts deem it as priority intervention for implementation of the water policy. Some specific topics would include:

An overview and analysis of the NWP document: In April, the chief ministers of Pakistan's four provinces approved the country's first national water policy – after over a decade of wrangling and consultations. With a large and growing population and some of the least amount of water per person in the world, Pakistan already faced huge challenges – made worse by climate change, population growth, abysmal mismanagement of water and disputes between provinces and with neighboring countries. The lack of a national policy made tackling these issues that much harder. The paper will review and analyze the long-awaited National Water Policy and decode what's written in the fine print and more significantly, what has been included and what has been left out. The detailed analysis or review for some strategic issues would be covered in selected topics below.

***Does NWP promotes an integrated Approaches to Water Resource Management under new challenges*:** Formulation of Pakistan Water Policy for the 21st century requires a major shift from the classic paradigm used in water resource management (supply enhancement, - command and control water allocation) to a more adaptive new paradigm (based on demand management and economic incentives). The intensifying economic competition for water quantity and quality within and between economic sectors and with climate change taking place is forcing institutions to rethink their approach to natural resource management. The symposium will assess if these unique policy needs are covered and suggest key gaps in policy documents. The objective is to encourage a multidisciplinary dialogue among the participants in the policy formulation process.

Proper Water Accounting and Auditing is missing: Pakistan boasts the largest contagious irrigation system in the world, which also poses large difficulties for its management. There is a need for proper accounting and auditing of water resources, taking stock beyond the simple accounting of volumes and flows, and a need to focus on issues relating to accessibility, uncertainty and governance of water. This part of the symposium would highlight innovative work ranging from simple crop and water budgets – water footprints to the use of remote sensing and in-situ sensing technologies (water informatics), that can allow real-time water accounting for over as small an area as a farm or as large an area as a river basin. The preference would start with a canal command or even smaller unit to provide information on water productivity, hardly estimated in Pakistan.

Water Quality Issues are equally important. Water quality has been degrading over time due to sewage and industrial effluent discharges, urban and agricultural runoff as well as saline water intrusion that is making its quality so low that it might not be safe for public use. Water pollution is often caused by organic matter, pathogenic agents and hazardous and toxic wastes are serious issues. A large part of the country's population is deprived of improved access to safe drinking water and sanitation, 27.2 million do not have access to safe water and 52.7 million do not have access to sanitation, more over 39,000 children under five die every year from diarrhea caused by drinking unsafe water and poor sanitation. Groundwater which is the major sources of water supply for agriculture and domestic use. The solution lies in better regulations and their implementation for point and non-point pollution --- proper treatment of sewage and industrial toxic waste necessary to improve the water quality. There are cost-effective ways to treat water which can be used for economic activities. Secondly, a proper groundwater management and drainage system are key to solving the issue. However, education and public awareness especially young people are needed to prevent pollution at source.

Water quality, of both surface water and groundwater, is a major issue. While there are laws governing the disposal of wastewater into the rivers, their enforcement has been ineffective. Access to clean domestic water is limited. Access to proper sanitation facilities is low and only about 1% of the total wastewater generated in the municipal sector is treated before being discharged into the rivers. Improper disposal of solid waste pollutes surface waters. Agricultural drainage is also an issue, from the perspective of sustainability of irrigated land as well as the environment.

Is water saving real: the agriculture sector uses most of the water, pays the least and wastes the most --- business, as usual, cannot be a future development path. The water planners should spearhead a policy shift in the provincial department of Agriculture from 'yield optimization per unit of land' to 'yield optimization per unit of water.' Only such a paradigm shift can help country's agriculture survive in an era of water scarcity. But we need also to know if water saving is real -- taking the case of the Indus Basin that has a water efficiency of 85% -- what it implies, a fact not well understood that the focus of saving water in last 25 years through on-farm water management programs might have good results in producing more with less water but at global levels there is hardly any saving as water fully used till reaches Kotri. We also need to keep in view of its negative externality on downstream users, after which the users are left deprived of water. The local efficiency of farmers is already very poor, causing greater problems for the poor farmers of the water-deprived areas.

Do we need to value water to save it? Like energy (Sui gas) we treated water as a free good, we had plenty of it but growing demand brings the ground reality – supply is finite but demand is open-ended. A committed policy to price water would be key to rationalize water use, generate funds for O&M and new investments. Broader policy guidelines are that in the short to medium terms bring the price of water to cover the O&M cost and in the long term incrementally move towards full cost pricing. It may be noted that to ensure full water cost recovery, user fees should be 1 percent of the value of infrastructure stock, which in Punjab

works out to Rs.1,800/hectare for water. The actual *abiana* (water rate) collected was Rs.150/hectare, even ignoring capital recovery, simple operations and maintenance would require a 0.5 percent *abiana* charge. Like the energy sector, we have to do it sooner than later. On the one hand farmers using canal water pay a negligible price for water that in fact can generates large values, but on other what poor are paying through water markets in Karachi for access to water for basic needs is very high (Rs 4000 to 8000 per tanker), this shows a case of policy and institutional failure on part water management in Pakistan. We cannot blame water markets for that, they providing a service, we much blame goes water board failing to provide a piped water supply service, and regulate the tanker markets.

Groundwater a water bank grossly mismanaged: Another serious issue is the over-exploitation of ground water through tube wells, which is becoming a severe threat to not only sustainable agriculture but also domestic water supply. The number of tube wells in Pakistan has increased significantly from 10,000 in 1960 to over 1,100,000 in 2016.[1] The efficiency and design of these tube wells are also poor because these are not installed using any sound engineering standards. Moreover, flat rate and subsidized electricity for agriculture tube wells have further incentivized farmers to operate them round the clock. All these are depleting groundwater rapidly in freshwater areas, resulting in serious salinization of productive land. Moreover, decreasing water table[2] requires more energy to draw water, which puts pressure on already limited energy resources at the same time increase the cost pumping. Low water productivity has led to continuous depletion of underground water resources, posing serious threats to agricultural production in the province. We are a fast match in India where they growing and exporting rice using valuable groundwater, which amounts to exporting virtual water. Like in India it is only a matter of time, rice is not profitable unless supported with a huge subsidy.

Decreasing surface water has prompted increasing reliance on groundwater to meet crop requirements as well as urban domestic use. The downside is depletion; more water is being pumped out that can be recharged through natural means.

A recent study by USAID on Optimal Groundwater Management in Pakistan's Indus Water Basin showed that under common property management, the state of the aquifer deteriorates over time and net benefits fall as a result. The study takes account of the long-term implication of present policies during coming 50 years. The water table height falls by 12 meters in the first 50 years, while the groundwater salt concentration increases by 0.09 $dSm{-}1$ in the same period. The deterioration in the groundwater salt concentration translates into a 1.25 percent reduction in the annual net benefits. Groundwater extractions fall over time as both the water table height and the quality of groundwater decline, thereby increasing the costs of extraction. The study reveals that as a result of the declining water table and an increase in the groundwater salt concentration, net benefits fall by around Rs 30 billion in the first 50 years". As the water table falls over time, the marginal cost of extraction increases and groundwater extractions fall over time and reach a steady state of 49.9 $Bm3$ after around 300 years. About 50 percent of the adjustment towards the steady state takes place in the first 50 years. This all shows the high cost of institutional failure in regulating groundwater management.

---

[1] The Economic Survey of Pakistan 2015-16.

[2] Due to excessive pumping, in many areas of Punjab, water table is decreasing two feet per year.

Environmental externalities and Climate Change*:* The important question is NWP embraces the recommendations of the National Climate Change Policy (2012) to counter the adverse effects of climate change, in particular, extreme weather events such as floods, prolonged droughts, and heat waves as well as the rising sea level inundating coastal land and aquifers. Climate change poses a huge challenge to agriculture with a significantly high deleterious impact on production and productivity. The Department of Agriculture Punjab estimates a loss in income of PKR 1 trillion from the decreased productivity of 5% per annum due to climate change. The agriculture sector will need to adapt to higher temperatures and varying availability of water resources, through different crop varieties and improved on-farm water management practices to conserve soils and moisture. Mitigating effects of agriculture on climate change by reducing GHG emissions can come from helping farmers adopt sustainable and climate-friendly practices and techniques, or Climate-Smart Agriculture (CSA), without sacrificing productivity. There is no safety net for small farmers to increase their resilience against climate change impact, exposing a large section of the farming community to high risk.

Besides the dictates of climate change, a considerable change in the land use pattern since the 1980s necessitates afresh identification and development of new AEZs in order to maximize the agriculture potential of Punjab/Pakistan. First, water resources conservation and management have to be reoriented to move towards a climate-smart agriculture.

Problems solution lie largely lie outside the water sector: Agriculture using 95 % of water, supports the argument that water shortage solutions lie outside the sector, the first and foremost is a shift in agriculture policy. Only two examples are cited, first, the cultivation of crops requiring more water than others should be discouraged. Sugarcane is a prime example. Farmers are switching to sugarcane cultivation because their net profits are larger. Considering, our national requirements for cotton and wheat, and excessive water use in sugarcane cultivation, the Government should discourage its cultivation, in particular in Southern Punjab. Second, the canal irrigation system of Punjab is supply driven, that uses farmers weekly turn as the principal distribution instrument. There are several weeks during the year, especially during the monsoon, when farmers do not need water and they close their respective canal water outlets (‘*moga’*). This necessitates the development of on-farm systems of harvesting rains and storing canal water, for subsequent use as per requirements. Thus, an effective policy intervention that promotes rain harvesting and water storage – initially through incentives and later through penalties – can go a long way in balancing farmers’ water consumption and availability.

Level of Participation

Experts involved in formulation water management policies and their implementation in public, private and academia.