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Environmental Justice Challenges and Post-flood Recovery in Punjab- Pakistan: A Qualitative Study

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Abstract

This paper adopts an environmental justice framework to explore whether existing social vulnerabilities shape the household recovery in the two most flood hit districts of the Punjab. Based on the data collected through in-depth qualitative interviews, the study revealed that distributional environmental injustices such as disproportionate burden of floods for disadvantaged households, procedural injustice viz lack of meaningful participation/involvement in flood assistance policy making and misrecognition of the needs and priorities flood affected communities and individuals significantly affected their prospects of recovery. This study suggests that impacts of exacerbating preexisting inequities can be minimized by adopting recovery approach based on the principles of environmental justice.

Keywords: Environmental Justice, Floods, Challenges, Recovery, Punjab, Pakistan.



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1. Introduction

Post-disaster recovery is a complex and multifaceted process. It includes the reconstruction of damaged infrastructure, restoring the services and redefining the goals of life. This process of rebuilding the life is shaped by multiple socio-political and ecological factors (Shaw, 2013). Post-disaster recovery planning requires that burdens of the catastrophic events on disadvantaged communities are minimized in the best possible way while the benefits of such policies are equally distributed. However, it has been observed that burdens and benefits of such policies are disproportionately distributed. The poor and dispossessed are usually held back perpetuating the preexisting conditions of social exclusion and vulnerabilities (Cutter, 2012). While an effective recovery entails that no one is left behind.

Inequities in the distribution of environmental harms and benefits are fundamental to concept of environmental justice. Environmental justice aims to address such inequities by ensuring that everyone irrespective of social position, identity, gender, race, creed and religion has equal access to recovery resources and that people are meaningfully involved in decision making process. It ensures that voices of marginalized are heard and people are at the core of design and distribution phase (Vilá et al., 2023)

Evidence demonstrates the inadequate addressing of pre-existing social inequities perpetuate the social inequality and marginalization (Kammerbauer & Wamsler, 2017). This has been observed in various social settings that social inequalities, constellation of powers, policies of neo-liberalism and procedural inconsistencies and lack of recognizing human diversity inequitably affect the post-disaster recovery in disadvantaged communities (Aijazi, 2015; Joseph et al., 2021; Rivera, Jenkins and Randolph, 2022). While significant barriers remain in addressing such deep rooted issues, the underprivileged individuals and communities are excluded from planning and execution process because the benefits are accrued more to the people who are comparatively affluent politically, socially and economically. This pattern reflects the underlying social vulnerabilities and various vectors of injustice that deprive the people of their fundamental environmental rights affecting the weakest segment such as women, children, elderly, poor and politically marginalized. Protecting the environmental rights of the people addresses the challenges of environmental injustice in the face of environmental risks and hazards.

The concept of environmental justice came into academic literature and everyday discourse of the individuals, communities and nations as the people began fighting against the presence of an environmental risk that interacted with their everyday life, life styles and livelihood. It appeared on the radar of indigenous communities, environmental activists and civil society organization just three decades ago. This aspect of justice particularly gained prominence due to indigenous and marginalized communities' resistance to unwanted environmental conditions such as industrial emissions, incinerators, technological failures, misplaced landfills, water, air and land/soil pollution, climate change and mineral extractions etc. Besides this, every day we hear the news of intermittent environmental hazards/risks such as floods, hurricanes, landslides, glacial lake outbursts, cyclones, earthquake, cyclone and wildfire turning into disasters that lead to a new form of environmental challenges. As the extent, frequency and intensity of environment related issues and their consequences are becoming manifold; the efforts to tackle them have been on the agenda of nation states and at international level as well. Consequently, environmental justice has become more relevant as it seeks to address the issues of fairness, equity, recognition of the individuals and communities facing environmental risks (Bullard, 2007).

1. Conceptualization of environmental justice in post-flood recovery process

There is a long debate regarding the definition of environmental justice and its conceptual pillars. Scholars believe that definitions vary with respect to objectives of an environmental movement, environmental activism and sociocultural context of issues and lived experiences and personal histories of people (Abbott & Wilson, 2015). Nonetheless, generally this concept seeks to address three aspects of environmental impacts challenges (1) inequities in exposure to environmental hazards and disproportionate access to environmental goods/amenities (2) uneven impacts of environmental policies/programs/actions (3) lack of meaningful participation in policy formulation and legal recourse. Owing to its plurality, the manifestations of environmental justice deeply depend upon the meanings of impacts of environmental hazards and their consequences (Schlosberg, 2013).

With the passage of time, this concept has expanded over space and time. In the last two decades, the concept of “climate justice” has achieved a significant attention of scientists, governments and policy makers due to its ubiquitous distributional impacts within and across the countries (Mohai, Pellow & Roberts, 2009). However, it is believed that climate change is one of the aspect/subcomponent of environmental degradation. The implications of climate change impacts on future generations and low income countries are serious and worthwhile. Consequently, climate justice is related to other concept such as ‘intergenerational justice’ and “just transition” (Skillington, 2019).

Intergenerational climate justice deals with implications of climate change for future generations, youth and children while just transition refers to social, political, economic and institutional changes required to address environmental degradation (McCauley & Heffron, 2018). This analytical category helps to understand the unequal impacts of such policies and meaningful participation of individuals and communities in policy making processes. Furthermore, it draws attention towards adaptive needs of vulnerable groups so that “no one is left behind” due to disruptive effects of such policies (Di Rosa et al., 2025).

Although there is a plethora of research indicating that marginalized groups experience disproportionate exposure to environmental hazard and access to environmental amenities, yet this claim is not always true as there are local nuances and contextual differences (Schlosberg et al., 2025). People do not see environmental injustice in isolation. They view environmental injustice at the intersection type and source of hazards, sociocultural aspects such as norms values and beliefs, practices, local power structure, level of awareness, individual vulnerabilities (physical and economic), gender, housing (size and quality), governance, infrastructure development and institutional response and actual and perceived implications of such hazards for personal and community wellbeing (Malin & Ryder, 2018).

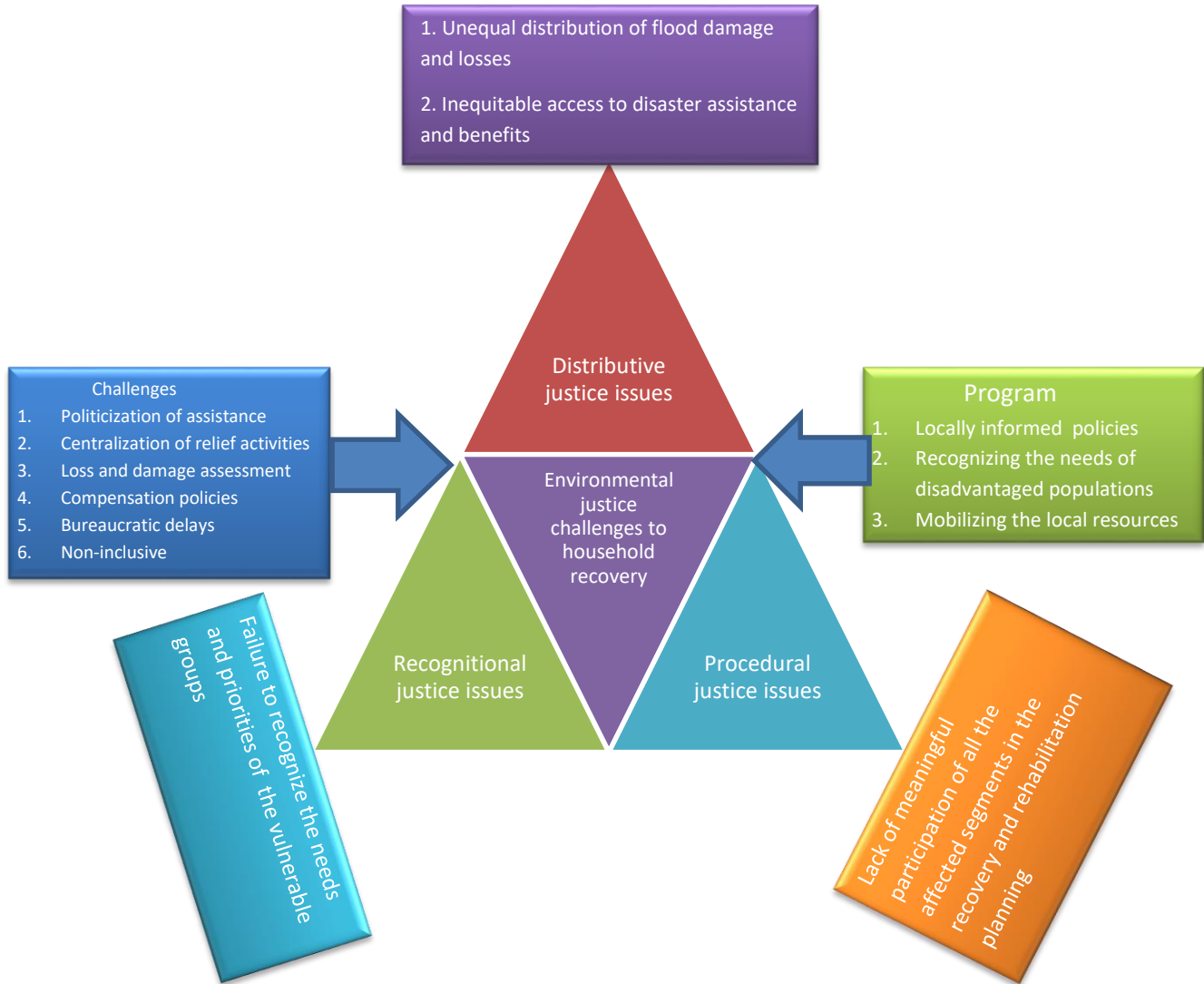
In order to understand the disproportionate exposure to various environmental hazards, it has become imperative to understand the exposure pathways (Smith & Laribi, 2022). However, there is limited data available owing to complexity of exposure pathways and lack of visibility of vulnerable groups. Environmental justice involves the involvement of concerned citizens to access local knowledge. Such lay knowledge and lived experiences of environmental hazards can help to recognize the unidentified and invisible pathways that have implications for overall wellbeing of the individual and communities (Abbott & Wilson, 2025). Documenting such experiences can also help to develop policies, programs and actions to offset the impacts of environmental hazards on vulnerable communities. Additionally, the consequences of environmental policies could be potentially different for various segments of the society. Governments may offer

policies to tackle different environmental hazards that could have unequal costs and benefits for different segments of society. The policy formulation depends upon the framing of environmental hazards, political orientation, institutional capacity and policy framework.

Floods are one of the most frequent and deadliest disasters in Pakistan. As climate change intensifies, the frequency and severity of floods and extreme precipitation are expected to rise and floods are becoming new normal in Pakistan (Dawn, 2025). Despite taking significant structural measures such as river management and construction of flood dikes etc, the loss of life and property by floods is continuously rising in the country (Alam, Ali & Pamucar, 2024). So far as since 1950 to 2022, Pakistan has faced 28 flood events and suffered a loss of 68,225 Million US Dollar, 15,199 lives lost, 230,704 villages affected and 701,558 sq.km area has been submerged by flood waters (NDMA, 2024). The floods of 2010 and 2022 were most disastrous and deadliest in the history of Pakistan. Recent 2025 floods have affected 6.9 million people, caused 1037 loss of lives, injured 1067, damaged or destroyed 229,760 houses, killed 22,602 livestock and displaced 152,140 people (Relief Web, 2025). A resilience strategy embracing preparedness and planning has become crucial for the Pakistan to minimize the casualties and damages by flooding (Mendoza & Khero, 2016).

Due to repeatedly affected by flood disasters, the socioeconomic vulnerabilities are getting deeper with the passage of time it has been reported by various studies that pre-existing social cleavages are posing considerable barriers to equitable recovery processes. Lack of holistic disaster management policies, reactive approaches and skewed recovery and rehabilitation policies adversely impact the disadvantaged groups (Khan et al., 2024; Khan.I et al., 2022). Environmental justice framework in post-disaster recovery addresses the issues of recovery inequities by ensuring that benefits of recovery policies and interventions are equally distributed (distributional justice). Environmental justice demands that people are treated fairly and are included in recovery decision making process at all level (procedural justice). It also ensures the inclusion of voiceless and dispossessed by providing the opportunity to all segments irrespective of gender, age, ethnicity, race, religion, creed and color (recognitional justice). Distributional justice ensures that burdens and benefits flood hazards and recovery policies are equally divided. It deals with fair treatment. Procedural justice deals with aspect of meaningful representation and active participation in formulating the recovery policies. Recognitional justice addresses that needs and priorities of the people are given due importance. The theoretical framework given in figure 1 presents the 1) conceptualization of environmental justice 2) interaction among three dimensions of environmental justice with the challenges such as centralizations of relief activities and politicization of relief activities. It also delineates the interventions to safeguard the environmental rights of the flood prone communities.

Figure1: Conceptualization of environmental justice framework for post-flood recovery



2. Objective and research question of the study

The overall objectives of this study were to examine the barriers to post-flood recovery in the two districts of the Punjab hit by catastrophic 2025 floods by applying the framework of environmental justice with a goal to achieve inclusive recovery policies. For this purpose, following research question was investigated:

RQ1. How does environmental justice inform the intersection of various structural inequalities that shape the recovery prospects flood survivors?

4. Research Methodology

4.1 Research Design and participants of the study

This study employed participatory qualitative research approach to explore the views of flood survivors regarding the challenges faced during recovery and rehabilitation phase. This approach helped to bring an extensive and rich data. This collaborative social science research method involves the active participation of the population directly affected by any environmental issue/event, their lived experiences, perceptions and assessment and actions proposed to arrive at a pragmatic solution. We conducted in depth interviews with underrepresented segments of

society such as women, minorities, transgender and disable. Purposive sampling was adopted to reach flood survivors in Multan and Muzaffargarh District.

4.2 Study settings

This study has been conducted in in the three target districts of Punjab namely Multan and Muzaffargarh. Owing to most flood prone areas in Punjab, these two districts have specific context that make them more suitable for this study. Muzaffargarh is located between two rivers namely Chenab and Sindh. This district is called Doaba. Predominantly, this is an agricultural district and second largest district in Punjab province in context of livestock production. This district has been severe victim deforestation and riverine floods. Different parts of the district have been affected by three mega floods in 2010, 2014, 2022 and 2025. The climate is arid, characterized by scorching summers and mild winters, with some of the most extreme weather in Pakistan. The highest recorded temperature in Muzaffargarh is approximately 54 °C (129 °F), making it one of the hottest places in the country. The ground water in different areas of city is contaminated with arsenic which exceeds WHO guidelines and other international standards (Nickson et al., 2005). According to ThinkHazard (2025), Muzaffargarh faces high level of multiple natural hazards threats such as river floods, extreme heat, water scarcity and wild fire and a medium level risk of earthquake.

Multan is considered as one of the oldest cities in the world and biggest metropolitan in South Punjab. This city is flanked by river Chenab on the west side and many areas of this district are prone to extreme flooding. The urban are faces many issues such as dilapidated/deteriorating physical infrastructure, overcrowding and population pressure. In the last two decades, many parts of this district was inundated by super floods (2014 and 2025). Many parts of the district face the risk of moderate drought while few parts face the risk of severe drought. District Multan is situated on eastern bank of River Chenab and northern bank of River Sutlej, and owing to this proximity to both rivers, it is prone to floods (NDMA, 2018). Multan is considered as city of mangoes. Multiple hazards faced by this district has severe implications for mango farmers. According to Think Hazard (2025), Multan faces high level of multiple natural hazards threats such as river floods, urban floods, extreme heat, water scarcity and wild fire and a medium level risk of earthquake.

4.3 Tools for data collection and data collection process

Data were collected with help interview guide. We conducted 24 in-depth interviews with flood survivors including women, transgender persons, persons with disabilities, and religious minorities in Multan, Muzaffargarh. As two tehsils of Multan and Muzaffargarh were battered by severe riverine floods in August-September 2025, in-depth interviews were conducted with floods victims in Muzaffargarh (Ali Pur) and Multan (Jalal Pur Pir Wala). Interviews were conducted in Saraiki, Punjabi and Urdu. Verbal consents of all the study participants were taken before interview.

4.4 Data analysis method

All interviews were recorded and transcribed. In order to familiarize with data, audio recordings were listened again and again. Data transcription also allowed to immerse that helped to look into patterns and initial ideas. Data were analyzed keeping in view three overarching objectives of this research activity 1) identification of key environmental justice challenges 2) service delivery gaps and 3) systemic barriers. A hybrid data analysis technique was adopted by utilizing both the computer assisted qualitative data and manual data analysis technique. The major form of analysis was thematic analysis. Initially the codes were flagged keeping in view the

overarching themes mentioned above. Similar codes were merged to arrive at categories under predetermined inductive subthemes and themes.

5. Results of the Study

Floods wreak substantial havoc on the socioeconomic health of impacted communities along with physical infrastructures. Such catastrophic events lead to destruction of business, deepening the inequalities, and prolonged impoverishments. Overall disasters cause a severe blow to livelihood of a considerable segment of impacted population (Shah et al., 2025). Livelihood consists of different assets such as financial, physical, human, natural and social capital (Armah et al., 2010). We asked the flood affected people to share their experiences relief and recovery. Particularly, our focus was on the livelihood recovery of the flooded household. Data analysis showed that flood victims livelihood is shaped by cultural norms and practices, evacuation decision, construction of house, damage to property and business. Preexisting social cleavages and socioeconomic position of the people, gender dynamics, local power structure, skewed financial compensation policies and ecological footprints multiply the impacts of floods. Data analysis revealed that preexisting vulnerabilities spear heads during extreme events that have long term implications for the recovery and rehabilitation of the disaster victims. As we conducted interviews with marginalized segment in flood affected areas, data analysis revealed that following factors are significantly impacting their livelihood recovery.

5.1 Politicization and centralization of relief activities

Environmental justice involves mechanisms of providing compensation to communities that have been disproportionately harmed by environmental degradation and implementing measures to restore and rehabilitate damaged environments. As people are disproportionately affected by environmental events such as floods, it is deemed appropriate that vulnerable population is given priority to compensate for losses. However, it has been reported both by the flood survivors and a government official involved in relief operation that political interests have predominated the needs and interests of need flood victims. The result is deepening of social cleavages that affected badly their prospects of livelihood recovery. Both the flood victims and a government official who was supervising the relief activity reported the political jockeying of relief goods distribution. A flood victim narrated it as under

“We have received nothing. As we live on the outskirts of the flood affected region, we could not gain the attention of people receiving relief goods. They (local politician) are more concerned about their own people. They are more interested in strengthening their own vote bank”.

A government official reported this aspect as under

“A local politician has asked me to provide 8000 packets of relief goods. How can I manage it such a large number of packets? I could have managed it if he had demanded 40-50 packets by requesting any Non-Government Organization. Now the situation is not in my control. That politician is sending me messages day and night and also threatening me”.

Environmental justice seeks to address these disparities by advocating that benefits of environmental policies are equally distributed. Unfortunately, the politicization and misuse of this catastrophic event is happening on both sides.

In 2025, Government of Punjab did not allow NGOs to conduct relief activities. Although some of them were reported to operating in the flood affected region. Denying the involvement of private sector further aggravated the situation although Adaptive Measure 5.5 of Punjab Climate

Change Policy Action Plan 2024 allows the involvement of Private Sector efficient and transparent disbursement mechanisms to target group.

5.2 Non-inclusive damage assessment and compensation policy

A one-dollar loss does not mean same thing for rich and poor. The gravity of losses depends upon who experiences it. Impacts on the well-being of the people are far greater than assets lost due to natural disaster (Bangalore et al., 2017). Environmental justice seeks to guarantee that all individuals, regardless of socio-economic status, have the right to live in a clean and healthy environment, free from environmental harm and discrimination (Pellow & Brulle, 2005). Imagine a family who earns livelihood from two cows and one of them is lost. The relative impact of this loss is far greater than the loss of a cow suffered by a well off farmer. The objective criterion of damage assessment is itself problematic. According to policy laid down by Government of the Punjab that only flood victim who have ownership document of the house are entitled for house damage and agricultural relief package. Neither this policy covers single mothers who are landless or landless widows and tenants or people living in a rented house. This “one size fits all” policy further marginalizes the most deprived section of the society. This “policy of exclusion” has serious implications for the livelihood restoration and long term recovery of flood victims. A flood victim narrated his story that

“We have constructed our house on the land of our landlord. Our “katcha pucca” (house made up of mud and bricks) has been washed away by flood waters. Now government has promised to compensate only those people who have land registry document (Fard malkiat). Now we are at the mercy of land lord. We will have to borrow money as winter season is creating trouble for us. Secondly, we have our first priority to complete the four wall of the house as it is compromising our privacy and sense of honor”.

Although worldwide research indicates that low income groups are inequitably exposed to environmental hazards, their outcome and may be not able to reap the benefits of compensation policies, however there are always local dynamics, nuances and exceptions (OECD, 2025). The compensation policy laid down by government of the Punjab to assist the flood victims is skewed towards those who are more “visible”. As disasters such as floods impact every segment of the society such as farmers, women, children, older adults and local businesses, the compensation policy does not cater too much inclusive. The small enterprises have suffered numerous losses. Even medium enterprises such as brick kilns were enormously damaged by flood waters, yet the business continuity has not achieved the government attention It is noteworthy that Adaptive Measure 5.1 of Punjab Climate Change Policy Action 2024 clearly states that “Establish microfinance schemes with low or zero-interest loans to support small businesses and entrepreneurship in climate-impacted areas”. One brick kiln owner narrated his woes as under

“Although Punjab Government and NGOs have been very active for flood victims, yet they have not laid down any policy to help the small business holders like me. My brick kiln has been severely damaged by flood waters and there are no chances of its reworking till January 2026, Government has done nothing for people like me and other who are running small business like retailers, whole sale dealers etc. we are very much sad at this policy of ignoring the business community. Livelihood of about 20-25 people is connected with my business. All of them will suffer including me. Many workers of are flood victims as well.

The compensation policy also ignores one of pivotal the cultural dynamics of a Punjabi village community where people live in joint family under one roof. Usually, in a joint family system, a widow or divorced daughter lives with her parents. There is also a practice that in a joint family,

married sons live with their parents in the same building/house. Although, they might be have separate kitchen. Flood compensation policy does not cover this important aspect of our social system. A young farmer who shares home building with his parents expressed his woes as under

“This house was built by the joint effort of my father, me and one of my brothers. We all our owner of this house and have our separate families. However, my father has not yet transferred ownership to any of our siblings. No the government is considering it as only one house and is not going to assist us although we all have suffered equal loss. From where should we bring the ownership documents? Everybody knows here that there are three families in this house”.

Similarly, along with the compromising the dignity and privacy of people who are land less, this policy of compensation is not aimed to address the agricultural loss of the tenants vz people who are landless and are cultivating the land of a landlord in different forms i.e either they sell their labor or they have obtained the land on lease. It has been reported in many studies that unskilled labors had to bear the brunt of catastrophic events such as natural disasters leading to serious loss of livelihood. An unskilled laborer narrated his woes as under:

“Although we were successful in obtaining the relief items when we were in the tents, the real challenge starts now is that we will have to start life from the beginning. Our home has received severe damage, providing food to children is becoming difficult with the passage of time. As all the people around us are affected by the floods, still it is not suitable to ask someone for help. During normal days, our women used to work in the fields and houses of well off people, but now everything has been disrupted. We are now at the mercy of government assistance that looks very difficult without any political connection”.

5.3 Death compensation justice concerns

What if the wall or roof of a house damaged by the strong currents of flood waters falls and leads to death of a family member? According to Gallup Pakistan (2025), floods caused 33% complete home damage, 27% were severely damaged and 25% had minor damage. Losses were higher among poor 41% and rural. Among those, 41% were kacha (mud), 26% were semi-pucca, 32% were pucca. According to this survey 44% deaths occurred within house. The government of the Punjab promised flood induced death compensation package for the individuals who died due to direct cause of floods such as collapse of or damage of house and drowning. As the flood caused a severe damage to a huge proportion houses (rooms and fourwall) a few flood survivors reported the death in their neighborhood after the people moved to flood damaged building to avoid the extremes of weather, secure the privacy start their life. However, Punjab government has devised no such mechanism either to prevent such deaths or to compensate such cases of death that were indirectly caused by the floods.

5.4 Insufficient and delayed compensation

Overall, many flood victims reported that delay in the disbursement of compensation package has created a considerable vacuum in rehabilitation process. Such situation has created uncertainty and confusion among flood victims adding woes to their worries. They were also disgruntled that compensation package does not commensurate with market price. A flood victim shared his concerns that

“The damage assessment process adopted by government is very complex and it does not involve local people. We are at the mercy of patwari (land revenue clerk). Secondly government pays a whopping 12 lac to contractor, while government is paying us very meager amount. Similarly, the agricultural compensation is too meager. How come 20,000 per acre is sufficient when the prices of fertilizers, seeds, diesel and irrigation water have gone too high”.

Similarly, the grievances redressal mechanism for flood victims is highly bureaucratized and located away from the flood victims' place of living. Ordinary people of village find it difficult to approach Office of the Assistant Commissioner. In order to approach Government Officials, they are at the mercy of local politician or a middleman that multiplies the chances of exploitation. A flood victim reported that

“The assessment team has not entered “right” information of my losses. I went to AC office many times, but no one listens to us. Even no one has information about disbursement of pledged compensation. Many people have to travel for a long time to reach AC (Assistant Commissioner) Office. Everybody is uncertain here”.

Such testimonials by the flood survivors reportedly reflect the deep rooted bureaucratic approach to deal with humanitarian issues. Such multifarious barriers lead to loss of lessons learned and cause inordinate recovery delays (Haris, Cheema & Subasinghe, 2019).

6. Discussion and conclusion

This study was conducted to explore the role of structural inequalities in shaping the post-flood recovery. Environmental justice perspective provided a theoretical lens that shaped the empirical approach of the study. Findings of this study reflect that ignoring the basic principles of environmental justice can lead to the policies that hamper the post-flood recovery prospects of individuals and households. Results indicate that recovery after disasters in Pakistani context occurs at the intersection of socio-demographic, cultural and economic factors. Deeply ingrained power structures, gender inequalities, poverty, landlessness, bureaucratic delays, top down and skewed assistance policies intersect in multifarious and nuanced ways in the aftermath of disasters. It has been found that marginalized groups are procedurally excluded as compensation policies adopt a more technocratic approach at the expense of participatory recovery and rehabilitation policies. Such policies categorically compromise the build back better strategy that leads to social resilience in the wake of catastrophic events in the future.

As social inequalities lead to heightened disaster risk, exposure and severity of the disasters, its effects also translate into recovery and rehabilitation phase as well.

The compelling conclusion of this study is that post-flood recovery is significantly affected by everyday social realities of the marginalized communities that are shaped by historical processes and material conditions. Environmental justice approach is directly related to environmental rights of the people. Safeguarding the rights of the people is equivalent to providing the environmental justice. Environmental justice is not only related to the claims of rights and identities of the people, it is a way to improve the lives and livelihood of the people by overcoming the structural inequalities and injustices in post-disaster recovery contexts.

Conflict of Interest

The authors showed no conflict of interest.

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