

## **Factors Responsible for Flood Disaster in Sindh**

**Naseer Memon**

Heavy rains occurred in Balochistan in the end of June not only brought disaster in Balochistan but the districts of Sindh on its Eastern border also received devastating flash floods. Hill torrents originating from Balochistan entered Sindh through Khirthar hills and inundated vast areas in the districts of Dadu and Shahdad Kot/Qambar. Thousands lost their abodes and were marooned in deep pond of water for several days. Stories of their miseries and negligence of government machinery are widely reported in media. The unprecedented gushing flood from Mula and Bolan rivers badly shattered the flood protection network and the MNV/RBOD network breached at several places bringing havoc to local communities. The floods once again exposed the vulnerability of the drainage project executed by WAPDA on the Right Bank of Indus. A careful review of the flood disaster reveals that the disaster was not merely a natural calamity but the part of credit also goes to bad engineering, poor flood-management strategies and virtually collapsed institutional systems. There is no doubt that Irrigation Department made best possible efforts to manage the flood but the approach was reactionary. Knowing the climatic and topographic features of the area and the history of high floods, infrastructure building in the area required a more cautious approach but the policy wizards (both engineering and political) hardly give a thought to disaster before it really occurs and take its toll.

**Torrential Floods in Sindh:** Sindh province has two sources of flood. The Riverine flood is more predictable and allows ample time to react whereas the torrential flood floods leave almost no time to respond. Torrential floods have lesser frequency and duration but very high intensity therefore impact is also sever. These floods normally occur in monsoon months of July and August when its catchment areas in Balochistan receive heavy rains. Western boundary of Sindh is connected with Blochistan through Khirthar hills. A series of ferocious torrents including Mula, Boolan, Khanji, Mazarani, Dillan, Buri, Salari, Shole, Gaaj, Angai, Naing and Bandani bring gushing waters from high altitudes of Khirthar to Kachhi plains of Sindh. This flood requires entirely different management systems, institutional capacities and infrastructure. High floods of 1942, 1944, 1948, 1956, 1973, 1975, 1976 and 1995 have sent several reminders of this fact. Among them floods of 1976 and 1995 were huge in magnitude and caused greater devastation to the flood protection infrastructure and local communities.

**Flood Protection System in Kachhi Plains:** Before the construction of Sukkur barrage, its command area on the right bank had natural drainage channels to carry torrential floods into Indus River. Part of flow would drain through Main Nara Valley Drain (an old river bed) and would feed into the fascinating echo system of once Asia's largest natural fresh water pond, Manachar Lake. In 1932, when the barrage was constructed, 70 miles long MNVD was properly shaped to carry a discharge of 2235 cusecs. Banks of MNVD also acted as flood protection barrier separating irrigated right bank areas of Sukkur command from hill torrents flood plain. The MNVD was later converted into RBOD by WAPDA to drain effluent from four districts, which devastated Manchar Lake. At one stage WAPDA was also bent upon connecting RBOD with Indus River but after lot of hue and cry by the civil society groups it retreated. Otherwise WAPDA would have added one more feather in their cap of catastrophic engineering products.

Flood Protection work in the torrential flood areas is much more vulnerable than the riverine flood protection work. In 1935 Flood Protection Bund (FP Bund) was

constructed along the natural contours to facilitate North-South diversion of torrential flows towards Manchar Lake. The objective of this 172 miles long bund was to protect irrigated areas from flash floods and safe diversion of flood to natural pond at Manchar. According to the Indus River Commission, flood protection bund has to be provided with 6 feet Free Board above the recorded highest flood. In 1995, flood water overtopped the FP Bund at several locations and it was breached at more than 30 locations. However the restoration work just rehabilitated it to the pre-flood level and did not maintain new free board of 6 feet above the 1995 flood level. Also its remodeling was completed to only 120 RDs and the remaining part of 100 RDs was not remodeled, which faced the recent flood impact. This fact was also indicated in the Flood Fighting Plan for 2007 prepared by the local office of the Sindh Irrigation Department.

A Flood Diversion Bund has been provided to divert gushing flows of Gaaj Nai in Dadu district. The 6.4 miles long bund also protects FP Bund from the direct stroke of Gaj Nai. In super flood of 1995 this structure was badly damaged. This bund was also later remodeled to pre-flood condition. However no additional strengthening was provided if similar flood strikes again. Luckily this year Gaaj did not bring its usual flow and the bund survived any major damage.

This year the flood came from the north-western boundary with Balochistan and it hit the districts of Shahdad Kot/Qambar and later on Dadu district. Mula and Boolan rivers brought the major flows, which breached FP Bund at RD 179, 180, 184 and 230. It set off a series of breaches and cuts and 34 breaches and cuts were recorded in MNV Drain. These breaches inundated several small and large villages and it also threatened Qambar and Shahdad Kot towns.

A detailed Technical Assessment is required to establish the role of infrastructure and management system responsible for this havoc. A rapid assessment based on site visits, meetings with local communities, irrigation experts and civil society groups brought the following facts to light.

- Effective early warning system is the key to manage flood disasters. Since torrential floods allow very limited time to respond, effectiveness of this system becomes even more important. It is strange to note that there exists no flood warning system between Balochistan and Sindh provinces. Since Khairthar mountains receive flood from Balochistan, there should be a mechanism by which Balochistan Government can inform Sindh Government well in time to take necessary precautions. Sindh Irrigation Department has only one gauge station at the mouth of Gaaj Nai in Dadu district. Flash flood from this point hardly takes 12 hours to reach mainstream areas. Even if the earliest warning is received, this duration is insufficient to manage any catastrophe in making. The modern weather forecast systems based on satellite information sources has made it possible to develop a fairly reliable flood warning system. It will definitely cost much less than what the government normally spends on repair of damaged infrastructure and relief and rehabilitation of devastated communities. Environmental, economic and social cost of losses will further justify this much deserving investment. This can be gauged from the fact that after 1995 flood damages, strengthening of Gaj Diversion Bund at Gaj Nai and FP Bund cost about 700 million rupees to public exchequer. Effective flood warning system will also help timely evacuation of vulnerable areas identified through careful mapping of flood prone communities.

- Infrastructure development in the flood plains is not being designed with prior understanding of natural flood routes. Irrigation experts believe that the road network in the area has also obstructed the free flow of flood. Some local roads and Rato Dero-Khuzdar Motorway are aligned against the flood flows and have inadequate cross drainage provision, causing bouncing of flood water. There is no mechanism whereby National Highway Authority or Provincial Highway Department seeks Irrigation Department's advice on the road alignment in the Kachhi flood plain. This lack of institutional networking is likely to cause more damage in future.
- Time and again it has been proved that tempering nature beyond a limit invites terrible consequences. WAPDA's experiment of converting fresh water MNVD into a saline water channel of RBOD resulted in disaster to Manchar Lake. Now WAPDA is undertaking several drainage schemes in upper reaches through RBOD-III which will canalize effluent from Balochistan's irrigated areas and drain it to the main RBOD drain. A complex drainage network for Usta Mohammad areas is under construction and existing EBOD is being connected to Hairdin drain and Chukhi through new drains under RBOD-III which will be ultimately connected with main RBOD network. There are strong political elements behind these decisions and WAPDA does not bother to involve Irrigation Department at local level to assess the potential threats which may stem through this made drive of drainage projects. According to officials of the Irrigation Department such coordination is virtually non-existent and if any consultation takes place it is restricted to higher offices which have little understanding of ground realities. Since WAPDA executes federal government's politically motivated projects, it hardly gives any ear to the local irrigation departments, civil society groups and communities. Failure of LBOD should have been enough lesson to learn from but it does not seem happening. Local Irrigation experts also believe that the designed capacity of RBOD-III is also insufficient to carry normal flows of the local drains let alone heavy storm water. In recent flood Miro Khan and Shahda Kot drains experienced backflow since MNV was facing high flood. This could have inundated Shahdad Kot and Miro Khan towns. Therefore this drainage network is posing a permanent threat to local areas. Likewise if Indus River receives heavy flood (above 700,000 cusecs), chances are high that it may choke RBOD-II at Bago Toro hills near Sehwan, which flows very close to Indus River.
- Drainage system in the area is being developed as stand alone engineering infrastructure rather than as part of a management package. There is a need to address the misuse of water in head reaches of Rice cultivation areas to reduce the quantity of drainage effluent. Irrigation system designed in British Period did not require drainage because it was based on judicious supply in head and tail reaches; violation of which has created the problem. Addressing root cause is more prudent rather than addressing effects, which WAPDA is practicing since years. This wrong approach has made drainage sector schemes in the country a long term liability and source of multiple disasters. This ill motivated approach is being enjoyed by a chain of powerful beneficiaries therefore it does not seem changing in foreseeable future.
- Flood Control Plan for Sindh Province was developed in 1978 and has not been revised since then. Whole landscape has undergone several changes

over the years and living with three decades old flood management system indicates the prevalence of institutional bankruptcy. This needs to be revised based on the experiences of last thirty years and new ground realities. Likewise Bund manual was also developed in 1978 and merits revision.

These and many other such facts reveal that the recent flood disaster was not merely an act of unkind nature but it was actually a resultant of bad planning, poor coordination and a complete institutional mess.