



# Differential vulnerability and resilience of earthquake: A case of displaced Tamangs of Tiru and Gogane villages of Central Nepal

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## ABSTRACT

### Background

Nepal's 2015 earthquake and its aftermath caused a total of 8979 deaths and 22,309 injuries. The earthquake brought rescue, relief distribution, reconstruction, and resettlement issues. The government authority has identified a total of 56 settlements for relocation. My argument is that the process of rescue, relief distribution, resettlement, and reconstruction actions are determined by the socio-economic and geographical/ecological settings of the affected people. I have substantiated my argument with the resettlement process of two Tamang villages, Tiru and Gogane in the Rasuwa district of Nepal.

### Research objective

The main objective of the paper is to explore the situation of differential vulnerability and resilience capacity of the Tamangs, an ethnically homogenous group. It examines disparities between the affected households in terms of assets, access, and opportunities; and analyses the role of social relationships, kinship network, and family size of the displaced Tamangs.

### Methodology

This study is based on qualitative methodology. The methods of data collection include observations, interviews, narratives, and key informant interviews (KII). However, to supplement the qualitative data, 100 respondents were selected for the survey. Quantitative data were analyzed descriptively. Qualitative data were analyzed thematically. Previous studies and government statistics were used as the sources of secondary data.

### The results

The responsibility of the first primary rescue and relief works were led by the local communities later supported by outside agencies. Household structure, neighborhood relationships, community bonds were the principal mechanisms of the disaster risk reduction process. Results of my research show that vulnerability and resilience are context-specific that are determined by time, place, nature of the disaster, climatic conditions, power relations, culture, individual's age, sex, social, and economic status.

### Conclusions and recommendations

The study concludes that vulnerability and resilience are two sides of the same coin. These two phenomena bring complexities and dynamism to human life. On the one hand, the earthquake and its aftershocks resulted in the complexities of the relocation of the victims, their livelihoods, and their social relations. On the other, it made the victims more resilient, more assertive, and more dynamics to utilize available resources and develop various adaptive strategies of survival. This study also infers that the general model of resettlement plans adopted by the government is inefficient and inadequate to address the context-specific problems of earthquake victims.

## 1. Introduction

On April 25, 2015, Nepal experienced a great stroke of 7.6 Richter scale earthquake. The epicenter of the earthquake was the Gurung village of Barpak in the Gorkha district. It affected more than 14 districts including Rasuwa which the Government of Nepal declared as 'crisis-hit' districts. Nepal experienced another major aftershock of 6.8 Richter scale magnitude

on May 12, 2015. Its epicenter was the border area of the Dolhaka and Sindhupalchowk districts of Nepal. The earthquake and its aftershocks killed 8979, injured 22,309, and damaged the physical properties of billions of rupees from the 31 affected districts [17,20,35]. The government authorities have identified 56 settlements for immediate relocation (16 in Gorkha, 14 in Sindhupalchowk, 13 in Dolakha, 10 in Rasuwa, and 3 in the Dhading district [25]. NRA (17 October 2019 update) reported that a

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total of 816,420 households were eligible for housing grants (<http://www.nra.gov.np/np>). The Post Disaster Needs Assessment (PDNA) has estimated a total disaster effect cost of US\$ 7065 million in social, productive, infrastructure, and cross-cutting sectors. According to government statistics, a total of 12,490 private houses were destroyed, and 217 houses were partially destroyed in the Rasuwa district alone [16,17]. Similarly, a total of 98 schools, 17 health posts, about a dozen government buildings, and 28 Gombas were destroyed in Rasuwa district. A total of 29 settlements and 836 households in Rasuwa were considered insecure and required relocation as per the Geologist's recommendation.

Disasters are products of society than of specific nature and takes place where people live [22,23]. This can be exemplified through an analysis of the vulnerability of the earthquake displaced Tamangs of the study area. They are interconnected with several aspects of hazards, existing vulnerability, and the ability to cope. The use of the concept of vulnerability is comparatively newer than resilience as it was applied since the 1970s [24]. Resilience was understood as a set of capacities and strategies and this concept is in use since the 1960s [21]. United Nations International Strategy for Disaster Reduction [32] has defined resilience as, "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner including through the preservation and restoration of its essential basic structures and function" (p. 24). Similarly, United Nations International Strategy for Disaster Reduction [32] has defined vulnerability as, "the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard" (p. 30).

Differential vulnerability and resilience are socially constructed and embedded in the complexities of a relationship that vary by age, sex, ethnic groups, religion, class, caste, and nature of the disaster. This pattern of vulnerability could be "historically produced" also linked to a disaster ([23], p. 3). This study considers vulnerability and resilience as key concepts to analyze the situation of the Tamang in the study area. Resilience relates to the ability to absorb impact, learning to adapt, respond and recover to disaster (s) [3]. The aspect of vulnerability and resilience are observed as two sides of the same coin. One positive side is resilience whereas the negative side is vulnerability. The earthquake affected indiscriminately, however, some categories of people were affected more than others i.e. females, aging people, the person with a disability, and marginalized groups, such as the Tamangs and Dalits. A study report shows that women and children were disproportionately impacted, marginalized ethnic groups were injured and died disproportionately and they also received more psychological trauma. Among them, poorer people were more vulnerable [31]. This study has focused on ethnic homogenous groups to see how differential vulnerability is experienced by the displaced Tamang people. Furthermore, this study explores community-based risk reduction mechanisms and shows how they functioned in the process of rescue, relief, and resettlement. Anthropologically speaking, understanding of disaster, resilience, and vulnerability is in the state of infancy in Nepalese academia. Therefore, this study explores how people experience and assess the process of disaster, resilience, and vulnerability in the local context.

Disaster unmasked the nature of a society's social structure, including the ties and resilience of kinship and other alliances [23]. Experiences of disasters, resilience, and vulnerability are varied by age, sex, social class, and ethnicity. Taking this issue into consideration the study focuses on how Tamang felt and explained the Gorkha earthquake with vulnerability and resilience on the socio-psychological aspect of the community. Attachment and affection with their dead relatives, sense of belonging to the place, house, and livestock are taken into consideration for the socio-psychological and socio-cultural analysis.

This study focuses on the interplay of how communities responded during the Gorkha earthquake disaster, 2015. Furthermore, this study compares life and livelihood and their perceptions of vulnerability and resilience. The effectiveness of community-based disaster management is considered important in analysis. The livelihood of the displaced was mainly based on local natural resources and remittance. Their primary source of income was based on agriculture, livestock, foreign employment,

wages laborer, and petty contractor for road, bridge, and house construction. They do dryland cultivation, livestock management for dairy production, meat, and supplementary cash income.

Displaced are found deeply embedded in their social, economic, religious, and political complexities relating to the rescue, relief, temporary settlement, food, shelter, the security of girls, child education, employment, rites and rituals, issue of handling of the property in the disaster areas and resettlement, which are associated with the differential vulnerability and resilience of individual and the community.

## 2. Context of study: Location and people

Tamang is one of the third largest ethnic groups, which constitutes 5.8% of the total population of Nepal [1]. They are settled in the central part of the country called Tamsaling [30]. They speak the Tibeto-Burmese language and follow Buddhism and indigenous shamanism also known as Bonism. Their traditional occupation is based on the agro-pastoral economy with a high degree of gender equality [5,12,14]. The displaced Tamangs come from the former Dandagau Village Development Committee (VDC) ward no. 7 to 9 and Haku VDC ward no. 8 and 9. These wards constitute a total of 376 households, with 1874 (male 897 and female 977) [1, 34]. The latitude of the area is 28° 05' 16" N to 28° 05' 54" latitude and 85° 13' 22" to 85° 13' 29" longitude. Gogane lies 1450 m above sea level (masl) and Tiru 2100 masl (Fig. 1). The climate of Tiru and Gogane is temperate and sub-tropical respectively. The summer temperature reaches a maximum of 25 degrees Celsius and during winter a maximum of 15 degrees Celsius. Gogane records a maximum of 30 degrees Celsius during the summer and 20 degrees Celsius during the winter. Gogane lies near the bank of Trisuli river-facing east, and Tiru facing east and west.

They produce sufficient food for a year in normal weather conditions. The Tiru and Gogane areas have steep slopes, and in many places, landslides are frequent during the rainy season.

The local geography varies in its fragility and the area is vulnerable to disasters with some landslides. Although the landslides have not taken place in the main settlement, the area is risky during the rainy season. The Gogane area landslide nearby the settlement become a big challenge. This suspicion about landslide loss exists in and around Gogane but not in Tiru. The locals believe that the main cause of the landslide is human activities, particularly the 216 hydropower projects, which blast mines to build roads.

Fig. 2 (top left panel) provides an overview of the temporary settlement of displaced households. The compact settlement has 83 households of four patrilineal exogamous clans that from Syanba or Ghale, Lapchan, Tilung, and Ghising. Fig. 2 (right, top panel) is another settlement called Khalde Bagar, which lies at the bank of the Trisuli River, where 259 displaced households have been settled. This settlement is vulnerable to flood. Prior to the displacement, their main occupation was dry land-based agriculture and foreign labor migration. Now, many displaced men have been trained in masonry. 97% of the respondents were food secured before the earthquake. They produced maize, millet, barley, beans, and potatoes. Livestock, that included cows, ox, buffalo, goat, and chicken provided them a supplementary income. They. Most displaced households lost livestock, especially buffalo during the earthquake.

Prior to the earthquake, the displaced had access to basic services such as drinking water and education within a maximum of 30 min of walk. But the local market, police posts, health posts, and financial institutions were about a day of walk. Those who are settled in Banda Chautari (Fig. 2, top left panel) are facing the problem of collecting drinking water. They have to walk down about 100 m on the steep hilly path, which makes it difficult in carrying the water up the hill despite the study has shown [13]. From the safety point of view, the Banda Chautari is safer than Khalde Bagar (Fig. 2, top right panel). However, the temperature is hotter in Banda Chautari as compared to Khalde Bagar. The heat shock is adjusted using an electrical fan and during the day by resting under the shadow of trees such as jack-fruit and banyan tree.

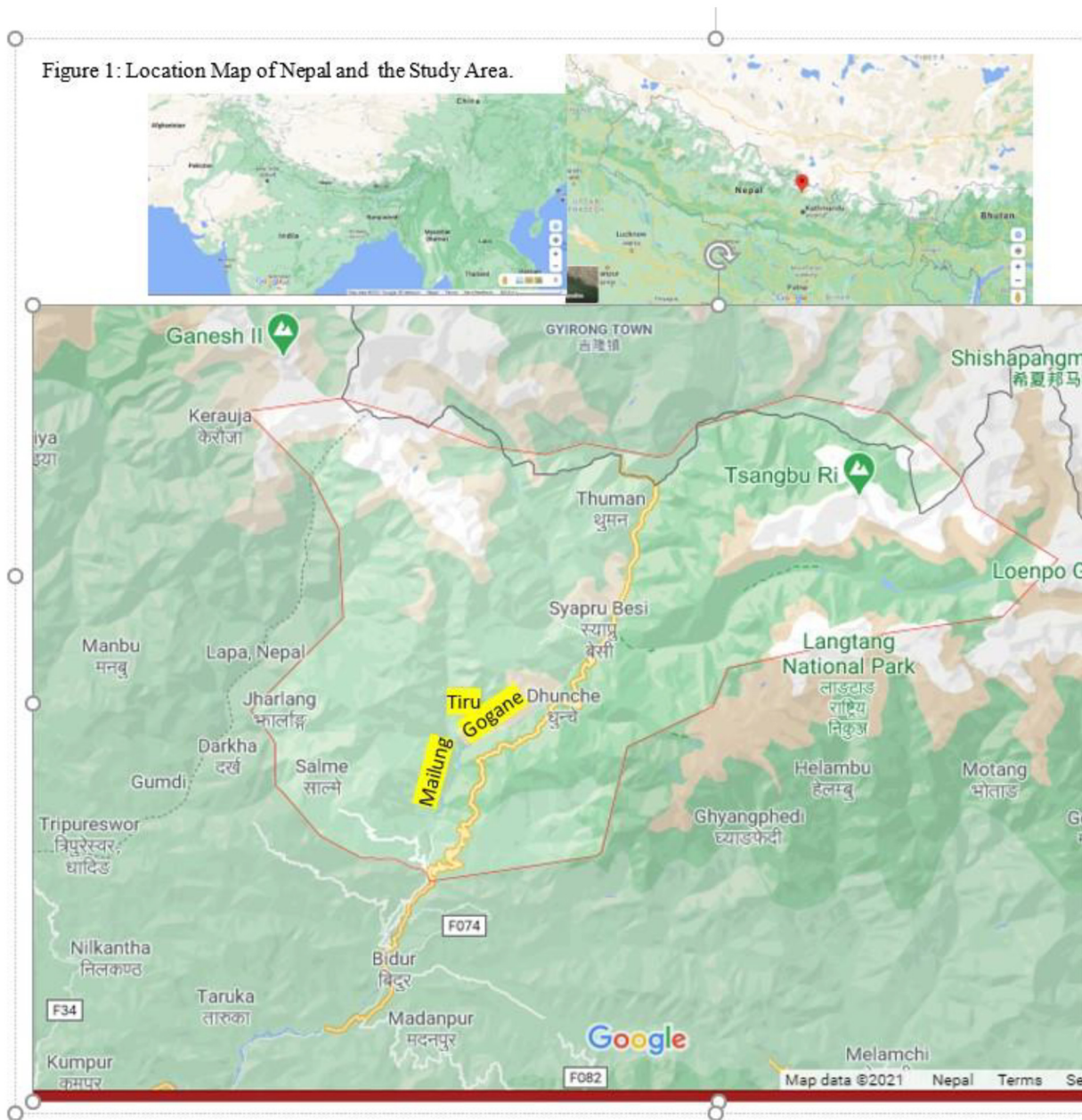


Fig. 1. Location Map of Nepal and the Study Area.



Fig. 2. Banda Chautari and Khalde Bagar temporary settlement (Left and right respectively).

### 3. Methods and material

This study has adopted an ethnographic approach based on both primary and secondary data. In addition, the publications of the Government of Nepal were reviewed about earthquake victims and displaced. Empirical research preferably journal articles on community-based disaster management were reviewed. Oliver-Smith [24] who has contributed a lot in the field of disaster stated that anthropologists apply their research methods and theory contextually, which is mostly determined by the purpose of research. They also rely on shorter fieldwork and apply quantitative methods with a questionnaire survey. In the context of disaster studies, they focus on operative relations and interconnections [24]. Also, Haaland [8] points out that the ethnographer's main objective should be engaged on following 'loops' and interconnectedness of a specific event and meanings. This study focuses on the life experiences of earthquakes displaced during the earthquake, rescue, relief distribution, and reconstruction. In this study, I have adopted a multi-sited study [15] to cover life situations at the place of origin and temporary settlements of displaced. The researcher spent about a month in the study site in 2019 and observing events of interest.

Field observation was a principal method of data collection, which was carried out three times during the research from Batar in Nuwakot and Khalde Bagar, the temporary settlement, Tiru and Gogane, the place of origin. One hundred households were surveyed adopting ethnographic sampling. The sample size was chosen among the displaced to collect data on some quantitative measures such as types of assets, employment, income, kinship network, family size, and education of the displaced. Twenty-four informants of both sexes were interviewed personally, and via telephone. Key informant interviews were conducted with five informants that include a ward chair and two ward members of Uttargaya Rural Municipality, one person who initiated temporary settlement in Khalde Bagar; and one who was not displaced from the place of origin.

In the process of data collection, two interviews were found extreme cases. The informant told unique stories that were chosen to present as a case study. Those narrative case studies became helpful to illustrate differential and dynamic vulnerability and resilience. For analytical purposes, the household was considered as a unit of analysis for the system of vulnerability and resilience to specific socio-economic and political conditions. The respondents' first and middle names are given in initials to address the ethical issue. As a limitation, this research lacks a long and engaged study of experiences of displaced Tamangs and stakeholders' perspectives.

### 3.1. Analytical framework

Anthropologists focus on social, cultural, environmental, food security/sovereignty, development, and several other issues from multiple perspectives [11]. This paper has explored socio-economic resilience and the status of vulnerability among the displaced, centering on how the natural disaster, the Gorkha earthquake affects the existing vulnerability. Focusing on the situation of the community and household level resilience, this study analyzes access to infrastructures (road, drinking water, schools, Gomba, market, health services); the household level absorptive capacity with property (land, house, domestic animals), human resources, employment, bonding social capital (kinship network), the household population for vulnerability and resilience. This study also includes aspects of social, geographical, physical, and spiritual affinities for delivering relief material to the people in disaster as highlighted by Prewitt-Diaz and Agrawal [26].

Fig. 3 presents an analytical framework of differential vulnerability and resilience of displaced of Tiru and Gogane by Gorkha Earthquake, 2015. The findings of the study are based on the understanding of resilience and vulnerability lie in the dimensions such as access, spirituality, socio-psychological stress, relation to decision-making position, and the geographical location of the settlement.

### 4. Findings

#### 4.1. Perception of the Gorkha earthquake and socio-cultural behavior

Disasters or natural calamities [10] are several kinds that may range from climatic to geological to technological and their scale of impact varies. It has been realized that disasters are taking place more severely and frequently [23]. The perception and expression of the shock caused due to disaster, for example, earthquakes varies by personal experience and worldview. Although similarities of perception is looked at from a time context [11], the perception of individuals differs by the way they observe and experience the situation. Thus, the etymological analysis of the Gorkha earthquake is essential to understand the nature and perception of the earthquake. The earthquake in the Nepali language is called "bhukampa" which means shaking/moving of the earth. The Tamang of Tiru and Gogane use the term "Sangul" which means shaking the earth.

Informants have different experiences regarding the earthquake. They have both hope and despair of the future conditions of life. In this connection, D. K. Ghale, the present resident of Batar said that the earthquake was like a "ghost" (bhut in Nepali). When it happens it destroys the life of human

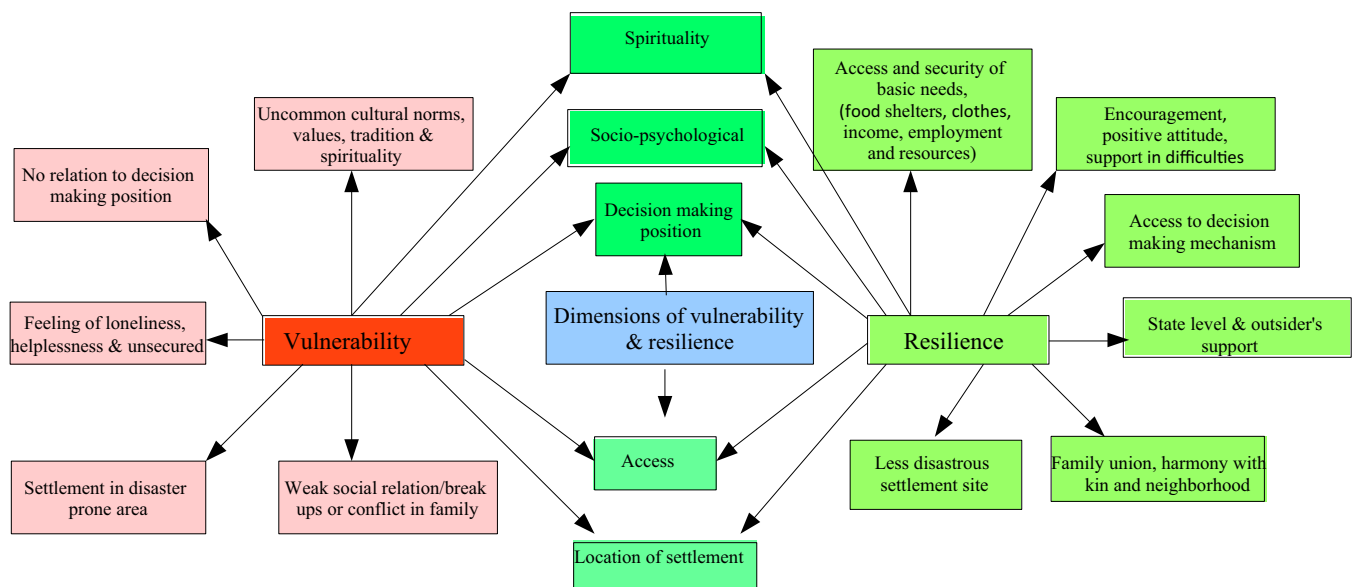


Fig. 3. Differential vulnerability and resilience among the displaced of Tiru and Gogane, Rasuwa, Nepal.

beings and animals, houses, pastureland, infrastructure (road, electricity, public service buildings). S. Tamang (47) expressed his psychological stress as “I fear very much to think about the house. I could not imagine the moment of that day. When I try to remember I go crazy (*pagal*) or distracted”. S. Lama said:

It was making a rumbling sound like Gududu...I saw mine and my neighbor's house collapsed. I became unconscious. Later, I could only remember our ancestors' saying a day would come to an end after shaking the earth. I thought maybe that day would be the end of life.

The displaced were still under trauma and fearful when they felt the aftershocks of the Gorkha earthquake time and again. They had the feeling of being dead. Some displaced still get afraid of natural phenomena such as thundering, lightning, loud sounds, and heavy rain. The psychological trauma still exists among the displaced. S. Tamang (34) said he gets scared when he hears thundering in the sky as he feels like the earthquake is happening again. N. Tamang (49) reported that his wife gets a headache when the sky gets cloudy. The informants were the witness of the death of relatives, destruction of houses and cattle.

Disasters do not always bring bad phenomena. The displaced Tamangs also have a positive feeling even in disastrous conditions. N. Ghale (37) expressed his positive thinking about the earthquake. He said, “a big rock falls in search of a good place, and the Gorkha earthquake of 2015 happened to bring us in these new places. Otherwise, we had no opportunity to experience the life that we are experiencing at present”.

The social bond, support, sympathy, and empathy during a disastrous time is the function of family, relatives, and neighbors. This is normal and usually, it happens in an ordinary situation. The Tamangs are patrilineal and parents expect their son(s) would support them during old age, sickness, and in a difficult situation. P. M. Tamang felt a shock in her expectation during the earthquake of 2015.

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#### Case 1: Socio-psychological shocks

P. M. Tamang (65) was married, lived happily with her husband as the owner of a small and lovely house in Mailung. Mrs. Tamang was the mother of four children, three daughters, and one son. Her first and youngest daughters left to India and Iraq, respectively, and have not returned yet. The second daughter is married and has a girl. Her son got married at a young age and had four grandchildren. Her son left for Malaysia as a migrant worker, within 18 months, he got injured, cutting his hand. At the same time, his wife eloped with a neighbor being pregnant. That made her son very depressed, later married a girl from Bhojpur. According to P. M., her new daughter-in-law physically, psychologically, socially, and culturally was not normal. Her attitude toward family and neighbor was very aggressive, and she quarreled most of the time. She was an alcoholic. She hardly cares about kin relationships, never tried to follow the norms and values of the Tamang community either. Police arrested her even at night because she quarreled with a neighbor. Before the Gorkha earthquake, P. M. had a fair economic condition. She had a buffalo and goats, a house to live in Mailung. She did not mind much the behavior of her daughter-in-law.

P. M.'s life changed due to the Gorkha earthquake, 2015. Her husband died and her house collapsed. She survived a leg injured; now, she is a person with a disability. Despite all losses, she was expecting support from her son. What she experienced after the earthquake made her very disappointed. Her son never supported her during her injury and treatment in a hospital in Kathmandu. Instead of supporting her, he sold her survived buffalo and goats; took the government grants (140,000 NRs) for his father's death and ritual performance. He did not support his mother to build a shelter in Naubise, and Khalde Bagar. P. M. was much disappointed to hear that her daughter-in-law insisted her husband to kill the last remained goat and consume as they knew that P. M. Tamang is returning home from the hospital. P. M. was depressed and said to me that no one should have the inhuman daughter-in-law like mine and *joining*, the henpecked husband like my son. However, she got some support from her sister, grandson, and grand-daughter as a hope of future life.

As a disabled person, she fears the flood of Trisuli river, if the flood kills her she does not have any grievances. She is worried and afraid if she is left injured with another leg. If it happens so, she is worried about how to move around. The earthquake of 2015 has changed her life drastically. She lost her warm companionship of husband, livelihood, shelter, broke her social bonds. This case is an extreme example of the way how a kind of resilient life changed to vulnerable due to disaster.

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Case 2 is another extreme example that demonstrates experiences of different human behaviors which was perceived as demon-like. The Tamang community is known for being cooperative and supportive in the community. Some felt empty, not being supportive, not acting like a normal human who ends with the hope of life. This case raises the question of how to judge human behavior on the level of honesty, sincerity, piety, and grace during the disaster shock.

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#### Case 2: Social cultural shock

A. Tamang (51), a resident of Mailung Besi lost his nine family members (wife, 5 grandsons, and 3 grand-daughters) in the earthquake. One survived three-month-old granddaughter needed to cut one leg. A. Tamang was severely injured on his head. He could not rescue his family members, even his wife; he became unconscious. He became conscious after a while he was in the Hospital, Trisuli, where he received primary treatment, later he was rescued by helicopter to KMC hospital, Kathmandu, where he was treated for 20 more days.

After losing nine family members, friends, and property, he had some experience of an unstable mind for about four months. The cremation of family members was carried by his brother-in-law and sisters. They are buried nearby, and cremation was done only after the aftershock of 12 May 2015. A. Tamang was a petty road contractor, which he has continued. He reported that he had 37 goats, which were stolen, killed, and consumed by his neighbors after the earthquake. He found that goats were killed next to the recent graveyards, had a party of beer and mutton. Some goats were killed and left inside the pen. His house and safe were broken, the thief had stolen money and several laptops of 216 hydro company were stolen. He heard that many gold earrings and finger rings of the deceased were pulled while bleeding. Observing such events, A. Tamang felt that humans become inhumanly worst, which is not comparable with any other demonic act. He further said that the disaster allowed him to confirm the relationship with the dearness of friends and relatives. Many of his relatives did not show up and even say hello, how you are?; during the harsh day of disaster.

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These cases suggest that there are some changes in community values and their behavior regarding human beings and the natural environment. This situation demands further analysis of whether nature indiscriminate violence and caused such changes to human behavior or society itself and that transferred to the crude individualist and violent. The behavior they observed shocked the displaced Tamangs during the disastrous situation.

#### 4.2. Community and government's rescue and relief distribution

Treatment to injured, rescue, handling food, and shelter, what people thought about, what types of mechanisms and problems to understand are always crucial factors in the disaster. These activities take place at the ‘disaster juncture-of neighbors, aid givers, government’ ([23], p. 8). In 2015, the United Nations has adopted the Sendai Framework in Disaster Risk Reduction (2015–2030) (SFDRR) having the principle guidelines as “all of society engagement and partnership” ([33], p. 13). This global policy framework focused on community-based disaster management initiation. In community-based disaster management different stakeholders collaboration is important [27] the role of the neighborhood, relatives, and community members during the disaster are assessed [28]. Shaw [29] has highlighted the effectiveness of community-based disaster management as collective actions at the local level even in developed countries like Japan. In the context of developing countries like Nepal, community-based disaster management was a customary tradition, which includes rescue, arrangement of basic relief, and resettlement with livelihood support. The study of the Tamang people shows the community-based disaster risk reduction is the most effective, where the community have taken active initiatives in different juncture of the disaster.

Community members were the first eyewitness and experience of disaster, who expressed through the act of rescue by immediate relatives and neighbors, which was possible due to the maintenance of humanitarian and cultural practices. 86% of respondents said that during the stressful situation, family members and lineage brothers rescued and supported them a lot, and only 14% of the respondents reported that they received support

from a maternal uncle. This information was confirmed from the field observation of the settlement pattern as the lineage brothers are the closest neighbors. The local volunteer youths and community leaders were mobilized tirelessly for handling the dead, rescuing injured, sick, children, and old to the safe area, sheltering collectively in the open sky on the top of the village. The grief of the loss of relatives, property, fear of feeling of livelihood insecurity were collectively shared with an emotional expression such as crying, tears, hope, prayer to the Gods, encouragement, and extend of condolences.

Despite their difficult lives without food and drinks, the grief of the loss of relatives injured and children's cry for food and drink; they tirelessly contacted for government rescue, which became successful after three days. The injured were rescued by the Nepal government using a helicopter adopting its policy measures [6], which was completed in three-shift. The injured were dropped off at Trisuli Hospital for primary treatment, and the seriously injured were referred to the hospitals in Kathmandu. The severely injured were dropped by helicopters, and others were transported by ambulance to Kathmandu. Rescue and relief distribution was carried out simultaneously. According to C. Ghale (55), at first, three bundles of noodles and two sacks of bitten rice were dropped by helicopter. Later they received rice and distributed 5 KG per household. After helicopter rescue, villagers collectively decided to move out of the village to a safer area; however, few were left in the village who was very old and poor. The displaced followed the safer path, which took three days to reach Naubise and Satbise of Rasuwa district. The short-cut roads were blocked and landslides continued when they passed the road.

Access to communication and correct information is vital during a disastrous situation. This study shows the problem of an effective and efficient communication system to get support from various organization (s) for timely rescue and relief. During the Gorkha earthquake, an attempt of excessive use of mobile telephone network and electricity cut off challenged for efficient communication to contact the central rescue mission led by the Government. Most of the rural areas of Nepal are connected with mobile networks. Similarly, during the Gorkha earthquake rescue and relief material distribution became a matter of power, property, status, and priority. The displaced informed that even to have telephone communication with the Member of Parliament, Kathmandu for rescue took three days. This situation created vulnerability to the disaster-affected areas. Similarly, the problem of communication affects at the individual level – as highlighted by a couple (S. Tamang and D. D. Tamang).

S. Tamang (27) had left the village to pay off children's school fees in Kalikasthan, Rasuwa. During the earthquake he could not make contact with his wife for three days. Some had informed that her husband died in the Lamachima landslide. When S. Tamang called his wife, she could not believe that her husband is talking to her. D. D. Tamang as a woman with infants fall into big trouble during the earthquake. D. D. Tamang had to take care of two small children while staying under the open sky far away from home, where they had no food and no proper clothes to sleep. She shared her psychological condition as she almost fainted when she heard about her husband's accident. She still remembers the whole sleepless night, and children's crying for food and drink, and her inability to support them. Besides that, she had many shocks due to information about the death of relatives. She expressed the grief of losing relatives and remembered them well. She became emotional while telling her experience of the period of helplessness during the disaster.

#### 4.3. Relief distribution and community strategies for temporary settlement

Relief distribution is closely associated with resilience. The displaced regularly received relief for a year after they settled in Satbise and Naubise. Relief distribution was voluntary work of GOs, NGOs, social, political, and religious institutions, which is closely associated with social, political, and religious relations. The major principle of relief distribution was prioritized to the most vulnerable by age, sex, orphanage, sick, pregnant women, women with the infant, injured, and older adults. Social vulnerability has been looked at from the inequality of the community [4]. Displaced were

happy/satisfied with the NGOs and other volunteers for their mechanism of relief distribution. The displaced received adequate food, medicine, water tank, utensils, gas, gas stove, clothes, medicine, toilet materials, and corrugated steel bundle from the government agencies and several different NGOs, individuals, and private companies as relief materials.

C. Ghale (55) reports that:

The first relief was distributed by the Patanjali group, a religion-based CBO in Rasuwa. Later other NGOs supported and cared for pregnant women and women who have delivered their children recently. They also provided safety materials to them. The orphanage children were sponsored for education. Single women were supported differently. NGOs provided spices for the Dashain and Tihar festival to single women.

Similarly, D.K. Ghale (61) informed that they got relief, mostly food, for a year. Lama from Bouddha, Soyambhu, Yarsa, and Rasuwa and the trekking office supported various food items such as rice, lentils, and oil. Sometimes they received unnecessary and inappropriate relief material, which they felt ashamed to receive sanitary pads, toilet papers, sweets. This statement clearly indicates that relief distributors were unaware of the local sanitary habits and cultural practices.

The non-displaced lacked opportunity for adequate relief. B. Tamang (48), non-displaced from Tiru, informed unequal treatment among the displaced and non-displaced while distributing relief materials. He received only a sack of rice (30 KG) in Dhunche. He traveled two days for that. He neither received a tent or a tarpaulin nor corrugated steel and cement. They mostly relied on their own food, which they had saved, used their own resources for rebuilding a house. However, he is better off at present because he cultivated his land, kept livestock that maintained his traditional livelihood. On the other hand, the displaced did not get a better life, and “almost all displaced are getting ready to return”. He further said those places are for those who have money and he added “*paisa chaina kam chaina*” if you have no money, nothing happens. The elderly displaced do not care about many other things. They expressed nostalgia for their own place saying *aafnai dharo, aafnai padhero aafnai gaumai ramailo* (own tap, own pond, happy lies in our village). The aforesaid narrative clearly shows the discrimination between accessible places and remote villages. The displaced people came down to an accessible and safer place after earthquakes. They received more relief materials than the people living in their own house which was remote and difficult to walk for relief distributors due to landslides. Similarly, earthquake displaced Tamang would not be happy in a confined shelter and would like to return to their homes regardless of the risk.

The displaced community adopted different strategies to solve their problem of safe and comfortable resettlement. The first strategy was split among themselves into two major groups by their political affiliation, kin relation. Despite the regular relief they received from Government and NGOs, the displaced faced problem of settlement in Kalikasthan, and Naubise. In Kalikasthan, the displaced were settled in the private land of Prem Tamang, a member of parliament from Rasuwa district, and those who were settled in Naubise in Rasuwa were settled in rented land. Due to the Government's failure for timely resettlement packages, they faced these types of problems. The second the displaced try to buy land and resettled. The displaced settled in Kalikastha found land near Batar Bazar of Bidur Municipality which was cheap as the land was under auction. This place was suitable for employment, market, a school for children, and sharecrop cultivation in neighbor's land. The nearest market Batar Bazar takes only 5 min by motorbike or 15 min on foot. The settlement was built by their own labor force. C. Ghale (55) informed that the land is registered to B. Tamang and B. B. Tamang. Some are worried and doubted whether this land will be registered to the individual who has contributed. Third, the displaced youth in Kalikasthan initiated an organized struggle. B. B. Tamang (34), the ward chair, the Uttargaya Rural Municipality-1 said a pressure group was formed as, “Tiru Struggle Committee” to highlight the issues in national news media and put pressure on the stakeholders on the

resettlement issue and their miserable uncertain situation. Their organized struggle brought the attention of the International Organization for Migration (IOM) and SCF. They adopted a strategy to receive financial and materials support. According to B. B. Tamang (34), SCF funded cash of 1,252,000 in Nepali currency, and IOM funded 800,000 cash. They also received three truck corrugated steel for roofing and room partition from the IOM. Second, the displaced mobilize their own cash and borrow. The displaced collected 150,000 per household. They also borrowed a loan of 15–16 hundred thousand from the financial institution which was used to buy land.

Fourth, those displaced who were settled in Naubise area of Rasuwa district found public land for temporary settlement in Khalde Bagar. Paying rent to landowners for their temporary settlement brought a problematic situation as cash flow and ownership of the land. They were also settled near Betrawati Bazar and they could be engaged in sharecropping in Naubise area. To use their resources this location was at a convenient distance. They could travel to Tiru and Gogane for about three hours on foot. However, they had to pay rent ranging from 300 to 500 NRs per month per household, depending upon the size of land they had occupied. They paid in total 1,539,000 NRs for 18 months collectively. First, they were afraid of cash flow out from their community, and second, the landowner sold the land on the condition that he will evacuate the displaced from his land. In such a difficult situation, they found public land in Khalde Bagar and moved. P. S. Tamang (59) led the move to Khalde Bagar. P. B. Ghale (33), the ward member, said that all displaced moved to Khalde Bagar by October 2017. According to A. Tamang (51), the area coverage is 82 *ropani* or 10.30 acres. Fifth, they received financial and material support from the government, NGOs, and private companies. They have built houses using corrugated steel for roofing, wall, and partition of rooms, NGOs, and 216 Hydro Project, a Korean company, granted some corrugated steel sheets.

#### 4.4. Reconstruction strategies and the use of resources

Build back better strategy adopted by the Government of Nepal for reconstruction [7, 18], which is relevant to resilient settlement. For resilient reconstruction infrastructure, cohesive community life and secured livelihood are principle components [9]. International Organization for Migration [13] has reported that total of 59,433 persons were displaced from 11,100 households, among them 49% were males and 51% were females. They were settled in 104 sites. A total of 2634 persons were displaced from the Rasuwa district. Among the displaced surveyed, 37% intended to return to their place of origin. Krishna Kanta Upadhyaya, the officer of NRA, Rasuwa reported that 310 households of 19 settlements are in the process of relocation in secured places. NRA has focused on ‘building back better’ strategy to restore and improve disaster resilient housing, capacity strengthening through social empowerment of people and communities, improve access to services, develop and restore economic opportunities, livelihood support, reestablish productive sectors, and enhancing the capacity of the state to address people’s need and future preparedness [18,19]. With the building back better strategy, the reconstruction and rehabilitation policy of the Government of Nepal has urged in situ relocation maintaining without harming community life, livelihood, and cultural practices [18,19]. The displaced from Tiru and Gogane are more concerned about the accessibility of both traditional and market resources to maintain livelihood, social, and cultural identity to locate their settlement for reconstruction.

Safe shelter belongs to resilience. All displaced owned a house (s) before the earthquake at the place of origin. Displaced have a firm agreement in understanding that they need to build a secured house in the future. Among the respondents, 74% replied that their house should be built using modern technology and style as the strategy of reconstruction (Fig. 4). Locals observed the fault of local people not giving priority to strong and secured houses. S. Tamang (29) says, “masons are also responsible for a large number of houses collapsed”. In his observation, the mason-built houses are attractive from the outside, but they were not strong



Fig. 4. Village shrine worship in Tiru.

houses. A. Tamang (51) said that “I had built a house, but it turned to be a cemetery for my nine family members”. It is hard to estimate in brief observation how many houses were there, and the nature of the house collapsed. In a rough estimate, about 90% of only top/roof floors of the house were collapsed and those houses were comparatively older. Those houses have been already repaired and used by the elderly and take care of their property. Only some houses were collapsed totally. These observations indicate that people from different strata (Government, non-government, and developers) would like to help the population for the resettlement of the victims. However, the quality of such works is questionable.

Displaced have experienced and analyzed geography, climate, accessibility of resources, the safety of livelihood, property in their place of origin. However, the will and strategies of the Government have pushed them into a situation of complexity. Neither they could plan their own idea nor they could rely on Government’s reconstruction plans and strategies. Three proposals of resettlement are among the displaced, which is a clear fight of the idea for what types of resources and how they utilized individually and collectively. First, the value of local land resources available in their villages and market-based resources were argued by those who were settled in Khalde Bagar. Their main target is the value of the Betrawati-Rasuwa Gadhi road. Rasuwa Gadhi is an international port that connects to China-Tibet. The road lies on the side of their settlement. Second, the focus has been given to integrated settlement in Tiru, given the focus on using local resources accessibility of basic infrastructure in their settlement sites following the principle of build back better. Third, some displaced wanted to settle in their own land taking tranches from the Government to build their house. The third category of people own a safe area for settlement and do not prefer to stay in a clustered settlement and no preference for resources available elsewhere. Elderly or senior citizens and middle class preferred to settle back to their villages, and the rich, young, prefer to settle in safer areas buying land.

The displaced and those who settled in Khalde Bagar tried to establish an integrated settlement in Khalde Bagar. Govinda Pokharel, then CEO of the National Reconstruction Authority, also agreed and spent 7 million NRs to prepare the land by removing boulders. The general and local election in 2017 changed the scenario as the Government and CEO of NRA changed. The local representatives, the government authorities, and other stakeholders stated in a single voice that Khalde Bagar is unsecured. My observation and understanding as a researcher reflect that Khalde Bagar is the most vulnerable area for flooding of the Trisuli river. This has brought dissatisfaction and frustration among the displaced. P. B. Ghale (33), ward member of Uttargaya Rural Municipality ward no. 1 said, “if the election was delayed for two more months, the integrated settlement would have been established in Khalde Bagar”. He estimates that “the area is big

enough for building 400-500 houses". He had a proposal to control the flood. He said, "we need to build a dam spending NRs 200,000 from each household which is allocated by the government to buy homestead". He further added Khalde Bagar is suitable because of accessibility to school, health services, Rural municipality services, transportation, electricity, use their resources and property in Tiru and Gogane, which lies only 3 h walking distance.

The elderly displaced are unhappy to live in temporary settlements as they lost resource, safety nets, climate, religious heritage sites of their place of origin. D. Ghale (61), who has been settled in Banda Chutari, thinks that if he dies in that place he will go to "hell". He further added that "to live in Tiru is good because of tasty water and the climate/weather is good". The land of their origin is connected with their spirit and livelihood (Fig. 4). The fertility of the land was found good in Tiru and Gogane (Fig. 5). He further added that if they work for three months they grow enough for a year. He thinks that during the winter, all displaced will return to Tiru. M. Tamang (30), Tiru, thinks that "only half residents of Gogane would come and settle in integrated settlement". He doubted because of the inconvenience of using their resources. The land for integrated settlement in Tiru (Fig. 6) is not safe from landslides if we try plotting with heavy equipment. P. B. Ghale (33) said that displaced should have a choice for their settlement, but we must live side by side to protect our social and cultural traditions.

Some displaced regret of leaving their place of origin. D. Ghale (61) said that we left our village because our brains did not work. He is not in favor of the integrated settlement and has big politics. N. Tamang (49) said that it is not practical. He said, "I do not see the possibilities and good future of integrated settlement because we know the opposite social behavior of animal and human. If we keep livestock in one place they fight first and a few days later they build harmonious relations but human beings first live in a harmony but later they fight". L. B. Tamang (35) thinks that they should build a house where their land is, so they can take care of their own land and crops, and use them properly. L. Tamang (26) said some of them do not prefer staying in Khalde; others say integrated settlement; others prefer to build a house in their private land. Those who have money they prefer buying land and live near or in the town. He thinks the displaced have become selfish by focusing on personal benefits only. These situations have created confusion among the displaced. The main problem is that the displaced are unable to decide independently.

The displaced had owned a house built using local resources and traditional techniques before the earthquake. After the earthquake, the displaced have become homeless. For recovery, the ownership and the status of institutional security have been central elements [2]. Among the displaced, a big debate is how to receive a tranche from the government



Fig. 5. Fertile field for green vegetable.



Fig. 6. Proposed integrated resettlement site and people have already built the house on their cost.

to buy a homestead and build a house. Until this study, they have not received any monetary grants except the compensation of dead and the cost to perform death rituals for those who have lost their family member(s). The elderly displaced wanted to take the total sum of the grant and rebuild their own house. The young are in favor of the integrated settlement and argue for access to community infrastructure. The ward chair is devoted to integrated settlement in Tiru.

The ward chair of Uttargaya Rural Municipality-1 in a telephone interview said that "a total of 300 households have a problem of housing." Now they are successful in registering land of the amount of 8 *ana* or 0.025 ha for 130 households in Tiru. They spent 180,769 per household. Seven hundred thousand rupees budget is allocated to prepare homestead, road construction, and drainage. The other 34 households have already bought land in Khole Besi. 53 households bought land in Boke Tar and 24 in Shanti Bazar. Still, 59 households have problems settling for homestead. The ward chair is satisfied a bit and reported that they are already able to build an access road to the integrated settlement (Fig. 7). Tiru health post has received the budget and plans to build a school. Electricity is available in the village since November 2020. Now Government is under the process of tender for reconstruction of integrated settlement. The standard of land allocation is according to the disaster victim relocation management



Fig. 7. Road construction to reach an integrated settlement in Tiru.

Procedure 2071 BS ([6] BS). The integrated settlement facilitates developing infrastructures or services like schools, health posts, drinking water, electricity, etc.

Resettlement is not only the process of resilience to the affected households/community which is embedded in the economic, political, social, and cultural aspects of the individual households. The concept of integrated settlement (*samuhik basti*) is naïve for village people. They prefer to live in scattered settlements for their livelihood. The government would like the earthquake victims to settle in an integrated way by which it can provide services in an effective way. Like the government, political parties would like the integrated settlement to organize their followers in one place. Reconstruction as a strategy to cope with disaster, the Tamangs have multiple strategies as presented in Fig. 6.

Seventy-two percent of displaced have a preference to be settled in the village, building a house using their own source of income adopting modern technology and style. 28% of respondents have said that they accept what the Government decides for them. Many of the respondents have thought family split is one of the adaptation strategies (Fig. 8). Few have thought about their future economic condition.

Some displaced have adopted a strategy of resettlement cultivating abandoned land with the support of relatives (Figs. 9 & 10), rebuilding their house using local materials (Fig. 11), and reinstalled livelihood following traditional knowledge and skills using local resources for cash income (Fig. 12).

4.5. Buying land and vulnerability

Some displaced initiated buying land and resettled. These displaced are trapped in a broker's conspiracy. According to A. Tamang (51), 28 households bought land for resettlement in Boke Tar, in Nuwakot district. After they registered the land, the problem arose as the neighbors did not allow them to use the access road to their homestead. The person who sold the land had committed to fixing the problem, but after selling the land, he did not support it, and they also requested local leaders but they are helpless. Local leaders committed to solving the problem before the election, but they did not. They have taken a 6.4 million NRs loan from a cooperative to buy the land. A similar situation has taken place in Shanti Bazar, where 14 households have bought the land, which falls under a high transmission line. The displaced expressed their frustration, hatred, anxiety as *yo bhukampata kasailai dasa kasailai Dashain bhayo, lato sojhoko din aayena, paidal hidne gadi chadne bhaye* (means someone's misfortune became hay day fortune of others; no day comes for the poor and innocent; pedestrian now became a car owner). Similarly, many people who came with



Fig. 9. Abandoned land left fallow in Gogane.

relief materials they also misused for personal benefits. He indicated the corruption during the rescue, relief distribution by the Government bodies in which CIAA took initiation of the investigation, which also directed to take action to the official [25]. Many news were published about fake victims and real victims and some households split to get extra relief material.

4.6. Performance of death rituals and spirituality

The displaced Tamang worried that they have been detached from the dead families and relatives as they did not perform proper death rituals. They felt that the death of their relative(s) was not more than an animal's death (*pasukai jastai maran bhayo*). They indicate it to mean they could not perform a proper death ritual for their beloved. They manage to bury their dead nearby their house only after 17 days of their death. The displaced went back to the village in a group and cremated nearby their houses. They have a feeling of fear and anxiety that improper death rituals of their relatives who died not in a normal way that might cause a malevolent effect in their life. The value of ritual has multiple aspects as the Tamang women need proper care of *tšen*, extra-human beings associated with the fertility of agriculture, human being, livestock, and wealth [12],

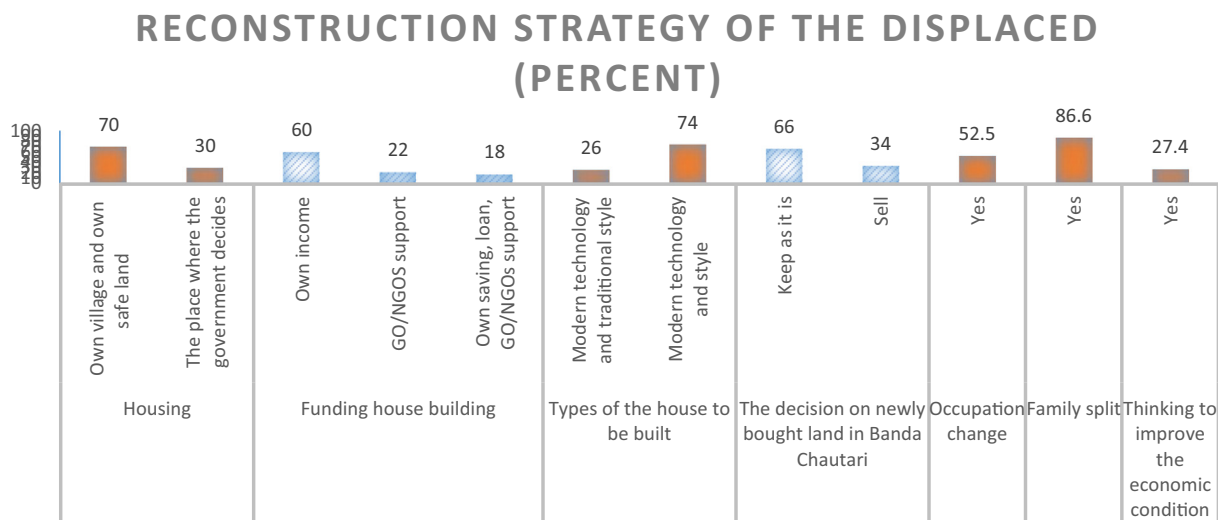


Fig. 8. Reconstruction Strategy of the displaced. (Source: Field Survey, 2018)



Fig. 10. Abandoned land for three years being brought under cultivation as a step to return to the place of origin.

which might be lost due to not following proper rules and procedure of death ritual.

Tamangs have their own norms and values to handle dead relatives. S. Tamang (47) said that their customary system was to take the corpse to the hilltop and cremate. If the dead body is improperly cremated, the dead person becomes a ghost, or the spirit will not get warmth and peace to their soul. Displaced settled in Khalde Bagar faced the problem of finding a cremation ground. They struggled hard with a deep and sincere request to the locals they get permission for cremation ground a specific area, where they could not perform proper cremation as they lack enough cremation ground. P. B. Ghale said that in their cremation practice, they cannot cremate many dead bodies in a single place. It is believed that their soul fights in heaven for the issue of using the same place. He further added that cremation of the dead is a must; if there is a problem to cremate the whole body, even a piece of the body part is needed to cremate.

## 5. Conclusion and recommendation

The finding of this study shows that differential vulnerability and resilience are complex, relative, and dynamic and vary by nature, scales of disaster, on the individual, household, and community. The common



Fig. 11. Longhouse in Tiru rebuilt-in own cost.



Fig. 12. Family members weaving baskets for cash income using local bamboo to support the livelihood.

aspects of resilience are physical, human, financial, natural, and social capital. This study has focused on people's perspectives on vulnerability, resilience, their social-psychological experiences, and relief operations in the aftermath of the 2015 Gorkha earthquake. Several opportunities and challenges of vulnerability and resilience experienced by the displaced during the immediate rescue, relief distribution, relocation, resettlement, and reconstruction processes. The analysis of culture, resources, geography, and society helps us understand the what are the valuable phenomenon of disaster vulnerability and resilience. The displaced community took active initiation in resettlement adopted multiple strategies that include splitting into groups, mobilizing own resources, organized group pressure, mobilizing political affinity, receiving cash and material support from GOs, NGOs, and private institutions that supported reducing risk during the disaster.

The Gorkha earthquake, 2015 in Nepal was a big shock to the people and the surroundings. Resilience the cultural process of adaptation. This study examined how displaced of Gorkha earthquake had coped collectively. Collectivity among the displaced Tamang was an important cultural and social aspect to overcome disaster. Collective decisions were also based on their own assessment of vulnerability, social and political affinity, and household resilience capacity. The vulnerability and resilience situation begins from own family and nature of the household, as the first response to the disaster to rescue their immediate family, friends, and neighbor, and find out where about their relatives. Social and psychological trauma were expressed among the family members, relatives, and neighbors while sheltering in safe areas sharing emotion, pain, wait for rescue by government agencies for the required treatment of the injured and relief materials. When the rescue was completed the Tamangs of the study area collectively decided to leave the place of their origin and walk toward safer areas and where they might get relief conveniently, as the second response. Third, they collectively decided to settle on the temporary settlements based on their kinship relation and they get relief material which by the time need to change as part of the adaptation strategy. Fourth, they approach their political representatives to the parliament and the government, government support, I/NGOs support, received funds from the government for those who lost their family members. In the end integrated resettlement program initiated by the government, a discussion at the household level began. This divided people where to settle; many different versions of proposals were forwarded; focusing on the utilization of their ancestral homeland and the local resources, maintenance of cultural practices and social bonds, access to modern infrastructures such as roads, electricity, school, health services, and the market. The majority of displaced wanted to settle in their homeland having built houses using modern technology and style financing with their own source of income. However, they

desire heavily the tranches of government funding. They even tried to solve the resettlement issue by initiating buying land collectively and again they encounter problems relating to the access road, high transmission line, and debt crisis. They also face negligence from the family members and inhuman behavior of neighbors and people who were shown as supporters. However, I understand that people did not hear about the voices of the elderly, did not pay attention to the sensitivity of the geological condition of the area, and utilize heavy equipment for building roads and homesteads and for other infrastructure. Neither they assessed concretely the loss and damage of the households, nor they assessed the future of their children about the new way of resettlement with better livelihood.

This paper argues that the government and NGOs-led relief packages and reconstruction strategies were not based on the concrete situation. Rescue, relief, and reconstruction demand understanding the environment, culture, and community. I argue that if participatory action research and planning were conducted using the local people's understanding, that would have addressed the resettlement problem comfortably and practically. This study found that the non-displaced, who occupy and maintain their local resources, were more resilient. Now many people like to take resettlement packages that will create further environmental, social, and economic challenges. The displaced could have been supported differently based on their vulnerability and resilience conditions but in a better way. Displaced became a long-term dependent on external support; and losing their self-reliant livelihood. Besides support from GOs/NGOs remittance of the migrant laborers supported significantly to maintain their livelihood. Many families who lost family relationships, and neighborhood social bond they had never thought of it before. The inhuman behaviors of nature and humans came to notice at the same time. The trust and support of the family and neighborhood were the primary sources of resilience and future hope were challenged. Despite all material and non-material loss and grieve, both the displaced and non-displaced Tamangs are aware of the quality of construction material and technology. Earthquake disaster has brought them to understand the value of diverse resources for livelihood as well as they are now aware of the corruption at different levels. This paper lacks the stakeholder's point of view; therefore, further comprehensive research would be better to carry out to substantiate the argument presented.

#### Ethics approval and consent to participate

This research involves human participants, human data, and human issues. The study was conducted under the SOSIN research project by the Central Department of Anthropology at Tribhuvan University, Nepal. The University does not have a policy for granting formal ethical approval for the low-risk research idea. The general issues such as obtaining oral consent from the participants before taking their interview, allowing them to leave the interview at any time, and not using any inappropriate means to obtain information were followed. The participants were informed about the research during the observation of their activities.

#### Consent for publication

Not applicable.

#### Availability of data and materials

The data are available.

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#### Authors' contributions

The author is the primary researcher and solely responsible for framing the paper, analyzing data, and interpreting the results, together with reviewing some literature and refining the manuscript.

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#### Declaration of Competing Interest

No competing interest.

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