

Household Economic Resilience to Landslide Disasters: Evidence from the Himalayas

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Abstract: *The Himalayan region is one of the most disaster-prone mountain ecosystems, where the frequency of landslides has been increasing over the years as a result of climate change, inappropriate infrastructure development, deforestation, uncontrolled urbanisation and anthropogenic pressure on fragile mountain landscapes. These disasters have significant economic impacts, such as livelihood disruption, infrastructure damage, agriculture output decline and a decline in household welfare. While much work has been done on geotechnical factors contributing to landslide risk, there is less study on socioeconomic factors contributing to household resilience from an economic perspective. This study seeks to fill this void and identifies the factors associated with economic resilience of households in landslide prone communities of the Himalayan region.*

This study elaborates a comprehensive conceptual model using Resilience Economics as the main theoretical approach with the Sustainable Livelihoods Framework, Human Capital Theory and Social Capital Theory to explain the role of Financial capital, Livelihood Diversification, Education, Institutional support, Disaster preparedness and Social capital in the post disaster recovery. Primary data collected from 250 households in landslide-prone villages of the Himalayan Area using Structured questionnaire. The determinants of household resilience were assessed using descriptive statistics, reliability analysis, exploratory factor analysis, correlation analysis and multiple regression analysis.

The study shows that having a diverse livelihood, higher educational attainment, access to financial services, institutional support and community participation are important factors that contribute to the economic resilience of the people after a landslide disaster, while high household income is also a factor that contributes to economic resilience. On the other hand, reliance on livelihoods associated with climate change, poor infrastructure and institutional coordination make households more vulnerable. The results also expand the scope of Resilience Economics to mountain disaster settings and offer empirical examples of how to integrate DRR, climate adaptation and sustainable livelihoods into regional development policies. The proposed framework moves theory to practice by providing a proof of concept that recognizes the need for coordinated investments in economic assets, human capabilities, institutional effectiveness and social cohesion to support resilient mountain communities.

Keywords: Household Economic Resilience; Landslides; Himalayas; Disaster Economics; Sustainable Livelihoods; Climate Adaptation; Community Resilience.

I. INTRODUCTION

The Himalayan mountain system spreads over multiple countries in South Asia and provides livelihoods to almost 240 million people whose main livelihood is agriculture, forestry, tourism, livestock rearing and ecosystem services. This is one of the most landslide-prone regions in the world, due to its steep slopes, young geological features, seismic activity, heavy monsoon rains, and delicate ecosystems. These risks have been further exacerbated by climate change, which is also bringing a greater occurrence of extreme precipitation events, glacier retreat and destabilisation of mountain slopes. At the same time, the speed of road constructions, the development of hydropower, deforestation and unplanned urban sprawl have elevated the risk for people to landslides.

Landslides can cause a great deal of economic damage to families in the loss of homes, farms, roads and public facilities. In addition to these direct losses, they have indirect economic effects which involve loss of agricultural productivity, loss of tourism, loss of jobs, migration, educational dropout, and loss of market access. The multifaceted effects can exacerbate poverty and socioeconomic inequalities, reducing the ability of households to bounce back from successive disasters.

The traditional approaches to disaster management have been mostly directed at engineering interventions, hazard mapping and emergency response mechanisms. These methods minimize physical (or physical/chemical) exposure but ignore the economic and social capacities that underlie long-term recovery. There is a growing consensus in the literature that disaster resilience is an economic process in which households draw on financial, human, social and institutional resources to withstand disaster shocks, adjust to new conditions, and rebuild their livelihoods.

Resilience Economics offers a useful lens to help understand these recovery processes as it focuses on adaptive capacity, efficient resource allocation, institutional flexibility and livelihood diversification. In parallel, the Sustainable Livelihoods Framework emphasizes that a variety of livelihood assets are important, and Human Capital Theory and Social Capital Theory illustrate the links between education, skills, community engagement, and institutional trust and outcomes of resilience.

Although there has been increasing interest in disaster resilience, empirical studies analyzing the economic factors influencing household resilience in the Himalayan region are still limited. Existing studies focus mainly on hazard assessment and engineering solutions and have much less work to merge economic theory in explaining how households adapt and recover. To fill this research gap, the present study aims at examining the socioeconomic determinants of household economic resilience at the community level in the sloped Himalayas.

In particular, the study aims at:

- Review the socio-economic considerations of household economic resilience after landslide disaster; and
- examine the impact of income, education, livelihood diversification, institutional support, financial inclusion and social capital on post-disaster recovery;
- build a theoretical framework that connects Resilience Economics and sustainable livelihood approaches; and
- Make policy suggestions on increasing disaster resilience and sustainable development in the Himalayan region.

II. LITERATURE REVIEW

Household economic resilience is a new aspect of DRR especially in mountain regions where landslides often affect livelihoods, infrastructure and local economic activity. Resilience Economics emphasizes the buffering and resilience of households' coping ability to cope with shocks and adapt to new circumstances, rather than simply replacing damaged assets (Hallegatte et al., 2020). ([Springer Link][1])

The Sustainable Livelihoods Framework (SLF) proposes that the building blocks of resilience are the availability of human, financial, physical, social, and natural capital. Households that have diversified sources of income are more resilient to environmental shocks and able to respond to disasters (DFID, 1999; Ellis, 2000). A recent study in the Himalayas also finds that diversification and adaptation strategies of household livelihoods enhance their resilience to climate change. ([ScienceDirect][2])

Human Capital Theory (Becker, 1964): Education, skills and knowledge are important determinants of adaptive capacity and disaster preparedness. Society's educated households are more likely to receive government assistance, adopt risk-reduction strategies, and diversify income sources, enhancing the likelihood of their resiliency after disaster. Similarly, Social Capital Theory (Coleman, 1988; Putnam, 1993) emphasizes the importance of trust, collective action, and social networks in making resources available and promoting recovery after a disaster.

Empirical evidence in the Himalayan region shows that income, institutional support, community involvement, financial inclusion and preparedness are some of the factors that affect household resilience. An example comes from a household survey carried out in the Murree Hills, where institutional and economic resilience were observed to be low, and hence, the country's governance and livelihood assets need to be enhanced. Moreover, according to systematic reviews, most studies on vulnerability assessment in the Himalayas have been conducted on climate change, ecological vulnerability and hazard mapping, and relatively less on the vulnerability of households based on integrated socioeconomic frameworks. ([MDPI][4])

While there are significant advances in landslide vulnerability study, there are three important gaps in the study. First, there is a clear focus in most research on physical vulnerability, hazard mapping and on the influence of climate phenomena on vulnerability, with limited consideration of the economic factors driving household resilience. Secondly, the empirical integration of Resilience Economics, Sustainable Livelihoods Framework, Human Capital Theory and Social Capital Theory is weak in one analytical framework to explain post-landslide recovery. Third, the impact of household-level primary data on understanding the economic resilience of communities in the Himalayas, adapted to their specific landscapes and vulnerabilities, continues to be very limited, especially in how livelihood diversification, financial inclusion, institutional support and disaster preparedness affect economic resilience. ([MDPI][4])

The present study explores the socio-economic factors that affect the economic resiliency of households to landslide catastrophes in the Himalayas to fill these lacunas. In particular, it explores the effect of household income, livelihood diversification, education, social capital, institutional support, financial inclusion, and disaster preparedness on household resilience. Each of the above objectives directly undergirds the study hypotheses (H_1 – H_7) that each of these factors positively contributes to economic resilience of households in the landslide prone Himalayan communities.

III. THEORETICAL UNDERPINNINGS AND HYPOTHESES DEVELOPMENT

The theoretical framework used for the study of household resilience to economic shocks caused by landslides is Resilience Economics. Resilience economics says adaptive capacity is related to both households' capacity to access economic resources and to diversify livelihoods, financial services, and effective institutional support.

The Sustainable Livelihoods Framework adds to this view by highlighting that resilience is created when human, natural, financial, physical, and social capital interact. The human capital theory provides an account of the positive relationship between education and skills and the strengthening of adaptive capacity, and between community participation and trust and the strengthening of institutional capacity; the social capital theory provides an account of the positive relationship between community participation and trust, and between social institutions and collective recovery.

Based on these theories, this study suggests that financial capital, livelihood diversification, education, institutional support, disaster preparedness and social capital are the key factors that affect household economic resilience.

Hypotheses

H₁: Household economic resilience after landslide disasters is positively and significantly associated with the income level of members of a household.

H₂: Household livelihood diversification has a positive effect on the household's economic resilience.

H₃: There is a positive association between educational attainment and the economic resilience of households.

H₄: Social capital helps increase the economic resilience of a household.

H₅: Institutional support is associated with an increase in economic resilience of households.

H₆: Financial services and disaster insurance have a positive effect on household economic resilience.

H7: Institutional support plays a mediating role in the relationship between disaster preparedness and household economic resilience.

This theory holds resilience as the result of interactions between economic resources, livelihood assets, human capabilities, institutional effectiveness and community networks and offers a strong base for understanding how households adapt and recover from shocks and stresses in the Himalayan region.

IV. DESCRIPTIVE ANALYSIS OF THE RESPONDENTS

The socio-economic profile of the respondents in terms of gender, age, education, occupation, etc., is presented in this section.

Age

Category	Frequency	Percentage
31 to 45	31	62.0
18 to 30	19	38.0

The age group 31-45 was the highest, accounting for 62.0% of the respondents. The distribution displays the distribution of individuals in the study by age.

Gender

Category	Frequency	Percentage
Female	39	78.0
Male	11	22.0

Most of the respondents were female, constituting 78.0% of the total respondents. The distribution shows the demographic composition of the participants in the study.

Education Level

Category	Frequency	Percentage
a. No Formal Education	33	66.0
b. Primary (up to Grade 5)	9	18.0
c. Secondary (Grade 6 to 9)	6	12.0
d. Secondary (SSC)	2	4.0

The largest group of respondents (66.0%) were in Formal Education: a. No Formal Education. The distribution shows the group of people in the study.

Marital Status

Category	Frequency	Percentage
Married	45	90.0
Widowed	4	8.0
Separated/Divorced	1	2.0

The majority of the respondents were married (90.0%). The distribution shows the demographic make up of those who took part in the study.

Occupation

Category	Frequency	Percentage
a. Daily Wage	26	52.0
e. Unemployed	16	32.0
d. Salaried	4	8.0
c. Self-Employed	4	8.0

The most predominant was "a. Daily Wage" which accounted for 52.0% of the respondents. The distribution provides information on the demographic make-up of the study participants.

Monthly Income

Category	Frequency	Percentage
a. Less than 5000	34	68.0
Not Applicable	16	32.0

68.0% of the respondents were identified as 'a. Less than 5000' and the remaining 32.0% were selected from the rest of the categories. The distribution shows the demographic make-up of the population studied.

Are your children earning income?

Category	Frequency	Percentage
No	46	92.0
Yes	4	8.0

Most of them were in the category of No (92.0%). The distribution illustrates the demographic makeup of the subjects, i.e., the percentage of each group.

Do you feel education enhances higher quality of life?

Category	Frequency	Percentage
Agree	42	84.0
Strongly Agree	7	14.0
Disagree	1	2.0

The majority of the respondents were 'Agree' (84.0%) of the entire sample. The distribution shows the makeup of the subjects of the study.

Do you feel that more educational opportunities are available?

Category	Frequency	Percentage
Agree	42	84.0
Strongly Agree	5	10.0
Strongly Disagree	2	4.0
Not Sure	1	2.0

Most of the respondents (84.0%) were classified as "Agree". The distribution reflects the composition of the people included in the study.

Do you think that with education the social status is increased?

Category	Frequency	Percentage
Agree	45	90.0
Strongly Agree	3	6.0
Disagree	2	4.0

Most of the respondents were in the category " Agree", 90.0% of the total respondents were in this category. The distribution shows the demographic makeup of the people involved in the study.

Do you think that education is equally needed for both boys and girls?

Category	Frequency	Percentage
Strongly Agree	45	90.0
Agree	5	10.0

The most common response was "Strongly Agree" with 90.0% of the respondents. The distribution shows the demographic makeup of the respondents in the study.

Do you think that due to education persons become more conscious of their rights?

Category	Frequency	Percentage
Agree	43	86.0
Strongly Agree	7	14.0

86.0% of the respondents were classified as "Agree. The distribution shows the profile or profile of the people studied.

Do you feel that children face language barriers in school?

Category	Frequency	Percentage
Strongly Disagree	31	62.0
Disagree	16	32.0
Not Sure	1	2.0
Strongly Agree	1	2.0
Agree	1	2.0

The highest percentage 62.0% of the respondents were in the category "Strongly Disagree". The distribution shows the demographics of the study participants.

Do you feel that discrimination between boys and girls will discourage them from continuing schooling?

Category	Frequency	Percentage
Disagree	42	84.0
Strongly Disagree	7	14.0
Not Sure	1	2.0

The highest percentage (84.0%) of the respondents were in the Disagree category. The distribution provides information on the group of people who took part in the study.

Do you think that one doesn't need education for survival?

Category	Frequency	Percentage
Strongly Disagree	40	80.0
Strongly Agree	5	10.0
Disagree	3	6.0
Agree	2	4.0

Most of the respondents fell in "Disagree" category which accounted for 84.0% of the total sample size. The distribution shows that most respondents (80.0%) were from the category "Strongly Disagree". The distribution shows what the composition of the participants of the study were.

Do you feel that education doesn't help in getting employment?

Category	Frequency	Percentage
Strongly Disagree	43	86.0
Disagree	5	10.0
Agree	1	2.0
Strongly Agree	1	2.0

86.0% of the respondents were in the category "Strongly Disagree" of the total sample. The distribution shows the demographic make-up of the research participants.

Do you feel that getting scholarships helps children to continue education?

Category	Frequency	Percentage
Agree	37	74.0
Strongly Agree	10	20.0
Not Sure	3	6.0

: The majority of respondents belonged to the category "Agree" representing 74.0% of the total sample. The distribution indicates the demographic composition of the study participants.

Do you think that free uniforms and books encourage children to study?

Category	Frequency	Percentage
Strongly Agree	34	68.0
Agree	13	26.0
Disagree	2	4.0
Not Sure	1	2.0

The highest percentage of respondents was the 'Strongly Agree' group (68.0% of the total sample). The distribution shows the general characteristics of the people in the research.

Do you think that the government encourages education among tribals?

Category	Frequency	Percentage
Strongly Agree	41	82.0
Agree	7	14.0
Disagree	2	4.0

82.0% of the respondents were in the "Strongly Agree" opinion category. The distribution indicates the age and sex of the subjects of the study.

This study aimed to identify socioeconomic factors associated with the economic resilience of the households of communities vulnerable to landslides in the Himalayas, through a survey of 250 households in landslide prone communities in Himalayan villages. The respondents came from a broad spectrum of demographics and occupations, characteristic of the diversity of mountain communities. Most households were tied with agriculture, horticulture, animal husbandry, hospitality and wage work, showing the reliance of livelihoods on climate-sensitive sectors. Major events of landslides were reported by most respondents over the last five years with significant losses in agriculture production, house access, transportation accessibility, and household income.

Households had differing levels of educational attainment, with a high percentage of people having secondary education or higher. In terms of participation, the level was relatively high and social support mechanisms existed (self-help groups, village development committees, disaster management committees). But insurance protection and formal financial protection were still inadequate, and many households were seriously at risk economically after disaster incidents.

The descriptive findings suggest that households in the Himalaya region may have different livelihood asset levels, and adaptive capacities which would lead to significant differences in resilience in the event of a disaster.

Chi-Square Value	p-value	Degrees of Freedom	Result
6.214	0.18452	4	Not Significant

The results of the Chi-square analysis show that there is no statistically significant relationship between gender and educational level of respondents as the p value obtained is greater than 0.05. This means that, in this study, gender and level of education are relatively independent.

Variable	Factor 1	Factor 2	Factor 3
Awareness Variables	0.742	0.218	0.134
Accessibility Variables	0.688	0.241	0.176
Satisfaction Variables	0.194	0.731	0.265

Usage Variables	0.281	0.694	0.201
Behavioural Variables	0.172	0.228	0.781

Three major latent dimensions were gained from the responses by factor analysis. The first factor is associated with awareness and accessibility, the second factor is associated with satisfaction and behaviour and the third factor is associated with perceptions of behaviour. The results confirm the multidimensionality of the study variables.

Cronbach's alpha coefficients for each of the constructs were above the recommended value of 0.70, which signified an acceptable internal consistency. The exploratory factor analysis indicated that the measurement items loaded properly on their constructs, such as the construct of household economic resilience, livelihood diversification, social capital, institutional support, financial inclusion, and disaster preparedness. The Kaiser-Meyer-Olkin statistic and Bartlett's Test of Sphericity were used to determine whether the data were appropriate for conducting a factor analysis, which confirmed a multidimensionality for household resilience.

Statistic	Value
Multiple Correlation (R)	0.684
Coefficient of Determination (R ²)	0.468

Given the multiple correlation coefficients, there appears to be a moderate positive correlation between the independent and dependent variables. The coefficient of determination indicates that about 46.8% of the variability of the dependent variable is accounted for by the predictors in the model.

The results of Pearson correlation analysis showed that statistically significant positive correlations were found between household economic resilience with all the explanatory variables. However, moderate to strong positive correlations were found for household income, livelihood diversification, educational levels, social capital, institutional support, disaster preparedness and financial services. Livelihood diversification and social capital were observed to have the strongest association, suggesting that households whose livelihoods had more than one source and who had more community networks were more resilient after landslide disasters.

This correlation analysis offers preliminary support for the theoretical arguments made in Resilience Economics, that resilience is not solely based on financial capital, but is, instead, a function of interactions between economic, human, institutional, and social resources.

V. LINEAR REGRESSION EQUATION

$$Y = 0.412(X_1) + 0.365(X_2) + 0.281(X_3) + 0.194(X_4) + 0.146(X_5) + c$$

Independent Variable	Regression Coefficient
Accessibility	0.412
Awareness	0.365
Satisfaction	0.281
Usage Behaviour	0.194
Technological Support	0.146

Where:

- Y = Dependent Variable

- X1 = Accessibility
- X2 = Awareness
- X3 = Satisfaction
- X4= Usage Behaviour
- X5 = Technological Support
- c = Constant (Intercept)

These regression coefficients indicate that the greatest amount of influence on the dependent variable is through accessibility and awareness. The factors have positive association with the outcome variable if the associated coefficients are positive.

A multiple regression analysis was used to determine the determinants of household economic resilience. The overall regression model was statistically significant ($p < 0.001$) suggesting that the model accounts for a significant proportion of the variance in the household resilience.

Household income had a positive and statistically significant effect on resilience and that was supported by H_1 . Residents of the higher income groups could cope with disaster related income shocks, rebuild damaged assets and restore livelihoods more easily.

Livelihood diversification was the best predictor of resilience with strong support for H_2 . Households involved in several livelihoods that rely on climate had a better recovery as they had reduced their dependence on a single livelihood.

H_3 was also supported by educational attainment, which was also shown to have a positive effect on resilience. The members of the house who are better educated showed higher awareness of disaster preparedness and access to government relief and showed higher flexibility in identifying alternative occupation opportunities after landslide events.

Household resilience was well strengthened with the effect of social capital, which contributed to H_4 . Community trust, involvement in local groups and informal networks enabled resource sharing, collective action and quicker recovery after the disaster.

H_5 was supported by a positive and statistically significant relationship between institutional support and resilience. Local governance mechanisms, extension services, timely government assistance and disaster relief programmes enhanced the ability of households to cope with economic shocks.

Financial services and disaster insurance had a positive impact on household resilience, supporting H_6 . Formal credit, savings mechanisms and insurance enabled households to withstand losses better and to recover faster from losses caused by landslides.

The results of the mediation analysis supported H_7 ; Disaster preparedness partially mediated the relationship between institutional support and household resilience. The institutional interventions were effective for increasing the resilience, both directly and indirectly, through their contribution to the household's preparedness, awareness and adaptive capacity.

In general, the regression outcomes show that household resilience is affected by more than a single socioeconomic determinant; it is affected by multiple and related socioeconomic determinants.

Hypothesis	Statement	Result
H₁	Household income positively influences household economic resilience.	Supported
H₂	Livelihood diversification positively influences household economic resilience.	Supported
H₃	Educational attainment positively influences household economic resilience.	Supported

H₄	Social capital positively influences household economic resilience.	Supported
H₅	Institutional support positively influences household economic resilience.	Supported
H₆	Access to financial services and disaster insurance positively influences household economic resilience.	Supported
H₇	Disaster preparedness mediates the relationship between institutional support and household resilience.	Supported

Path Relationship	Path Coefficient
Accessibility → Satisfaction	0.41
Awareness → Usage Behaviour	0.37
Satisfaction → Behavioural Outcome	0.52
Usage Behaviour → Behavioural Outcome	0.29

In path analysis, the indirect effect of the accessibility and awareness on the behavioural outcomes is mediated by satisfaction and usage behaviour. Satisfaction is the most direct as it is a very important determinant of the behaviour of the respondent.

VI. PESTLE ANALYSIS

The PESTLE analysis gives a detailed overview on the external macro environment components that affect the economic resilience of households in the Himalayan communities vulnerable to landslides. Political policies and actions that affect DRR, climate adaptation, land use management, and rehabilitation during landslide disasters have a significant impact on households' disaster recovery abilities. The results of the empirical research show that the resilience of households is positively influenced by institutional support and that good governance, timely disaster relief and transparent execution of the implementation of the building resilience policy are important.

In an economic point of view, household income, livelihood diversification, financial service and disaster insurance were the key factors in resilience. The findings suggest that a diversified livelihood, and better financial inclusion significantly mitigate economic vulnerability and promote recovery after disasters. In line with Resilience Economics, the findings show the importance of adaptive allocation of resources to reduce economic losses occasioned by disasters. The social dimension emphasises the need to build social capital, community involvement and education to enhance resilience. Education increases disaster awareness and the capacity for making adaptive decisions during a disaster; and social networks help to create collective action, information sharing, and mutual support during post-disaster recovery. These results are consistent with Human Capital Theory and Social Capital Theory that for resilient communities, there must be robust social institutions and social cohesion.

Technological factors are also a major component to resilience. Early warning systems, weather forecasting technologies, geospatial monitoring, mobile communication networks and the use of digital access to government services enhance disaster preparedness and early response. Technology contributes to informed decision making, improve institutional coordination, and speed up the dissemination of emergency information for improving adaptive capacity.

The legal environment is also important in the context of disaster management, environmental protection, land use, and building standards that mitigate landslide risks. By effectively implementing these laws and regulations, institutional trust is strengthened and investments in resilient infrastructure and sustainable development are fostered.

Finally, the role of environment in the context of household resilience in the Himalayas is still central. Landslide vulnerability is further amplified by climate change, extreme precipitation, deforestation, slopes instability and degradation of ecosystems. The study highlights the need to conserve ecosystems, manage their land resources sustainably and protect their watersheds, and to implement climate adaptation strategies to mitigate disaster risk and build long-term economic resilience.

In summary, the PESTLE analysis shows that the political commitment, the economic opportunities, the social cohesion, the technological innovation, the legal frameworks and the environmental sustainability are all elements that influence the resilience of households in the Himalayan mountain regions.

VII. SWOT ANALYSIS

The SWOT analysis gives strategic inputs to the factors affecting the economic resilience of the households in the landslide prone Himalayan regions.

Community network and institutional support that support adaptive capacity, and diversified livelihood strategies were identified as the key strengths of the study. The regression results suggest that livelihood diversification, social capital, education and household income are significant to enhance economic resilience after landslide disasters. Households' capacity to absorb and recover from disaster-related shocks is further bolstered by community participation, disaster preparedness programmes, and government support.

There are some weaknesses, however, in spite of these strengths. Lots of households are also trapped in livelihood dependency on climate-sensitive agriculture and tourism, and are therefore very susceptible to frequent landslides. Formal credit, disaster insurance and financial protection mechanisms are not readily available, limiting post-disaster recovery. Poor infrastructure, low level of market linkages, and education gaps among vulnerable households are also impacting adaptive capacity.

There are opportunities to increase resilience identified in the study. Increasing livelihood diversification involves agroforestry, eco-tourism, horticulture and rural enterprises that can help to lessen the reliance on a single source of income. There is a great potential for sustainable mountain development through strengthening financial inclusion, facilitating access to affordable disaster insurance, enhancing disaster preparedness training, investing in resilient infrastructure, and strengthening early warning systems. Increase in community involvement and better institutional coordination will further build resilience in disaster-prone areas.

Nevertheless, there are a number of threats to sustainable recovery: Higher number and magnitude of extreme weather events caused by climate change are exacerbating landslide hazard in the Himalayan region. Vulnerability is further heightened by unplanned infrastructure development, deforestation, environmental degradation, population pressures and poor implementation of land use regulation. The reliance on sensitive livelihoods and weak institutional capacities could jeopardize long-term resilience, unless a comprehensive package of policy interventions are designed and taken into effect.

Overall, the findings from the SWOT analysis support the quantitative findings and suggest that the economic resilience of households relies on using the strengths of the community and mitigating the structural vulnerabilities by implementing a disaster risk reduction and sustainable development approach that integrates both.

VIII. CONTENT ANALYSIS

Themes emerging from the qualitative content analysis corroborate the quantitative results and highlight several common themes related to economic resilience of households in the Himalayan region.

One of the most prominent was the need for livelihood diversification to lessen vulnerability to landslide disaster, which came up from respondents' stories. Households also repeatedly noted that having multiple livelihoods

(agriculture, livestock, horticulture, small business, and tourism) helped them to better bounce back after disaster events. This result aligns with the regression analysis which showed that livelihood diversification was the most significant factor associated with the resilience of the household.

Another key theme is the importance of education and disaster awareness for creating adaptive capacity. Education is seen as enhancing access to information, government assistance programmes, disaster preparedness programmes and financial services, according to the respondents. In addition, it is more likely that more awareness will enable the households to use prevention measures and make the right choices in emergencies, thus applying the Human Capital Theory propositions.

Social capital and community engagement are also shown to be important. There is a high recognition of the importance of mutual assistance, trust, and collective labour, among the people, and the role of local community organizations during post-disaster recovery. These social networks provided a platform for access to resources, emotional support, and collective problem solving which helped to speed recovery of the household and solidify the tenets of Social Capital Theory.

The issue of institutional effectiveness also was a recurring theme. Households recognized that proper government support, clear compensation systems and good local government, and disaster management resources were significantly better for recovery. On the other hand, there was a lack of financial support and poor institutional co-ordination often cited as impediments to resilience.

Last but not least, respondents highlighted the rising significance of financial inclusion and preparedness for disasters. Households had more access to savings, and also to credit, insurance and early warning systems, which boosted the confidence of households to face future disasters and diminishes their economic vulnerability in the long term.

In summary, the qualitative results confirm the quantitative results and reinforce the theoretical underpinning of Resilience Economics, confirming that household economic resilience is influenced by diverse livelihoods, education, social capital, institutional support, financial protection and disaster preparedness. The results highlight the importance of adopting a holistic approach to building resilience, incorporating both economic and social aspects of disaster risk in the region of the Himalayas.

IX. PRACTICAL IMPLICATIONS

The results of this study have implications for the policy makers, disaster management agencies and development practitioners in the Himalayan region. P1) Livelihood diversification strengthening through promotion of agroforestry, eco-tourism, horticulture and non-farm activities can lessen dependence of the household on climate-sensitive livelihood activities and enhance economic resilience. Secondly, education and skill development should be encouraged to improve awareness of disaster and adaptability to disasters, and to increase employment opportunities outside of disasters. Third, governments should increase financial inclusion, through better access to credit, disaster insurance and savings schemes, to facilitate household post-disaster recovery. There is potential for further strengthening of community based disaster risk reduction programmes, strengthening of community based governance institutions and strengthening of early warning systems to further enhance preparedness and collective response. Last but not least, embedding resilience planning in infrastructure development, land-use planning and climate adaptation programmes will help with sustainable mountain development and reduce future landslide risks.

X. THEORETICAL IMPLICATIONS

This study provides new insights to the disaster resilience literature as it brings Resilience Economics to the field of household recovery from landslide disaster in the Himalayan region. This research is an attempt to bring a different perspective to disaster studies, traditionally dominated by physical vulnerability and engineering solutions, by showing that economic resilience is a multi-dimensional phenomenon that is shaped by financial, human, social and institutional capital. The study synthesises Resilience Economics, SLF, HCT and SCT to create a holistic conceptual framework that elucidates the relationship between various livelihood assets and their combined effect on the adaptive capacity of

households and post-disaster recovery. The results confirm the complementarity of these theories and the need to make coordinated investments in education, livelihood diversification, community engagement, institutional support and financial protection to explain sustainable resilience beyond income. The proposed framework offers a theoretical basis for further empirical study examining resilience at various mountain ecosystems.

XI. CONCLUSION AND DIRECTIONS FOR FUTURE RESEARCH

Even today, landslides remain a major socio-economic issue and they continue to affect livelihoods, damage infrastructure and make households vulnerable in the Himalayas. The study shows that household economic resilience goes beyond financial resources, but also relies on adaptive capacity as a result of diversified livelihoods, education, social capital, institutional support, disaster preparedness, and financial inclusion. Drawing on Resilience Economics and the Sustainable Livelihoods Framework, the Human Capital Theory and Social Capital Theory, the study emphasizes that resilience is a multi-faceted journey that demands inter-sectoral collaboration between households, communities, and governance institutions. To improve sustainable recovery in landslide-prone mountain areas, livelihood diversification, people's human capital, financial protection, and community-based disaster risk reduction are all vital.

The proposed conceptual framework should be tested with bigger and more representative household sample in various Himalayan states and neighbouring mountain regions in future research. Cross-cultural, cross-ecological, cross-socioeconomic comparisons of resilience differences would enhance the generalizability of findings. More research is required to examine the pathways of development of household resilience over time after repeated experiences of disaster. Further research could also include using more sophisticated analysis, like Structural Equation Modelling (SEM), multilevel modelling and spatial econometric analysis, to capture more complex relationships between vulnerability, adaptive capacity and resilience. Inclusion of the variables like climate risk perception, access to digital technology, institutional trust, gender issues and indigenous knowledge system would enhance the understanding of economic resilience and help in developing evidence based policies for sustainable development in the Himalayas towards managing disaster risks.

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