Disaster Risk Governance: Effects of Floods on Small Businesses in Jhang and Dera Ghazi Khan Districts, Pakistan

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ABSTRACT

Adapting to future climatic variability in semi-arid and arid areas requires devising effective adaptive strategies across sectors. It is in this context that this research surveyed two districts, Dera Ghazi Khan and Jhang in Pakistan, and investigated the impact of floods on small businesses through vulnerability analysis. The findings showed that flood damage to infrastructure and capital goods was debilitating for small businesses. Moreover, loss of utilities like electricity and transport was a significant hindrance in resuming business operations. Stocks and access to credit were deemed to be essential for ensuring quick recovery. In addition, the role of extended family, neighbours, police and Non-Governmental Organisations, was also found to be integral. Furthermore, risk was exacerbated due to the lack of effective early warning systems in communities. Therefore, decision-making was often based on existing power structures and tended to accentuate risks in flood-affected areas.

Keywords: Flood risk, disaster risk management, vulnerability analysis, small businesses, governance.

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1. INTRODUCTION

Pakistan is regularly cited as one of those countries likely to be the most affected by climate change (Eckstein et al. 2017). The mean temperature is likely to increase by 3.8°C in the country by 2100, along with increase in precipitation, heat waves, dry spells and heavy rainfall events [although with different confidence levels] (Haensler 2013). This will have repercussions in terms of the frequency and intensity of floods in the country which is already seeing the impacts of climate change in terms of extreme weather events, including riverine flooding. The economic impact of the 2010 floods was approximately US$ 10 billion.

Disasters constitute a threat to overall businesses irrespective of their size and resources (Samantha 2018). Natural disasters cost the global economy US$ 160 billion, a modest number compared to US$ 250 billion in 2017 (Rasmi 2019). From an economic perspective, a natural disaster can be defined as a natural event that causes disruption in the functioning of the economic system, with significant negative impact on assets, production factors, output, employment, or consumption. Examples of such natural events are earthquakes, storms, hurricanes, floods, intense precipitation, droughts, heat waves, cold spells, thunderstorms and lightning (Hallegatte and Przyluski 2010). This vulnerability to natural disaster risk is particularly worrying in the context of climate change, which may change the frequency, intensity, and spatial distribution of floods and droughts (Hijioka et al. 2014). Therefore, future climate change may become a significant obstacle in eradicating poverty (Hallegatte et al. 2016).

A substantial part of the world population is particularly vulnerable to natural disasters, like floods and droughts. Such disasters can reduce household income, destroy homes and productive capital. The impacts on small businesses can be severe and, in some cases, completely wipe away a business. Studies have shown how businesses are affected when floods occur, especially their impacts on Small and Medium-sized Enterprises (SMEs) (Wedawatta et al. 2014).

Pakistan has faced recurring floods since 2010 and their scale and magnitude has been significant (Federal Flood Commission 2016). In order to assess the impacts of floods on small businesses in semi-arid regions of the Punjab province in Pakistan, a mixed method study was undertaken in the districts of Dera Ghazi (D.G.) Khan and Jhang. These two districts have been amongst the most significantly affected areas due to floods, and offer a unique case study to examine flood impacts on small businesses and their response. D.G. Khan faced floods in 2010 (OCHA 2011) and in 2015 (The News 2015). Jhang has faced floods in 2010 (The News 2010), 2013 (Hanif 2013), 2014 (Islam 2014), 2015 (The Nation 2015) and 2016 (The Nation 2016).

SMEs are vital actors in the economy and the wider business community. Enabling them to tackle threats emanating from a changing climate can lead to a thriving economy, inclusive growth, job opportunities and reduction in inequalities (OECD 2017). While considering the contribution of informal businesses into account, SMEs generate more than half the employment and Gross Domestic Product (GDP) in most countries irrespective of income levels (IFC 2010). In addition, SME development can contribute to economic diversification and resilience.

This study argues that floods have severely affected small businesses in D.G. Khan and Jhang, with grave repercussions for the livelihoods of owners and employees. They have been affected by both direct and indirect impacts. Direct impacts[1] include damage to buildings, equipment, vehicles, inventories, on-site business interruption and human losses. Indirect impacts[2] include lack of access to markets due to inundation, demand supply disruptions, price fluctuation, off-site market offset, reduction in property values and stock market effects. In addition, infrastructure damage and disruptions of utilities such as water, electricity, and transportation and communications links frequently force businesses to shut down in the aftermath of floods.

This research study revealed that businesses with access to relief and assistance were more likely to reopen and resume operations when compared to those without such support. It found that in the aftermath of floods, access to credit was the most important factor determining whether a business survived flood damage. It was not clear whether public sector assistance was delivered in ways sensitive to /supportive of the needs of small businesses. Post-disaster relief, in terms of rapid delivery of assistance, was also noted as critical for ensuring business survival.

There is dearth of literature about the vulnerabilities and options for small business in Pakistan in case of floods. The fundamental objectives of the research included analysis of channels of impacts and vulnerabilities of rural businesses in flood-prone districts in the Punjab province of Pakistan. Furthermore, to identify recovery mechanisms available to small businesses in the aftermath of floods; and explore avenues through which they can be made resilient to extreme weather events.

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[1] Direct contact might result in damage to buildings, land, equipment, products, stock, capital goods or inventory.
[2] Indirect impacts are other business and market variables that are affected by floods like lack of market access due to inundation, supply and demand fluctuations and price fluctuations.

2. LITERATURE REVIEW

Floods affect small businesses through several different mechanisms. Along with direct impacts, including damage to buildings, equipment, vehicles, inventories, on-site business interruption and human losses (Rose 2009), floods also cause large-scale indirect impacts on businesses, market fluctuations, reduction in property values and stock market effects, as well as sociological and environmental effects (Ibid.). In addition, infrastructure damage and disruptions in utilities such as water, electricity, and transportation and communication links frequently force businesses to shut down (Asgary and Naini 2011).

The impacts of climate extremes on small businesses are much more significant as compared to large businesses (Zhang et al. 2009). Small businesses, most of which are located in rural areas, lack permanent structures, hazard management programmes, financial resources needed for recovery and access to governmental recovery programmes. Similarly, they are slow to recover in the aftermath of a disaster as their market share is small, unlike large firms which usually have significant savings (Ibid.). Operations in many businesses rely on capital goods such as tools, machinery and equipment production (Amadeo 2018). If damaged, these assets can be expensive and difficult to repair and replace.

According to Asgary et al. (2012), the impacts of floods on small businesses in developing countries is not well studied. 54% of small businesses relied on electricity; 17% on transportation; 1.8% on the telephone; and about 7% on oil and gas in terms of fuel (Ibid.). Risk perception of small business owners also does not align with the fact that they were in the immediate path of the flood as they considered themselves safe from flood waters. In the aftermath of the 2010 floods, 90% of the respondents were able to recover within six months. However, only 22% performed at the same or better level compared to the pre-flood situation (Ibid.).

Zaman (2012) found that as a result of floods, small businesses face risk to buildings, stocks, land and capital goods. Floods also temporarily decrease the availability of labourers, especially when businesses are trying to restart. Alesch et al. (2001) suggest that disasters impact small businesses significantly but not proportionately (due to varied location, type of flooding, structure type and financial viability). Small businesses are big employers and play a major role in most rural communities, but the losses caused by disasters often result in business going bankrupt, and ultimately failing to restart, resulting in unemployment and rise in inequality. In the aftermath of floods, one of the most significant issues owners faced was lack of knowledge about how to respond to such events so as to avoid the same level of risk as before. As such, they

reverted to what they were doing before, thus, increasing their vulnerability to extreme events (Ibid.).

Small business failures arising from extreme climatic events lead to significant losses for the economy and communities alike. According to Webb et al. (2002), long-term recovery of businesses varies from case to case due to a number of factors. These factors range from business sector of operation, its age and monetary resources, impacts of market fluctuations, disaster impacts, disruption of operations, and owner's understanding of the economic climate (Ibid.).

Relief and assistance in the aftermath of floods ensures that small businesses are able to restart and function again (Mel et al. 2010). Speedy assistance helps businesses to quickly rehabilitate and start earning again and get back into the market. Slow recovery delays entry into the market and lowers the chances of recovery altogether (de Rugy n.d.).

3. CONTEXT OF FLOODS IN PAKISTAN

The Asian Development Bank (ADB 2017), while identifying major climate threats, predicted that Pakistan will be facing frequent and increased incidences of floods. Furthermore, the fifth assessment report of the Intergovernmental Panel on Climate Change warns that floods negatively impact rural livelihoods (Hijioka et al. 2014). It is estimated that around 51% of the total income of rural Asia comes from non-farm sources (Haggblade et al. 2010).

Floods and other climate-related disasters have been increasing in frequency as well as intensity (Manzoor et al. 2013). They are also more damaging as waterways have become increasingly congested due to expansion of human settlements in flood plains. Floods can result in mass displacement of people as was witnessed during the 2010 floods in Pakistan. The resultant inflation and food insecurity significantly hamper recovery and delays reopening of small businesses (Oxfam 2011). Small businesses are usually the most vulnerable to shocks, and take comparatively longer to recover from disasters than larger businesses, if at all (LEAD 2015). Monetary losses accrued by floods since 1947 have been approximately US$ 38 billion (Federal Flood Commission 2016).

4. METHODOLOGY

This study was based on a mixed method approach in which the investigator collected and analysed data, integrated the findings and drew inferences using both qualitative and quantitative approaches. A qualitative study of existing literature was conducted to assess the issues and hindrances small businesses face in the aftermath of floods and how they coped with them. On the quantitative side, a structured questionnaire was used to collect quantitative data from small business owners in D.G. Khan and Jhang districts as the study was based on semi-arid and flood-affected areas.

Ten Union Councils (UCs) (five from each district) in rural areas, regularly impacted by flood events, were studied. Using the random sampling technique, a list of flood-affected small businesses was developed in the selected UCs. A total of 20 businesses were selected in each of the UCs. In total, a survey of 200 small business holders (100 from each district) was undertaken (see Annex 1 for map of the study area). In the same UCs, Key Informant Interviews (KIIs) with ten business owners and community leaders were also conducted so as to triangulate the information being sought in the survey. Ten Focus Group Discussions (FGDs) were also conducted, one in each UC to understand the vulnerabilities, threats and experiences of the flood-affected people.

In order to further refine the data, Exploratory Data Analysis was used as highlighted by Tukey (1977), that is, researchers collect or analyse not only numerical data, which is customary for quantitative research, but also narrative data, which is the norm for qualitative research in order to address the research question defined for a particular study. As an example, in order to collect a mixture of data, researchers might distribute a survey that contains closed-ended questions to collect the numerical or quantitative data; and conduct an interview using open-ended questions to collect the narrative or qualitative data. A comprehensive work plan was devised based on which a questionnaire was developed, and trainings were given to enumerators after testing the questionnaire. Data analysis included data entry into SPSS for descriptive investigation. The output was collated in an Excel sheet from where information was tabulated in percentages.

5. FINDINGS AND DISCUSSION

5.1. Channels of Impact

In order to understand the effects of floods on small businesses, this study started by looking at channels of impact. It was assumed that the time needed to recover and resume business operations constitutes a proxy for assessing flood impacts on small

businesses. Factors correlated with time required to reopen business are, therefore, proxies for channels of impact which are in the form of:

1. Loss and damage to physical infrastructure;[3]
2. Impact on services and utilities;
3. Impact on business stock; and,
4. Disruptions in labour availability.

The type of structure housing a business determines, to a great extent, its survivability and sustainability in case of flooding. Most of the buildings of small businesses in rural areas, such as the study sites (D.G. Khan and Jhang), lacked permanent structures; whereas, those with such structures, were comparatively strong and resilient. Non-permanent structures cannot withstand the impacts of floods. However, while the type of structure can enhance a business' resilience in face of floods, this cannot be taken as a general rule. Such businesses may also be deeply impacted. D.G. Khan and Jhang had various structure types such as permanent, semi-permanent and temporary/makeshift. Businesses which had established permanent structures showed greater resilience and recovery.

It was also observed that the respondents were hit in two distinct ways: direct and indirect. Direct impacts mainly centred around being caught in the path of the flood waters, while indirect impacts occurred due to other disruptions caused by floods. Around 85% of respondents in D.G. Khan reported that their business was impacted directly by floods, and 14% as indirectly affected. In case of Jhang, 73% respondents reported their businesses were impacted directly, and 27% as indirectly. The directly impacted businesses were in significant majority. They are discussed below:

Respondents who faced direct impact of floods were also asked regarding the nature and type of damage incurred on businesses. The primary factor behind direct impact was the business location in relation to flood plains, breaching section or flash floods path. If a business was in close proximity to the flood path, chances of direct impact increased significantly. Furthermore, the damage was high in terms of costs. The survey found that in case of district Jhang, 91% of the flood-affected small businesses encountered damage to land and buildings. In district D.G. Khan, 95% of the small businesses confronted damage to their land and buildings.

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[3] The infrastructure included in the questionnaire had four basic criteria: permanent (concrete, cemented); semi-permanent (mixture of clay, bricks and cement); temporary/makeshift (shacks or shanty structures, made of discarded steel, plastic and plywood acquired from scrap); and others (agricultural).

In contrast, damage due to indirect impacts lasted longer depending on various factors such as inundation, relief and assistance, access to credit, and access to markets etc. Due to inundation of roads, access to markets was disrupted which affected small businesses in the immediate aftermath of floods. In district Jhang, 90%, and in district D.G. Khan, 79% of indirectly affected small businesses faced disruption in terms of access to markets. This has significant repercussions for business operations. Figure 1 depicts the ratio of direct/indirect impacts on businesses in both districts:

**Figure 1: Ratio of Direct/Indirect Impact on Businesses in Jhang & D.G. Khan**
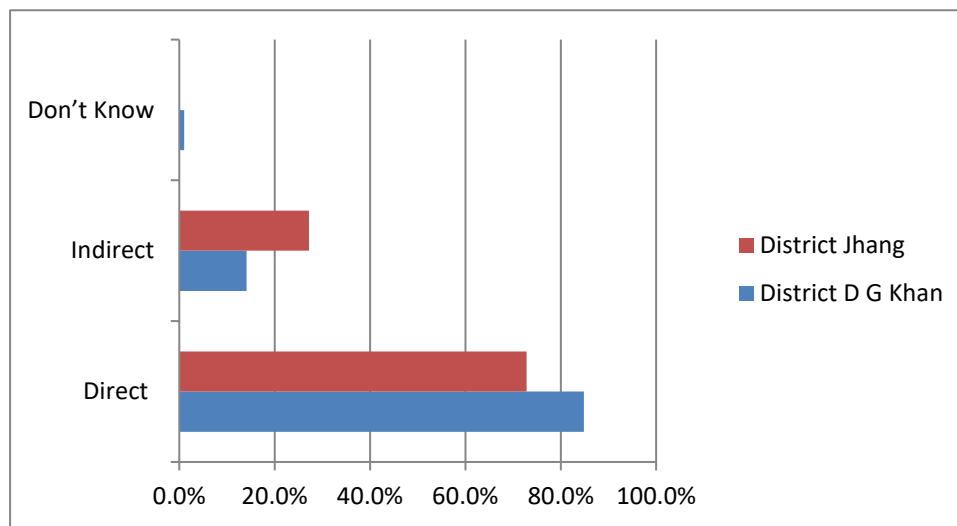
Source: Survey data.

The following section looks at the direct and indirect impact of floods in the study areas:

5.1.1. Loss/Damage to Buildings and Land

There were significant differences between the recovery time of businesses in permanent structures and those in semi-permanent structures. As discussed above, the time to recovery constitutes a proxy for assessing impact of floods on small businesses. Those in permanent structures were more likely to recover within a week (25%) or to never recover at all (23%). Those in temporary structures were more likely (46%) to take 3-12 months to recover compared to those in permanent structures (25%). In this regard, structure types portray the resilience of small business. Only 39% of the businesses in this study had permanent structures. Figure 2 depicts the damage to buildings and land:

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Figure 2: Damage to Land or Buildings in Jhang & D.G. Khan
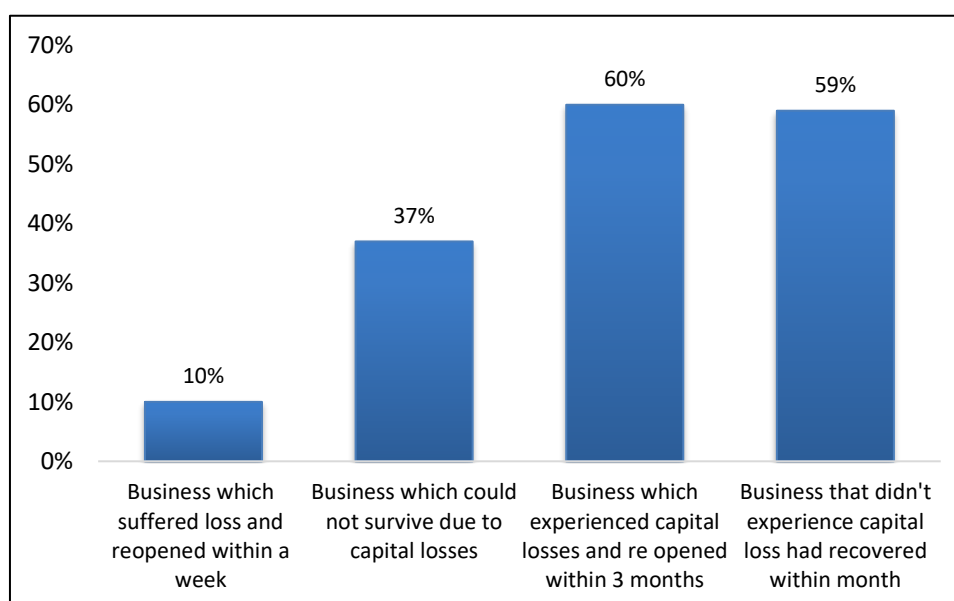

Damage to Land or Buildings
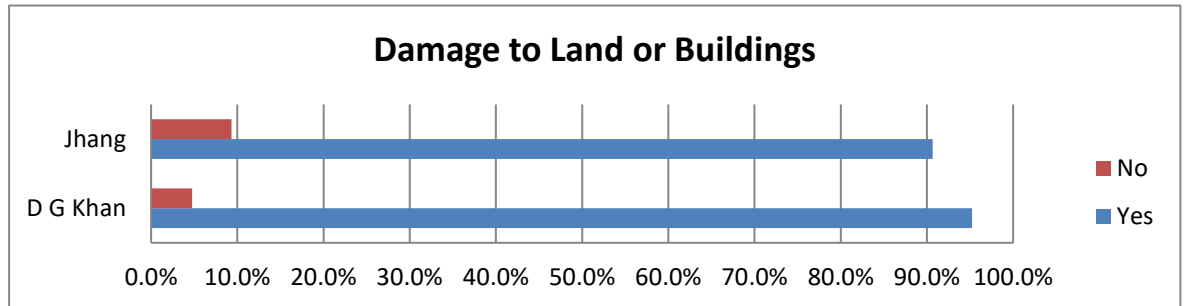
Source: Survey data.

5.1.2. Loss of or Damage to Equipment

Businesses that suffered loss and damage to capital goods (equipment necessary for functioning of business) took longer to recover. Just 10% businesses that suffered capital losses reopened within a week, compared to 37% businesses that did not. Around 60% businesses experiencing capital losses took between 3-12 months to recover. However, in contrast, 59% businesses that did not experience capital losses had recovered within a month as shown in Figure 3. The survey found that in both districts, the majority of businesses sustained damage to capital goods (74% in Jhang; 75% in D.G. Khan).

**Figure 3: Capital Losses and Impact on Businesses**

A bar chart showing percentages for four categories:
- Business which suffered loss and reopened within a week: 10%
- Business which could not survive due to capital losses: 37%
- Business which experienced capital losses and re opened within 3 months: 60%
- Business that didn't experience capital loss had recovered within month: 59%

Source: Survey data.

Businesses for which the maintenance of equipment is a serious constraint (due to financial situation in the aftermath of floods) were more likely to take longer to recover. Around 58% took 3-6 months to recover, compared to an average of 38% for all businesses. Just 2% resumed operations within a week, compared to 16% for all businesses. 21% businesses with challenges in maintaining equipment had not yet reopened or resumed full operations, compared to 15% across the whole sample.

In case of D.G. Khan, 55% businesses considered equipment maintenance a problem, while 39% considered the same to be a problem in Jhang. In the aftermath of floods, when businesses, houses and livestock are damaged or lost, and there is a lack of cash to maintain equipment, other priorities take precedence.

Figure 4: Loss of Business Equipment as a Result of Floods
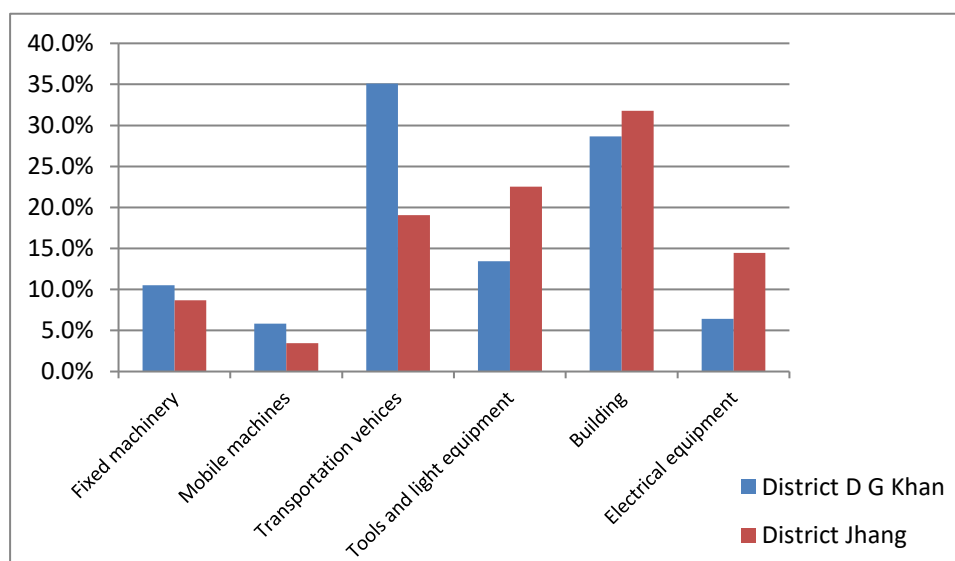
Source: Survey data.

5.1.3. Loss of Services and Utilities

In the aftermath of the floods, small businesses face disruption in access to utility services such as energy supplies, which can hinder resumption of operations. Other significant indirect impacts include disruption in transportation. However, the study did witness differences in recovery time for businesses correlated with their sensitivity to energy and transport access.

In case of D.G. Khan, where respondents who mentioned electricity as a significant hindrance in resuming business, 33% restarted business operations in less than three months; and 37% in three to six months. Of the ones which mentioned transport as a hindrance in the district, 13% resumed business operations in less than three months; and 47% in three to six months.

In case of Jhang, the respondents who mentioned electricity as a significant hindrance in resuming business, 26% restarted business operations in less than three months; and 37% in three to six months. Of the ones, which mentioned transport as a hindrance in the district, 8% resumed business operations in less than three months and 46% in three to six months.

However, the difference and trend in terms of sensitivity to energy access was very clear. Businesses, more dependent on energy access, took longer to recover than those

that were not. This may be because these businesses are also more reliant on capital equipment which requires a constant supply of electricity. The study found that 39% of the respondents in D.G. Khan, and 46% of the respondents in Jhang believed that access to electricity in the aftermath of floods was a serious problem which made it difficult for businesses to continue operations as shown in Figure 5:

Figure 5: Loss of Services and Utilities Due to Floods
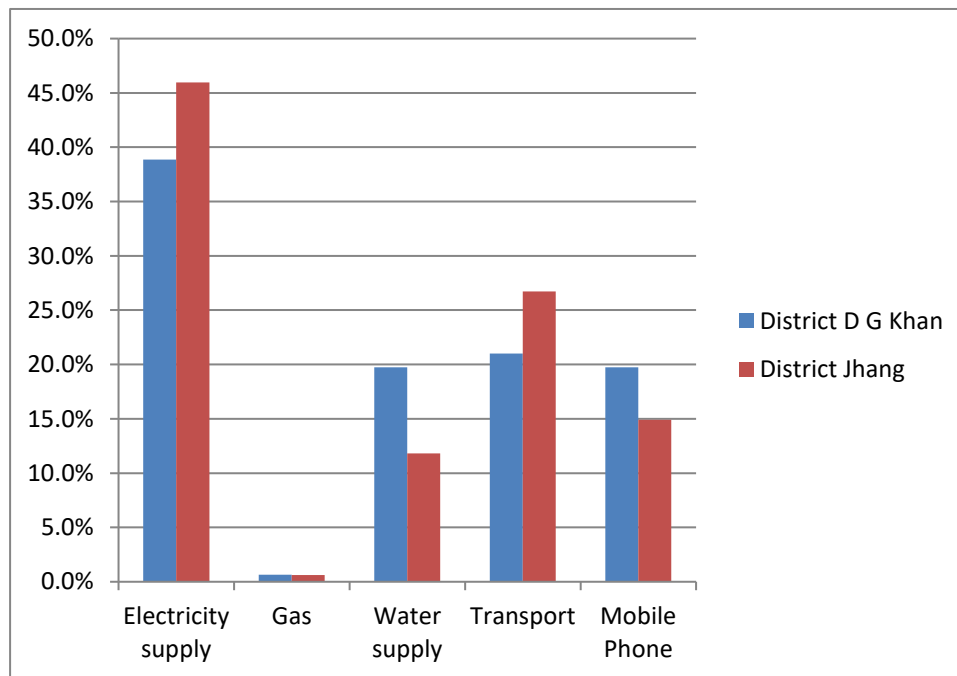
5.1.4. Loss of Business Stock

Just as permanent infrastructure can increase resilience in terms of reopening of businesses hit by floods, so can business stocks. 'Stocks' can be finished products for sale (maintained in the inventory, if any) or raw material essential for manufacturing of finished products. Once business goods are damaged or swept away, stocks can help enable recovery for businesses.

Around 46% businesses that did not experience stock losses were able to recover operations within a month, compared to 18% that experienced losses. However, 24% that did not experience losses were also more likely to never recover or reopen as compared to 13% businesses that had experienced stock losses. However, there were cases in which businesses that did not experience stock losses did not open. This may

be due to significant damage to land or buildings which could have rendered the remaining stocks useless. For instance, if as a result of direct impact of floods, the whole structure and business equipment is lost, it becomes very difficult (financially) for the business to restart or reopen despite having business stocks intact (Figure 6):

Figure 6: Loss of Business Stock
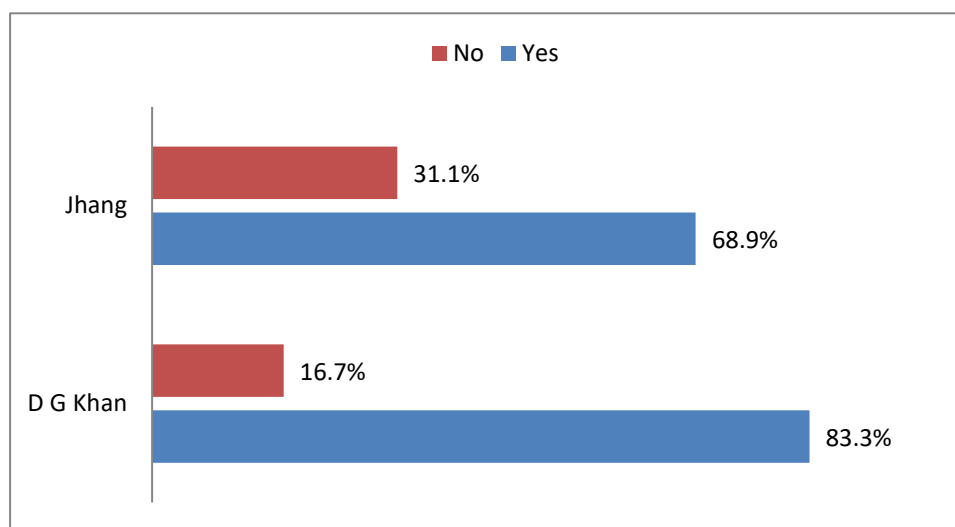
5.1.5. Loss of Labour

This study found that businesses in neither Jhang nor D.G. Khan faced labour disruptions that could significantly delay recovery. In the study sites, small businesses rarely employed labourers for recovery. In case of rebuilding or recovery, family members and neighbours lent a hand. The survey also analysed injuries and deaths that might have occurred as a consequence of floods. In both districts, it was found that not a single injury or death was reported in males or females. The employees and labour remained largely safe even when the floods had impacted their businesses. One of the reasons for this was the timely nature of early warnings that allowed people to close down businesses.

5.2. Factors Enabling Recovery

5.2.1. Assistance

Results showed that in both districts, 97% of the small businesses affected by floods did not receive any help in repair work from government authorities. Repair work differed on the basis of nature of business as well as degree of damage. One

fundamental thing to note here is that in this survey it was inquired if the government had helped the businesses, apart from owner's home, in repair work. In case of homes, the number (of people that were provided help in repair work in monetary terms) might be somewhat higher but not substantially. The following section discusses how relief and assistance programmes were executed in D.G. Khan and Jhang. Receipt, access and speed of assistance are the parameters that were analysed to assess the efficiency of such programmes.

5.2.2. Access to Finance

Access to finance was not the most widespread factor affecting the speed of recovery. Of the 200 businesses surveyed, just 37 (18.5%) reported that access to credit was a significant constraint in their recovery. However, for those businesses for which access to credit was a constraint, it was a highly significant problem. Around 46% of these businesses had not recovered from the flood, and only 5% recovered within a month. Villagers and small businessmen alike lamented that in the aftermath of the floods, politically connected persons received assistance even if they were not impacted. Similar discrepancies were mentioned regarding the bias of the *patwari* (village accountant) and local politicians in providing relief and assistance.

5.2.3. Receipt of Assistance

The survey inquired whether the businesses received assistance or help in order to reduce impacts of floods. Majority of the respondents (56%) did not receive any kind of assistance, whereas 44% did receive assistance. Figure 7 shows that 52% of the respondents (in D.G. Khan) and 36% (in Jhang) received assistance. Businesses which did not receive assistance were more likely to recover quickly (23% had recovered within a month), or not at all (22%). Businesses that did receive assistance recovered more slowly – only 13% recovered within a month, and 54% took three to six months to recover but were less likely to fail (8%). This was an interesting finding. It is likely that government officials when giving aid were aware of the constraints and practical implications of how the funds might eventually be used effectively so they gave aid to only those who could put it to good use. In other words, aid was only given to businesses presumed to have a chance for quick recovery, and as such was not given to anyone who asked.

This research only focused on small business owners. However, a future research can look into detailed interaction with governmental officials to understand how they distribute funds and whether potential recovery/ need of businesses is calculated and if so how.

Businesses impacted directly and indirectly both received assistance. However, the ones impacted directly received a higher percentage of assistance. Out of the ones directly impacted and assisted, only 10% managed to resume business operations within three months of the floods, and 57% resumed business in three to six months. Of the businesses impacted indirectly and provided assistance, 33% managed to resume business operations within three months, while 47% resumed business operations in three to six months.

**Figure 7: Businesses that Received Assistance in Jhang & D.G. Khan**
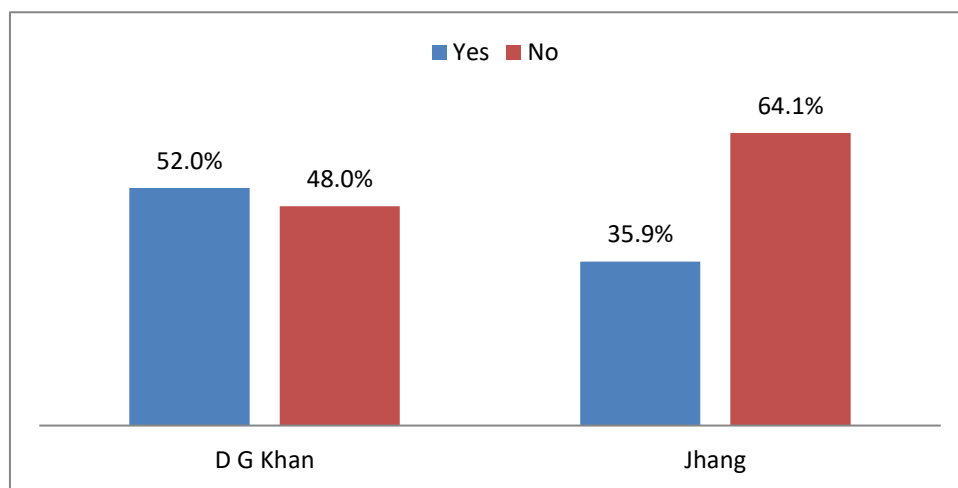
Source: Survey data.

5.2.4. *Different Sources of Assistance*

Sources of assistance (Figure 8) in the aftermath of floods ranged from family members and neighbours, police, Army and Non-Governmental Organisations (NGOs) in the form of material help (tents, blankets and medicine), monetary help, physical help (construction of damaged structures), *WATAN* and ration cards. Those assisted by charities were more likely to recover within a month, implying either that they were smaller businesses with lower investment needs, or possibly that charities disburse money faster. Around 70% of those receiving assistance from the authorities took three to six months to recover, implying that state assistance is likely focused on larger, capital-intensive businesses.

Figure 8: Different Sources of Assistance or Help
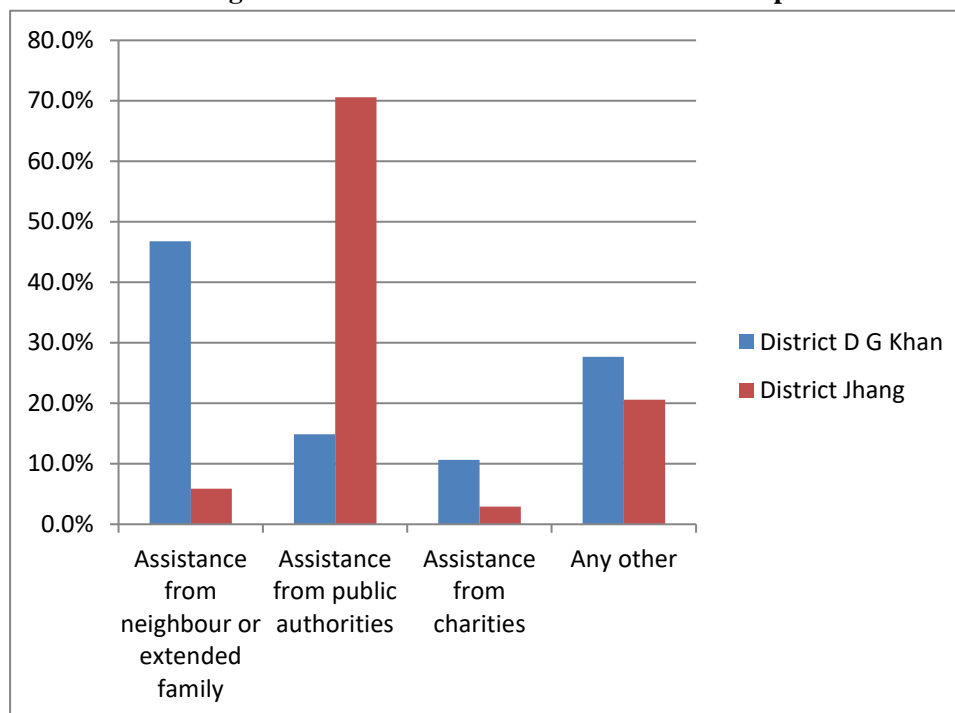
Source: Survey data.

5.2.5. Speed of Assistance

The longer it took for emergency assistance to reach a business, the greater the chances that the business would not recover. Timely assistance and help have significant chances of reducing long-term impacts borne by small businesses. Less than 5% of businesses which received assistance within a few days failed to recover. Around 29% of businesses which received assistance within 'a few weeks' failed to recover, as did 50% of businesses which received assistance within 'months', and 28% of businesses which never received assistance (Figure 9). The study highlights the need for timeliness and quick relief and assistance in the aftermath of floods.

Figure 9: Speed of Assistance
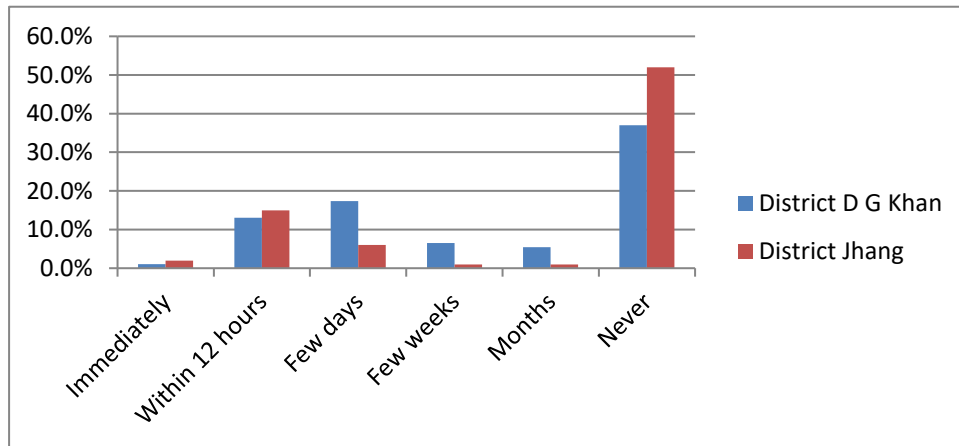
5.2.6. *Repair Work in the Aftermath of Floods*

Impacts of floods vary due to location, nature of flooding, degree of contact with floods and physical condition of a business. Yet, varied levels of repair work invariably, become necessary for all businesses that are affected by floods. In Jhang, 50% and in D.G. Khan, 67% of the respondents undertook repair work.

To what extent a business undertakes repair work is a question of available funds. Those with savings in hand are able to do so rapidly, while others who cannot are faced with the grim choice to acquire funds or shut down their business. During the course of this study, the team met some business owners who did not have the necessary funds, and thus, ended up closing their business and working for someone else.

It is important to clarify that not undergoing repair work does not necessarily mean that the owner did not have enough cash to do so. In some instances, it was observed that the business was hit indirectly and did not require any physical repair work. Indirect impact means market fluctuations, demand and supply changes and business staying closed due to inundation. In these scenarios, there may be no physical repair work needed, but the business faces other economic challenges.

5.2.7. *Role of Government in Repair Work*

While assessing repair work, it was important to evaluate the role or assistance provided by the governement, if any. Repair work differed on the basis of nature of business as well as degree of damage. An overwhelming majority in both districts reported that there was no government help in repair work for businesses. Survey

results showed that the government supported only 3% of the respondents in terms of provision of assistance for repair work. When the governemnt does not help or assist in repair work, then owners usually acquire loans from friends and family which further constrains them and increases their overall vulnerability. In complete absence of government and relatives help or assistance, businesses shut down permanently, and the owner becomes someone else's employee. Results showed that in both districts, 97% of small businesses affected by floods did not receive help in repair work from the government which was imperative for their rehabilitation.

5.2.8. *Early Warning of Floods*

An early warning system is about prevention/avoidance of risk and is not a recovery factor. However, early warning is an effective way of informing the population beforehand of any imminent danger in the form of floods. This study found that 85% in Jhang, and 63% in D.G. Khan received early warning prior to floods (Figure 10). The number was lower in D.G. Khan due to absence of any mechanism system of early warning for flash floods in the Sulaiman Mountain Range. Mode of communication was primarily government officials (Jhang 35% and D.G. Khan 33%), mosques (Jhang 30% and D.G. Khan 32%), radio (Jhang 18% and D.G. Khan 21%) along with television and local people.

Majority of the respondents received prior warnings, although, they lacked any clear instructions regarding what to do if floodwaters rose precipitously. Additionally, the severity and duration of the imminent floods was not communicated. The reaction of the respondents after the warning was also dismal, owing to the fact that most people had nowhere else to go when evacuation orders were given. Small business owners did not have properties or homes in other areas where they could temporarily shift after a warning. Some respondents moved in with their relatives in other villages or nearby areas on higher grounds.

Some respondents also shared their views regarding previous warnings that were communicated but the floods did not come, so accuracy of flood warnings was also an issue. There were also concerns that women could not be taken out of homes and asked to spend a week in the open or government-sanctioned camps.

Both districts have predominantly conservative societies. This is exacerbated due to the lack of security for families as well as access to water supply and sanitation. This forced many families to stay in their homes until the floodwaters made it impossible to remain in their residences.

While the early warning system works well in terms of riverine flooding, this is not the case when it comes to flash flooding in D.G. Khan. Flash floods, emanating from the Sulaiman Mountain Range, wreaked havoc on communities in this district. One of the reasons was the lack of early warning system whereby the only source of information regarding floodwaters was mobile phone contact with those in the upper reaches of the catchment who were able to send a warning (up to 2 hours warning time) regarding the impending flood. Flash floods travel at a very fast pace and contain a lot of silt and sludge that cause great destruction, and that too, in a very short time. Respondents living in the flash flood-prone area mentioned that they only get one to two hours to evacuate, and in this short time, it is hard to ensure evacuation of valuable and other important household items.

Figure 10: Early Warning of Floods or No Warning
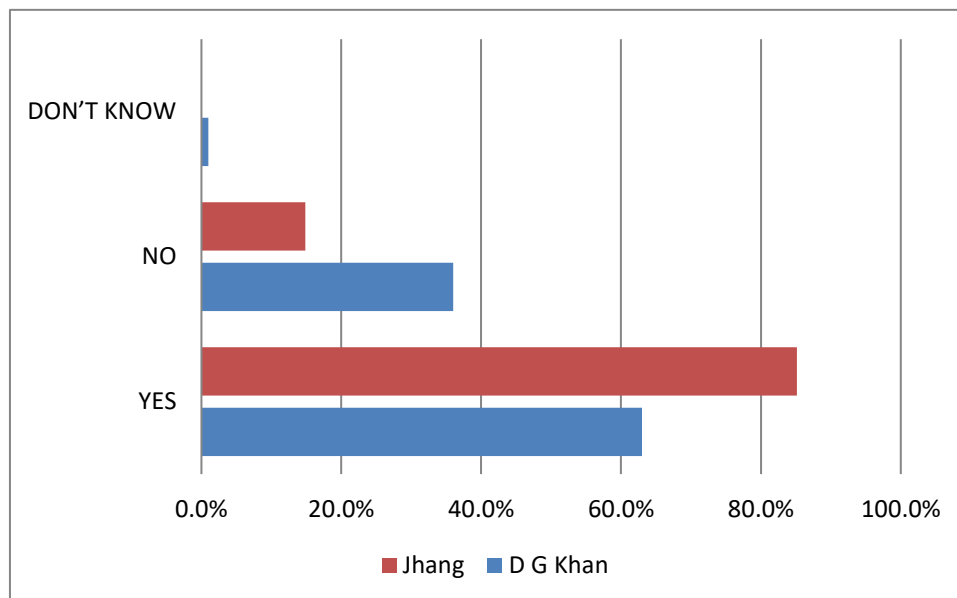
Source: Survey data.

6. RECOMMENDATIONS

1. Along with announcements of impending floods, evacuation plans and temporary camps for residents on higher grounds should be established by the government. A comprehensive early warning system covering the whole of Pakistan is essential. Accuracy and timeliness must be prioritised.

2. It was found that government-funded relief and assistance is more focused on political and social-connectedness. Distribution of relief and assistance must be merit-based and to those most in need.

3. Areas close to dykes and embankments that are at greater risk must have camp sites earmarked in advance. Camps should have the necessary requisites such as medicines, food, blankets, water etc. so that citizens have greater confidence in evacuating and securing their possessions. Timely evacuation and available transport can reduce impacts of floods on communities and businesses.

4. Electricity supply is a significant hindrance is resuming business operations. The government should ensure supply of electricity in the aftermath of floods to allow a better chance of recovery to small businesses.

5. There is a need of extending government funds (insurance or low interest loans to flood affected) to increase chances of business revival.

6. Land use planning and flood plains management is necessary so that small businesses can be discouraged from operating in active flood plains. The ones that are already within the flood plains should be helped and assisted by the government to move out.

7. The state should develop policies for insurance and social safety nets for small businesses in districts that are prone to recurring floods impacts. Without such policies, small businesses will keep on suffering, and eventually, shut down. Prospects of further poverty loom large over small business owners if these policies remain elusive.

7. CONCLUSION

Pakistan has endured recurring floods since 2010 and their magnitude has been significant. Small businesses face serious vulnerabilities in terms of access to finance, early warning system, biased and inequitable relief and assistance distribution mechanism due to which they are often completely destroyed. However, despite such challenges, a robust relief and assistance mechanism can help businesses reopen and operate. Unfortunately, such mechanisms are not timely, adequate nor fair. This study suggests that the judicious and fair distribution/provision of assistance can significantly reduce the time to resume business operations and enhance economic resilience of small businesses in rural areas. Small farmers usually sow seeds and buy fertilizers and pesticides on loans from large landowners and *Arti* (middleman). So, if crops are devastated and houses damaged, there is no way of paying back the loan. Hence, small farmers get entrenched deeper into poverty. Due to such implications, it is imperative to provide need-based and adequate relief and assistance in the aftermath of floods.

The impact of flood damage on infrastructure and capital goods can be debilitating for businesses, especially without assistance. The absence of utilities like electricity and transport is also a significant hindrance in resuming business operations, while availability of water and mobile phone connectivity are also major concerns. In addition, access to government support, in terms of financing recovery through availability of credit, is important. Moreover, the role of extended family, neighbours, police and NGOs is integral to the recovery of businesses. Effective early warning systems, with national coverage, can help in mitigating flood losses which could eventually increase resilience of small businesses and communities. As climate change takes hold and Pakistan faces more extreme weather events, particularly floods, the government needs to put in place key measures to address this challenge.

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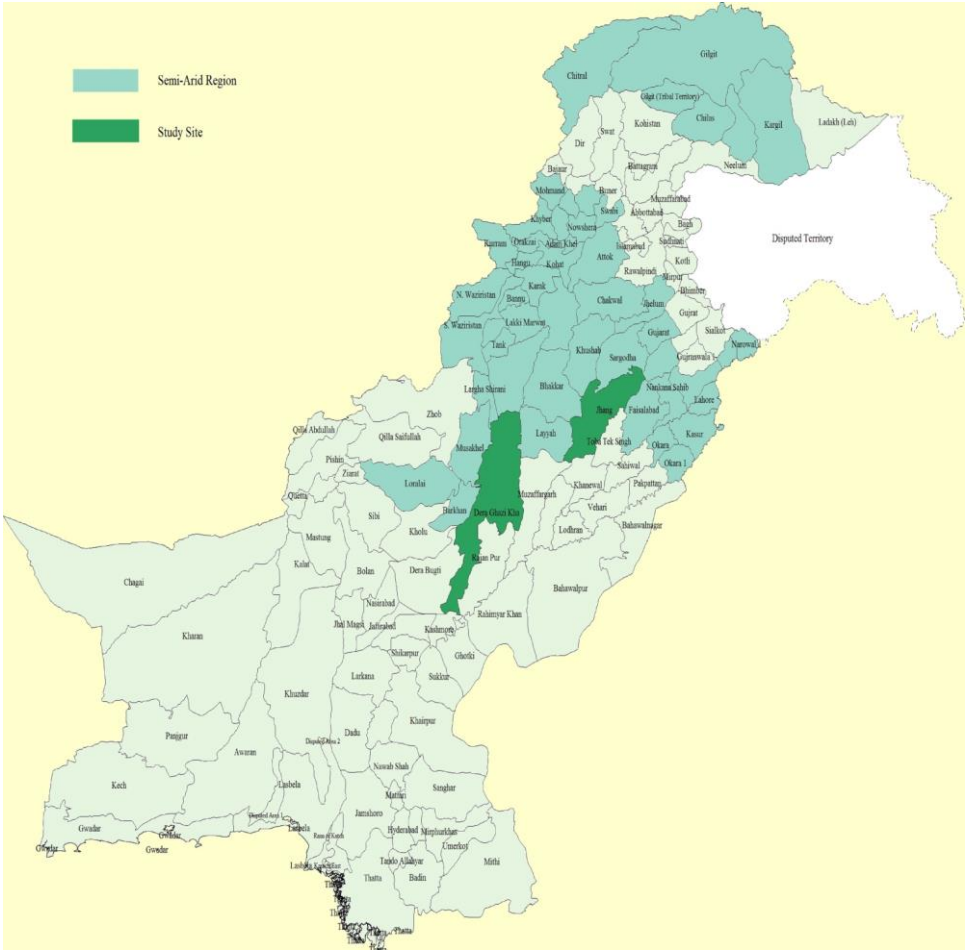
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Annex 1: Map of Pakistan with Dera Ghazi Khan and Jhang Districts

Source: Authors' own.