

**CHANGE OF ENVIRONMENTAL PATTERNS AND ITS IMPACT  
WITH SPECIAL REFERENCE OF PAKISTAN**

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The change in the environmental pattern according to the environmentalists is due to Global Warming which heats up the earth and the temperature rises. It happens when Greenhouse Gases (carbon dioxide, water vapour, nitrous oxide and methane,) trap heat and light from the sun in the earth's atmosphere, which increases the temperature. The increase in the temperature brings climate changes. Summers are getting longer and winters becoming short. In addition to more rainfall there is also reduction in ice on the Tibetan plateau and changing precipitation patterns with less snow at higher level plus more rapid runoff from the mountains. The atmosphere becomes less stable which causes deeper convection and intense rainfall. The less stable atmosphere leads to more air flow over mountains and less lateral deviation. So the monsoon winds and precipitation can be higher in the North West Pakistan and Western India and weaker in the North East.

This change in the environmental shift is posing serious challenges to the world at large including Pakistan. We experience a continuous dry and wet cycles. The dry cycle hit the country from 2000 to 2005. River flows were reduced to alarming extent. Against the normal average availability of 138 MAF the flow reduced to an average of 97.13 MAF. Parts of Baluchistan, KPK, Punjab and Sindh were badly hit. A great loss was sustained by the nation in the form of death of Live-Stock and, production of food grains in the barani agriculture practiced areas.

This was followed by a wet cycle which went to the peak during the current year 2010. The country has been hit by unprecedented rains/thunder showers and floods during the current monsoon season. The magnitude of river flows witnessed this year surpassed record of the last 80 years. The floods which started from 29<sup>th</sup> July continued until 15<sup>th</sup> Aug. The peak flow recorded at the Attock on 30<sup>th</sup> July was 1.2 million cusecs. Large areas of KPK, Punjab, Sindh and Baluchistan were hit by floods inflicting heavy losses to human lives, infrastructure, crops and agricultural lands. Certain villages in KPK were completely washed away while in Punjab, Sindh and Baluchistan certain areas are still inundated. The estimated loss is in billions.

An area of the 160,000 Km<sup>2</sup> was affected all over the country which is 1/5<sup>th</sup> of the total land area of Pakistan. The loss of human life was reported as 1637 and 1.2 million houses were damaged. About 4.15 million acres of cropped people were rendered homeless who are still lying under open sky. Massive damage to infrastructure including buildings, roads, bridges, railway tracks, irrigation system,

small dams and power installation has taken place. The nation and top hierarchy did not learn any lesson from the fast flood to manage its water resources and avert such like eventualities. This time it surpassed all the previous records. It was incumbent that after commissioning of Tarbela Dam, work on the construction of other major storages should have been started. WAPDA who is the custodian of water and power resources of Pakistan stuck to the controversial Kalabagh Dam and other developments were made hostage to its construction. Neither Kalabagh, nor any other mega storage could be built. Further the forests in the watershed are mercilessly being destroyed by timber Mafia and denuded and bald watershed is also adding to flash floods. The country is suffering from drought and havoc of floods and we are sleeping. We have lost 34 precious years since the commissioning of Tarbela Dam during which three major storages could be built which was not done and the nation has been left to the mercy of drought and floods. It should be borne in mind that this is not the only floods which occurred and will not come in future. Due to climatic change such like floods and even more severe may be occurring and the nation will continue experiencing such calamities of floods and droughts unless we manage our water resources. The economy of Pakistan will never improve and further developments will come to a standstill, as whatever is available in the exchequer, will be lost to compensation and reconstruction, rehabilitation of infrastructure due to floods. The world is laughing at Pakistan as it could not manage its water resources and the nation is left to suffer calamities one after another. When our hierarchy will wake up? It is generally argued in the higher circles that Pakistan does not have the finances for the construction of storage Dams and without foreign loans these storages cannot be constructed which is just an excuse and side-tracking this high priority issue. What I would suggest is that the Govt. should freeze the development of the entire sectors except health and education and all the PSDP (Public Sector Development Plan) resources be diverted for the water & power resources. The Dam, spillway, tunnels and even the power house building are always constructed with locally available material. The foreign exchange is only required for the power generation equipments. We should build the storage dam with all the appurtenant structures with local finances and install the power generating units when foreign loan becomes available. The work on three or even more storages should be started side by side which will manage floods as well as provide water for irrigated agriculture. This will also enable to bring new areas under irrigation to make the country self sufficient in food and fibre for the growing population. These storages will also meet the energy requirements at a very cheap tariff.

How the effect of climate change on Pakistan is viewed by IRSA (Indus River System Authority) to manage floods and combat drought is described as under.

IRSA is of the firm opinion that a permanent solution to flood management and to remove shortage of water for Irrigation during low session and drought lies in building Dams on Indus River and its tributaries. Bhasha Dam is ongoing. The feasibility study for Munda Dam has since been carried-out by JICA. Other sites for building storages and hydropower generation like Katzara 20 miles downstream of

Skardu Town (storage capacity 35.00 MAF of water and generation capacity 15000 M.W of power identified during 1962 by Engr. Fatehullah Khan the then Chairman IRSA). WAPDA, has identified storage sites on Indus and on its tributaries with a total storage capacity of 34.1 MAF and on Jehlum River and its tributaries 3.57 MAF and off channels storage with a capacity of 21.65 MAF.

From April 1<sup>st</sup>, 2010 to October 31<sup>st</sup>, 2010, 54.85 MAF water has escaped below Kotri Barrage. This water could have been stored to avoid the current havoc by floods and would have been utilized for cultivation.

In Water Accord para 2, **117.35 MAF of Water** was distributed in 1991. At that time, the average available annual river flow was 142 MAF. The total water requirement of the provinces, and the canal system capacity was 105 MAF (the balance supply was to come from future storages which could not be built). Water Accord para-4, provides to store  $(142-105) = 37$  MAF of “balance floodwater” that escaped to sea. If Water Accord would have been implemented and floodwater under para-4 stored, there would have been no flood devastation and no dispute between Sindh and Punjab over water for Irrigation. Sindh and Punjab both have equal share of 37% in floodwater para-4. Each of them would get 13.69 MAF of additional water.

Again, water Accord para 6, provides to create storage wherever feasible on the Indus and other rivers in confirmation of para-4 to implement para-2. If this water was made available, there would have been no water dispute. The water availability in shortage periods on the average comes to 97.13 MAF against 105 MAF required. This shortage can only be removed by building flood storage reservoirs otherwise damages by flood and dispute over water distribution will continue. Bhasha Dam when constructed may hardly be able to make up the loss of storage due to siltation which by now has reached 4.22 MAF. The entire Water Accord is storage based.

Similarly, para-14 (e) requires to avoid all wastages. This means to **store floodwater** by dams and to carry out **Water Management** of the 150 years old, obsolete, wasteful and incompatible canal irrigation system that wastes 50% of 105 MAF of Water due to seepage and as **system wastages**.

## WAY FORWARD

1. Watershed management in the catchment of Indus and its tributaries which on the one hand will result in reduction of greenhouse gases and will retard the flash floods and siltation of the reservoir.
2. Except health and education the PSDP of all other sectors be freezed and finances diverted for Water & Power Sector Development Works.
3. Work on three or more storages should be started simultaneously. There is no dearth of experienced engineers in the country in Dams construction technology whose services be requisitioned if WAPDA feels any deficiency in the availability of experts on Dam construction.

4. Weather forecasting system be improved for advance warning of floods.
5. The adoption of high use water efficiency technologies like sprinkle and drip are expensive. Awareness amongst the farming community be created to adopt the simple raised bed and furrow irrigation rather than flood irrigation.
6. The irrigation department be allocated the required funding for the maintenance and upkeep of the flood protection works.
7. Necessary laws for stopping the public from encroaching the rivers be introduced and implemented in letter and spirit.