© *The Pakistan Development Review*
62:3 (2023) pp. 437–444

Rain Rain Go Away: A Snapshot of the Flood 2022 and Way Forward

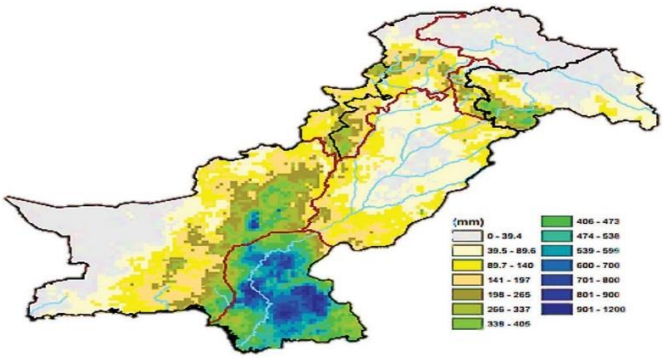
SOBIA ROSE and ABEDULLAH

The devastations caused by the recent floods in Pakistan are the result of poor management. Despite several warnings of an unusual rainfall during the months of July and August, a lack of preparedness resulted in a huge catastrophe. The knowledge brief in hand provides a snapshot of the extent of rainfall and subsequent floods, as well as the losses that occurred after the disaster. The major threats from the recent floods include the threat to the food security of an already deprived population; loss of education and health; and an increase in social unrest due to more criminal activity. To tackle the issue in future both structural and non-structural measure should be adopted. Structural measures are long-term development interventions while non-structural measures are based on short-term response to build community resilience. We are compelled to live with the floods due to our topographic situation. Better management and adaptation stratifies can help to minimise the losses in case of next disaster.

WHAT CAUSED FLOODS?

The already fragile economy fighting with inflation and political instability plunged in confronting the worst flood of its history, which testifies the fact that climate change has become a menace for Pakistan. The year 2022 is quite an unusual year for Pakistan as rainfall in majority of the areas remained quite abnormal (Figure 1; ICIMOD, 2022).[1]

Fig. 1. Rainfall in August 2022



Sobia Rose <sobia@pide.org.pk> is Research Fellow, Pakistan Institute of Development Economics, Islamabad. Abedullah <abedullah@pide.org.pk> is Chief of Research, Pakistan Institute of Development Economics, Islamabad.

[1]ICIMOD, 2022, The 2022 Pakistan Floods: Assessment of crop Losses in Sindh Province using Satellite Data, https://lib.icimod.org/re- cord/35984

During sizzling months of heatwave people pleaded for a relief in terms of rain but quite contrarily to heatwave the monsoon rains in summer dumped almost 243 percent more than average making it the wettest month of August since 1961. The rain poured only in the month of August was 37 percent higher than average seasonal monsoon rainfall. Even at one point, it rained for continuously 72 hours.[2] The Table 1 explains the extent of rainfall received during the month of August in different provinces of Pakistan and compares it with the normal rainfall.

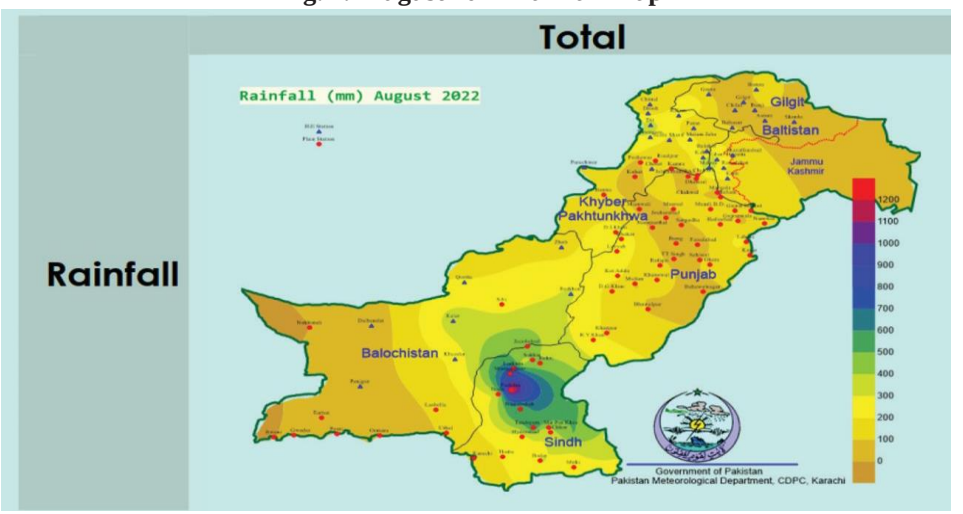
Table 1

Distribution of rainfall across provinces during August (PMD, 2022)[3]

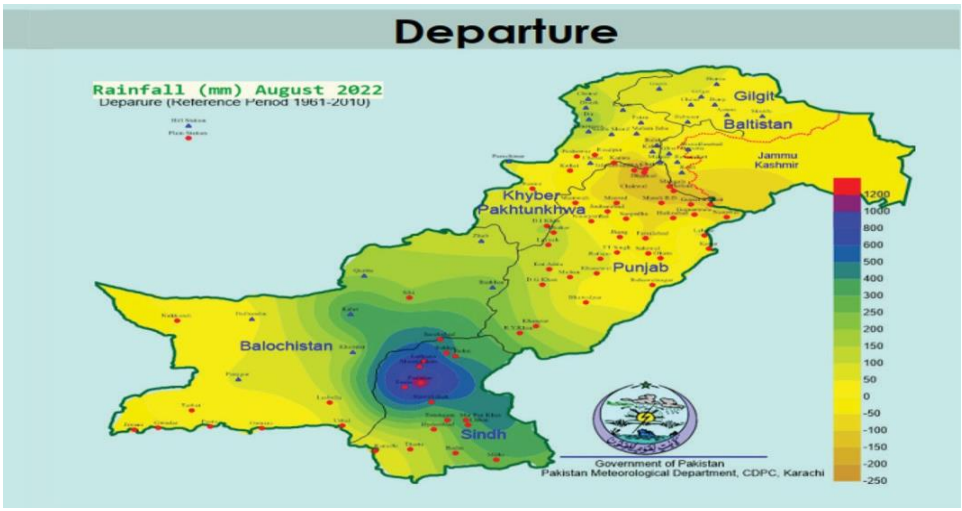
	Normal (mm)	Average (mm)	Departure (percent)	Comment
Pakistan	56.2	192.7	243	1st highest (previous record 116.7 mm in 2020)
Azad Jammu & Kashmir	150.7	146.1	-3	29th highest (record 308.2 mm in 1997)
Balochistan	22.4	154.9	590	1st highest (previous record 83.3 mm in 2020)
Gilgit Baltistan	16.7	55.7	233	2nd highest (record 89.1 mm in 1997)
KPK	103.6	163.9	58	4th highest (record 225.4 mm in 2010)
Punjab	93.3	141.7	52	10th highest (record 282.6 mm in 1973)
Sindh	53.6	442.8	726	1st highest (previous record 247.9 mm in 2020)

Sindh and Balochistan received first highest level of precipitation since 2020 with 590 and 726 percent extra rains respectively. However, overall in South Asian region an above normal rainfall was predicted during the month of June to September 2022. This nonstop rainfall in the month of August resulted in history's biggest riverine floods in Pakistan(Figure 2, ICIMOD, 2022).[4]

Fig. 2. August 2022 Rainfall Map[5]



[2]https://news.climate.columbia.edu/2022/09/12/the-flood-seen-from-space-pakistans-apocalyptic-crisis/
[3]PMD, 2022, Pakistan Metrological Department, Monthly weather report of August 2022
[4]ICIMOD, The 2022 Pakistan Floods, Assessment of Crop Losses in Sindh Province using Satellite Data.
[5]Pakistan Meteorological Department, Pakistan's monthly climate summary, August,2022.



The impact of climate change and resultant natural disasters is different across regions. In developed regions, its affect is less prominent because of heavy investment on infrastructure, while in developing regions generally and specifically in the less developed countries near equator impact is severe because of two reasons; soil compaction due to which water takes long time to seep into the land and this is what happened in the recent floods. The country faced long dry spell as that took all the moisture from the soil causing compaction and that is the reason flood water is still standing in the lower parts of Sindh and Punjab. Secondly communities are not much resilient to cope up the damages. Further measuring damages of floods is another fundamental challenge for a developing country like Pakistan because the cost of rehabilitation becomes exponentially higher as compared to the actual damages.

Fig. 3. Number of People Affected Due to Flood Across Pakistan

Source: USAID, 2022.

The primary challenges that we face in short term are in fact centred on relief and rescue: health, disease outbreak, accommodation for the millions displaced, drainage of water, and infrastructure, immediate housing demand, loss of education and loss of standing crops. In the absence of immediate responses, the drag on economic productivity in subsequent years will put the affected regions of Sindh and Balochistan on sever poverty. The estimates indicate that 33 million people are affected. According to the national disaster management authority (NDMA), 664,000 people are dislocated and are compelled to reside in flood relief camps while out of this 87 percent are only in Sindh Province, indicating that the intensity of flood affects in Sindh Province is alarming. Figure 3 also testifies this fact that most of the affected population belongs to the Sindh province (USAID, 2022).[6] However, the severely flood-hit communities are more likely to fall into the small farmer categories but they belong to the districts where the poverty indicators were already very high. Although it is claimed that the majority of these are subsistence farmers with little contribution to the overall economic activity but, it's multidimensional affects in terms of health, education and economic loss in near future are hard to quantify right now. It is very alarming that almost 650,000 girls and pregnant women were also among the flood victims out of which 11 percent were due to deliver in the month of September (UNFPA, 2022).[7] Infrastructure and loss of connectivity is still proving to be the biggest hindrance in the way of provision of health care facilities to affected people.

POST-FLOOD ISSUES AND CHALLENGES

Along with the immediate damages as direct results of a disaster, the migration in search of safe living leads to urban sprawl (Boustan, et al. 2012) because it is less likely that migrated population will return to their previous residences. Although people relocate to the safer places but economic activity slows down as at new place it takes time to settle down and get economically active. The problem of increased congestion twins with a surge in criminal activity that we noticed right after the floods of 2010 when only the cases of murder & homicide increased by 3.3 percent (World Bank, 2021).[8] that was higher than usual pattern of crime data and same is expected to happen after the floods of 2022.

According to the Ministry of Foreign Affairs (MOFA), 2 million acre of cropland has been damaged which has badly affected the supply chain of agriculture commodities particularly for tomato and onion. This lead to increase the prices of these commodities exponentially and thus flood is considered as one of the major source of food inflation. Similarly, Sindh is contributing 30 percent in Pakistan's total cotton production which has also badly affected due to flood—threatening the future export of textile from Pakistan. Almost 20 percent of wheat production comes from Sindh. It is anticipated that if proper agronomic measures are not adopted the land in Sindh will not be usable for crop production within the next few months. Pakistan will need to import more food, which could raise costs and worsen the country's balance of payments crisis. Before the floods, food inflation was at 26 percent, and in recent days, prices of some commodities has surged

[6]USAID, 2022, United States Agency for International Development. Fact Sheet No. 1, Pakistan Floods. [https:// reliefweb.int/report/paki- stan/pakistan-floods-fact-sheet-1-fiscal-year-fy-2022].

[7]UNFPA, 2022, United Nations Population Fund, Women and Girls bearing the brunt of Pakistan Monsoon Flood.

[8]https://www.macrotrends.net/countries/PAK/pakistan/murder-homicide-rate

by as much as 500 percent. These high costs will be felt heavily in cities, which are home to large poor and working-class populations. In the longer term, this could exacerbate a public health challenge: stunting in children attributed to poor nutrition. According to an estimate by Food and Agriculture Organisation, almost 40 percent of flood-affected population in Balochistan is unable to access medicines and health care. Besides supply chain the cold chain is also badly disrupted leading to low immunisation that will ultimately lead to disease outbreaks in the long run.

After any disease outbreak and natural calamity, the number of the school dropouts and number of out of school children increase along with more early childhood marriages specially girls belonging to far flung rural areas because once they are out of school it is less likely that the family will send them again to the school. According to provisional data from provincial Education Departments on children dropout rate indicates highest dropout in Sindh (19,750) followed by Balochistan (2,859), Punjab (2,158), and Khyber Pakhtunkhwa (420). In addition, at least 7,062 schools are being used as temporary shelters for people who have been displaced. Besides being affected the schools with intact infrastructure also being used for the provision of shelter making the situation more gruesome for the flood affected communities.

WHAT IS THE WAY FORWARD?

There are two measures to protect people after the flood and as a preparatory measure for the next flood:

(1) Keep the floodwater away from communities through structural measures
(2) Keep communities away from floodwater through non-structural measure

Finances are the pre-requisite to make the system ready for any future disaster. Pakistan although not contributing much in the global CO2 emissions but it is one of the biggest victim of climate change damages. Regarding climate reparation funds approved by the UN in which high CO2 emitting countries owe a reparation fund to the global South. Although this can be a major source of money to work on mitigation and adaptation strategies for the future but the lack of trust in the utilisation of these funds is one of the major concerns by the international communities. Firstly, to avail the reparations, internal political and economic instabilities need to be settle down and secondly we need to present a national fund utilisation account in the form of disbursement linked indicators where ministry of foreign affairs can play a central role by keeping in liaison with the Ministry of Climate Change and other relevant provincial departments. Taking the following structural and non-structural measures can help in minimising the effects of flood in future.

STRUCTURAL MEASURES

Better early warning systems are frequently claimed to reduce losses; however, inadequate backup equipment combined with a lack of proper hydrological network coverage at river basins limits forecast accuracy in developing countries. In the post-2010 flood scenario, the UNESCO developed the capacity of the Flood Forecasting Division of Pakistan Meteorological Department (PMD) through technological improvement, and this system is working excellently for the forecasting of floods. The purpose of these early warning systems is to enhance the response time of communities and institutions to

stimulate flood protective measures. Even if we consider that early warning systems have been installed with full utilisation of the latest technology, the reluctance at the community level is the biggest issue to tackle. No early warning system functions well without an effective flood response strategy, which history shows that we do not possess. Therefore, it is important to understand the climate scenario of Pakistan and to establish more rainfall monitoring networks at district and tehsil levels. The current 100 stations of PMD are not sufficient to cover 540 tehsils of Pakistan where the rainfall patterns vary to a greater extent. Along with this, media campaigns must be launched with area-specific evacuation plans to communicate losses in case people refuse to relocate (this happens in most cases, as people are less likely to leave their residences). In flood-hit areas, early warning responses at the community level can be taught in school curriculums to minimise the losses in the event of the next hazard like this. Duplication of information provided by different departments also leads to mistrust at the community level. Therefore, the warning system must be highly centralised, and the responsible institute should play an active role to evacuate and shift the people to safe places in the future. To make it happen an district level online portal can be generated where existing players e.g. DDMA, PDMA, NDMA, non-government organisations and other civil society organisations can register themselves so that a central coordination mechanism can be developed to intervene in more effective way.

The floods of 2022 cannot be compared with the floods of 2010, as the basic reason for this flood was the unusual rainfall in non-catchment areas that is the result of longer dry period before the floods as temperature and rainfall patterns are changing as a result of climate change. Quite interestingly, the recent floods have not raised the water level in our biggest water reservoirs, i.e., Tarbela and Mangla.[9] In addition to this, quite ironically, there will be a water shortage in the upcoming Rabi crop season, which makes it clear that despite continuous hazards in the past, we were not well prepared. Even the Disaster Response and Coordination Center was established belatedly on August 30th, 2022 (Bhutta, et al. 2022).[10]

The water storage structures are required according to the topography of the area. For example, in Balochistan, groundwater recharge techniques such as water banking should be adopted, as surface water storage cannot be utilised in the long term due to the harsh and dry weather conditions of the province. If the recent floodwater was flowing from Balochistan to Sindh, it means that minimising the flow of water through check/gabion structure could have been made earlier that would have led to increased ground water absorption (seepage) by turning a curse into a blessing. Keeping it as a lesson in our policymaking can lead to exploiting the potential of hill torrents in the future.

The Public Sector Development Plan (PSDP) of 2021 reveals that even after 12 years, there are still some development schemes being initiated to recover from the damage caused by the flood of 2010. Along with these recovery schemes, given the hydrology of Balochistan province, a number of federally funded small dam projects were launched in the province.[11] There is a need to undertake satellite-based assessment of such schemes

[9]https://ffd.pmd.gov.pk/maf-forecast

[10]Bhutta, Z. A., Bhutta, S. Z., Raza, S., & Sheikh, A. T. (2022). Addressing the human costs and consequences of the Pakistan flood disaster. The Lancet, 400(10360), 1287-1289.

[11]https://100dams.org/

with respect to floodwater preservation and drought protection. Likewise, in order to improve water use efficiency in agriculture, there were some parallel projects in Sindh, Balochistan and Punjab with the names of Punjab Irrigated Agriculture Productivity Improvement Project (PIPIP), Sindh Irrigated Agriculture Productivity Enhancement Project (SIPEP), and Balochistan Integrated Water Resource Management. The evaluation of these projects is the need of the hour as similar projects were launched in Bangladesh also such as Water Management Improvement Project, Bangladesh weather and Climate Services Regional Project and Bangladesh has appeared as a success story in managing the risk of flood.[12]

To avoid the damage of floods in the future, a strong local government structure with better support from provincial and national governments is required.

The Federal Flood Commission has made huge investments over the years in effective flood plain management plans, but such strategies were never materialised due to a lack of ownership on the part of provincial and local governments. The FFC prepares activated flood plain maps and flood inundation maps that are shared with provincial and local governments. Unfortunately, due to poor enforcement, such plans are rarely consulted while giving permits to establish new housing societies for urban expansion. The lack of compliance is also visible in recent events of urban flooding in major cities in Pakistan.

Pakistan is at nature's disposal in terms of the impact of climate change and resultant floods. To avoid the losses in education instead of using schools as immediate shelters the special flood shelter homes must be constructed. In this regard, Bangladesh shelter home specifically designed for the disaster victims can serve as a benchmark to minimise the impacts of floods in terms of education of already poor chunk of populations.

NON-STRUCTURAL MEASURE

A unified management of water resources is required. There are more than 15 institutes dealing directly or indirectly with the floods, such as the National Disaster Management Authority (NDMA), Ministry of Climate Change, Federal Flood Commission, and Pakistan Commission for Indus Waters, along with Provincial Irrigation Departments, the Pakistan Army, and many relief and social protection departments, as well as a number of non-government and local organisations that provide relief after the floods. The inclusion of too many institutes also creates problems in decision-making. Any development activity to avoid floods and even relief activities after the flood also becomes slow due to the increased footprint of the institutions lacking coordination. Further- more, it also leads to the duplication of activities. Therefore, it is required to streamline the efforts under one umbrella at the local level using local knowledge and local experts with vertical integration in disaster governance. Historically civil society organisations have proven themselves to penetrate deeply in disaster hit areas. Disaster management should be bottom up approach with more organised local government structures with multi sector collaborations at federal level. But, this collaboration should be long lasting, and not be limited to immediate disaster relief.

To revive the economy there must be grants and loans for the affected businesses because without financial support these businesses are less likely to regain their existence

[12]https://www.economist.com/the-economist-explains/2022/06/23/how-does-bangladesh-cope-with-extreme-floods?

as they bear significant losses in terms of income and damages to the local infrastructure. Although financial aid of Rs.25,000 under the Flood Relief Cash Assistance through Benazir Income Support Programme (BISP) is being provided to every flood-affected family in the flood-hit areas using the BISP database. It will lead to the wastage of resources as the scope and eligibility of the cash transfer recipients has not been clearly defined and for this purpose a targeted approach, the scope and eligibility must be defined during the ex-ante studies related to flood risk management and funds must be conditional cash transfers to revive the local businesses.

In the short term, the situation can be turned the other way round by proper management and planning. Most of the rain fell on agricultural land across the country. Due to excessive rainfall in the preceding months, soils will hold enough moisture which permit timely sowing and assures healthy crop production.[13] However, educating farmers on the proper use of weedicides must avoid potential weed threats due to the availability of moisture. To retain moisture, proper tillage practices must be carried out (e.g., deep ploughing and Suhaaga).

CONCLUSION

Amid to agro-based nature of Pakistan's economy, for a long time it was believed that the climate of the country is quite suitable for agriculture, since there are four seasons, therefore, we can get variety of crops and reap economic benefits in diversified ways. However, the situation is not same now, the four seasons, once believed to be a blessing could be detrimental without proper adaptation strategies and the recent floods prove to avail the reparations from the global north we need to improve our environmental governance. Some short run measures can be adopted to recover from recent floods i.e. measuring exact flood damages as the first step, cash transfers to the targeted populations to rehabilitate the most affected people, and release of soft credit to support the local small businesses to bring the economic activities back to normal. In the long run to avoid, such damages there should be better early warning systems with community engagement plans. The early warning systems should be centralised to increase the trust of general public. Disaster resilient structures such as checks in the way of hill torrents should be constructed and area specific water conservation techniques should be adopted to address the future threat of water scarcity. Local populations should be trained to conserve water in natural ways to utilise this water during dry spells. With the investment to improve the adaptation ability will help to minimise the flood losses in the future.

[13]Pakistan Meteorological Department, Seasonal Outlook for November 2022-January, 2023.