SOCIOECONOMIC IMPACTS OF THE 2022 FLOODS ON PAKISTAN: AN ANALYSIS

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ABSTRACT

The recent floods in Pakistan in the year 2022 are considered the worst calamities of Pakistan's history, which affected the lives of millions of people. Based on current literary works and present data, this research focuses on the socio-economic impacts of the 2022 floods in Pakistan. The findings of this research intend to address the 2022 floods' subsequent consequences on agriculture, infrastructure, health, education, and livelihoods. Examining the multiple sectors that affect marginalized groups – across all provinces of Pakistan. The qualitative method is used to assess the vulnerability of key sectors and their holistic impact on the country's economic stability by analyzing the primary and secondary sources. In addition to the detailed analysis of the socioeconomic impacts of flooding, the research also gives the evaluation of the cost of damages with the recovery expenses, rehabilitation, and reconstruction efforts made by the Government to deal with the disaster. Pakistan could tackle the disaster consequences and handle future risks after adopting risk reduction strategies with developmental frameworks and introducing effective disaster management policies to the existing system.

***Keywords**: 2022 Floods, Socio-Economic Impacts, Pakistan, Disaster Management*

Introduction

Climate change is one of the world's most emerging challenges and is responsible for the worst global weather patterns that cause severe natural disasters. Natural life, as well as the economy, will face severe consequences all over the world because of the changing global climate pattern (Pounds & Puschendorf, 2004). Flooding, droughts, and intense cyclones resulting from abrupt heat waves, increases in sea levels, and precipitation variability are directly responsible for injury, illness, and even death (Masson-Delmotte et al., 2021). The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report for the Asia region highlights vulnerability to climate change threats, in agrarian economies (such as Pakistan), due to their geographical location, population growth, economic situation, and limited ability to adapt (IPCC, 2013).

According to the report, the South Asian temperatures will rise above the global mean (14.9°C) in 2030–2040, leading to faster melting of glaciers and changes in rainfall patterns. Consequently, the sectors that rely on water such as agriculture efficiency and its performance will be affected significantly (Chaudhry, Q. U. Z, 2017). Compared with other parts of the world, the South Asian region is more affected by floods in the summer monsoon season (June–September) resulting in severe destruction to life and livelihood in flood-prone countries (Almazroui et al., 2020; Douglas, 2009). In the affected region lives, property, crops, and infrastructure were severely damaged by heavy monsoon-induced floods. In the South Asia region, 741,000 acres of crops including maize, jute, and vegetables, and 185,000 acres of paddy were destroyed by the 2022 floods. As well as 318 people died across India and 141 in Bangladesh during these floods.

Pakistan is amongst the most highly vulnerable countries due to these environmental changes, even though it contributes only 0.43 percent to greenhouse gas emissions (Munir & Munir, n.d.). Countries like Bangladesh, India, and Pakistan face the intensity and severity of floods, increasing with time (Mirza, 2011). The geographical region where it lies is expected to have a high-temperature increase by 2.5°C to 3.5°C which is above the global average (GAT 14.9°C); the land area of the country is largely arid and semi-arid (per year less than 250 mm of rainfall is received by about 60% of the area while between 250-500 mm received by 24%). The Himalayan glaciers of Hindu Kush-Karakoram mostly feed the country's rivers. By the end of the century, those glaciers

as reported will reduce one-third of their ice due to global warming (ICIMOD).

Having an agriculture-based economy, Pakistan is highly climate-sensitive because of its increased monsoon rain variability, which is responsible for the threats of heavy and intense floods (Rasul et al., n.d.). The durations of these floods are increasing in frequency and severity each year making the country more vulnerable. On average, Pakistan experienced 21 extreme-level floods, one flood every three years between 1950 and 2011 (Ali et al., 2022). In recent years, the devastating 2010 and 2022 monsoon floods were the two severe events that affected millions of people in Pakistan very badly (Waseem & Rana, 2023). As in the past, Pakistan faced various severe floods but the August 2022 extreme rainfall events were exceptional which the reason for catastrophic and disastrous flood disasters were across the country.

All the socio-economic aspects of lives including agriculture, livestock, infrastructure, and human mortality were worst affected by the 2022 floods (Malik et al., 2023). The country's agriculture sector such as standing crops and the agricultural infrastructure was damaged the most by floods. Which included irrigation channels and watercourses, farm-to-market roads, and power distribution networks in rural areas, almost in all four provinces. A crop area of about 2.245 million hectares was damaged with around 1.4 million livestock lost, and 14 million in danger due to silage shortages (Niazi, 2013). The 2022 floods began in the northern mountainous part of KPK and later through the South Punjab, Sindh, and Balochistan which caused severe social-economic impacts all over the country. According to statistical data, the floods resulted in a loss of $30 billion, which may be equivalent to a quarter of the country's external debt.

The affected people's social, economic, and health status was significantly influenced by flood disasters, especially those with low income who were left behind by a large proportion of food, health services, and property during the pandemic. Due to improper healthcare facilities and other essentials, the concerned groups were more likely to get infected with diseases like chronic respiratory disease, diabetes, and heart disease (Khan et al., 2024). Almost 94 districts were declared as 'calamity-hit' by the government, about 33 million people were impacted with over 8 million people displaced. The 2022 October Report of Post-Disaster Needs Assessment (PDNA) stated that the 2022 floods damaged around 8,330 km of roads and 3,127 km of railway

tracks. Further, 780,000 houses were damaged, which resulted in the whole infrastructure collapse in Pakistan. The high incidence of food product prices was attributed to the unavailability of markets and brief disruption in the food supply channel after the disaster, which added to the economic issues in the country (Knippenberg, Amadio, & Meyer, 2024).

Although detailed literature is present on the 2022 floods in Pakistan, there is a prominent gap that covers the socioeconomic impacts of the 2022 floods and the influence of these impacts on economic stability in the country. The current studies mainly focus on the abrupt consequences of floods but fail to give detailed scrutiny on the socio-economic consequences of various important sectors and lack of comprehensive economic impacts analysis, which is discussed in this study.

Literature Review

A detailed literary work has been done on the 2022 floods in Pakistan, examining various aspects of floods in the county's different regions. The researchers have written comprehensive literature regarding floods, flood devastation, and their impacts on Pakistan. Shah et al. (2023) have published the largest research work on the 2022 floods in Pakistan. However, the current studies left a notable gap that covers the detailed assessment of the socio-economic impacts of the 2022 floods, the influence of those impacts on economic stability, and the challenges the country has faced during flood disasters, discussed in a given study with details.

The article titled "Exploring the Effects of Floods in Pakistan: Pre/Post Flood Analysis 2022" by Asifa Iqbal, Humaira Nazir, and Nighat Khurshid, published in the "International Journal of Disaster Risk Reduction" with an emphasis on flood events and gender in Pakistan in 2022. Using cross-sectional questionnaires and field surveys carried out in the villages in and around Khipro, Sindh, this study examines the socio-economic status of the men and women before and after the floods. The work shows that although women have improved access to information on disaster preparedness, they are still at a higher risk primarily because of social factors or restricted movement. To strengthen community resilience and sustainable post-flood development, the authors call for more gender-sensitive disaster risk reduction and response.

The article "Floods in Pakistan: A State-of-the-Art Review" by Waseem and Rana (2023) provided a comprehensive overview of floods in Pakistan and emphasized that climatic change has

increased the duration and intensity of flood disasters. The authors identified 601 articles in the Scopus database of flood research from 1950 to 2022. The authors gathered bibliometric data and provided a thematic analysis of the articles. The study defines various research interests as gender, social networks, livelihood, food security, risk perception, vulnerability assessment, and Geographic Information System (GIS) & Remote Sensing. However, as mentioned above, the authors find that there is a lack of systematic research concerning socioeconomic and institutional factors of flood risk reduction in Pakistan. Therefore, the authors suggest that subsequent studies should assess ways of climate change mitigation and Flood risk management to formulate policies for improving flood resilience.

Similarly, the impacts of the 2022 floods on the education sector in Pakistan are described by Sujaya, Abdul-Haq & Imran in their article entitled "Educational Sustainability: An Anthropocenic Study in the Wake of the 2022 Floods in Pakistan". The articles explained that the disaster impacted over 33 million learners across all levels of learning with 27,148 school-going children killed. Carrying out a qualitative analysis, the study looks at the educational, psychological, and physical risks in the post-flood period and uses the information from newspaper ads, documents from NGOs, and the disaster management departments. The study establishes the need to include global warming, natural catastrophe risk factors, disaster preparedness, and response in the teaching and learning curriculum for the youths to enhance their preparedness for future environmental impacts.

The article "Impact of 2022 Flood on Socio-Economic and Health Status of People Residing in Flood-Stricken Areas of Pakistan: A Cross-Sectional Survey" by Khan et al. (2024) provides detailed insights that how disastrous the impact of the 2022 floods has been on the socio-economic and health disruption among the people of Pakistan, the flood affected nation. According to the study, 40 percent of the population ended up homeless; they also brought destructive shocks in incomes of low and moderate-earning groups indeed of 9 and 22 percent respectively. Besides, 48.7% said they lost their source of income because of the floods, and the cases of illnesses or disabilities increased from 16.4% to 83.4% after the event. Interestingly, as many as 92.8% regarding the statement that health and sanitation had been worsened by the floods in their areas. The authors stress that intervention infrastructural, nutritional, and medical support for such communities is required

to help them recover from such disasters and to build up their ability to bear the brunt of further devastating natural disasters.

Knippenberg, Amadio, & Meyer, 2024 explain in their article "Poverty Impacts of the Pakistan Flood 2022." that the 2022 floods have the worst impacts on people's lives and livelihoods. They have explained the socio-economic impacts of the 2022 floods and have given three ways in which floods affected the different aspects of life of people. First, they discussed the impact of floods on the income and sources of families such as crops, livestock, business, etc. Second, they mentioned the loss of potential assets, including productive tools, their homes, workplaces, etc. And third, they discussed that due to floods the prices rate became very high due to food shortages. In addition, the flood raised disease incidences and deteriorated health infrastructure and the availability of hospitals and other health options. According to predictions floods increase the national poverty rate by 4.0% to 4.3% in Pakistan.

The article titled "Floods and Flood Management and Its Socio-Economic Impact on Pakistan" provided by Manzoor et.al 2022 assesses the social and economic losses due to the 2022 floods in Pakistan and also offers an insight into the aspects of disaster adoption and management. Floods, one of the most catastrophic natural disasters, are analyzed by the authors as having adversely affected the social and economic situation of Pakistan and caused poor people to become poorer and unemployed, and the environment to become more polluted. They pointed out that even though, flood occurrence cannot be prevented, its effects can be significantly minimized by proper planning and well-organized training. This paper establishes the current situation in the application of protective measures and reveals problems in the application of appropriate flood management measures. Lastly, it includes a few recommendations for effective flood control in Pakistan like Risk Management, Infrastructure development, as well as Awareness.

Despite detailed literature, there is a potential gap present in the existing data. The present literature mainly focuses on a few impacts of the 2022 floods on Pakistan but fails to give a comprehensive assessment of the socio-economic impacts of the 2022 flood on Pakistan and how these impacts affect the overall economy of the country. In this study, all important flood-affected key sectors are thoroughly explained moreover, the research

provides a critical analysis of economic losses regarding the 2022 floods in Pakistan.

Methodology

This research followed a qualitative method, using secondary data. Secondary data is gathered from sources currently available in the form of books, research articles, academic journals, government reports, articles from newspapers, magazines, journals, history-related documents, and internet sources, in a thoroughly scientific manner. The data is systematically gathered to analyze the socio-economic impact of the 2022 floods in Pakistan.

Impacts of the 2022 Floods on Various Sectors of Life

The global temperature is increasing over time resulting in severe hydrological disasters in vulnerable countries like Pakistan. The country's Mean annual temperature (MAT) has increased by 0.12°C due to climate change. The sea level has increased by 1.1mm, which has caused negative weather disasters like intense precipitation, marine submerged coastal erosion, and flood disasters, which have badly hit Pakistan's economy and its other important sectors (Chandio et al., 2020). Due to heavy rains, Pakistan has seen extensive hydroclimatic risks such as heat waves, Seasons of flood, droughts, and landslides, clearly explaining Pakistan's vulnerability to climate change disasters. The durations of these floods are increasing in frequency and severity each year making the country more prone. On average, between 1950 and 2011 Pakistan experienced 21 extreme-level floods, one flood every three years (Ali et al., 2022). Almost all the regions of the four provinces were influenced by flood disasters and hence declared calamity-hit zones (Swal, 2023).

In the year 2022, due to severe hydroclimatic variability, the most destructive course of floods was evident in Pakistan. The intense rise in heat was noted in May 2022 and caused the floods in August 2022 in the country. These natural disasters on the national level have badly hindered socio-economic conditions (Sarwar et al., n.d.). The high level of temperature and heat waves affected the main provinces of Pakistan, with Sindh and Punjab the most, and the current 2022 floods caused some additional consequences in affected provinces in Pakistan. Heavy rainfall, glaciers melting, and heat waves have caused low-pressure formation above the surface were some causes of floods in the 2022 monsoon season in the country (Nanditha et al., 2023, Vox, 2022). The main effects of these disasters were on the agricultural, productivity capacity of

the soil, the availability of underground water, and the socio-economy of the country (Sarwar et al., n.d.).

In this study, the 2022 floods' socioeconomic impacts across several sectors in Pakistan are analyzed. These sectors include agriculture, infrastructure, health, education, the needs of migrants, and displacement. which demonstrates how the given sectors were interrupted causing the financial loss in terms of Gross Domestic Product (GDP) and reconstruction costs that occurred in flood-hit regions of the country. The study also provides details on the recovery efforts including the rehabilitation of agricultural production, rebuilding of important infrastructure with affected health and education systems, and measures for consequent impacts of migration and displacement restoration. All these sections provide a holistic overview of all impacted sectors with coherent ideas that to what extent, the 2022 floods disturbed the social and economic development and hindered sustainable growth across the country.

Socio-economic Impacts of 2022 Floods

The subsequent social and economic effects of the 2022 floods in Pakistan worsened the existing conditions and resulted in lifetime results. Several significant socioeconomic impacts were produced by droughts, strong winds, and heavy floods that occurred due to intensified precipitation. These events also affect the ecosystem and the human population (Easterling et al., 2000). The country's common and widespread natural disasters are Floods, primarily caused by excessive rainfall (Bian et al., 2020). From 1985 to 2015, Pakistan has faced 66 flood events on a regional scale. Fifty were temporary flooding events and sixteen were long-term floods. In the 2022 flood, 33.05 million people were affected mostly in Sindh and Balochistan, with 1,638 fatalities and 12,865 injuries, primarily in Sindh and Punjab impacting 118 out of 160 districts, roughly 70% of the country (NDM, 2022). While in Khyber Pakhtunkhwa 19% were reported of all recorded deaths with 30% of all injuries recorded in Punjab (OCHA, 2022). The significant impacts of the 2022 floods on the socio and economic sphere are discussed in detail in the following section of the paper.

Agriculture and Livestock

Agriculture and livestock were hit hard by heavy monsoon rain and 2022 flood events in disaster-prone regions of Pakistan. The floods killed 750,000 livestock and destroyed farmland of about 18,000 square kilometers, also the key exports of the country i.e cotton crops were affected 45% by floods (NDMA, 2022;

Bloomberg, 2022a). The agriculture sector contributed almost 22.7% to GDP with around 37.4% labor force to employment noted before the 2022 floods. The value addition of important crops cotton, rice, sugarcane, and maize was about 19.44% and their contribution to GDP was 4.41%. Other crops contributed 13.86% to agriculture and 3.14 percent to GDP. From the year 2021 to 2022, the value addition of livestock to agriculture was 61.89% with a GDP equal to 14.04% and the noted growth was 3.26% (Government of Pakistan Finance Division, 2022).

After the 2022 floods, the resulting losses and damages to Pakistan's agricultural sector were calculated as US$12.9 billion out of a total cost which was US$ 30.13 billion. That agricultural cost was 43% of the total damage and losses. The crop production sector had 82% damage and loss in the total with 7% of livestock and 1% of fisheries/aquaculture (Government of Pakistan Finance Division, 2023). Around 2.2 % loss of FY22 GDP was calculated as the direct impact of these floods. The calculated agricultural sector decrease was 0.9% of GDP the most. The economy and market productivity of Pakistan will be negatively affected by agricultural losses caused by such frequent flood disasters (PDNA, 2022).

The agricultural sector of Pakistan saw intense long-lasting disruption in crop production, food security, and the livelihoods of millions in recent years. The cost of the 2022 flood destruction in the agriculture sector calculated in Sindh was 1,145 million PKR followed by Balochistan with 319,048 million PKR cost, Punjab with 52,517 million PKR, and KPK with 19,846 million PKR (Government of Pakistan et al., 2022). Similarly, total damage to agriculture, livestock, and fisheries was estimated at $3.7 billion, with recovery needs of around $4 billion (Government of Pakistan, Finance Division, 2023). Future farming and cultivation along with agriculture productivity will be significantly disrupted by the 2022 flood-induced consequences.

Infrastructure Damage

The infrastructure is a crucial sector for Pakistan in terms of financial development, communication, transportation, and as well as energy systems and technology. Historically, for infrastructure development, the country allocated 7% to 9% of its GDP. The development of infrastructure has led to an average economic growth rate of 7% per annum (State Bank of Pakistan (n.d.). The role of infrastructure in the country's development can be indicated by the concern of The Public Sector Development

Program (PSDP) which allocated 900 billion PKR for infrastructure development in Pakistan in 2021-2022. However, significant economic losses caused by the 2022 floods to the country's infrastructure highlighted high vulnerabilities of the infrastructure (UNDP, 2023).

According to reports, 6700 km of roads, 269 bridges, and 1460 healthcare centers were damaged, and 18590 schools were destroyed (OCHA, 2022; Save the Children, 2022). The disruption of public infrastructure had worse impacts on the disaster-prone regions where people already have a bad quality of life. According to reports, almost 14.9 billion dollars was the damaged cost of infrastructure and housing along with 15.2 billion dollars was the cost of financial losses (UNDP, 2022). In the year 2022, the damage to infrastructure due to floods included roads of 8,000 miles (13,000 km), and 410 affected bridges which disturbed the whole communication system with limited access to markets and other important facilities. The floods affected the Sindh province the most nationwide, with 64% of the total road damage and 40% of the bridge damage. Along with that, the floods also affected Pakistan's rail network very hard (Center for Disaster Philanthropy, 2022).

Moreover, in Balochistan and Khyber Pakhtunkhwa, the damage to critical public infrastructure was considered the highest which was 17% and 12% respectively of total recorded road damage (OCHA, 2022). While in Punjab the cost of the damage was calculated at 134.93 PKR with 148.292 PKR loss caused by the 2022 floods (Ministry of Finance, Government of Pakistan, 2022). Before the floods, 92% of drinking water was accessible but due to the affected water systems, only 36% of that water was safe to consume. Almost 56% of the water was either contaminated or of poor quality as the result of the damaged water system, the other significant impact of the 2022 floods in the country made more than 5.4 million people rely on contaminated water from ponds and wells (Center for Disaster Philanthropy, 2022).

Displacement and Migration

Displacement and migration are considered among the challenging issues in Pakistan. Although the country faced such problems before the floods due to smaller disasters and the people moving from rural to urban due to poverty or climate stress, the 2022 floods worsened social distress and economic depression. The flood disasters hit worst the southwestern province of Balochistan and the southern province of Sindh, with more than 500,000

people currently living in shelters due to floods that shed away the houses and infrastructure (Tunio & Inside Climate News, 2022). According to OCHA's Multisectoral Rapid Needs Assessment, displaced people especially women were unaware of their rights related to Gender-based violence (GBV), as in provinces like 85% in Sindh, 69% in Punjab, 82% in KP were the number of displaced people with poor camp management (Government of Pakistan et al., 2022).

The increasing climate change threats resulted in floods more often in Pakistan than normal, which compelled some vulnerable communities to be repeatedly displaced. The exposure of vulnerable people to natural hazards was high including women, children, senior citizens, and disabled people facing disruptive consequences and socioeconomic costs (OCHA, 2023). Approximately 33 million people were affected in Pakistan by flood disasters, in which 8 million people were displaced, 13,000 were injured, and 1,700 were killed (OCHA, 2022). Most of the people who were displaced in floods belong to rural areas having agriculture as a source of income, and hence due to their displacement the agriculture sectors face the subsequent impacts in terms of economic productivity.

Due to these widespread economic displacements, Pakistan's national poverty index has increased by an additional 5-7%. The displacement of key members of agriculture sectors including farmers, laborers, and traders disturbs the agriculture sector which is one of the key drivers of economic sources on the rural and national levels (OCHA, 2023). The total calculated number of displaced people in the provinces KPK, Punjab, and mostly in Sindh and Balochistan was 1.8 million in mid-2024 (International Federation of Red Cross and Red Crescent Societies, 2024). The flood destroyed over 2.1 million homes leaving millions of people homeless. The ineffective governmental actions along with limited resources made the rehabilitation process very slow (Center for Disaster Philanthropy, 2022).

Impacts on Health Sector

The 2022 Floods were also highly responsible for severe risks of diseases in Pakistan. The flooded area with standing water made the place favorable for viruses and microbes which caused several WBDs in the country. Apart from that displaced people who had poor hygiene and malnutrition easily get affected by infection thus increasing the disease ratio in the affected regions (Sarkar, 2022; Baqir et al., 2012). Moreover, the vector-borne diseases (VBDs)

outbreak was across almost all provinces of Pakistan, especially where floods have recently hit. Acute watery diarrhea (AWD) and Cholera with periodic diarrheal disease outbreaks were the most common diseases in Pakistan (Government of Pakistan et al., 2022). Apart from that more than 1.5 million boys and girls were worst malnourished in flood-affected areas, which had increased in numbers because of the absence of clean water and proper hygiene.

Similarly, children who had poor immune systems due to malnutrition suffered from issues related to VBDs the most caused by floods (AP, 2023). The floods destroyed around 1460 health facilities making it difficult to access health facilities, while the vaccine temperature control systems were affected worst due to 349 damaged fridges, and solar direct drive systems in floods. The health system worsened due to climate change-induced disasters, triggered by inadequate trauma sustenance resources and improper healthcare provision, mainly for children (Ali et al., 2023). Millions of people in one way or another way were inflicted by various diseases; they have long-term problems in the health care system, nutritional imbalance, and disease control and thousands of innocents have paid with their lives due to unprecedented floods.

In flood-affected regions, there were reported 3.4 million suspected malaria cases, with 170,000 confirmed cases and 25,932 confirmed dengue cases with 62 deaths. Moreover, 1,000 confirmed cholera cases were reported across 12 flooded districts of the country (World Health Organization, 2022). A series of WBDs including diarrhea, cholera, skin and eye infections, malaria, and fever caused by flood events, particularly across Sindh and Balochistan (IRC, 2022). The water sources were contaminated by floods, which resulted in breakouts of these waterborne infections in the community (Abdullah et al. 2024). The 2022 floods made the water contaminated resulting in clean water inaccessible to locals caused disease outbreaks in the regions hit by flood. According to an estimation of PDNA about $313 million to the healthcare sector for rehabilitation and reconstruction, accounting for damages to over 2,000 health facilities and the spread of diseases due to stagnant water and displacement (OCHA, 2023).

Impact on Education

The recent floods had negative consequences on the education and learning field of Pakistan depriving many students of access to education. The floods destroyed the schools leading to emotional trauma for innocent children. Not only the lives of people were

affected by the 2022 floods but it also made the affected more vulnerable, particularly the education sector (Abdullah et al., 2024). The displacement of children, their delayed enrolment, repeated relocations, and their family problems were prominent determinants that showed the educational vulnerability of children in flood disasters (Shah et al., 2022). All of a sudden, the most traumatic circumstances ruin families, homes, safety, and education of the millions of children in the country. Almost 2 million children in Pakistan remained deprived of schools due to the destruction of about 27,000 schools in the most severe flooding in the country's history (UNICEF, 2022).

During the time of severe pandemic between March 2020 and March 2022 for 64 weeks, all the schools in affected regions were fully or partially closed, considered the world's longest closure of schools (UNICEF, 2022). When the devastating floods hit Pakistan during the Moonsoon 2022, more than 3.5 million children lost their education access. These negative impacts on education had the worst effects on Pakistan's human capital and compromised the overall economy of the country (Perry, Barón, & Dahlin, 2023). Lack of education associated with lower earnings contributes to higher crime rates, poorer health, and loss of life, which result in reduced participation in political and social institutions (Pinto & Jones, 2020). The other studies highlight that the impacts on the schooling of students in grades 1-12 might earn 3% less over their whole life, which could result in a decline in the country's economic growth by 1.5% lower annual GDP (Hanushek & Woessmann, 2020).

The floods of 2022 left long-term negative consequences on the education infrastructure, student learning process, and overall economic effects in the country. Already present disparities in perceiving education were worsened due to thousands of damaged or destroyed schools. Before the flood disasters, about 18.7 and 20.7 million children were out of school. The estimations showed that at least an additional 1 million children could not go to school due to a lack of resources and financial stress (PAMS 2021, Government of Pakistan 2019). Approximately 3.5 million children had lost their schooling at the time of the disasters (NDMA 2022; UNICEF 2022). The strong global evidence showed that this natural disaster negatively impacted education and led to long-lasting effects (Barón et al., 2022). This disruption has created challenges for children to resume their education, with lasting implications for literacy and human capital development.

Economic Impacts

Pakistan is facing a long-term economic crisis due to floods, impacting the growth of GDP, reserve assets were on the decline, and inflation was on the increase during the flood events. The amount of total damage was calculated as US$14.9 billion with US$15.2 as the total loss and US$16.3 billion was calculated amount of total reconstruction needs caused by the 2022 floods (Amnesty International, 2022). As estimated, the floods caused around US$2.3 billion in damages in Pakistan and this fiscal year the annual economic growth of the country has been reduced from 5% to 1.6% (Jamil et al., 2022). Along with that, the 2022 floods caused damage with a cost of an estimated 150.4 billion PKR (US$700.0 million) to the public sector, and 2.2 billion PKR (US$10.6 million) to the private sector. The largest damage was reported in Sindh which was 62.2% followed by KP with 14.4% damage, 13.1% in Balochistan, 3.4% in Punjab, 6.6% in Water and Power Development Authority (WAPDA), and 0.3% damages in Special Regions (Government of Pakistan et al., 2022). During the floods, the GDP decline is estimated to be 2.2%, with agriculture seeing one of the biggest affected sectors in Pakistan (PDNA, 2022).

Conclusion

Pakistan faced severe, multidimensional consequences resulting from floods in the year 2022 having the worst impacts on the different sectors of the country. Which has a severe effect on the development process of the country. The rural economic system was disrupted due to the collapse of the country's important sectors including agriculture, infrastructure, displacement, health, and education, pushing the country into severe poverty. The 2022 floods affected the Pakistan agriculture sector which is the backbone of the country's economy and a source of income for people of rural areas. Floods led to losses of crops, soil fertility, and irrigation structures, which produced food shortages and income losses for millions of Sindh, Punjab, Balochistan, and Khyber Pakhtunkhwa farmers. Infrastructure was also hit hard by the 2022 flood disasters, the destruction of roads, bridges, hospitals markets, etc made the situation harsh for flood-affected people.

Displacement and migration added to these difficulties, proclaiming the vulnerable displaced individuals to fragile accommodations together with severe accessibility to assets. More people fell ill as water-borne diseases cholera, malaria, and dengue that erupted in the flooded regions overwhelmed a weak health

sector. Education was also greatly affected because many schools were shut down or found in very bad conditions, pulling millions, especially girl children out of school. Females, kids, and the older generation continued to suffer from more impacts of floods including access to health, displacement, loss of their sources of income, etc. The many ways in which a disaster worsens social inequalities underscore the need to ensure social-inclusive disaster recovery. To address these challenges, fragmented and integrated interventions are needed from several sectors. The flood lessons of 2022 have to become the pivot for change: change that is necessary for the country to become more resilient, equitable, and sustainable.

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