

RESEARCH ARTICLE

Socioeconomic impacts and government assistance in the aftermath of landslides in Mayoon since 2010: A qualitative study on the vulnerable village of Hunza, Pakistan

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Abstract

The primary objective of this study is to assess the socioeconomic conditions of the inhabitants of Mayoon village and evaluate the level of government support provided to them following the landslide. Additionally, the study aims to explore any changes in gender roles that occurred during the resettlement process. Mayoon is a modest village situated in Lower Hunza that has endured multiple landslides, rendering it susceptible to such natural catastrophes like avalanches, landslides, Glacial Lake Outburst Floods (GLOFs), rock fall and flash floods. However, the frequency of landslides has increased since 2010, between 1994 and 2014, there were 78 floods, 16 landslides, and 8 debris flows. Ten participants i.e., five males and five females were purposively selected for this research. A semi-structured interview protocol was prepared keeping in view literature and personal observations, which consisted of 12 open-ended questions. Thematic analysis was used to analyze data. Four major themes were extracted from transcribed data namely, post disaster impact on living, resettlement issues, government role and gender role and disaster. It was discovered that most residents of Mayoon village, who were mainly farmers relying on agriculture, suffered from the landslides. The disaster not only destroyed the farmlands but also the cultural belongings such as cultural sites once they gathered for religious activities. Once they gathered to perform their religious activities, the region was devastated by the disaster. Marriages, cultural events, and festivals were celebrated with zeal and zest, but post-disaster celebrations changed the way they were celebrated earlier. Many affected people had to move to different areas for safety, resulting in the loss of social connections among them. Despite knowing the risk of more landslides, most of them resettled in the same village due to unavailability of sufficient land. The local government failed to relocate them to a safer place and is unable to provide services to the affected individuals.

Keywords: Land slide; disaster Management; response-oriented; socioeconomic issues; government assistance

Introduction

Natural disasters are sudden and violent events that have a massive effect on the social and economic welfare of human beings. They causes severe disruption in functioning of society. (Cossart & Fort 2008). Numerous studies have shed light on the fact that a significant proportion of natural disasters can be attributed to intrinsic geophysical and atmospheric processes on our planet.

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Natural disasters can be a result of environmental processes that lead to floods, droughts, earthquakes, landslides, and other environmental disturbances. Landslides are considered to be the most common hazard on Earth (Solana & Kilburn, 2003). Although landslides affect smaller areas, they often cause severe human and financial losses (Ho, Shaw, Lin & Chiu, 2008). Landslides are most common phenomena in mountainous regions of Pakistan (Bacha, Shafique & Werff, 2018). It is estimated that one-third of the total world landslides occur in the Himalayan region (Khan, Collins, & Qazi, 2011; Khan, 2000). When we talk about the impacts, natural disasters have affected millions of people worldwide annually. There were 4,130 natural calamities recorded around the world from 2004 to 2014, resulting in approximately five million people being killed and a minimum of 1,195 billion US dollars in losses. Approximately 75% of the global population resides in areas vulnerable to such events. In the period between 2000 and 2008, the average annual economic cost related to natural disasters was estimated to be \$94 billion, with a reported estimate of losses between \$35 billion and \$50 billion in 2009 (Hallegatte, Vogt-Schilb, Bangalore, & Rozenberg, 2016). Landslides cause 1016 deaths and loss of four billion dollars' worth annually on a global scale (Bacha *et.al*, 2018).

Every segment of society is affected by natural disasters: men, women, the elderly, kids, people with disabilities, and even trees, crops, and cattle. Stated differently, these losses can be referred to as landslide-related indirect losses (Schuster & Highland, 2001). The poor individuals are highly affected by natural calamities (Shah, 2010). This study examines the socioeconomic effects and challenges associated with resettlement in the wake of a landslide, specifically focusing on the vulnerable village of Hunza, Mayoon. The purpose of this qualitative study was to identify the issues that arise during resettlement and to determine the effects of landslides on post-disaster socioeconomic circumstances and the disaster effect on gender roles and responsibilities.

This study focused on a small village in the lower Hunza, Mayoon. This village was badly affected by the 2010 landslides and subjected to various subsequent landslides. Gilgit-Baltistan, Pakistan is highly vulnerable, the village for this research is located in Gilgit and hazard-prone area according to the National Disaster Management Authority, based on high frequency of avalanches, landslides, Glacial Lake Outburst Floods (GLOFs), rock fall and flash floods. These hazards have been quite frequent since 2010. This village is prone to land sliding. In the past, many landslides hit this village, and AKAH has labeled this village as the most vulnerable. The inhabitants living there continue to endure a lot of financial losses. This study tries to find out the post-disaster socioeconomic impact on the inhabitant's government assistance and changed gender roles following the land sliding. This area remains under-researched, and this will be a novel study in literature. Previous research was conducted on the reasons for land sliding and the topography of the village. The findings from this research would provide literature for further studies. Nearly every nation has experienced some form of natural disaster, but due to their physical, social, cultural, and economic weaknesses, some have been hammered considerably more severely than others. These vulnerabilities are higher in developing countries than in developed ones (Dankelman, 2002; Preet, Nilsson, Schumann, & Evengård, 2010). The majority of countries in Asia and Africa are prone to disasters, mainly because of the topography and climatic conditions. Cyclones, tsunamis, floods, earthquakes, and heat waves have become quite common in many Asian countries (Baig & Sharif, 2013).

According to the International Federation of Red Cross (IFRC): "The Asian continent and the Pacific Islands represent only 30 percent of the global landmass but have sustained over 50 percent of all recorded disaster events. The region has sustained 82 percent of total disaster fatalities, and its population represents 85 percent of all people affected by disasters since 1997" (Supancana, 2010).

Pakistan is widely recognized as being highly susceptible to a multitude of hazards, encompassing hydrological, meteorological, geophysical, and biological domains, such as floods, earthquakes, landslides, cyclones, avalanches, lake outbursts, droughts, pandemics, and epidemic diseases. Pakistan is significantly exposed to climate-induced disasters and related threats and has experienced a wide range of disasters over the past 40 years,

including floods, earthquakes, droughts, cyclones, and tsunamis (Chaudhry, 2017). Pakistan, in particular, has experienced ten major disasters starting from 1935 Quetta earthquake to massive floods in 2010 (Rasheed, Usman, Ahmed, Bacha, Zafar, & Bukhari, 2019). Between 1947 and 2000, Pakistan saw 85 natural catastrophes that resulted in the loss of almost 29,000 lives and nearly 2.55 billion dollars. Approximately 80,000 lives have been lost and 84 natural catastrophes have caused an estimated 22.38 billion dollars in economic losses since 2000 (Maqbool, Hussain, & Khan, 2017). The Kashmir earthquake in 2005 resulted in the displacement of 3.2 million people. Approximately 73,318 people lost their lives as a result of the earthquake (Hamilton, 2007). Similarly, the unprecedented monsoon rains and floods of 2010 affected people across Pakistan; 18 million people were directly affected and 1,985 people lost their lives, not counting the material losses. Over the past five decades, the country has experienced a significant number of 162 natural catastrophes, leading to substantial loss of life and property, with an estimated value of \$1.3 billion (Khan, 2018).

Gilgit-Baltistan, nestled in the northern regions of Pakistan, boasts breathtaking landscapes, but its vulnerable topography exposes it to natural disasters, notably floods and landslides. The frequency and severity of disasters have witnessed a substantial increase in this area. Gilgit City, located in the formidable Hindukush-Karakorum-Himalayan (HKH) region, like other mountainous valleys in the country, is under severe threat from the catastrophic consequences of disasters (Shah, Rana, & Ali, 2023).

The province of Gilgit-Baltistan, in northern Pakistan, has been frequently and severely affected by landslides in the past, and prone to more landslides induced devastation in the future. Notable events include the floods of 1980, 1994, 1996, 2010, and 2014. As per a report by Community World Service Asia in 2015, Skardu, Ghanche, Gilgit, Ghizar, Astore, and Hunza districts are highly susceptible to future flooding and land sliding. As a result, flood disasters are common and almost occur annually in this region. There were 246 deaths recorded and approximately 113,416 populations were affected in Gilgit-Baltistan from 2010 to 2017 (Ali & Iqbal, 2021).

A significant event took place in January 2010 when landslides blocked the Karakoram Highway and Hunza River. The magnitude of land sliding and rock falls was severe, resulting in the formation of an artificial lake that stretched for 25 km. This incident led to the flooding of five villages and caused extensive damage, including the destruction of a 25 km stretch of the Karakoram Highway (Khan, 2018). Gilgit-Baltistan, Pakistan is a highly vulnerable and hazard-prone area according to the National Disaster Management Authority, based on the frequency of avalanches, landslides, glacier lake outburst floods, rock fall, and flash floods. These hazards have been quite frequent since 2010, potentially due to changing climatic conditions and unique tectonic settings resulting in massive destruction, economic loss, and human migration (Khan, Karim, Ahmad, Qureshi, Ali, Rehman & Beghum, 2019).

Natural disasters can affect the local economy in several ways, such as lowering business productivity through the destruction of housing infrastructure, upsetting supply lines, causing unexpected expenses for consumers, or harming productive assets. Different correlations between the frequency of disaster events and local earnings, housing prices/rents, and net migration to the impacted area may arise from the influence of various channels (Khan *et al.*, 2019). The Mayo landslide is in the Hunza district, located at a distance of 65 kilometers from the main Gilgit town (40 km aerial distance north of Gilgit) between longitudes 74°24.7' to 74°25.9' and latitudes 36°14.3' and 36°14.75'. The area comprises 160 houses, 10 shops, two schools, and one community center (Khan *et al.*, 2019). The village is at risk of being affected by landslides, as indicated by the Aga Khan Agency for Habitat. The landslide covers a total area of 1500 m² and has continuously increased since its first activation in 1976 (Khan *et al.*, 2019). According to the residents, initially, it only damaged a few acres of land. After a long-dormant period, recent triggering episodes were recorded in 2010, 2011, and 2012, associated with heavy rainfall, seismic activity, and steep angles, instigating the evacuation of 20 families. In August and September 2020, the landslide's eastern side was triggered twice and damaged farmland, two houses, and the local playground. The community residing

at the toe of the landslide, i.e., 120 families, almost 1000 people, a secondary school, and a few shops, are all at risk of the landslide hazard (Rehman, Zhang, Meng, Su, Catani, Rehman & Ahmad, 2020). Even though people are living in the same area. Because of their financial situation, they are unable to move to other locations. They are waiting on support from the local authorities, but they don't hear back favorably from them. To investigate the socioeconomic effects and relocation concerns, the current study concentrated on the individuals affected by landslides since 2010.



This picture, taken from Nagar Village shows the land slide of Mayoan Village.

The Calamity Act 1958 was the first strategy adopted by Pakistan to deal with disaster situations. All disasters till 2006 were handled under the Calamity Act 1958 by the government of Pakistan. The only law available in the country to handle disaster situations was response-oriented, and in the aftermath of the Kashmir earthquake in 2005, the government reviewed its laws dealing with disasters. The requirement was met by promulgating the National Disaster Management Ordinance (NDMO) 2006, which was the initial serious effort towards cohesive disaster management. With the mutual effort of various federal ministries, United Nations agencies, and NGOs, the National Disaster Risk Management Framework (NDRMF) was framed in 2007, offering strategic guidance for disaster management in the country. The NDRMF identified mainly institution capacity building, mass awareness, establishing training workshops, risk assessments, and others. By the Act of Parliament, NDMO 2006 was enacted as law and renamed as National Disaster Management Act (NDMA Act), 2010 to reduce the risks and manage future disaster situations effectively and efficiently. However, disaster management in Pakistan has been often highly disorganized due to the overlapping roles and responsibilities of various government agencies, like power development, defense forces, emergency cells, and different national and international NGOs (Ali & Iqbal, 2021).

The second chapter presents literature review, it include past researches on socioeconomic status of the victims in Gilgit Baltistan. The third chapter presents the methodology of the study, it includes research design, sample procedure and analysis. The results are covered in Chapter four, along with the major themes that were extracted

from the transcripts of the interviews. The discussion and conclusion, as well as the study's limitations and potential implications, are covered in the last chapter.

Objectives

- To explore the socioeconomic effects of landslides on the primary affectees of the village of Hunza, Mayoan.
- To identify (if any) the changed gender roles and responsibilities of the primary affectees during resettlement in the aftermath of the landslide disaster in Mayoan.
- To determine how the government assisted the affected people following the landslide.

Research questions

This research assumed that landslides have a different impact on the residents of one of the most vulnerable villages in Hunza, Mayoan. This qualitative study focused on socioeconomic status and whether gender roles changed after the disaster. In addition, it explored how the government assisted during resettlement after a disaster.

- What socio-economic impact can a natural calamity, i.e., a landslide, have on the residents of Mayoan associated with agriculture?
- How did the government assist the affectees after the landslide?
- How do gender roles and responsibilities change during resettlement in the aftermath of the landslide disaster in Mayoan?

Literature review

The current study focused on the socio-economic impacts of landslide affectees of Mayoan village since 2010 and the resettlement issues. Mayoan, situated in Lower Hunza, is a small village that has experienced recurrent landslides, rendering it susceptible to such natural disasters.

The frequency and severity of disasters have witnessed a substantial increase in Pakistan. Gilgit city, located in the formidable Hindukush-Karakorum-Himalayan (HKH) region, like other mountainous valleys in the country, is under severe threat from the catastrophic consequences of disasters. The region has experienced frequent hazards such as floods, especially Glacial Lake Outburst Floods (GLOFs), landslides, and earthquakes in recent times. A study conducted on multi-hazard risk perception: An empirical study of the remote Gilgit city. The current study, therefore, quantifies risk perceptions of Gilgit citizens in a multi hazard environment through perceived hazard, disruptions, and impact dimensions. The primary data is collected via household surveys using a semi-structured questionnaire. The paired sampled test and index analysis have been applied to determine the perceived risks in a multi hazard environment. Results of the study reveal that most respondents perceived the impacts of floods/GLOFs on daily life activities as the highest in a multi-hazard environment (Shah, et. al, 2023).

A study conducted on flash floods and its consequences in Gilgit Baltistan. Climate change is the primary element driving the formation and growth of glacial lakes and glacial lake outburst floods (GLOFs). Floods have had a negative impact on the environment, the population's socioeconomic development, and the primary sources of income, such as the forestry and cattle sectors. According to the Food and Agricultural Organization's agricultural assessment report, the floods caused unprecedented damage to agriculture, livestock, fisheries, and forestry. Primary infrastructure, including tube wells, water channels, homes, animal enclosures, individual seed

inventories, fertilizers, and agricultural equipment, was also devastated by floods (Aslam, Hayat, Pari, Sameen, Ahmed & 2023).

A study conducted on socioeconomic impacts of natural hazards on residents living in Ghizar, Gilgit Baltistan. According to the results it is found that climate-induced floods, landslides and heavy rain fall damages crops and accommodations, human life, shelter, and infrastructure. Most of the residents were aware of climate induced flood hazards (Abbas, & Khan, 2020).

A study was conducted to understand how climate change impacts socio economic conditions of mountain communities and their livelihood sources in Gilgit-Baltistan. Surveys and in-depth interviews were conducted to gather data from Passu Village. The interviews and household surveys' responses showed that climate-induced changes and their impacts have already been felt by the residents of Passu village. Their perspectives reflect that with time, residents of Passu village have reduced their reliance on climate sensitive sectors such as agriculture in order to reduce their socioeconomic vulnerability and are now more engaged in different professions to earn income. Governmental and nongovernmental organizations implemented different projects to assess and monitor multiple hazards that may be associated with glacial lake outburst flood events. Although climate-induced changes and related disasters vary substantially across regions and agro-ecological zones in Gilgit-Baltistan, the research showed that vulnerability to the effects of climate change remains in those mountainous villages where the majority of the population is still dependent on agriculture and tend to have a poor adaptive capacity and weak institutional structures (Aaliya, 2018).

Furthermore, a study conducted on changes in the social relationships of individuals with disabilities displaced by disaster. To fulfill the research objectives thirty-nine people with disabilities displaced by Hurricane Katrin were interviewed about their long-term recovery experiences three years following the disaster. Results were analyzed using grounded theory methodology. Additional analysis of the category of social relationships revealed six underlying properties: 1) proximity to others, 2) frequency of social interactions, 3) diversity of relationships, 4) intimacy with neighbors, 5) cohesion with family, and 6) formality of relationships (Stough, Ducey & Holt, 2017). Another study conducted on the effects of natural disasters on gender relations in the case of the 2010 Attabad disaster in Gilgit-Baltistan. This instrumental case study provided a holistic view of the disaster from a gender lens, drawing from Naila Kabeer's 'Social Relation Approach' to analyze pre-existing gender relations, and the role institutions play to reinforce, strengthen or shift existing gender relations in the aftermaths of the disaster. The study concluded that the institutions play a crucial role in strengthening existing gender inequalities, by reinforcing the existing gender relations. This research suggested that community resilience and gender mainstreaming were important to address the existing gender relations, so that disasters were managed in a way to bring social change and justice to society (Khan, 2018).

A study was conducted on the Socio-economic effects of Attabad Lake. The purpose of this study was to ascertain the effects of Attabad Lake's accidental formation on the social and economic landscape of the Hunza district. Using random selection techniques, a set of eighty respondents were chosen from the Lower, Central, and Upper Hunza. The results showed that, Attabad Lake is the cause of several issues, the most significant of which are the "financial crisis, lack of transportation facilities, lack of infrastructures, and mental sickness." (Kakar & Sakhi, 2012).

Methodology

This qualitative study set out to examine the socioeconomic effects of landslides and government assistance in resettlement following the landslide of the residents of Mayoan Village, and whether or not gender roles altered as a result of the disaster, with a focus on landslides that had happened in Hunza.

Research design

Qualitative research is important for studying human behavior and the social world in a multidimensional way. It provides space for emotions, feelings, experiences, memories, and all other kinds of expression. It helps to describe and understand a social phenomenon holistically. A qualitative approach was chosen to provide space for the subjective experiences of people, their memories, emotions, and feelings. The inductive process of qualitative research was involved, as the data was gathered from a specific area of study and used to construct different concepts and theories. Qualitative research is more relevant to the study as it provides a greater capacity to collect more in-depth and meaningful details about the experiences of people (Clarke, & Braun, 2017).

Sampling and selection

This qualitative research study employed the use of the purposive sampling technique. The primary landslide survivors were interviewed. A total of ten landslide affected Mayo residents, five of them male and five of them female made up the sample.

Inclusion criteria

- Men and women land sliding affectees from the village Mayo, located in Hunza were included in the sample.
- Primary affectees were included in the study.

Interview protocol

A semi-structured interview was the technique for data collection. An interview protocol was designed keeping in mind the objectives of the research, subjective insights, and findings from the literature. The open-ended questions allowed the participants to elaborate and reflect on their experiences. It provided them with more flexibility and gave permit scope for individuals to answer questions more on their own terms and conformability. This also allowed us to probe the participants to elaborate or to follow a new line of inquiry introduced by them (Clarke, & Braun, 2017). There were 12 questions in the interview protocol addressing socioeconomic challenges post-disaster, government assistance, and gender roles after disaster.

Procedure

The interviews were conducted on different media platforms such as zoom, messenger and other social media apps on the basis of availability of access to the participants because it was impossible to meet them face to face. Prior to conducting interviews, participants' oral agreement was sought, and their confidentiality and privacy were guaranteed. The participants were then given a brief explanation of the goals and purpose of the research. The interviews took place in their mother tongues, and they were recorded with consent. Later, the interviews were transcribed and subjected to a thematic analysis.

Analysis

The transcribed interviews were examined using thematic analysis. Thematic analysis is a great tool for linking unrelated concepts. Finding themes is the aim of thematic analysis. The researcher looks for themes in the interview data by conducting a thematic analysis. This approach's main objective is to give the researcher the ability to draw

important themes from unprocessed data. The themes include either significant or intriguing patterns in the data and the respondents' exact words. Connecting themes can be created by grouping themes with similar meanings, experiences, or patterns. Throughout this phase, the researcher becomes acquainted with the transcribed material (Clarke, & Braun, 2017).

Results

With a focus on landslides that had occurred in Hunza, this qualitative study set out to investigate the socioeconomic effects of landslides on the population of Mayoan village located in Hunza, concerns that arose following the disaster, and whether or not gender roles evolved as a result of the disaster. For this purpose, five males and five females were purposively recruited and interviewed, and the interviews were subjected to thematic analysis. The following themes were extracted from the transcribed interviews i.e., post disaster impact on daily living, gender roles and disaster, resettlement issues, and Governmental role having different subthemes. Table 1 shows the connecting themes with major themes.

Table 1: Major themes with connecting themes

Major	Connecting Themes
Post-Disaster Impact on Daily Living	Financial impact Cultural depletion Loss of social ties
Resettlement issues	Access to services Unavailability of sufficient land Livelihood disruption Infrastructure redevelopment
Governmental role	Ineffective disaster communication Mismanagement of government and Non-government organizations (NGOs) aid
Disaster and gender roles	Reinforcement of traditional gender roles

Table 1 shows the major themes extracted from all transcribed interviews of participants. Four major themes are having different subthemes i.e., Post disaster impact on daily living, resettlement issues, governmental role, and disaster and gender roles. For the major theme of the post disaster impact of living, there are three subthemes i.e., financial impact, cultural depletion, and loss of social ties. The major theme resettlement issues, it has four subthemes i.e., access to services, unavailability of sufficient land, livelihood disruption and infrastructure redevelopment. For the major theme of government issues, it has two subthemes i.e., ineffective disaster communication and mismanagement of government assistance. For the major of theme disaster and gender roles, it had only one theme i.e., reinforcement of traditional gender roles.

Post disaster impact on daily living

This major theme had three connecting themes: financial impact, cultural depletion, and loss of social ties. Land sliding badly affects the residents financially. Majority of people living in Hunza, Mayoon Valley are farmers and dependent on agriculture for their livelihood. Landslides not only swept the agricultural land away but also houses and barns. The financial well-being of the impacted individuals and families is obstructed by the landslide in addition to the actual loss of land and property. Many people were in difficult situations due to the lack of income from agricultural activities, which worsened the economic challenges.

One of the female participants said that:

“Our survival depended on these lands. The land was everything to us. We were all in great difficulty.”

The male participant said that:

“Our resources, including land, trees, cattle, fields, and gardens, all were destroyed. Along with that, even the people who were engaged in business suffered losses.”

“Our lands, which were once just ruins, were cultivated by our forefathers who irrigated them and planted fruits. The income obtained from these fields sustained a family, especially from cherries. Now, all these lands have fallen victim to landslides. If I speak about my home specifically, we used to earn around 50K annually from cherries alone, which is equal to 400K now. Only cherries have suffered this much loss; now, imagine how much overall loss there might be. Just imagine the extent of overall loss.”

In the Mayoon Hunza region, landslides have far-reaching effects on the cultural fabric that has long defined the indigenous tribes, in addition to their economic effects. This terrible event destroyed not only the tangible assets and the surrounding environment, but it also dealt a severe damage to the rich fabric of indigenous customs and culture. The disastrous power of the landslide was primarily felt during cultural rituals, such as religious festivals, marriage celebrations, and funeral rites. The religious festivals had lost their typical passion and enthusiasm in the middle of the disaster's aftermath, especially since the customary gathering places for these ceremonies had been destroyed by the landslide. Religious festivals, which are typically characterized by colorful rituals and the gathering of women at particular locations, had an interruption that represented the disaster's wider upheaval. These events were originally held in cultural sanctuaries, but the landslide destroyed them, making it impossible for the community to continue these ancient practices with the same fervor and vigor. A crucial cultural event in the community's existence, marriage rituals were also compromised.

One of the male participants said that:

“Weddings, festivities, and funeral rituals became very brief. Every household was affected by this disaster; transportation issues arose. People from other villages couldn't come for condolences due to transportation problems, leading to delays. Weddings, which used to be grand celebrations, became simpler after the disaster.”

“Due to the disaster, I had to postpone my son's wedding for a year because our home was destroyed, and we were living in a shelter. It wasn't feasible to have my son's wedding in the shelter because it consisted of a single room. If it were my daughter's wedding, there wouldn't have been an issue as daughters move to their in-laws' home, but sons bring their brides home.”

“Before the disaster, we used to celebrate Nowruz and other festivals with great enthusiasm, but after the disaster, everything came to a complete halt.”

Many of the displaced people after the disaster either resettled in the same area or, if it was economically feasible, in separate locations. The social ties they had with their neighbors were broken, even in situations where they choose to relocate inside the same village. One of the participants said that:

“We are three sisters, and after the disaster, we got separated. One sister shifted to Danyor, another to Hunza, and I am here. They are busy with their families, and our meetings have become infrequent.”

“We shifted to Gilgit after the disaster on rent because our home was hit by boulders, and there was no suitable and safe land available. Whenever we go home, it’s usually for work, weddings, or in the unfortunate event of someone’s passing”

Resettlement Issues

The next major theme was resettlement issues. It had five connecting themes i.e., access to services, limited available land, livelihood disruption, infrastructure development, mismanagement of government and NGOs aid. The major issue affectees encountered after disaster is access to services. The local government and the NGOs working here were unable to provide healthcare facilities. In the village of Mayoan, there is a single dispensary, which is located away from the settlements, people travel to other places for major healthcare facilities. After the disaster, there was complete blockage of road mostly children, pregnant, and women were affected. Initially, the government provided tents to the affected people. It was not possible to live in tents as these areas are prone to rainfall. The shelters were built by the government in collaboration with AKAH. The distribution of funds and the food were not properly managed at the community level. Some of the affectees were left without support.

One of the participants said that:

“We had to face many challenges, especially in terms of healthcare. Due to roadblocks, we had to go to Nagar for a dispensary or travel to Hunza DHQ.”

“My delivery had just taken place, and my son was only 21 days old. I was putting the baby to sleep when suddenly there was a loud noise. I told my mother-in-law that something seemed wrong. She reassured me, saying it was just raining heavily and nothing was wrong. I went outside myself, took my baby, and spent the night at my uncle’s house. My health deteriorated, and the bleeding increased.”

“The provision of rations and other essentials was not adequate. Whatever little we received from the government was insufficient. The government was supposed to provide as much as the loss incurred. They gave us only 20k rupees, either as a joke or a mockery.”

The next sub-theme was resettlement issues due to unavailability of sufficient land. Most of the area of Mayoan is mountainous and people have limited area of land. Government is unable to provide a safe land for rebuilding infrastructure, affectees rebuilt their homes in the areas provided by relatives or if they have land in other safe area they rebuilt there. The female participants said that,

“My uncle showed me a piece of land, and I built a house there for the second time. The government did not provide any land or financial assistance.”

The male participant said that:

“If I talk about my home, my house is nestled against a mountain, and it was significantly affected by boulders. Livestock sheds were destroyed, and our agricultural land, which was almost one canal, was wiped out in the sliding. Now, we have shifted to Gilgit. We don’t have any land left to rebuild our house. Currently, we are living in rented accommodation in Gilgit, and I work in Serena Hotel”

“Fortunately, we had enough land, and while more than half of it was taken by landslides, we managed to build our house on the remaining safe area. Initially, the family members were not agreeing to build a house there due to the risk, but later due to my stubbornness they agreed both I and my husband are old. What if our death came in that shelter, it would be a disgrace for my family. We built the house with a bank loan, but the government did not provide any assistance after inspecting the house”

The next sub theme under resettlement issue was livelihood disruption. The people residing in these villages lost not only their houses, but also their agricultural land and barns. The majority of affectees were dependent on agriculture for their livelihood. These people found different ways of earning money. Males shifted to other areas in search of jobs leaving behind wives and children. The female participant explained that:

“My husband went to Gilgit in search of work. Initially, we used to earn a lot from the land. I cultivated potatoes, tomatoes, and vegetables, and by selling them, I would get enough ration for the entire year. Now, we don’t have any land, and we are dependent on my husband for support.”

“Couldn’t stay in the shelter, so I called my younger son who had gone to Gilgit for education to come and help build a house, because of that his education was effected”

One of the male participants said that:

“Now, we don’t have much agricultural land left. I can’t depend on agriculture anymore, so for income, I now work on small jobs in Gilgit.”

The next sub-theme was infrastructure redevelopment. The disaster happened during July 2010 due to heavy rainfalls. Initially, the affectees moved to the schools. Majority of affectees were initially given tents by the government. After those shelters were built by AKAH. The family system of Hunza is mostly extended family, and the shelters were not suitable for a family having large no of family members.

One of the participants said that: “The shelters were very small, not suitable for a family. The shelters were built based on income assessment. Speaking about myself, my agricultural land was limited, and most of it was taken by landslides, leaving only a small garden. This didn’t generate enough income, so we were provided with a small shelter consisting of one room and a bathroom. All of us, including my wife, four children, and my parents, lived in that small shelter. I came to Gilgit for work and later brought my family with me to Gilgit.”

“The government officials initially provided a tent, which was very difficult to live in. Later, they gave us a shelter that was better than the tent. It protected us from rain and cold in the shelter.”

Government Role

The next major theme was the government’s role pre during and post disaster management. It had two connecting themes i.e., ineffective disaster communication and Mismanagement of government and Non-Governmental Organization’s aid. The people were unaware of the land sliding and the local government did not inform the residents earlier about this disaster. It happened during heavy rainfall of summer of 2010. The residents had become accustomed to the occasional rock falling from the mountain. But something bad happened during this time, people evacuated their places on their own by hearing the sound of boulders. The participants said that;

“During heavy rains, there would be minor landslides, and the falling of stones was a normal occurrence. All of this happened on a small scale, and there was no anticipation of such a massive incident... Regarding the disaster, we were not well-informed; there was no survey to give us an idea of the potential dangers... Rainfall had been occurring for 10 days before the disaster, and stones were falling. The main reason was that the mountain had become very old, and frequent rain had weakened it, leading to the disaster... There was no alternative option; if a disaster occurred, we would have to move to another place... There was no plan or information available.”

“We had no idea about it. We were sleeping at night when a loud noise woke us up. I woke up my children, and we went outside. We spent the night at a relative’s house. In the morning, we found out that our area had been affected by a massive landslide, and stones had hit our house.”

“We were unaware of it; there was no warning letter issued by the government.”

The next sub theme was the mismanagement of government and NGOs aid. The participant explained this theme as: “Throughout the northern areas, there were landslides and floods due to intense rainfall. In the initial days, there was a survival crisis, and government aid helped for some time. Later, community organizations got involved, creating a plan on a need basis, including a plan regarding school and college fees, but it was not fully implemented. People are still living in that area, although they are aware that the danger is not completely gone. Neither the government nor community organizations have been successful in proper implementation.”

“The government did not provide any assistance as expected; they only provided shelters, and initially, Aga Khan Agency for Habitat (AKAH) started providing rations, etc. We built our house ourselves by taking a loan, and the government did not provide any compensation after inspecting the house.”

“The handling of things was not organized, and it continues to be the same. If they are aware that there is still a threat, why are they not taking appropriate steps?”

Gender roles and disaster

The next major theme was gender specific issues. It had one connecting theme i.e., reinforcement of traditional gender roles. In most societies, the division and classification of roles and responsibilities is gender based. Men perform the roles that satisfy the masculinity i.e., they are expected to be the bread winner of family, and the women perform feminine roles for example doing household chores, taking care of children, elders and cattle. In these areas, women were responsible for household chores and men were responsible for working outside the home and earning money for the family. There was also a distinction between what kind of agricultural work would a woman do and what will be done by a man. Females sell agricultural products, milk, butter, dry fruits, etc. to generate income. They used the money they made from these pursuits to support their kids and pay for household bills. However, when the agricultural land was destroyed by the calamity, women discovered new means of generating cash to feed their families. On their families' farms, they grew crops, and they manage their livestock in relatives' barns.

The participant said that:

“In my opinion, women have been more affected by this disaster. Due to the disaster, we shifted to shelters, and we couldn't bring animals with us. Managing livestock is the responsibility of women, and since women were not able to bring them along, they suffered more. In the morning, women used to go to provide fodder. In my view, women have suffered more from this disaster.”

Discussions

The first theme that appeared was the post-disaster impact on daily living. It had three connecting themes i.e., financial impact, cultural depletion and loss of social ties. Natural disasters are sudden and violent events that have a massive effect on the social and economic welfare of people. Following the calamity, the people of this village not only lost agricultural land but also homes. In addition to the real loss of land and property, the landslide affected the financial security of the affected individuals and families. Due to the loss of revenue from agricultural activities, many people found themselves in precarious positions, which made the economic difficulties worse. These results supported by Rehman, Wali, Tahir and Ahmed (2012) stated that the region of Gilgit-Baltistan experienced an annually multiple natural hazard. Geographically, a large area of the region is covered by the largest mountains. Mostly settlement of the region is exposed to multiple natural hazards like floods, avalanches, earthquakes, Lack-outburst, land sliding, etc. The region experienced floods and avalanches on a regular seasonal basis. These calamities have significant negative impacts on the social and economic life of the inhabitants.

Gilgit-Baltistan, Pakistan is a highly vulnerable and hazard-prone area according to the National Disaster Management Authority, based on frequency of avalanches, landslides, glacier lake outburst floods, rock fall and flash floods. The region is susceptible to these natural hazards due to its mountainous terrain. These hazards have been quite frequent since 2010, potentially due to changing climatic conditions and unique tectonic settings resulting in massive destruction, economic loss and human migration (Ali & Iqbal, 2021).

The next sub theme was cultural depletion. The landslide destroyed the regular gathering locations. Before the landslide religious festivals, usually marked by vibrant rituals and the assembly of women at specific sites,

experienced a disruption symbolic of the disaster's broader upheaval but after the landslides. The landslide destroyed the cultural sanctuaries where these events were previously held, making it impossible for the community to carry on these age-old customs with the same zeal and intensity. The landslide destroys the intangible culture, and these results were supported by Dembedza, Chopera, Mapara, and Macheka, (2022) protecting cultural heritage is proving to be difficult due to the increased occurrence and frequency of climate-induced natural disasters. Disasters usually result in the loss of oral traditions, languages, traditions, and beliefs and of the traditional food systems. Traditional monuments, figurines, historical sites, and buildings are at risk of being destroyed by extreme climate events like floods and hurricanes, and some of these assets are irreplaceable. The stories and practices associated with these assets also disappear. Relocation of people to safer places due to climate change-induced disasters can result in communities parting ways with some traditional materialistic assets such as cemeteries, worshiping places, and sacred places that are specific to that community, as well as their associated practices. The intensity of the impact of a disaster on a specific culture mainly depends on the people in that culture and the strength and resilience of that culture. However, climate change-induced disasters are slowing down cultural development as well as causing irreversible damage to cultural heritage or destroying the entire areas of cultural heritage both tangible and intangible and in the process some practices and stories around indigenous knowledge.

The next subtheme was loss of social ties. Most of the people lose social ties with their neighbors even living in the same village. The people once gathered in specific sites for different religious events, but after the disaster the sites were destroyed by landslides. Additionally, families relocated to safe places, others moved to different areas for income, and social ties were lost in this way. Further connections with adjacent villages were lost because of loss of infrastructure. These results were supported by Stough, Ducey, and Holt (2017) that there is typically a fall in people's general levels of happiness and contentment following a calamity. The emotional toll of losing intimate social relationships and a sense of belonging within a community is more strongly linked to this decline than it is to a lack of practical help. Rather than a decrease in the perceived availability of practical help, the observed decline in quality of life is thus anchored in the absence of emotional support and a sense of community. In Pakistan's hilly regions, the direct effects of slope failure and landslides include fatalities, house collapses and partial destruction, and different forms of infrastructure damage. Roads and other communication routes, pipelines, irrigation channels, the water supply system, and entire human settlements are all frequently disrupted (Khan et. al., 2011).

The next major theme was resettlement issues. It had four connecting themes access to services, unavailability of limited land, livelihood disruption, and infrastructure redevelopment. Keeping with the theme of available land, the Mayoon region is mountainous. Residents of Mayoon solely own land in Mayoon, which makes up roughly 5 kanals when all the fields and gardens are included. They are not landowners outside of Mayoon. During the relocation process, the impacted individuals attempted to reconstruct homes and barns on secure property. In locations susceptible to landslides, affected individuals and family members donated land for residential reconstruction. The government did not give the affected individuals land. These results are novel and would serve as literature for further studies.

Under the subtheme livelihood disruption, the landslide affects people to find new ways of income. Most of the agricultural land was swept away by the landslide. Now they are not very dependent on agriculture. These findings are in line with the study conducted by Aaliya, (2018) found that the impacts of climate-induced changes on local livelihoods reflect that climate-induced changes and related disasters have significantly impacted the socioeconomic conditions and livelihood sources of the residents of Passu, a village in Hunza, over the past decade in the form of glacial lake outburst floods, river erosion, and runoff. The local people have lost their lands due to flash flooding and river erosion. Changes in the monsoon cycle over the past 30 years have also resulted in a

decline in the annual agricultural yield. Locals have consequently become less dependent on agricultural methods. They attempted to relocate their families along with them as they went to different places in search of various formal or informal jobs.

Under the subthemes of infrastructure redevelopment and access to services. In the aftermath of the landslide in Hunza, the affected residents initially received tents from the local government, followed by the collaborative effort of the government and Aga Khan Agency for Habitat (AKAH) to construct shelters. AKAH also played a role in providing ration support for a temporary duration. Despite the local government's assurance to cover educational fees, this commitment was not fulfilled. Notably, the construction of houses was undertaken by dedicated members of the local community. The majority of people in Hunza are followers of Aga Khan and members of the Ismaili sect of Shia Islam. An international hierarchy of Ismaili councils, which offer social and religious services, organizes Ismaili's worldwide. The Aga Khan Development Network (AKDN) offers chances for social and economic development through several specialized institutions and operates in nations all over the world. In Gilgit-Baltistan, the key players in the region's development are the institutions of AKD, AKAH is working under AKDN, and AKAH helped these affectees.

The next major theme was the government's role. It had two connecting themes i.e., ineffective disaster communication and mismanagement of government aid. Under the theme of ineffective disaster communication, they were unaware of the disaster, government officials were unaware of the landslide. They neglected to notify the village's locals. Members of the neighborhood informed them. The 1958 Disaster Management Act was Pakistan's initial response to a disaster. The Pakistani government handled all catastrophes up until 2006 by the Calamity Act of 1958. The 2010 National Disaster Management Act replaced the 1958 Calamity Act, which addressed primarily situations after a disaster had occurred and did not address disaster preparedness. There were weaknesses and gaps in that recently created Act. The government evaluated its disaster-related laws following the 2005 earthquake in Kashmir because the only legislation in the nation designed to deal with such events was response-oriented. The National Disaster Management Ordinance (NDMO) was established in 2006 to offer a full range of Disaster Risk Management (DRM) at the national level. To lower risks and manage potential disaster scenarios, the National Disaster Management Act (NDM Act), 2010 of Pakistan was approved by the parliament. (Ali & Iqbal, 2021; Deen, 2015; Shah, 2010). Pakistan's government is often focused on post-disaster activities, such as, search, rescue, food distribution, provision of shelters, and monetary compensation. In Pakistan, most of the educated class, government functionaries, and policymakers were not versed with the term disaster management, especially terms and practices related to the pre-disaster phase, i.e., prevention, mitigation, and preparedness. (Ali & Iqbal, 2021).

Under the subtheme of mismanagement of government aid, the affectees were unsatisfied with the way the government treated them. The aid was given based on favoritism, not given to the deserved ones. Disaster management in Pakistan has been often highly disorganized due to the overlapping roles and responsibilities of the various government agencies, like power development, defense forces, emergency cells and different national and international NGOs. The effectiveness of the first legislation, i.e., the national disaster management ordinance in 2006, was tested in the 2010 floods, which exposed government organizations' inefficient and disorderly response. These governments were not only marred with minor interpersonal and organizational deviant workplace behaviors, e.g., showing favoritisms, resource waste, and sluggish working but also infested with serious deviant workplace behaviors, e.g., stealing, corruption, accepting kickbacks, and criminal negligence (Ali & Iqbal, 2021; Raoof, Rasool, Sattar, Shami, Murtaza, Ashraf, & Malik, 2021).

The next major theme was disaster and gender roles. It had a single connecting theme Reinforcement of traditional gender roles. After a disaster, the survivors had no home or land to return to. They now reside in shelters. They relied on institutions for all kinds of facilities. After the disaster, the roles and responsibilities of men and women

have varied, but some labels are still the same. Men are still the breadwinners of the family. Their responsibility has grown now that they do not have land or any other sources of income. They leave their wives and kids behind in search of alternative sources of income since they were previously dependent on agriculture. The traditional roles, i.e., looking after animals in the barn and doing agricultural work, decreased. Agricultural land is swept away by a landslide. Women are still the caretakers, and all the household chores are on their shoulders. These results were in line with Khan (2018) study conducted in the Hunza found that the earning and income of the family are entirely on the men. The amount of work for women has been reduced, which has increased their economic dependency on men. Men travelled to other areas for income generation. This financial burden on men has psychological impacts on both men and women. Some women, to help their families do handicraft work and work in nearby fields to feed a cow or sheep in order to fill the economic issues within the household. Neumayer and Plümper (2007) stated that traditional labor divisions can increase women's vulnerability to disasters. Rodríguez, Quarantelli, Dynes, Enarson, Fothergill, and Peek (2007); Twigg (2004) found that the most fundamental reasons for women's vulnerability are due to the position of women in society and their productive, reproductive roles and expectation for them to participate in community tasks, which they are expected to continue in a disaster situation. These tasks will under more difficult conditions often be exacerbated.

Conclusion

The current study focused on the socio-economic impacts of landslide affectees of Mayoan village and government assisted the residents during resettlement. It also focused on how tried to find out changed gender roles in resettlement following land slide. Mayoan, situated in Lower Hunza, Gilgit is a small village that has experienced recurrent landslides, rendering it susceptible to such natural disasters. The results showed that the residents of Mayoan Valley were farmers and dependent on agriculture for their livelihood. Landslides not only swept the agricultural land away but also houses and barns everything that supports their lives. Many people were in difficult situations due to the lack of income from agricultural activities, which worsened the economic challenges. Both the tangible and intangible facets of their culture were destroyed by the avalanche. The victims of the accident were unable to completely enjoy their religious and cultural holidays when it happened. Nowruz, a religious celebration marking the start of a new year, was observed simply. Women congregated in designated areas for enjoyment, and the locations were cleared after landslides. They left on their own before the landslide started, without being notified of the calamity by local government representatives. The local government failed to resettle the primary survivors. Initially the government provided the tents and then shelters were provided. The shelters were not enough for a large family, as extended family prevails in this area. Most of the families built their houses on their own if their land is sufficient or provided by their relatives. After the disaster, the roles and responsibilities of men and women have varied, but some labels are still the same. Men are still the breadwinners of the family. Their responsibility has grown now that they do not have land or any other sources of income. They leave their wives and kids behind in search of alternative sources of income since they were previously dependent on agriculture. The traditional roles, i.e., looking after animals in the barn and doing agricultural work, decreased. Agricultural land is swept away by a landslide. Women are still the caretakers, and all the household chores are on their shoulders. Pakistan had NDMA, in 2010 to deal with disaster before all the disasters were tackled under Natural Calamity Act 1958. Unfortunately, disaster management in Pakistan has been often highly disorganized due to the overlapping roles and responsibilities of various government agencies, like power development, defense forces, emergency cells, and different national and international NGOs. The nature of this investigation is entirely qualitative. More researchers will include a quantitative component. The research comprised just of primary survivors. Because natural catastrophes are more common in the north, the findings, despite their limitations, will

be helpful to researchers who plan to study different types of natural disasters. These results will furnish literature for subsequent investigations.

Declaration: We (all authors) declare that the paper is our original work and is not published anywhere.

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