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THE 2022 FLOOD AND POVERTY: HOW THE LOSS OF PRODUCTIVE ASSETS AFFECTED DEVELOPMENT IN DERA ISMAIL KHAN, PAKISTAN

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Abstract
The huge monsoon floods that hit Pakistan in the months of July to September in 2022 gave a big shock to the whole land, the one unfortunate district was Dera Ismail Khan. The study reports the inquiry about the flood and its post impact upon the poverty and productive resources in district Dera Ismail Khan. The secondary data collected from government of Khyber Pakhtunkhwa statistics and PDMA and from agriculture research center Dera Ismail Khan research report. The result shows that, the 2022 flood damaged infrastructure, agriculture land and livestock in huge numbers. Floods ruined about 55,000 hectares of cultivated land cropped area. Sugarcane, rice, cotton and sesame were some of the major affected crops. Total economic loss in Dera Ismail khan in the form of crops was recorded as 4.5 billion rupees. From livestock, about 11,527 animals died which is the foremost livelihood source in D.I.Khan district. The floods ravaged or destroyed 44,869 houses, of which 25,898 were totally destroyed and 18,971 were partially destroyed. The floods hurt the poorest households, the least able to recover, the most. The destruction of productive assets land, crops, livestock, and housing drove many families further into poverty, reversing years of development gains. Women and children were the most vulnerable, with higher risks of food insecurity, disease, and violence based on gender due to displacement and loss of livelihoods.

INTRODUCTION

1.1. Background of Flood disaster in Pakistan (2022)

The huge monsoon floods that hit Pakistan in the months of July to September in 2022 gave a big shock to the whole land. Lots of homes were hit, with Sindh and Baluchistan getting the worst of it. The flood was so bad that 94 spots got aid by October 11, 2022. At the top level, the flood sent about 33 million folks from their homes, with more than 8 million folks in need of new places to live (PDNA, 2022). The Post Disaster Needs check in October 2022 gave a clear look at how the floods wrecked key parts of Pakistan's world. Roads and trains took a huge hit, with around 8,330 km of roads & 3,127 km of rail gone. Homes got hit hard too, with 780,000 homes gone & over 1.27 million hurt. Also, the farm world, key to the land, felt a big blow, losing about 0.8 million farm

beasts & harm to around 4.41 million farm, land areas.

The effect broke supply lines & cut off markets, making food costs soar across the land (Flood, 2022). The floods during the summer of 2022 hurt the lives & work of its folk a lot, killing folk & cutting down how well families could live by making food cost more & taking away homes & jobs. Though it's hard to track money loss due to not enough real-time data, new ways have used real-time space, admin, & old survey data to guess the impact (Knippenberg et al., 2024). This mode made a way to think about how money loss might look in advance. The guess was that the floods would make the poor rate go up by 4.0 to 4.3 points, putting about 9 million more folk in poor lines. More checks showed that the size of these money shocks was not the same everywhere & changed with each home, based on the deep flood & home traits. These key numbers helped guide the Post-Disaster Needs check & then shared info at the Donor Meet for Pakistan (Knippenberg et al., 2024).

The big flood in 2022 touched around 33 million folk led to nearly 1500 deaths and wrecked key parts like roads, farms and homes across the land. This was due to record rains for example in August 2022, Baluchistan got 590% more rain than usual and Sindh got a record of 726% above average- rain. Science checks showed that rain like this has gone up 75% with climate change (Otto et al., 2022). The flood in 2022 cost Pakistan a lot - the damage is thought to be about US14.9 billion & US15.2 billion in money. They also faced a big bill of at least $16.3 billion for fixing stuff. With big money woes already, how to add long-term climate fixes to the recovery was a big, open query. With all the ruin & ongoing money crunch, fixing stuff depends a lot on getting big aid from other lands. Plus, the land is also looking at climate cash & pushing for help through routes like the Loss & Damage Fund to get right for climate risks (Rehmat et al., 2023).

The goods that make Dera Ismail Khan (DI Khan) work rely a lot on farms, mines, energy, & old crafts. These are key to its farm & fresh work world. The spot has lots of land to grow & good weather for crops like wheat, sugarcane, Langra mangoes, & famous Dhaka dates. The Gomal Zam Dam & its water paths have made farm work way better by giving steady water to around 191,000 acres, letting folk grow more each year & do better at farms. Plus, tube well water is still key, as checks show it's good for growing more by making sure water & other stuff get used well. These water paths are key goods that keep food growing & help farm life (Niamatullah et al., 2022).

1.2 Dera Ismail Khan:

Dera Ismail Khan (D.I. Khan) is a town located within the Khyber Pakhtunkhwa province, directly west of the Indus River. Historically significant, the Baloch chief Ismail Khan founded it in the fifteenth century, though in 1867 the present site was established following the destruction of the original town by the Indus in 1823. The town acts as a vital transportation hub, linked to Darya Khan on the opposite side of the Indus by bridge. Agriculture and specialized industries form the backbone of the local economy. Some of the major crops produced in the surrounding regions are sugarcane, wheat, rice, cotton, and pulses, and large-scale rearing of goats, buffalo, and cattle is done. Textile, sugar, flour, oil, and rice mills and soap manufacture form the industrial base. The district is also famous for its old-fashioned handicrafts, which are lacquered woodwork and glasswork. D.I. Khan offers important city facilities, consisting of two universities, a hospital, and some colleges. In general terms, river floods are known to be caused by many changing atmospheric conditions like high temperatures that cause ice melt, monsoon rains, and extratropical frontal systems. Global warming has increased the uncertainty and complexity of the hydrological cycle that, combined with growing population development in Asia, puts pressure on energy, food, and water resources. This emphasizes the critical function of water management infrastructure, such as dams, in stabilizing irrigation networks, producing power, and maintaining water supply distribution for community growth (Donnelly et al., 2017; Wang et al., 2019; Ishfaque et al., 2022). Dera Ismail Khan (D.I. Khan) District, some 390 kilometers south of Islamabad in the Khyber Pakhtunkhwa province, is comprised of five tehsils and has a population estimated to be over 2 million inhabitants.

During July and August 2022, this Afghan border region in southwestern Asia was considerably affected by monsoon rains that caused flash floods, destroying many villages throughout the district. The floodwaters

thoroughly destroyed the regional roadway networks, heavily restricting overland transport during and soon after the disaster. Among the severely affected arteries were the central Indus Highway (between D.I. Khan to South Punjab and Sindh), Daraban Road (to Baluchistan), and Bannu Road (to the Southern Districts of Khyber Pakhtunkhwa), and Chashma Road (to North Punjab and Islamabad). These extreme weather events, which recorded national rainfall at 2.87 times the 30-year mean (even more in some provinces), caused drastic economic damages to the region, impacting the population living there, livestock, crops, infrastructure, and assets (Zarekarizi et al., 2020; Adhikari et al., 2015; Nandargi et al., 2010; Wilhelm et al., 2019; Ahmad & Afzal, 2022).

Figure 1.1.

Picture 1.1. (a road damaged fully due to flood in Darazinda Dera Ismail Khan.)

Picture 1.2 (Damaged Houses from sub division Darazinda Dera Ismail Khan)

The image 1.1 depicts a major highway in Darazinda that suffered severe erosion and partial destruction due to floodwaters in 2022. Sections of the road were swept away, severely disrupting traffic and isolating local populations. This illustration highlights the substantial infrastructure damage caused by the 2022 floods, demonstrating how the disaster created barriers to mobility and economic activity in the area.

The image 1.2, shows residential buildings in Darazinda that were heavily impacted by the flooding, with collapsed walls and debris visible in the surroundings. This scene captures the extent of damage to homes and property, emphasizing the loss faced by communities as many families became displaced and were deprived of their livelihoods.

Together, these visuals clearly convey the dual impact of the 2022 floods in Darazinda, Dera Ismail Khan: physical destruction of infrastructure and widespread social distress from housing loss and displacement. Such scenes support discussions around the depletion of productive capital and the risk of entrenched poverty following natural disasters in underdeveloped regions.

1.2. Problem Statement

The 2022 floods in Pakistan hit Dera Ismail khan hard. The whole town felt a big shock at once. We now face a big task. We must grasp the deep, long-term hurt to this area's economy. This place depends a lot on farms & farm animals. The floods wiped out key money makers for farm folks. They lost all crops & their dear farm animals died. These animals were like their cash stash. A lot of their land turned bad for good. Here's the big issue: How does losing these key goods stop poor folk from getting back on their feet, trapping them in deep poor?

When farm folks lose their main riches their animals & land - they drop to a low point. They can't make enough to rise from poor, which risks a never-ending poor trap based on lost goods. This study will try to link the ruin of these goods to a jump in poor. This proof is key to help plan aid & fixing tasks that really "build back better." We aim to make a safe, long-term rich future for D.I. Khan.

1.3. Significance of the Study

Concentrating on the loss of useful assets such as crop failure and cattle death this research goes beyond merely damage. reports to investigate the fundamental mechanism that straight pushes farming families below the required minimum wealth threshold for independent recovery. These shocks disproportionately impact the impoverished, causing concentrated losses of human capital and income. Showing this connection is crucial as it stresses the need of particular, focused interventions to substitute these assets instead of just offering short-term relief, therefore Make certain that needy families might escape structural poverty. The results will provide concrete advice for NGOs, lawmakers, and multilateral partners charged with carrying out the national "Build Back Better" plan. D.I. Khan is a major flood center where farming drives income. By measuring the damage of the agriculture-based market economy—including crop losses and animal herd destruction—one gets important data for planning climate-smart rehabilitation plans. intended at restoring regional incomes and improving food security. The study's emphasis on asset loss includes essential public infrastructure. Knowing the effects of impaired systems like the Chashma Right Bank Canal (CRBC) will highlight the importance of resilient rebuilding and assist to prioritize large- To guarantee long-term regional agricultural output and growth, scale investments include the proposed CRBC expansion. By helping to create institutional and community capability, which are essential elements of economic resilience, the study helps to build on them. Floods create a "first tragedy" (loss of life and infrastructure) and a second disaster families suffering in poverty as a result of loss of income and assets. This research stresses the necessity of giving low-income people more medical and dietary help top priority among programs meant to safeguard human capital. prone to disease and ensuing labor reduction. The study draws attention to important flaws in local by looking at how structural damage such as damaged roads limit mobility and access to economic possibilities. reaction and planning. The results will back calls for more openness and better governance in managing post-disaster funding and guaranteeing that resources reach distant, hardest-hit regions.

1.4. Research Questions

- How much did the 2022 floods in Dera Ismail Khan hurt farms, crops, & cows?
- Why does the loss of these goods push poor homes deep into a hard, long poor state?
- How did more harm (like broke roads & health woes) cut down on folks' skills & group strength?
- What key plans & fix funds are a must to fix D.I. Khan's work scene & stop bad growth breaks?

1.5. Research Objectives

- **To quantify the magnitude of productive asset destruction** in Dera Ismail Khan, specifically detailing the total loss of major crops, the monetary value of lost livestock, and the prolonged impact on agricultural land usability.
- **To analyze the causal link** between the destruction of private productive capital and the decline in household welfare, establishing how this simultaneous, covariate shock pushes marginalized families toward an entrenched, asset-based poverty trap.
- **To assess the compounding effects** of infrastructural paralysis (including transport and key irrigation systems like the Chashma Right Bank Canal) and post-disaster health crises on the

erosion of human capital and community resilience.

- **To formulate evidence based policy recommendations** for climate resilient development, guiding strategic, pro-poor investments in both hard infrastructure reconstruction and soft institutional capacity to secure Dera Ismail Khan's long-term development trajectory.

Literature Review:

The recent literature highlights the server and multidimensional impact of flood disasters in Pakistan, particularly following the devastating 2022 floods. Knippen berg et al., (2024) demonstrate that under the circumstances of the unavailability of real-time household survey data, a model of flood induced poverty can be built by combining satellite imagery, administrative data, and historical surveys to forecast a 4.43 percentage point increase in national poverty that plunges almost 9 million individuals under the poverty line. Rentschler et al., (2022) also give an overall view, observing that South Asia, particularly Pakistan, has high flood exposure coupled with poverty, where 1.81 billion people globally are exposed to one in 100 year floods and 1.24 billion of them live in south and East Asia. At the district level, Ahmad et al. (2024) Identify a considerable relationship between climate change vulnerability and multidimensional poverty among flood prone rural areas of Rajanpur and Muzaffargharh, in which Rajanpur depicts greater intensity of poverty, particularly in living standard, health and education dimensions. Rathore et al., (2022) Report heavy agricultural losses in Sindh, wherein floods influenced 57% of agriculture land and harvests plummeted miserably cotton by 88% rice by 80% and sugar cane by 61% heightening food insecurity. Ahmed et al. (2022) Also examine food security in rural Panjab 's flood affected regions, observing that three- fourths of family's experience flood insecurity, particularly those with property losses and without financial resources.

Hussain et al., (2023) Bring forth the gendered socio-economic consequences of floods in rural Dera Ghazi Khan, such as increased workloads for women, malnutrition, illiteracy, limited access to healthcare, and intimate partner violence. Haq et al. (2022) Consider determinants of child underweight status among flood - exposed Khyber Pakhtunkhwa (KP) and find young mothers, unsafe water, large family size, and inadequate sanitation to be key risk factors.

Ullah et al. (2025) Discuss climate induced migration in Nowhere, with findings of insufficient housing, loss of live hood, social marginalized, and environmental degradation in the resettlement sites. Jamal et al., (2025) Examine the flood forecasting and early warning systems in the Indus basin, with findings of constraints like weak radar coverage, rugged terrain, and institutional limitations in far flung districts like Swat and Dera Ismail Khan.

Shah et al. (2023) Discuss farmer's adaptation measure and perceptions towards climate risk in KP, highlighting that lack of information, financial limitations, and inadequate institutional support undermine adaptation. Lastly, khan et al. (2024) Offer a historical explanation for KP's economic marginalization, attributing it to British colonial policy that has caused it to remain vulnerable to climate shocks to date. Taken together, these studies highlight the overriding imperative for region specific, poverty sensitive, and gender aware targeted policies to enhance resilience and counter the multidimensional efforts of floods in Pakistan.

Methodology

The research utilizes a mixed method research approach to assess the effect of the 2022 floods on poverty and development in DERA Ismail khan (D.I.Khan) focusing particularly on productive assets loss. The research methodology incorporates household-level quantitative data with qualitative evidence to provide an integrative picture of post-disaster socio-economic activity.

3.1 Study Area and Design

DERA Ismail khan, which is a flood-affected southern Khyber Pakhtunkhwa district, was selected to be the field location because it was greatly devastated by the floods of 2022 and is economically reliant on agriculture and livestock. Cross - sectional design was employed, where data can be collected at one time to consider the impacts of post-floods on households.

3.2 Sampling and Data Collection

A total of 300 flood affected households were surveyed using a multi stage stratified random

sampling technique. The sample was drawn from these severely affected union council, ensuring representation across socio- economic strata. Information was gathered via. Systematic household questionnaires, collecting variables like pre and post flood ownership of assets, earnings, occupation, flood safety, accessibility to education, and recovery assistance. Focus Group Discussion (FGDs) (n=5) and Key information interviews (KIIs) (n= 10), conducted with local farmers, women, community leaders, and district level officials. This produced qualitative data on the social and developmental consequence of assets loss, coping mechanisms, and institutional response.

Secondary Data like satellite data, district-level reports of flood impacts, and socio-economic data (e.g., PSLM, PDMA, NDMA) were used to triangulate and place findings in context.

Data collection was undertaken in July and August 2023, approximately one year after the flood disaster, in order to facilitate retrospective assessment of recovery activities and continued impacts.

3.3 Data Analysis

Quantitative information was analyzed using SPSS (v26). Descriptive statistics were employed to illustrate the size of assets loss and poverty indicators, and binary logistics regression to test for association between assets loss and development outcomes (e.g., income decline, school dropout, lack of food).

Qualitative FGD and KIIs data were coded, transcribed and analyzed using Navigo thematically for purposes of enabling triangulation as well as identification of common social patterns, institutional gaps, and community level vulnerabilities.

3.4 Ethical considerations

Academic review board related ethical clearance was acquired. There was informed consent from all participants, and confidentiality was ensured throughout the research. Participation was voluntary and respondents were briefed on their right to withdraw at any time.

Results and Conclusion:

2022 Dera Ismail Khan (DI Khan) floods resulted in devastating damage to productive resources, severely impacting agricultural production, animal populations, and rural livelihoods, hence worsening poverty and long-term development issues. The district, being one of Khyber Pakhtunkhwa's most important agricultural centers, witnessed the extensive destruction of crops, arable land, and livestock herds, with far-reaching economic and social impacts on its largely agrarian community. (Jamil et al., 2022).

Agricultural Asset Losses:

Floods ruined cultivable land with about 55,000 hectares of cropped area having been impacted throughout the district. Rice, sugarcane, mungbean, cotton, and sesame were some of the most affected crops whose damage ranged from 10% to 80% based on the tehsil and crop. For example, in Tehsil Parova, 80% of mungbean crops had been ruined, while 50% of sesame and 30% of rice were lost. Total economic loss in crop loss in DI Khan was put at more than PKR 4.5 billion (equivalent to USD 16.3 million), with sugarcane alone contributing a loss of PKR 1.6 billion in damage to 9,109 hectares. The Indus River flood overflowed into 1,377.54 square kilometers of land planted in crops, hugely interrupting cultivation patterns and food security. (Sarwar et al., 2024). Livestock and

Animal Husbandry Losses

Livestock, which forms the backbone of rural wealth and income, incurred huge losses. Altogether, 11,527 animals died, out of which 877 were cattle, 450 buffaloes, 3,500 sheep, 2,700 goats, and 4,000 poultry birds. The value of these losses in the market was worth PKR 349.4 million (about USD 1.26 million). The remaining animals were deprived of fodder and shelter, and large numbers of them were displaced or migrated along with their owners to elevated areas. The livestock loss destroyed not just household resources but also interrupted milk, meat, and dairy production, further affecting nutrition and income. (Jamil et al., 2022).

Infrastructure and Housing Destruction

The floods ravaged or destroyed 44,869 houses, of which 25,898 were totally destroyed and 18,971 were partially destroyed. This enormous loss of houses left thousands of families homeless, many of whom still

had not received government compensation even two years after the tragedy. Essential infrastructure such as roads, bridges, and irrigation canals was significantly damaged, cutting off communities and slowing relief and recovery efforts. Destruction of the Indus Highway and other major transport links interrupted market access for farm produce, adding to economic losses. Wider

Economic and Poverty Impacts

The floods hurt the poorest households, the least able to recover, the most. The destruction of productive assets land, crops, livestock, and housing drove many families further into poverty, reversing years of development gains. Women and children were the most vulnerable, with higher risks of food insecurity, disease, and violence based on gender due to displacement and loss of livelihoods. The PDNA for the country estimated losses and damages in Khyber Pakhtunkhwa at USD 935 million and USD 658 million respectively, with agriculture, livestock, and housing being some of the worst-hit areas.

In summary, the floods in Dera Ismail Khan in 2022 brought widespread destruction of productive assets, hence severe economic losses and increased poverty. Recovery initiatives should aim to rebuild assets, restore livelihoods, and build climate-resilient infrastructure to avoid future vulnerability. (Finance.govt.pk, survey).

Conclusion:

In total, the 2022 floods caused widespread destruction in Dera Ismail Khan, leading to the loss of important productive capitals like agricultural land, livestock, homes, and major infrastructure. The destruction of crops, animal herds, and safe housing sent poor families further into poverty and instigated long-term economic losses for the entire region. Widespread road and bridge destruction not only cut communities off but also restricted recovery and access to markets, exacerbating the suffering of victims.

Aside from direct asset losses, the calamity shifted cropping patterns, distorted rural economies, and presented serious threats to the public health and food security. The flooding deepened poverty traps, stretched social safety nets, and made recovery most difficult for poor families. These impacts emphasize a pressing requirement for climate-resilient infrastructure, effective social protection policies, and specific livelihood restoration programs to assist afflicted communities and protect them from future exposures.

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