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Tweaking Household Assets to Recover from Disasters: Insights from Attabad Landslide in Pakistan

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ABSTRACT

We assessed change in the asset profile of households of Gulmit village while they were attempting their recovery from Attabad landslide disaster, which occurred during 2010 in Pakistan. Primary data came from 183 randomly selected households of the disaster affected village through field work conducted in 2013. The physical, social, financial, natural, and human capitals were evaluated using weighted average indexes and cumulative indexes developed for accounting pre- and post-disaster situations. The findings reveal that all these capitals are interlinked. Any change in physical capital caused redundancy of natural capital negatively affecting livelihood opportunities locally. Loss of income and savings was result of negative impacts on financial capitals. The study further found that social capital is crucial but perishable. Human capital appears to be the most crucial hedge against vulnerabilities as healthy, qualified and skilled humans can choose alternative livelihoods in the face of climate changes, explore options, and divert their occupations while attempting recovery from disasters. Furthermore, relief packages and food aid interventions are necessary but not sufficient condition for effective disaster recovery. The relief operations are

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important in short term and helpful during the period when communities are passing through the coping stage. The restoration of physical capital (crucial infrastructure) and human capital are the most important aspects to focus upon for building resilient communities and mitigation of the negative impacts of climate change induced disasters.

Key words: Sustainable livelihood framework, disaster recovery, household assets, coping strategies, glacial lake outburst flood, landslides, Attabad.

1. INTRODUCTION

Climate- and human-induced disasters hamper economic growth, raise poverty levels, and cause immense human sufferings. According to the International Red Cross, the frequency of natural disasters has increased from a global annual average of 428 events during 1994-1998 to 707 events per year during 1999-2003 (Torrente et al. 2008). The countries with the lowest human development have experienced 142% increase in disasters during this period (Wijkman 2006, UN/ISDR/WMO 2004). The World Bank (2013) reveals that disasters caused a global economic loss of US$ 3.5 trillion during 1980-2011. Between 1961 and 2010, every year natural disasters claimed about 99,000 human lives and affected 129.6 million people (Mitchell et al. 2013).

The economic losses of developed countries could be greater, while the poorer and developing countries bore greater losses in terms of lives and livelihoods (de Goyet et al. 2006). These countries have faced difficulty in rebuilding their shattered communities and infrastructures (Bremer 2003). The primary reason behind intensified impact of disaster in developing countries perhaps is their weak social, economic and political conditions (Alcántara-Ayala 2002), which make the debate on various forms of capital (physical, social, financial, natural, and human capitals) relevant in dealing with disasters.

A recent report from Centre for Research on the Epidemiology of Disasters (CRED) and United Nations Office for Disaster Risk Reduction (UNDRR) has revealed that the world has witnessed more than 7,000 disasters during the last 2000-2019, killing nearly 1.23 million persons affecting 4.2 billion people (many even frequently) and cost nearly US$3 trillion in economic losses (Mizutori and Guha-Sapir 2020).

Pakistan's vulnerability to climate change is high. The country has experienced many climate-induced disasters during the last two decades. Disasters in the past, such as the 2005 earthquake, and major floods in 2010 and 2011, led to the loss of thousands of human lives and livestock and destroyed private properties, businesses, agriculture and public infrastructure worth millions of dollars according to the National Disaster Management Authority (NDMA 2012 & 2013). The regions of Kashmir, Gilgit Baltistan and parts of Khyber Pakhtunkhwa (KPK) province are particularly vulnerable to landslides and avalanches.

One of the most severe landslides in Pakistan occurred in Gilgit Baltistan in 2010. This landslide formed a lake near Attabad in Hunza valley (NDMA 2012). It killed 20 people, washed away 19 km of the Karakoram Highway (KKH) and blocked the flow of the Hunza River for five months. It resulted in displacement of 6,000 upstream

residents and interrupted the land route access of around 25,000 people (Petley et al. 2010, Delaney and Evans 2011).

The key policy concerns with many climate change induced disasters (like Attabad disaster in Pakistan) are their deleterious impact on the earlier investments in infrastructure and siphoning of development funds towards rescue, relief and repair (Hallegatte et al. 2007, Thomalla et al. 2006). Due to these reasons governments and donors increasingly promote resilient infrastructures and communities who can withstand frequent disasters. Nevertheless, focus is still on need-based approaches which resort on finding out what people in disaster situations need and does not allow looking for what they have possessed and how their capacities can be fortified. Thus, it is impossible to create resilient committees without adequate understanding of what people do from within in face of disaster and in the recovery phase and how government and international donor may augment their existing levels of resilience.

In this backdrop, the objective of this study was to understand the internal dynamics of household's livelihood assets (i.e., the way people change the combination of physical, social, financial, natural, and human capitals) to recover from the disaster situations based on the case study of Attabad landslide in Pakistan.

The next section presents the conceptual sketch that informed the data collection, analysis, and interpretation; and next follows a methodological section detailing data collection and analysis. Subsequent section presents the results and paves the way for sections on discussion, conclusions and recommendations.

1.1. Conceptual Sketch: Livelihoods and Climate Change induced Disasters

A livelihood refers to sustenance through activities, assets and capabilities, and is considered sustainable if it can withstand shocks and stresses in the long run while keeping its natural resource base intact (DFID 2001). An asset portfolio is the asset base of a household and gives a clear framework to understand household capitals including physical, social, financial, natural, and human capitals, and other assets that help them earn and diversify their livelihood (Davies and Bennett 2007). In light of the livelihood approach, the ability of a household to survive shocks and stresses can be conceptualized as a function of their access to and control over assets (Ellis 2000).

Based on Sen's work, various asset-based approaches to livelihoods and household well-being are currently in fashion (Hussein 2014). These set of approaches emphasize households for having stable access to and control over assets to safeguard their well-being in the face of various vulnerabilities (Jakobsen 2013). It is a paradigm shift from

earlier development approaches (Mazibuko 2013) as it offers a sophisticated and comprehensive understanding of livelihoods and the different elements that people combine to earn it (Small 2007). The sustainable livelihood framework (SLF) is linked with sustainable development thinking but provides a more practical way to address the complexities of multiple survival strategies because it focuses on people, their existing resources and activities (Restrepo et al. 2009).

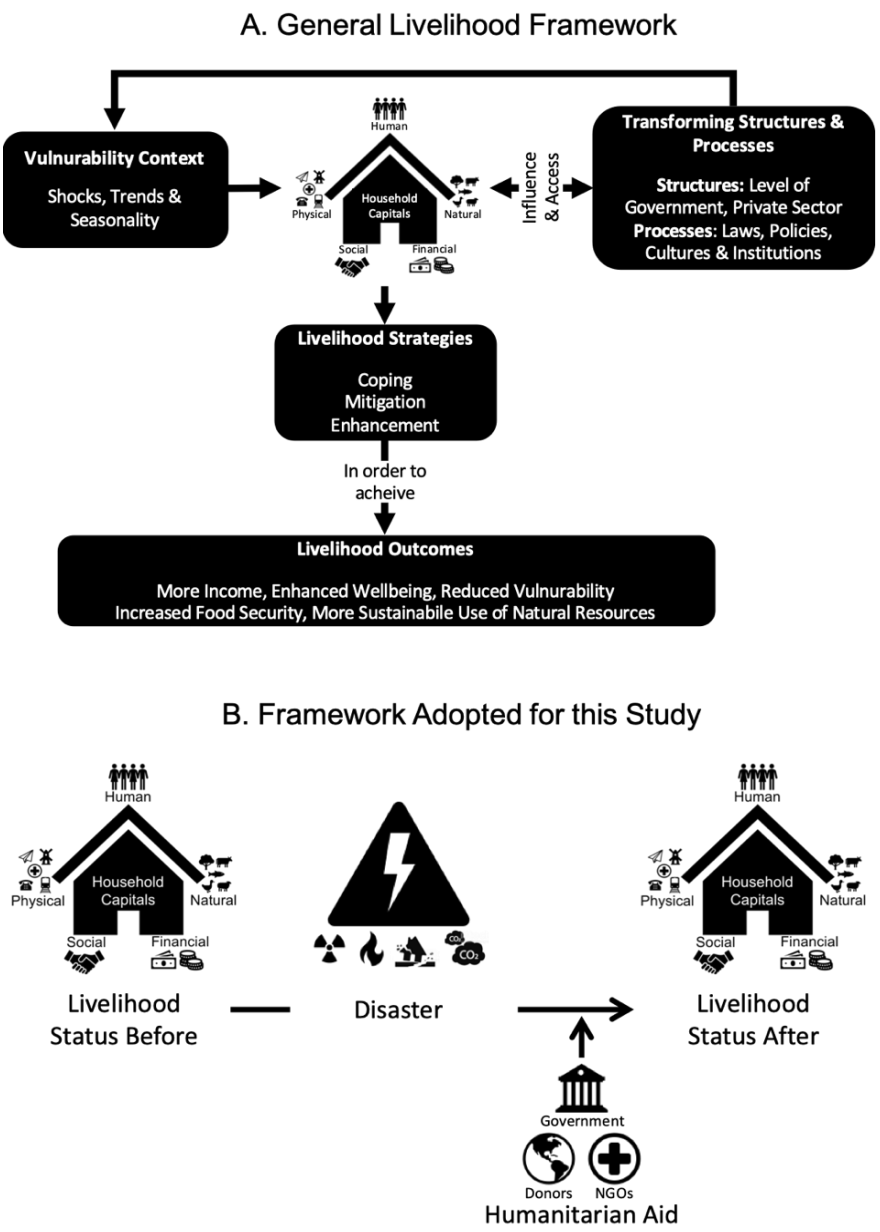
Livelihood assets owned by households represent the basic building blocks with which households undertake production, engage within the market, and participate in exchange with other households. According to Bebbington (1999), one can conceptualize the asset-base of people as a combination of various capitals. These include health, skills and experience of household members (human capital), their relationship with wider communities (social capital), their natural environment (natural capital), as well as physical and financial capital (Arega et al. 2013). Nevertheless, how people make trade-offs and which capital they rely depends on what development, poverty, livelihood, and even disaster means to them, the constraints under which they take decisions and the power relations that shape their agency.

This asset pentagon asserts on substitution of various capitals by making various combinations to achieve desired livelihood outcomes (DFID 2001, Müller-Böker 2008, De Satgé and Holloway 2002). This is even true for disaster situations as well where people respond to any shock by changing the combination of their household assets as required by the situation to achieve positive livelihood outcomes (DFID 2001). For example, in case of a drought in Sundargarh district of Orissa, Mishra (2007) found majority of the Oraons changing their occupation; some selling or mortgaging their lands and other household assets while others temporarily migrating. This proposition is also somewhat similar to Jacobs and Makaudze (2012) who argued that people change their livelihood strategies overtime as they adopt in response to change in their surroundings.

Nevertheless, people are not completely on their own in disaster situation and it is not only the disaster that shapes their post-disaster livelihoods. Disaster may trigger some level of humanitarian assistance by the government, NGOs, and other entities such as national and international donors and philanthropists. Thus, one can conclude that resilience of a household to a disaster may be a function of their own assets and capabilities plus the institutional arrangement and external support that mediate their relationship with the disaster. Relying on these underpinnings, this study used DFID's sustainable livelihood framework, particularly its asset pentagon and livelihood outcomes as the conceptual framework. Figure 1 summarizes various ideas borrowed from these discussions. The succeeding section serves two purposes: the way this

conceptual framework was operationalized for this study; and provide methodological details of the Attabad case that helped in understanding the broader research question that we have raised above.

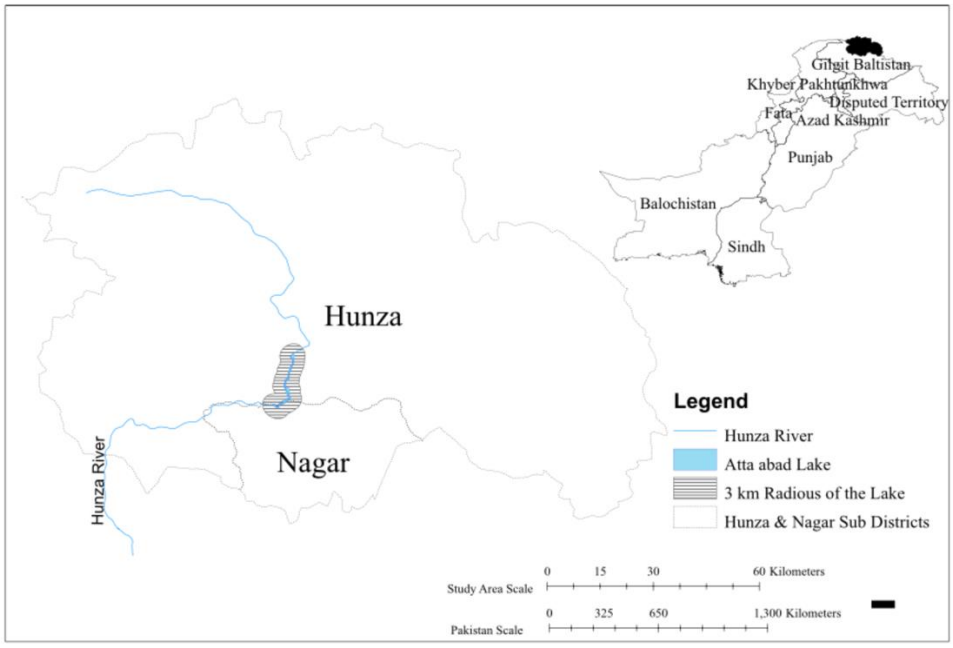
Figure 1: Conceptual Framework



2. METHODOLOGY

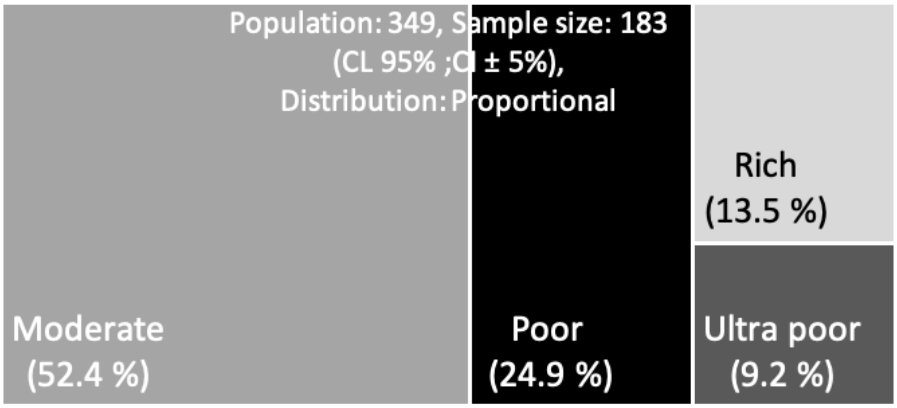
The Hindu Kush Himalayan (HKH) region, that includes the Northern Areas of Pakistan (Figure2), is the earth's most critical landscape in the context of climate change. The region that experienced the direct impact of this landslide consisted of Gulmit village and surrounding areas. At the time of disaster, this village inhabited about 2,500 persons and was serving as the headquarter of Gojal sub-district. The main market of the area had more than 130 shops, the hub of the local administration with facilities like a post office, bank, schools and a hospital.

Figure 2: Study Area Map



Primary data came from the sample household survey of 349 (sample drawn at 95% confidence level and ± 5% margin of error), two Focus Group Discussions (FGDs) and four key informant interviews carried out in 2013 (Figure3). The details of coordination schema and survey tools can be found in supplementary materials. The selection of respondents followed the random sampling technique applied on the sampling framework obtained from FOCUS Humanitarian Pakistan. Following the techniques suggested by Miah (1993) and applied by Mahdi et al. (2009), and Memon and Thapa (2011), the information on various variables of five capital assets were converted into Weighted Average Index (WAI) and Composite Indices (CIs) to present the overall changes in the livelihood assets. Statistical difference in the before and after means of the key variables came through *t-test*.

Figure 2: Conceptual Framework



3. RESULTS

This section contains the results of the analysis. The analysis focuses on the process of recovery of households from the Attabad landslide in 2010 based on the analysis of changes in household capitals to understand the strategies that people adopted to recover from disasters and bounce back to the pre-disaster state of their livelihoods. It assumes that the successful recovery from disaster situations is a function of the household's ability to strategically manipulate its capitals and, thereby, approach the desired livelihood outcomes in the short- and long-run. It further assumes that the quicker a household bounces back to its pre-disaster state, the more sustainable or resilient it is to face recurring disasters.

3.1. Changes in Physical Capital

Key construction materials for a typical traditional house in the Gulmit village were mud, rough stones, and wood. Since the construction of Karakoram Highway (KKH) in 1986, people started connecting to cities for education and employment. Their increased exposure to urban housing and lifestyles resulted in modifications and improvements in their own rural houses.

Traditionally, only few households had separate rooms and bathrooms for each household member. Table 1 presents the housing details of these households before and after the disaster. The average number of toilets increased in the low and moderately disaster affected households while it had slightly decreased in the highly affected households. The reason was that the 11 houses of the highly affected household were yet to be fully reconstructed. The numbers of separate kitchen in all

the three disaster categories also increased (Table 1). It was also observed that households constructed a separate kitchen when building their new house.

Table 1: General characteristic of housing in Gulmit village

Housing characteristics	Categories of disaster effect							
	Low (n=99)			Moderate (n=54)			High (n=30)	
	Before	After		Before	After		Before	After
Average house area sq. feet	1343	1346		1441	1444		1593	1496
Rooms per house	2.96	2.97		3.4	3.5		3.8	3.1
Toilets per house	1.54	1.55		1.87	1.88		2	1.8
House having Separate Kitchen	66	67		38	39		24	26
Houses with no kitchen	33	32		16	15		06	04
Source: Households Survey 2013								

The close proximity to Hunza River caused some houses of Gulmit to experience higher impact of Attabad disaster than those located farther. The River blockage due to landslide formed a lake with constantly rising water levels that drowned close to 17% of the houses in Gulmit. Since the water level rose gradually, these people could move to safer places along with all their movable assets, including the housing materials such as wooden roofs, windows, and doors.

To assist in disaster recovery process, the governmental and non-government organizations arranged tents for the internally displaced persons (IDPs). Within a couple of months of the disaster, the Aga Khan Planning and Building Service Pakistan (AKPBSP) provided affected households with shelters as a short-term remedy. Meanwhile, the Government of Pakistan also extended a relief package having provision for the reconstruction of damaged houses. Most of the IDPs had land in other parts of the village as well. They utilized the construction materials from their erstwhile houses and the grant from the Government to reconstruct their houses at these new sites.

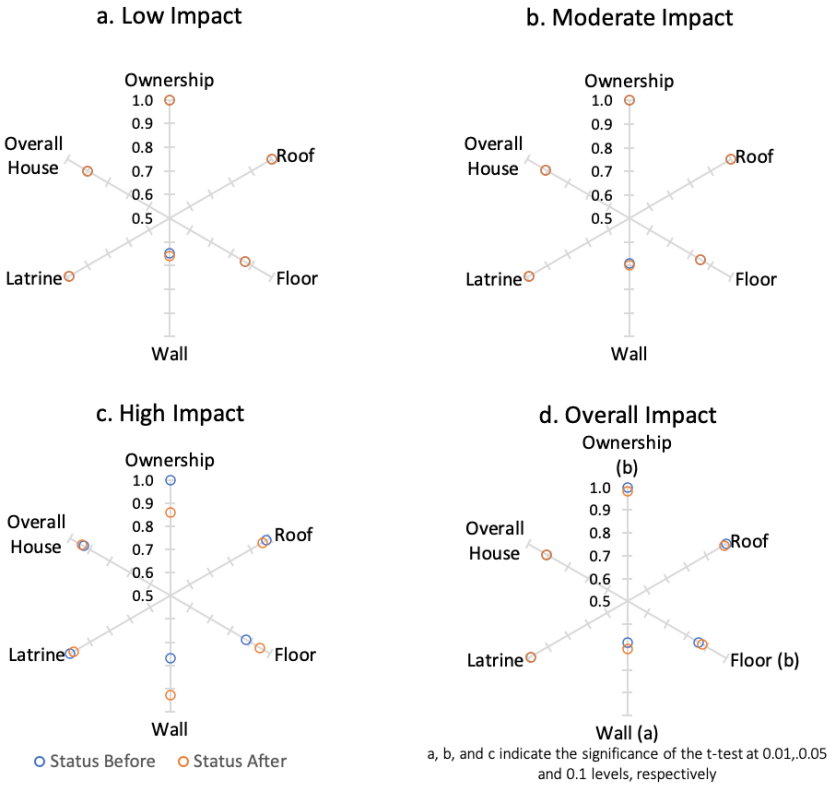
Despite this assistance, about 11 households could not complete the construction of their homes till the time of this survey. Four of these households had been living with their relatives and family friends while the remaining seven were still in the shelters and living a congested life due to their large family sizes till the time of this survey. Finally, it is noteworthy that none of the disaster-affected household had moved out of Gulmit.

After the disaster, there appears to be slight improvement in the quality of floors and walls of the highly effected households (Figure 4). This was because they appropriately utilized the construction compensation and the material of their dismantled houses to construct their new houses with reasonable improvements. This is quite reasonable in purview of the fact that when people construct new houses they tend to improve and customize it based on their experiences of living in their old houses.

Therefore, disaster-affected household tried to fulfil their wish list to the extent possible within the limits permitted by the resources at their disposal. In this case, it is evident that the physical features of their dwellings had improved after the disaster as compared to the state of their dwellings before. Changes in the house ownership, type of floor and wall were highly significant (Figure 4) as people who had constructed new houses had improved the quality of housing such as type of floor and walls.

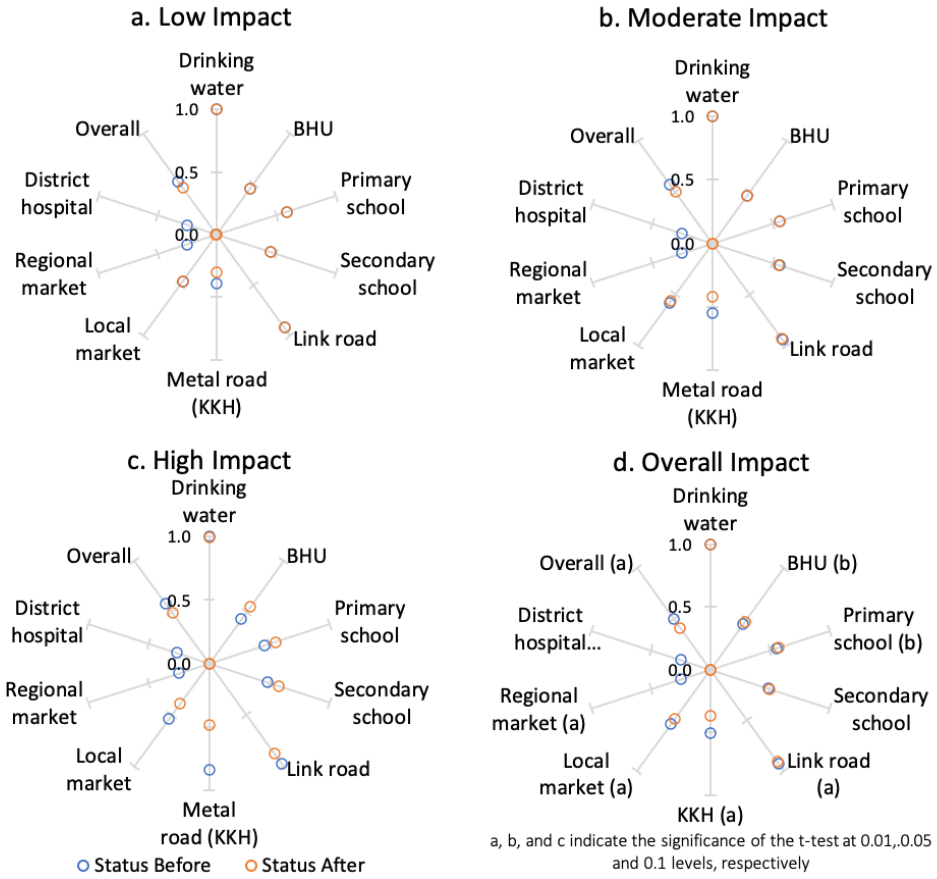
Figure 4: Changes in quality of housing in Gulmit village

(Source Household Survey 2013)



Changes in household's access to basic facilities varied from facility to facility. Changes in some facilities were highly significant while in others only moderate or negligible. Access to some facilities had slightly improved after the disaster while in other cases it had decreased (Figure 5). Drinking water facility remained mostly unaffected. This was because the local management and people had done significant labour work to repair the supply line wherever damaged. The Water and Sanitation Extension Program (WASEP), responsible for the provision of tap water facility to the community, provided the technical assistance to local endeavours for the restoration of water supply.

Figure 5: Changes in access to basic facilities (Household Survey 2013)



Access to the Basic Health Unit (BHU) and primary school buildings significantly improved (Figure 5). Among the highly affected households, the access to BHU,

primary and secondary educational facilities had improved. The majority of the highly affected households shifted to Dalgiram and Chamangul hamlets of the village. The English medium school, where most of the children study, and Aga Khan Health Unit exist in Dalgiram while the BHU and Government boys' high school were located in Chamangul. As a result, the access to school and health had improved.

The households of the other two categories faced no changes because they were not dislocated. Since all the displacement for these two categories had occurred within the village, there was almost no change in their access to these facilities such as school and local hospital. Changes in access to a metaled road (the KKH), regional market, district hospital and local market were highly significant (Table 3). The artificial lake submerging the KKH blocked the access to regional market and district hospital while the local market was also not easily accessible to the highly affected households because of their relocation to other places of the village. These households faced problem in accessing the link road and local market; previously they had the market and link road connected to their doorstep.

3.2. Changes in Social Capital

Social scientists (e.g. Szreter and Woolcock 2004) have identified three types of social capital: i) Bonding capital, ii) Bridging capital and iii) Linking capital. Bonding capitals include networks with homogeneous groups, kinships and friends within certain organizations or ethnic enclaves (Szreter and Woolcock 2004). Bridging capital refers to heterogeneous networks (Jenkins 2006) beyond the bonding capital. Linking capital refers to ties and networks negotiating social and economic differences; the norms of respected and network of trusting relations between people (Szreter and Woolcock 2004). Interactions with ethnic and religious groups, village committee, village/ women organizations (V/WOs), were the bonding capitals while interaction with NGOs and political party were the bridging capitals considered in this research (Figure 6).

The extent of bonding social capital decreased with an increased effect due to the disaster. The bonding social capital of the low-affected households had the same level of interaction as they had before the disaster (Figure 6). However, the interactions of moderate and highly affected households had substantially decreased with an increased effect due to the disaster. This was because highly affected people had dispersed from their old places to new neighbourhoods. They were living away from their long-established neighbourhoods, relatives, and friends. For example, interaction with ethnic group had decreased for highly and moderately affected households.

Majority of the people belonged to the same tribe and had good integrity in performing their customs, working together in the field and helping each other. Moderately affected

households had lost their agricultural land, shops, business, and trees, while the level of interaction of low affected households remained the same as they suffered minimal loss. Changes in bonding social capitals were significant such as interaction with ethnic group, village committee, village organization and religious group (Figure 6). These changes were due to the highly affected households (IDPs) that have been displaced and felt isolated from their old place, relatives, neighbours, WO platform and settlement.

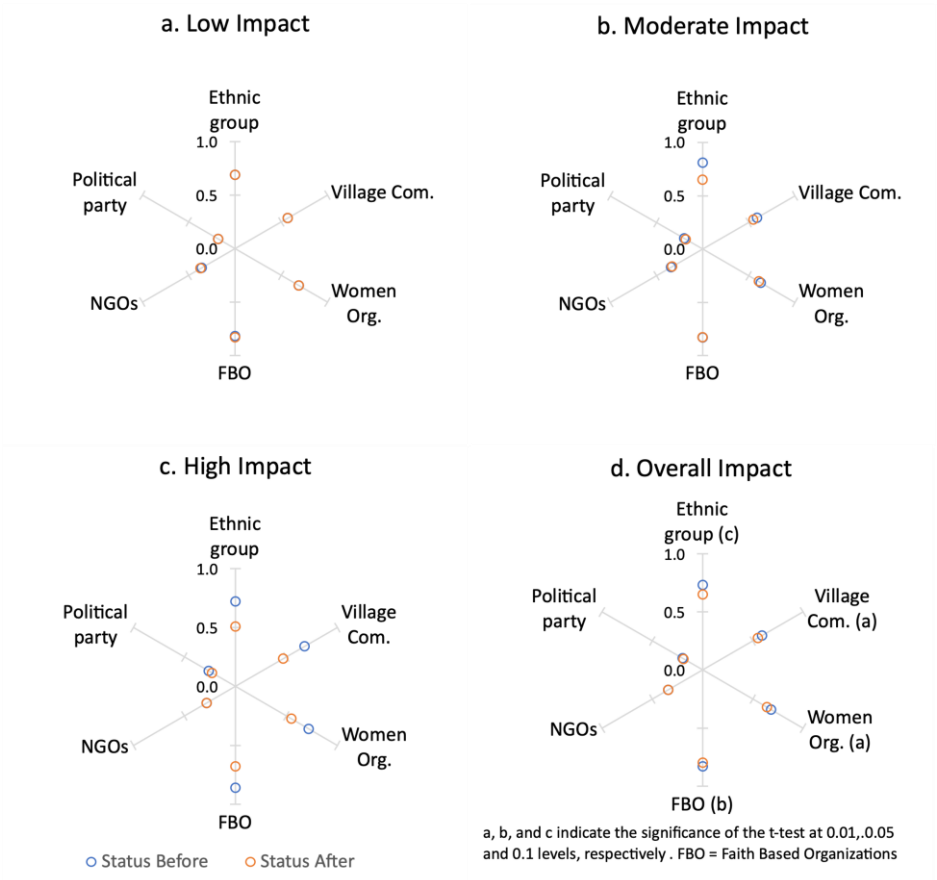
People of Gulmit village have strong affiliations within and outside the community through various organizations. FGD participants elaborated that linkages with NGOs were higher in Gulmit than the other villages of the valley. This was evident from the assistance received by affected people from various NGOs and governments. In any case, interaction with NGOs remained the same (Figure 6) with negligible changes before and after the disaster. The Aga Khan Development Networks (AKDN) continued its support to this community for several years to improve their life quality through the provision of clean drinking water, saving schemes, entrepreneurship opportunities, women empowerment, housing improvements, disaster risk management, education, and health interventions.

Insights on social capitals may also come from the analysis of the cash and in-kind support that people have been receiving from different organizations and countries. The Government of China, Government of Pakistan, USAID, World Food Program, AKDN, NDMA, Bahria Welfare Trust and others supported the community during the recovery from the disaster. Since the disaster occurred, the Chinese Government partially continued its relief package till 2015. Besides reconstruction and relief activities, these NGOs also arranged training sessions and awareness programs on disaster recovery. As this was a major disaster in the lives of many, the people also faced mental stress and other psychological problems. To help them recover, these organizations arranged entertainment programs for the affected people.

During the FGDs, it emerged that after six months of the disaster, people stopped paying fees of their children at a community English medium school. Since these schools pay teachers' salaries from the fee of the students, their management faced difficulties. However, they managed it through the school funds that donors and visitors extended. The honorary Board of Governors directly approached the external donor organizations and raised funds. Last but not the least, the interaction with political parties marginally decreased (Figure 6) as people were busy with survival efforts, which caused them to keep political participation at the lowest priority. Overall, the social capital, being non-material asset, played a vital role in supporting the livelihood

and its recovery in the times of limited access to other livelihood capitals such as agricultural lands.

Figure 6: Changes in Social Capitals (Household Survey 2013)



3.3. Changes in Financial Capital

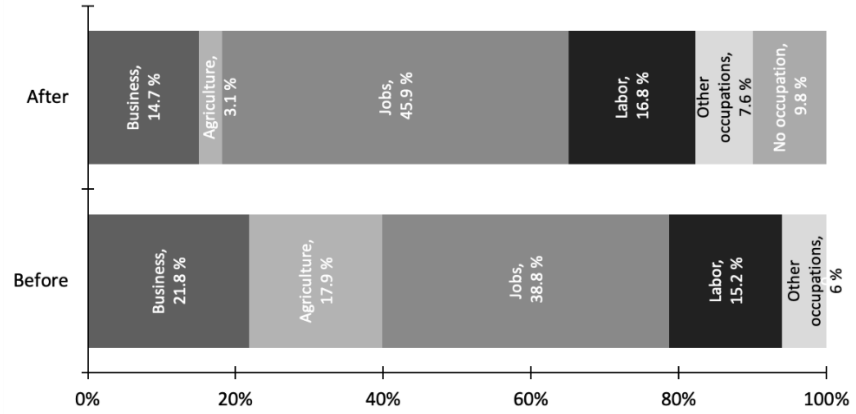
People in the study area derived their income from diverse sources such as agriculture, services, livestock, and skilled labour. People also accessed different credit institutions that helped improve their financial position. Therefore, financial capital was observed through the three major sources of income (primary, secondary, and tertiary), access to different credit markets, and the status of loan and savings before and after the disaster.

The Attabad disaster had altered the local occupational structure. Before the disaster, households derived their income from diverse sources such as agriculture, business, jobs and skilled labour (Figure 7). Agriculture (natural capital) was the economic mainstay for most of the households. Potato was the major cash crop and primary

income source before the disaster although people also grew fruits such as apricot and apples. However, after the disaster, jobs became the main source of income for the households (Figure 7). Those whose livelihoods were dependent on agriculture diverted to other sources of income either because they lost their agricultural lands or because they lost their connectivity with the regional market.

The disaster caused inaccessibility to market for agriculture products. Before the disaster, brokers from the cities would come to Gulmit to purchase potatoes. People had been earning profits from growing potatoes; such production became non-profitable due to increased transportation cost due to the blockage of KKH and lost market connectivity. People from the city stopped coming to purchase cash crops and fruits from Gulmit. This motivated people to suspend their agricultural activities and search for other income sources.

Figure 7: Changes in Occupational Structure of Households in Gulmit Village (Household Survey 2013)



The submerged area situated along the KKH was the local commercial hub for many. Due to landslide, they lost their businesses including hotels, restaurants, markets, shops for rents, banks, and other properties. Those who had shops had shifted their valuables to safer places while those who were running hotels, restaurants and shops for rents were left with nothing as their properties were submerged in the lake. Since the area is famous for its natural beauty, tourists would visit the site before the disaster and supported the local economy and livelihoods of those engaged in hoteling, tourist guiding and similar set of activities. After the disaster, tourists stopped visiting the area. This resulted a sharp decrease in the income of many. Some households' source of income was the livestock partially fed on fodder purchased from the city. Due to

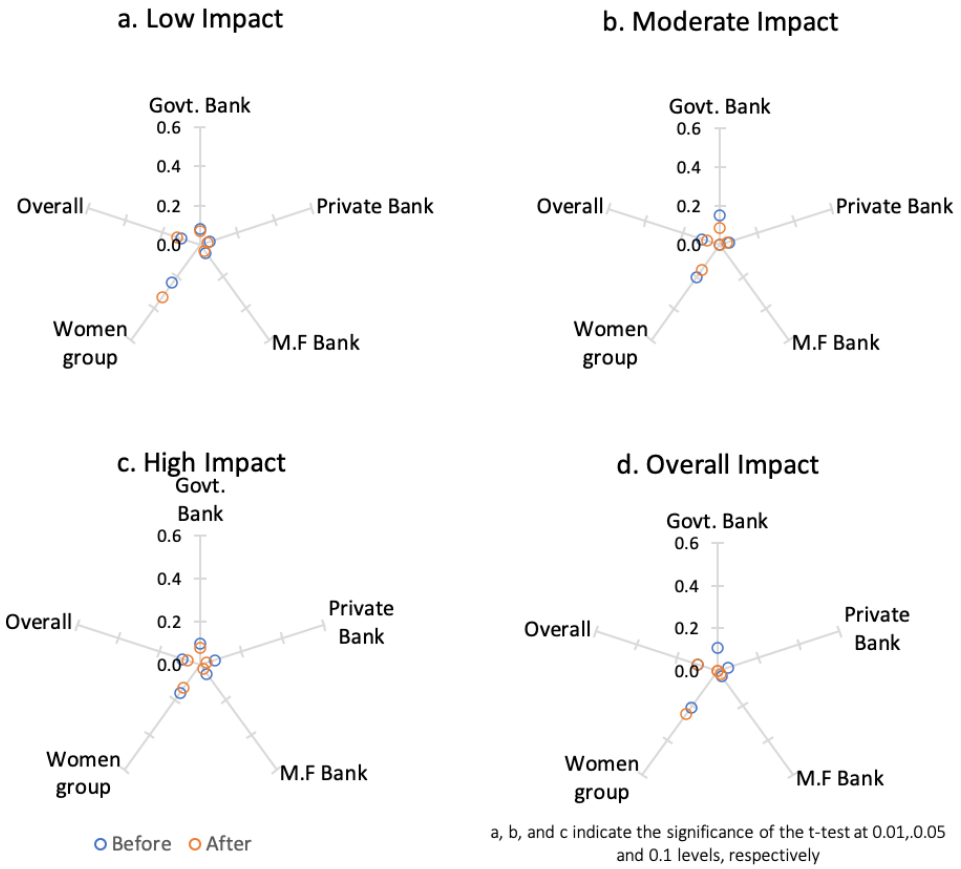
escalated transportation cost, they reduced their herd sizes and no longer could rely on it as primary income source. Notably, the unemployment increased (Figure 7).

People of remote areas use various credit markets to support livelihood scale projects. Each sub-section of the village has its own V/WO and majority of the villagers obtain loans from it. Throughout Gilgit Baltistan, the Aga Khan Rural Support Programme (AKRSP) has established V/WOs to encourage people save some part of their income for contingencies. Members of the WOs obtained loans for the purpose of education, purchase of seeds and fertilizers, marriages of their children and other domestic needs. Some households obtained loans from the National Bank of Pakistan as well that operates in the village. Businesspeople, entrepreneurs, and skilled persons had access to loan facility extended by the local banks.

People preferred to borrow from V/WO because the funds from their savings circulated within the village and the profit was divided among the members of the V/WO. Prior to the Attabad mishap, people had higher access to financial markets for loans and deposits. According to paired t-test, changes in access to private and government banks were significant (Figure 8). They would borrow from formal institutions and pay back upon the receipt of income from crop farming activities while at the same time saving some part of income with V/WO.

However, after the disaster, they hesitated to access these institutions because of the apprehensions of defaulting as most of them had lost their income from crop farming. Amid this a general decrease in the access to formal credit institutions, the access to V/WO had particularly increased in the low affected households as they realized the value of savings in the disaster situations. Medium and highly affected households had lost their agriculture land, forest and other income sources, and so their access to V/WO slightly decreased (Figure 8).

Figure 8: Change in Access to Formal Credit (Household Survey 2013)

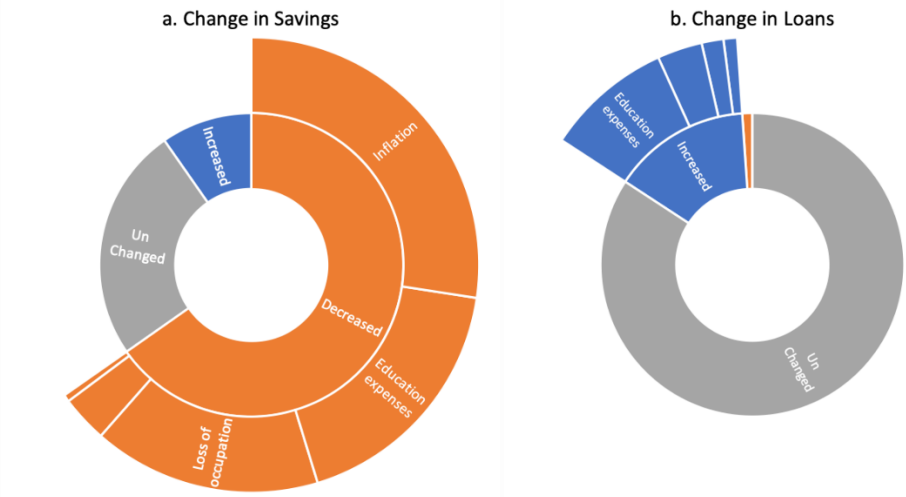


Together with the livelihood losses of many, the savings decreased after the disaster due to the higher prices of consumer goods, increased educational costs, and failure of local businesses and economic activity (Figure 9). Educational expenses increased after the disaster since students go to cities after matriculation for higher education – where cost of schooling is very high. Also, increased transportation cost had made the production of cash crops unprofitable. Loss of this income source affected the savings of farmers. Similarly, those who lost other businesses, which submerged in the lake, also had nothing to save.

People hardly met their kitchen and schooling expenditures after the disaster. While entangled in disaster recovery, living expenses of many of the households were greater than their income. Initially, people used their savings; once this faded, they approached the credit market to maintain their living expenses. Thus, the average loan per household had increased after the disaster. In majority of the cases, people used loans

for educational purposes, the reconstruction of the damaged/dislocated houses, and starting new businesses as well as purchasing public transportation vehicles and boats.

Figure 9: Reasons of Change in Savings and Loans (Household Survey 2013)



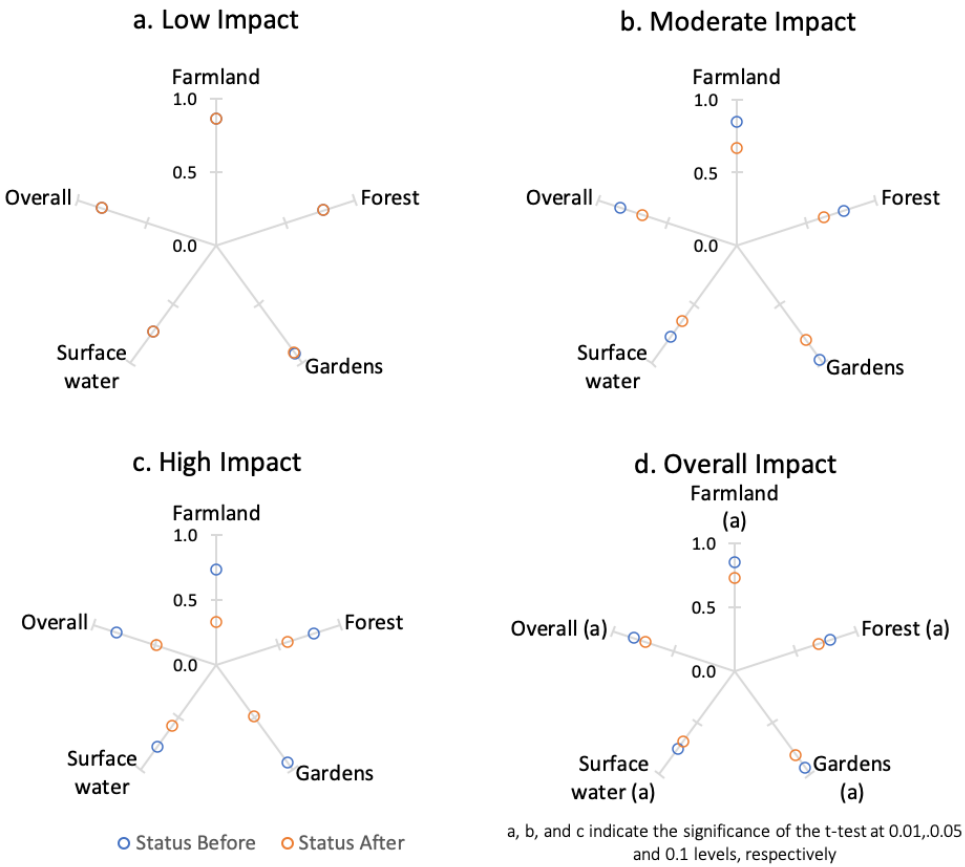
3.4. Changes in Natural Capital

Natural capital is intricately linked with vulnerability because disaster destroys natural capitals like agricultural land, trees, and forest. The landslide also killed more than 5,000 fruit and other trees. Natural capitals are particularly important to those who derive all or part of their livelihood from agriculture and livestock. Agricultural land was the major livelihood source for most of the households in the study village. As mentioned earlier, agricultural households in Gulmit would grow potato as the main cash crop that enabled these poor people to educate their children and fulfil their basic needs.

Natural capitals were analysed through the changes in access to agriculture land, forest, garden, and surface irrigation. Changes in these variables were highly significant (Figure 10). Access to these amenities among medium and highly disaster affected households decreased (Figure 10) as they lost their agriculture land, forest, and garden.

Figure 10: Changes in Natural Capitals and its Building Variables

(Household Survey 2013)



Households who owned more agriculture lands, forests and human resources also kept substantial number of livestock compared to those having fewer of these resources. Since people of this area consume milk tea as an integral part of their everyday diet, they keep at least a few cows to meet their domestic demands. Those having surplus milk sell it to earn small cash. Households also earn small cash income by selling butter and eggs. However, this income generation and subsistence opportunity was not present in its earlier form as the number of livestock had decreased after the disaster and changes in these variables were highly significant at $p<.05$ (Table 2). The major reasons of changes in livestock included the lost access to forest and agriculture land, lack of human resource, and lack of feed/grass. However, loss of income from cash

crop was also one of the major reasons for decrease in livestock since many people sold their livestock to fulfil their domestic needs and educational expenditures. Also, forests were a major source of fodder for the livestock of the local community. The forests of moderate and highly affected households had submerged resulting in reduction of their herd size.

Table 2: Changes in livestock ownership of households in Gulmit village

Livestock	Before					After				*t* test
	Total	N	$\bar{x}$	SD		Total	N	$\bar{x}$	SD	
Cows	516	177	3	2		390	178	2	1	.000
Sheep	1430	116	12	12		909	112	8	6	.000
Goat	248	21	12	5		151	15	10	4	.001
Hen	87	9	11	3		71	14	5	2	.609
Source: Household Survey 2013										
Paired t test is significant at .05 level.										

3.5. Changes in Human Capital

Only 2% of the population was affected from the disaster and most of them were from the category of highly affected households. Human capital did not decrease as literacy rate of this area was high and people's priority was to invest in education. Gulmit village has many educated and professional people living abroad and in major cities of Pakistan. They also made efforts to bring their people out of the disaster shock by channelling funds through different NGOs and donors that visited the affected area.

The disaster had no severe effect on the physical health of the people of the study village. Majority of the highly affected villagers, however, have been facing mental trauma as pointed out by them during the household survey, key informant interviews and FGDs. In disaster situations people usually become weak and unhealthy due to shortage of food but this problem did not appear in the study area as the Chinese Government provided them food aid comprising of high-quality rice, flour, cooking oil, sugar, and milk powder. A few of them also grew substance crops and vegetables and used domestically produced dairy products.

The disaster did not affect education due to timely government intervention. The Government of Pakistan was cognizant of disaster effect on education and provided compensation to the affected families so they could continue their children's education. The disaster affected the education of only 28 students for some months of which some 25 students could continue their education and three of them left their studies because of domestic and financial problems and other causalities (death of father in an accident). Three had completed their 14 years of education and were employed.

After the disaster, different local and international NGOs organized trainings for the affected people to provide them skills to earn income. Those who received trainings used their newly learned skill for income generation. About 13 people received trainings and among them 11 were females. Those who had skills before the disaster but were not using it for income generation again started using their skills because they had no other option of survival.

4. DISCUSSIONS

Livelihood reliance on primary sector poses formidable challenges to millions in the countries vulnerable to climate change. Those engaged in primary sector consume natural capitals as a main source of livelihood and thereby remain highly vulnerable to the impact of climate change (Senapati 2020). Majority of the households of Gulmit village of the Northern Areas of Pakistan also used natural capitals in terms of agriculture and livestock. The local cash crop (potato) was the major income source for most of the households before the disaster. The households saved some of their cash earned from cropping in the V/WOs and spent it when needed (for example for their children's education) and thereby invested in building their human capital. This suggests that there is an intricate link between household capitals and that the exchanges take place between different capitals (Mumuni and Oladele 2016).

However, the disaster has changed the entire socioeconomic fabric of the society. High consumer prices of everyday goods and services, and loss of connection with regional facilities such as market for agricultural crops, civil hospitals resulting from the damage of KKH (physical capital) had a detrimental effect on the local livelihoods.

Owing to pre-disaster investments in human capital in the form of education and nutrition, the second major source of the livelihood of this village was employment in public, private and NGO sectors. Hence as happens in other contexts as well (e.g., Mahdi et al. 2009), households in the study area were also using a combination of natural, human, and other capitals to earn their livelihoods. The loss of physical capital, the road in this case, is one of the most important damage in natural disaster reported in literature (Faiz et al. 2012).

The disaster caused a near complete loss of local interest in agriculture whereby many of the affected people even did not cultivate their lands for subsistence purposes. They relied on food aid from China that continued till 2015. The number of livestock decreased because people sold them to fulfil their domestic and educational expenses. The other reason of reduction in the number of livestock was the seasonal shortage of fodder/grass. These situations have decreased the households' access to natural

capitals. This suggests that depending on the nature of disaster, people's dependence on natural capital may vary and inter- and intra-capital exchange may take place (Xu et al. 2018).

In our case, Gulmit had strong human and social capitals, which enabled people's connection with NGOs, the Government and foreign aid organizations for relief and recovery. Thus, they were quite successful in getting food and non-food items and compensations for their damaged properties. Consequently, social, and human capitals were the combinations the households exploited for post-disaster livelihood recovery. Amid all this, as also has been observed elsewhere (e.g., Mumuni and Oladele 2016), the disaster raised psychological problems, trauma and relief addiction, loss of virtues (such as self-reliance and self-esteem) and thereby eroded human capital. These traits were the key concerns of many community members as well as development practitioners in the study area.

In a nutshell, it emerges out forcefully that capital endowment may have a mediating as well as moderating impact on the livelihoods in disaster situations and people in a community may experience disaster differently in accordance with their access to livelihood capitals. The livelihood coping strategies may also have strong connection with the nature and combination of household's resources and capital endowment. The empirical support for these findings in the broader body of knowledge is constantly emerging (see Khayyati and Aazami 2016, Qiu et al. 2018) and with more and more studies we would be better at understanding the role of capital endowment in mediating the socioeconomic impact of climate change, natural disasters and sustainable development.

5. CONCLUSIONS

The objective of the study was to understand how disaster-prone households strategically chose the combination of different household capitals and assets at their disposal while attempting recovery from natural disasters. A mix of qualitative and quantitative methods were deployed for the analysis of variation in the five livelihood capitals of the households affected in Attabad landslide. The major conclusion of the study is that household capitals, namely, physical, social, financial, natural, and human are intricately interlinked. Any change in the physical capital caused redundancy of natural capital, thus negatively affecting the local livelihood opportunities. Loss of income and savings resulted in negative impacts on financial capitals. It is concluded that social capital is crucial but perishable and its overexploitation may erode this hard-earned capital through investments in building relationships and mutual trust.

Human capital appears to be the most crucial hedge against vulnerabilities as qualified and skilled humans can choose alternative livelihoods in the face of climate changes, explore options, and divert their occupation while attempting to recover from disaster. Furthermore, relief packages and food aid interventions are necessary but not sufficient drivers of effective disaster recovery and continuing these for longer periods may cause community to lose values such as self-esteem and self-reliance. The restoration of physical capital (crucial infrastructure) and human capital are the most important aspects to focus upon for resilience of vulnerable communities and mitigation of negative impacts of climate change induced natural disasters.

6. RECOMMENDATIONS

Disasters have always occurred in the past and will continue in future. The key to the survival of humankind has always been its function to adapt and recover to best of their ability. In modern times, due to improvements in communications technology and calls for humanitarian assistance, relief is one of the major resources available to disaster affected communities. However, understanding disaster with reference to different livelihood capitals and strategies may provide insights for policies striving towards self-reliance as opposed to aid addicted communities. To inform policies for restoring the livelihoods of disaster-affected communities at Attabad and elsewhere, the following recommendations emerge from this study.

- While planning relief, policy makers need to understand different phases of disaster recovery. Immediately after disaster, it makes sense to provide support in the form of food and other daily use items. However, continuing such policies in the long run, as has happened in Attabad, does not make sense and may cause aid-addiction such as among the people in our study area.
- Communities should be considered as 'subjects' of their disaster recovery and all rehabilitation attempts. What relief effort can do in rehabilitation is to understand local livelihoods and provide key support that may be in the form of restoring the damaged infrastructure[1] or resource system upon which local livelihoods prior to disaster were depending. While restoring these crucial physical and socioeconomic infrastructures, direct aid in terms of food and non-food items should gradually decline so that communities try to regain their lost livelihoods without indulging into aid-addiction or losing self-esteem and self-reliance.

[1] Pakistan started the reconstruction of missing piece of KKH at higher elevation around the lake in 2012 and completed it late 2015.

- Immediate support, while looking at tangible needs, should not ignore intangible needs such as mental health and psychological support and must make such provisions for peoples' recovery from the traumas.
- The role of human capital is crucial in the disaster preparedness of communities. Investment in human capital, particularly education implies that a diversified human capital will remain on standby to face any unforeseen situation.
- Like other capitals, social capital is also likely to exhaust if overused. The bridging social capital, which is characteristic of the most disasters in developing countries due to the vigilance of humanitarian organization nationally and internationally, must act carefully. Given the increasing frequency of disasters, it is an important but not a sustainable capital. Overuse and overreliance on bridging social capital in the coping phase of disaster recovery may restrict people to be the subjects and masters of their recovery from the disaster. Thus, it might be good for organizations other than governments to see where they can invest in interventions that focus on reviving peoples' livelihoods, and not just feeding them on day-to-day basis. Such interventions may include restoration of critical physical infrastructure, agricultural inputs, and grants to regain lands and start businesses.

7. LIMITATIONS AND FUTURE RESEARCH

Different disasters types have different implications. Some human-made and natural disasters displace communities within the same area, as has been the case in this study, while others cause them to be displaced to far-flung areas. In both cases, there are different implications for the conceptualization of disasters and their impact. While conceptualizing this study based on the literature review, we could not notice these distinctions at inception. As a result, some of our measures lost their validity. For example, households dislocated within a periphery a few kilometres may not notice much change in their access to different facilities as there has not been much difference in terms of distance. It is not only problematic but sometimes meaningless to measure such distances. Instead of measuring such distances in terms of kilometres, one can measure the differences arose in terms of difficulty to access or cost of access. Bringing these measures will make analyses more meaningful than the way presented in this study. Future studies should make this as an implicit part of conceptualization of disaster impacts. While we selected our sample with reference to different disaster categories, we could not perform how different income groups respond and recover from disaster. Future research should address this issue as it can provide new set of insights, which will help in understanding people's efforts of disaster recovery. This study analysed only variation in livelihood capitals but ignored the institutional

processes that play a key role in catalysing change in these assets. Future studies may incorporate this aspect for more in-depth understanding of entire livelihood change scenarios. Finally, putting the findings of this study in perspective of the time lapse since the survey was held, much development work has taken place over the past eight years. The KKH initially restored in 2015 is now undergoing major upgradation works under the China Pakistan Economic Corridor initiative. Thus, it may be useful from to repeat how resilient are people's livelihoods and the level of livelihood recovery in the long run as this case can offer useful policy and theoretical insights on our understanding of human and nature interactions.

8. REFERENCES

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