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Tracing livelihood trajectories: Patterns of livelihood adaptations in rural communities in eastern Nepal

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Abstract

Mountain communities are adapting their livelihoods to a complex combination of social, political and economic changes and associated risks. Despite recognition of adaption in response to multiple changes in sustainable livelihood and critical climate change literature, risks attributed to biophysical effects of climate change have increasingly assumed importance. Consequently, diversification is promoted as an adaptive approach to reduce such risks. However, understanding livelihood adaptation from the vantage point of climate change alone might lead to a limited understanding of non-climatic factors also shaping it. This paper proposes understanding adaptation through analysing long-term livelihood changes and using society rather than climate change as a conceptual starting point. It argues that such an approach has better potential to highlight a broader range of dynamic drivers operating over decades and to inform contextually grounded rural livelihood adaptation policies. Changes are traced in the overall livelihood trajectories among four rural communities in Nepal, in living memory, to understand the role of adaptation in shaping it. Qualitative life narratives were collected and complemented by key informant interviews, field observations and the analysis of official documents. The findings suggest that livelihoods have shifted not only from subsistence towards income generation but also from engagement in diverse livelihood sectors towards specialisation; the opposite of the advocated diversification. The role of political, economic, social and cultural processes within and outside the community has been prominent in shaping this trajectory.

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Introduction

Mountain communities are subjected to a host of global environmental and socio-economic influences posing complex challenges and risks (Hurni et al., 2005; Jodha, 2005). However, it is the vulnerability to climate change that increasingly attracts attention (Gentle and Maraseni, 2012). It constitutes the foundation for international and national adaptation policy agendas (Kohler et al., 2010), promoting diversification of livelihoods as an effective adaptive strategy to reduce risk (Agrawal, 2008) and to achieve environmental sustainability and rural poverty reduction (Barrett et al., 2001).

Notwithstanding the importance of climate change concerns, studies have pointed out that vulnerable communities do not necessarily adapt to climate changerisks in isolation (See Leichenko and O'Brien, 2008; Parsons and Nalau, 2016). Therefore, understanding or supporting adaptation from the vantage point of climate alone is likely to overlook other important factors shaping livelihood adaptation in mountain communities, which have so far only afforded marginal focus (Bassett and Fogelman, 2013; Leichenko and O'Brien, 2008).

The purpose of this paper is to contribute to a holistic understanding of adaptation through tracing long-term livelihood trajectories, using society rather than climate change as a starting point. The approach is not to ignore the urgent need to address climate change and associated risks or rejects the risk-reducing potential of diversification. The intention is to understand from a historical standpoint, how communities have adapted to complex combination of changes of which climate may be one. At the same time highlight that their manifestations are socially mediated, and thus the role of contextual non-climatic factors may acquire more relevance to understanding adaptation in specific contexts (Becker, 2014).

The study involves analysis of the trajectory of long-term livelihood changes as it has the potential to highlight dynamic drivers operating over decades (Scoones, 2009).It focuses on rural communities in four villages of Khumjung, Buksa, Kengma and Ingla in eastern Nepal. Nepal is among the least developed countries in Asia and with its landlocked geography deemed particularly vulnerable to contemporary global change (UNCSD, 2012). Livelihood diversification has long been a quintessential part of rural development and sustainability policies in Nepal, aided by the international community (Chhetri et al., 2012).

To meet the above mentioned purpose, the paper will attempt to answer two research questions–what changes in livelihoods in living memory do members of the communities

in Khumjung, Buksa, Kengma and Ingla express? What factors shaped the main trajectory of livelihood adaptation?

Theoretical framework

Adaptation: A process to deal with risk

To understand adaptation from the vantage point of society involves conceptualising it as a dynamic process by which a population achieves a "working relationship" with its environment (Agnew, 1981:106), by responding to some changing condition, stress, hazard, risk or opportunity (Smit and Wandel, 2001); here closely related to reducing livelihood risks (Agrawal, 2008; Halstead and O'Shea, 1989). Adaptation could range from being mobile to reduce risk, changing land use to increase production of a resource over space and time, pooling resources from multiple sources, diversifying activities, exchanging and storing resources,to innovating new techniques to address livelihood needs (Agrawal, 2008; Thornton and Manasfi, 2010).

Livelihood and diversification

Livelihood is here conceptualised as going beyond income, not only to include both cash and kind, but also other factors, such as social institutions, gender relations, and property rights (Ellis, 2000), required to sustain and support livelihoods. Such broader conceptualisation helps to avoid neglecting *access* to resources in addition to the *availability* of resources (Bebbington, 1999), which defines the opportunities available to individuals and communities (Sen, 1997). Thus, livelihood diversification could conceptually imply construction of portfolio of income earning activities from *dissimilar* sources (farm, non-farm, remittances) and building social support capabilities (See Ellis, 2000). In contrast to specialization, which implies reducing the number of livelihood activities focusing on one or a few for greater efficiency (Ellis, 2000, p.291).

Literature is rife with examples suggesting livelihood diversification as a central adaptation strategy to reduce risk (Agrawal and Perrin, 2008; Chambers and Conway, 1991; Scoones, 2009), but changes in livelihood portfolios of households can go both ways and lead to either diversification or specialisation and even a mix of both (Guillet et al.,1983; Sharma, 1997). At the same time it becomes essential to highlight the trajectory of livelihood pattern and understand if the overall pattern is towards diversification (or specialisation) and in what way?

It could also be misleading to assume livelihood diversification as altogether positive and its benefits as uniformly spread across households and communities. Several

factors have been shown to limit the opportunities of livelihood diversification, such as rigid labour markets (Barrett, et al; 2001), unfavourable physical environment, seasonality, inflexible management policies, limited personal skills, time constraints, rigid institutions (Hussein and Nelson, 1998), and gender differences (Davidson, 1998). Thus, a broader conceptualisation of livelihood is justified for a more holistic understanding of adaptation.

Non-climatic macro changes

Mountain communities in Nepal have experienced and adapted to significant non-climatic changes starting with the opening of the economy in the 1950s and its subsequent market-orientation (Pant, 2005), political changes towards democracy (Bista, 1991; Lawoti, 2007) and cultural changes driven by tourism (Dhakal, 2014; Nepal, 1997). Trekking tourism, in particular, has been seminal in changing the social, cultural, and environmental landscape (MacLellan and Thapa, 2000; Stevens, 1993). Spoon (2011) exemplifies some of these shifts among *Sherpas* from "spiritual and agro-pastoralist socio-economic values to more tourism centred economic logic" (p.657). However, most recent debates about adaptation and changes in the country have been driven by the climate change agenda (Nepal INDC, 2016; UNDP, 2014), even when it is clear that non-climatic changes have been fundamental (Forsyth and Evans, 2012).

Methodology

Background and study site

This study focuses on mountain and hill communities residing eastern part of the country (Figure 1), where agricultural and non-agricultural activities, common throughout the country, contribute to different degrees to the local economy. Although, livelihood adaptation is observed in the western mountains and Manang and Mustang area (Thapa et al, 2017) yet the study of eastern part of Nepal could benefit from a range of experiences concerning factors potentially driving adaptation. That in combination with logistical limitations motivated focusing on the eastern mountains and hills, where Khumjung is located on the main tourist trail to Mount Everest, Kengma and Buksa are located off the main trail but still having tourism related livelihood opportunities, while Ingla is located far from such tourism infrastructure. In Khumjung and Kengma, *Sherpas* are the dominant community, both in terms of number and ownership of property, but *Rais*, *Gurungs*, *Magars* and *Diyalis* are also living there and often referred to as people from *Oul* or belonging to *Solu* region or lowlands (South of Khumbu). Buksa comprises mainly *Rais*, while *Gurungs* are the dominant community in Ingla, but with *Tamang, Chettri, Baun* and *Damai* minorities.

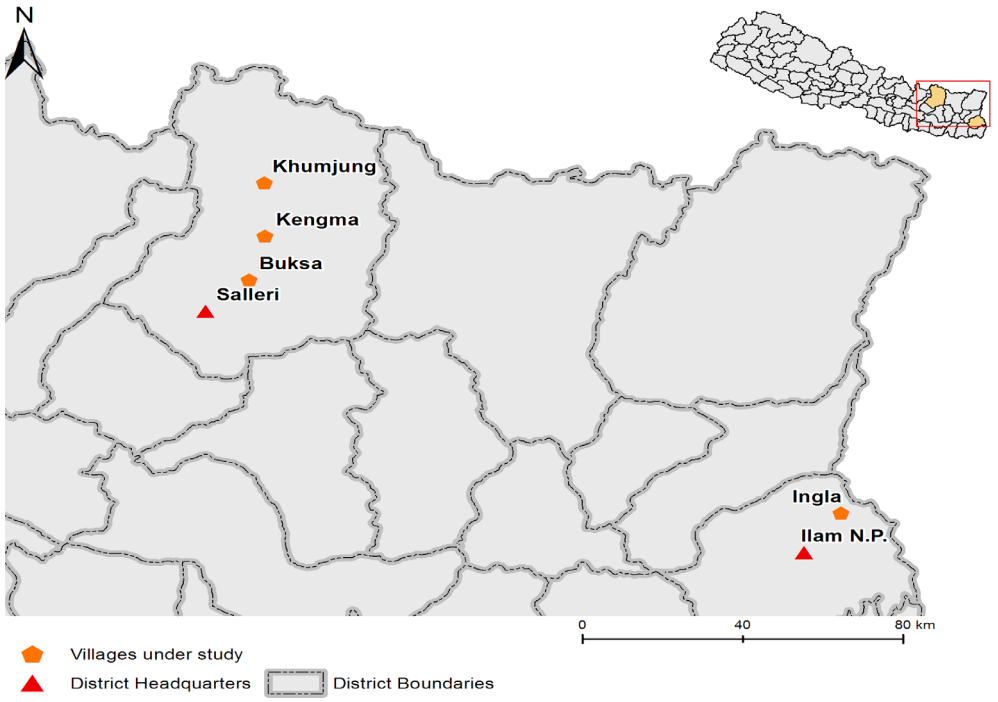

Figure 1: The locations of the villages

Data Source: ICIMOD (International Centre for Integrated Mountain Development) (2008) Settlements of Nepal, (2008), district Boundary of Nepal (2009). Kathmandu, Nepal: ICIMOD.

Method

A case study methodology was deemed appropriate (Flyvbjerg, 2001). Life narratives were collected through in-depth interview of community members which were complemented by key interviews. Women and men aged over 50 were purposively selected to provide a long-term perspective on the livelihood changes experienced by villagers. Although the rule was not strictly followed to avoid missing out on valuable narratives, exceptions were particularly made in connections with people from *Oul* and key informants. Eighteen interviews were conducted in Khumjung (nine women and nine men), four in Kengma (three women and one man), five in Buksa (three women and two men), and twenty-one in Ingla (ten women and eleven men). The interviews in Khumjung were conducted in the local Sherpa language with the help of a research assistant, while Nepali was used with respondents in Kengma, Buksa and Ingla. Key

informants include a representative of the Himalayan Trust, the former district head of Solukhumbu, a representative of the former Jamuna Village Development Committee (it now is administratively placed under Sandakpur rural municipality), and a representative of the Namsaling Community Development Centre. Field work was conducted between December 2014 and March 2015. The narratives were supported by data drawn from sources, which are provided in the table below.

Table 1: Overview of the data gathering techniques

Type of technique	Mode of interaction	Type of information
Field observation	Observations during trek and walks with research assistant in the village. Informal chats. Taking photographs when during walks. Participatory observation during in village marriage celebration, religious ritual village monastery and helping in some of the daily chores.	Data used for making interview guide and contextualize findings from the respondent interviews. Used to understand the interactions in the villages and islands.
Interviews	In-depth interviewing (more open ended) Key informant (Semi structured interview)	Life narratives used to understand changes in living memory (emphasis on livelihoods) and adaptation to these changes. Information concerning formal efforts when it comes to adaptation and development work in the areas. Data also helped understand interaction between formal authorities the community interaction with.
Focus Group discussion	Facilitating during the group discussion.	Data used to understanding new topics emerging during the course of discussion, due to diverse viewpoints. Also helped confirm issues raised in earlier individual interviews.
Documents NAPA, INDC, other related government reports	Desk studies	Data used for statistical information and understand government position when it comes to adaptation.

All interviews were transcribed and analysed (Figure 2). To draw out themes, open coding was conducted followed by development of categories using codes (See Saldana, 2011). Narrative accounts collected during interviews were subjected to thematic analysis and supported by the use of NVIVO as a tool for qualitative analysis.

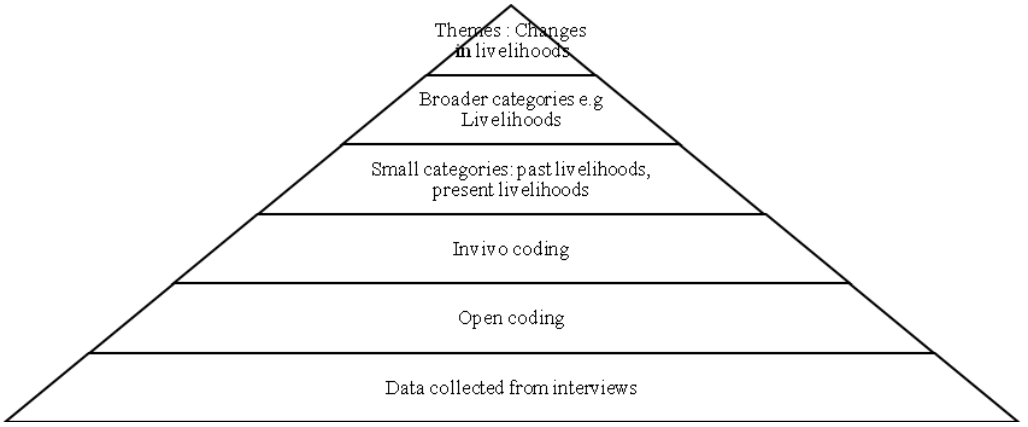

Figure 2: Steps showing thematic analysis of interview data

Results

Khumjung

Historically, agriculture and trade with Tibet were the major livelihood activities. Agriculture was a subsistence activity and involved the whole family. Crops were limited to *aalu* (potato) and *phapar* (buckwheat). Harsh physical conditions continue to be an important influence on agricultural activities in Khumjung, limiting the variety of crops that can be grown. Agro-pastoralism was practised on a large scale that involved transhumance between altitudes for pastures. The village *Chule* near Khumjung still serves as a seasonal herding home for few pastoralists. Animals (*yak* and *nak*) were traded and used to carry meat and wool for barter that were exchanged for salt with Tibet. This was then exchanged for grains with the people living in the *Oul* region or warmer areas south of Khumbu region. However, trade with Tibet stopped following the introduction of stringent border controls by China in 1959 (Stevens,1993). Pottering and trekking guides were mentioned as tourism-related livelihoods that were done on a small scale.

> "Earlier when I used to be around 14, we used to have *Yak* and *Nak* and go to Tibet. There was not so much tourist system[..]" (Male, 74, Khumjung)

The present has a different story to tell. Livelihoods are centred on tourism and related activities. According to the Youth club head there are around approximately 180 houses in Khumjung village. Mostly men were pointed out as engaged in trekking related activities. Few females work as porters, others are engaged in agricultural activities and manage tourist lodges/ restaurants, which are all dominated and owned by the Sherpa. In other words Sherpa households are directly or indirectly involved with tourism (Brower, 1991). Residents find this very remunerative as tourists pay in foreign currency, usually dollars or euros and is indicated in the quote below.

> "It is expensive to do agriculture, labour is expensive [..]but if you climb the Himal you will earn dollars" (Male, Khumjung, 73).

Respondents noted that in the past, the only big concern was stockpiling food for the winter but now they had to think about rising living costs. In Khumjung, one of the lodge owners noted that even 1000 rupees was not enough for the labor or *Khetala* cost. At the same time in Buksa (a relatively non tourist area), the cost for hiring labour to do farm work was noted as 125 rupees excluding tea and snacks. With tourism, there is a strong tendency to specialise and cater to the increased cost of living, for example, cost of food, education fees, health, travel and aspirations of a higher standard of living. Accommodation and food costs are high partly due to the cost of delivering to higher altitudes and intermittent supply during bad weather conditions and economic blockades.

> "[..]The past system was affordable but now that we have the dollar system everything is expensive[..] trekking has allowed us to earn a lot of money and lead a comfortable life, but it is full of tension compared to the past." (Male, 73, Khumjung)

> "Even 5000 is not enough, sugar, rice, milk is expensive. It is not even enough to buy chilly and salt. You need at least 10000" (Female, 80, Khumjung).

The tension mentioned in the above statement and the expenses in the following are indicative of the increase in living cost with the proliferation of tourism and adapting to the modern way of life, in comparison to the monastic way of life in the past (*See* Nepal, 2015). The importance of tourism has escalated to the point that agriculture, historically the main livelihood activity, has been adapted to cater to the tourism sector. This adaptation includes land use changes from agriculture towards more land being used

for the construction of lodges, shops and restaurants. e.g. increase in number of tourist lodges from 1 in 1979 to 35 in Khumjung (Rai, 2017). Most of the *Years* (Highland settlement) settlements that were earlier potato and hay fields have now been converted tourist towns (LAPA, 2015). Even the harvesting season of potatoes has been adapted to suit the needs of tourists. According to one lodge owner, potatoes are harvested early to make them available to guests. Respondents voiced worries about their dependence on tourism, best summarised by a female lodge owner in Khumjung:

> "If tourism ends I do not know what will happen, we have used all our ancestral lands for tourism-related purposes [..]". (Female, 50, Khumjung)

There has also been a change in the size of the house and cement material being used for its construction. Although mud is still used for construction, it is on a much-reduced scale and limited to those with low income families. Studies have confirmed growing inequality with tourism, between *Oul* people and Sherpas, and among Sherpas themselves based on assets owned and the kind of engagement in tourism activities (Ortner, 1989; Spoon, 2011). Escalation of tourism activities has coincided with an overall decline towards engagement in earlier subsistence pattern of agricultural activities. Approximately 10 of the respondents indicated a decline in agricultural productivity due to an unwillingness to perform heavy agricultural work, low returns, storage issues and changing weather.

One of the older respondents expressed changes in climate over the course of 20-25 years, in terms of the amount snowfall and rainfall which was expressed as bad for the agriculture in the *Oul* region that would indirectly affect them –

> "Before, in winter it used to snow heavily, but it has reduced… in winter there used to be almost two feet of snow [..]if there is rainfall the seedlings would grow better in *Oul* [..] there will be no famine [..]"(Male, 73, Khumjung)

The concerns are valid as traditionally, a buffer stock of food and fodder as a reserve for the winter months was maintained to reduce the risk of food unavailability. The tradition is still followed but comprises more of groceries and packaged food, particularly among those owning lodges, to cater to tourist demands all-round the year. Additionally, new techniques such as greenhouse have been introduced to increase the production of food but to cater tourist demands, especially spinach and onions, that would not otherwise be possible at high altitude. Greenhouse production remains on a small scale; it started

with one lodge and has been copied by others in the village who observed the benefits of growing a wider variety of crops.

Today, Sherpas migrate abroad and to Kathmandu mostly for work and education supported by their extensive social network both domestic and abroad (Sherpa, 2015). The extent of migration has been such that it is pointed as being responsible for decline in the growth rate (LAPA, 2015). But this has made remittances another major income source. Tourism being a seasonal activity, during the off-season, most Sherpa stravel to Kathmandu to live off their earnings. Those who cannot afford to go to Kathmandu in the off-season migrate to nearby *Chule*, which is warmer and has better grazing conditions. This migration of Sherpas has resulted in a lack of human power to sustain agricultural activities, in turn creating a need to hire labour from outside the family, especially people from *Oul* or *Solu* region. The main tasks for labour are manual in nature and include agriculture, construction and collecting firewood. People from *Oul or Solu* region migrate seasonally or permanently to avail these employment opportunities. Availing education facilities for their children at the school and presence of social networks in Khumjung was also stated as a pull factor to migrate. One of the migrants (belonging to *Magar* community from Okhladhunga), living in Khumjung for the past 9 years with his family stated that

> "there are lot of Magars here, in fact I came earlier 17 years ago with them and now have settled here due to growing demand for construction work" (Male, 36)

When it comes to government's role, residents noted that almost all of the basic services such as water, electricity, transport and medical facilities had been established by international NGOs, and were either maintained by them or local Sherpas. Even the school was started and looked after completely by a private foundation, known as the Hillary foundation. There are informal institutions that take care of local resources such as the *Nawa* system for forest protection and local youth club for who do repair work of the local facilities among other activities. In Khumjung, politics was considered immoral and limited to those in power.

Kengma and Buksa

Historically, the main livelihood activity has been selling agricultural products in Buksa and Kengma. Especially in Kengma, little income was generated from trekking-related activities outside the village and most residents were engaged in agriculture.

> "Earlier there was no trekking and there was mainly agriculture and there was a lot of manure. But now a lot of them have started doing trekking work and there is less manure." (Female, 67, Kengma)
>
> "[..]it is mainly agriculture for those who cannot afford anything else, those who can, have started doing new things." (Female, 58, Buksa)

The agricultural production although is pointed out to have declined, attributed to engagement in trekking by men and reduction in livestock owned. A few shops operate along the main trek route especially among the Sherpa in Kengma. This, however, is not the case in Khumjung where such shops, including small tea stalls, are operated by people from *Oul.* In Kengma, the village's menfolk, in particular, work as guides and porters during the tourist season (spring and autumn season, totalling up to 4-5 months) and undertake agricultural activity in the off-season. The women, on the other hand, are engaged in agricultural activity all the year round. In Buksa, among the respondents, the other source of income apart from agriculture is making traditional baskets known as *doko*. to sell locally, although not much can be said about the demand from the present study.

In both Kengma and Buksa, production includes millet, barley, buckwheat, raddish and maize. There was no particular mention of change in the type of crops except that potato was being grown in Kengma much more due to its demand from Lukla. There was also a mention of willingness to grow more but limited by availability of labour and manure. Some is consumed by the villagers themselves, but a significant part is sold at the market in Lukla and even locally, but this amount could have been influenced by the consumption pattern and size of the household.

The location of the airport at Lukla has provided a market for commercial agriculture, especially for nearby villages like Kengma. Favourable climatic conditions support a variety of agricultural crops. Therefore, although neither Kengma nor Buksa are located directly on the trekking route, they are both influenced by tourism. In Buksa, livelihood problems are related to access to water and lack of manure, while access to water and lack of firewood were problematic in Kengma. Water supply was a problem for respondents who did not live close to the water source, and those who could not afford to pipe water closer to home. In both Kengma and Buksa use of water pipes is popular that was facilitated by the government support. However, some pointed out that it was incomplete and had to set it up themselves. Firewood supply was also considered an issue particularly post the implementation of forest rules barring people for collecting

firewood all-round the year. When it comes to helping them solve livelihood constraints, respondents in Kengma and Buksa, noted that government officials only visited the village during election indicating mistrust. The role of NGO was mentioned in provision of educational facilities.

Ingla

Ingla has always been oriented to agriculture. However, historically it was carried out at a much larger scale with a focus on food crops and cattle providing the required manure. The quote below summarises the state of agriculture

> "Even in the past it was agriculture, we planted maize, potato and even cardamom[…] but now there is no more cardamom" (Female, 70, Ingla)

Women often had to travel long distances early in the morning to fetch grass, firewood and water in the forest, and returned only in the afternoon. Mostly men worked in the fields and provided porter services, such as carrying heavy loads to the market. Lower-caste households worked as blacksmiths and carpenters as most owned tiny, if any, agricultural land. Although these activities, and others such as spiritual and natural healers, have been passed down through the generations, very few younger men are involved in them.

Until 2014, cardamom was a very profitable crop leading to an increase in reforestation activities to grow Alder trees. Increased overgrazing had led to barren lands, and reforestation activity was an intervention supported by the Red Panda Network to rectify the problem. The reforestation activity was indicated as a major incentive to grow trees with the purpose of providing shade to cardamom farming. Households in Jamuna municipality (where Ingla is located) on an average has 0.05 hectares devoted to cardamom (Bhattarai, 2016).

Table 2: Cardamom production in Ilam

Year	Area (ha)	Production(Mt/ha)
2006/2007	2,837	1,427
2007/2008	2,837	1,727
2008/2009	2,000	963
2009/2010	2,106	694
2011/2012	1,760	694
2012/2013	1,450	502
2013/2014	1,132	520

Source: *Adapted from K. C. and Upreti, 2017*

The practice of cardamom farming was ended by pest attacks (Table 2) that more-or-less completely destroyed production and caused enormous economic losses for the whole village. Efforts are on-going to reintroduce cardamom with more dependence on dairy and *Chiraito* (medicinal plant). Traders visit the village to collect agricultural produce. Poor transport facilities made respondents dependent on them despite unfair bargaining practices. Although road connection improved for Ilam district and improved the price of cardamom, dirt roads still connect many remote villages including Ingla, making its location remote in relation to the markets for production. There does exist one car pool system but its operation depends upon the number of passengers.

Other food crops, such as potatoes, are sold to a limited extent. The main sources of income from farm-based activities are the sale of dairy products, such as milk and *churpee* (a local cheese). Milk products are sold to the local dairy. Goats, pigs, hens are raised for their meat and cows for their dairy products, and homemade liquor made from millet is sold. An attempt by the Red Panda Network to train the community in guesthouse activities was unsuccessful. When cardamom production ended, residents turned to the production of the medicinal plant *Chiraito* as a source of income supported by an international NGO, working with micro-finance schemes *Bachat* ('to save' in Nepali). The scheme is operated by women and involves pooling in of money to provide loans to members, often used to reduce livelihood risks. Although *Chiraito* market value is far below than that of cardamom, respondents were banking upon it, due to the lack of alternative sources of income.

Wild boar attacks is another major threat to agriculture mentioned by the respondents that had led many residents to stop growing potato and maize altogether and even move elsewhere within the village to reduce the risk of attack. It was indicated that the government was unable to provide sufficient help to tackle the issues of the wild boar or provide alternatives to cardamom farming. Other studies in Nepal have also reported on this issue (Aase and Chapagain, 2005)

The government did, however, encourage the use of urea, although many residents claim to learn from neighbours. Interestingly, changing weather conditions and the government-sponsored use of urea were reasons stated for increased pest attack. Respondents did refer to climate when talking about agriculture.

> "Even if we grow more potatoes, there will be *Chilsa* (potato disease), which was not the case before [..]now you can find similar disease in beans and lentils." (Female, 57, Ingla).

Many respondents described a noticeable change in sowing times, the crops grown, and attributed declining productivity to changing weather conditions. Field notes reveal references made to climate change include –decrease in visibility of snow, depletion of water resources, appearance of mosquitoes and increase in weed population. One of the farmers expressed:

> "There has been increasing appearance of this plant called *shiru*, also known to cause itching, which earlier 20-25 years back was not the case particularly in the upper colder reaches of the village" (Male, teacher, 45 years, Ingla).

In the village, migration abroad continues to be a major livelihood activity. Migrants engaged in manual labour or unskilled activities provide remittances from destinations such as Qatar, Malaysia and Hong Kong. The extent of the migration was to an extent that one of the wards in the village had mostly women inhabitants and was also attributed to disturbing the community values with increase in the number of extra marital affairs and children outside marriage. Other activities in the, village include teaching either in the local school or those located in other nearby villages. Among the respondents, two male and one female were teachers at the two schools located in Ingla.

Discussions

It is now time to discuss how the findings may answer the two research questions. Although the two research questions are connected, the discussion is structured in two parts, each addressing one of them.

The main trajectory of livelihood adaptation

It is clear that livelihood patterns have shifted from subsistence-related activities towards commercial, profit-oriented livelihoods in all four villages. In Khumjung, the tourism economy has raised expectations, as community members can now earn a comfortable living during the tourist season. This opportunity to earn money is also attracting people from Kengma and Buksa, although they have to be mobile to benefit. In Ingla, lucrative cardamom and *chiraito* plantations drove many to use most of their land for these cash crops. Similar studies also confirm this trend attributed to diseases (Khadka, 2011), climate change (Rijal, 2014), and land degradation, made worse due to lack of institutional support (Sony and Upreti, 2017). This shift from subsistence to income generation has not only happened in the studied villages buta nation-wide phenomenon (Khadka, 1998), and a part of a global process described by Polanyi (2001) as "the great transformation": The transformation of the mode of exchange from reciprocity

and redistribution to market exchange. This shift has far-reaching consequences, spanning from changes in the composition of the local labour force (Kelly, 2012) to increasing affluence and deprivation (Bauman, 2004). However, it has also been shown that adapting livelihoods from subsistence to income generation may allow mountain communities access to crucial services not available under the previous subsistence regime, such as education and health care (Lama et al; 2017).

Tightly connected to the shift from subsistence livelihoods towards income generation is a parallel shift from diversified livelihood portfolios towards specialisation. This is clearly visible in all four villages, with tourism being the dominant sector in Khumjung, Kengma and Buksa, while commercial agriculture is the dominant sector in Ingla. What started as diversification with the arrival of the first tourists and internationally connected cardamom buyers, which were initially seen as complements to the already highly diversified livelihoods of the communities, have over the years proven lucrative and gradually displaced other livelihood activities. Many households and communities are still engaged in different livelihood activities, but most focus more or less solely on activities anchored in a *single specialised sector*, with food production persisting as a source income but on a heavily reduced scale.

It is important to note that there are two aspects of diversification; (1) diversifying the livelihood portfolio regardless of the sector, or (2) changing from activities in one to several sectors (Hussein and Nelson, 1998; Niehof, 2004). This means that just counting the number of different types of livelihood activities is not sufficient for grasping if a household has diversified or specialised their livelihood. They may engage in numerous different activities, yet being dependent on one for the main part of their livelihood, or on several that all belong to the same sector. For instance, some households in Khumjung can live well on one mountain guide salary, while another well-off household has a lodge, a restaurant, and a porter's wages. Some households are even engaging in more livelihood activities now than in the past, but the resources used and the nature of these activities are similar.

Hence, the diversification advocated for in both science and policy has been trumped by specialisation everywhere. This move towards specialisation has proven to increase the vulnerability of the now tourism-dominated livelihoods in Khumjung, Kengma and Buksa, as well as the commercial agriculture-dominated livelihoods in Ingla, to the impact of shocks (Lama et al., 2017), epitomized by the 2015 earthquake and the pest attack on cardamom.

Factors shaping the livelihood trajectory

This main trajectory towards specialised income-generating livelihoods is not in any way driven only by climate change, yet it is fundamental in determining livelihoods and livelihood risks depending on the context. This trajectory can be seen as a response to financial stress exerted by rising living costs, which include financial costs related to education, healthcare, and maintaining living standards that they now have become accustomed to. Focusing on one or few of the most lucrative livelihood activities is rather understandable in these circumstances, especially considering the limited and shrinking labour capacity of the households and communities, with many young people migrating abroad or to Kathmandu. Similar trends are found in Africa (Batterbury, 2001; Ellis, 2005). Although it could be said that such migration is a form of diversification considering potential remittances, it has been shown to have a negative effect on rural productivity (Bryceson, 1996; Lipton, 1980).

It has also been argued that the flow of goods, services, and ideas associated with globalization and the opening of the economy transform the aspirations and goals of these communities (Spoon, 2011; Nepal; 2015), making higher income- earning livelihoods more attractive to fulfill present and future aspirations. The associated cultural changes, replacement of spiritual and agropastoralist values with a tourism centered logic (Spoon, 2011); and the desire to become competent and take advantage of this dollar economy (Nepal, 2015). These changes could potentially explain the failure of the advocacy for diversification either because the proposed alternative livelihood activities prove less lucrative than established activities, or because one of them proves more lucrative and displaces the others. However, more lucrative livelihood activities might not only displace others on economic grounds. Considering their particular spatial needs and the lack of available land in the studied villages, it is also common to find tourism or commercial agriculture activities on land formerly used for food production or other livelihood activities.

The study also indicates the importance of social networks as a primary factor driving the adoption of new livelihood activities. Particularly in the case in Ingla, where the growing cardamom was learnt from neighbours and relatives. Additionally, the migration of people from lower altitudes (the *Oul*) was facilitated by social networks of people belonging to the same village and ethnic community already relocated in Khumjung or engaged in seasonal work. The role of social networks in shaping livelihood decisions has also been observed elsewhere (Adler and Kwon, 2009; Niehof, 2004).

The trajectory towards specialisation can also be seen as trading off the reduction of vulnerability to a range of everyday risks–connected to malnutrition, lack of healthcare, illiteracy, etc – against the increase of vulnerability to the impact of shocks, as suggested by Lama and colleagues (2017). To complement their argument against the vast literature on the wholesale benefits of diversification (Cannon, 2013; Hussein and Nelson, 1998) and any voices branding this specialisation as maladaptive (Stringer et., 2016), statistics show that the annual tourist visits to Sagarmatha National Park rose to 45,000 between 2016-2017 (45,000), a number (30,000) higher compared to the pre-earthquake level (Government of Nepal, 2017:2). This suggests that judging the livelihood decisions of households and communities demands proper care.

Specialization appears to work rather well in relation to many issues that the people living in the studied villages consider important. For instance, official reports confirm the reduction of health problems and increase in education levels over time in mountain and hill communities in eastern Nepal (UNDP, 2014), which have been shown to also be linked to enhancement of capacity to reduce risk (Wamsler and Lawson, 2012). It may, therefore, be fruitful to consider specialisation in relation to Agrawal's (2010) suggestion that market exchange can substitute all other adaptive processes as long as the communities have access to markets, which is largely determined by factors external to them.

The opening of the economy was obviously seminal for the shift towards specialised income-generating livelihoods, and temporary trade embargoes by India coincided with internal political tensions hit the local economy hard with skyrocketing prices on basic commodities (Lama et al., 2017). However, the market economy provides very unequal opportunities for communities across Nepal due to limited transport infrastructure. The importance of roads for availing livelihood opportunities and diversification is well established (Olsson et al., 2014), but this limitation can be partly bypassed if you happen to live on the main trail to the most famous mountain peaks in the world, which attract tourists regardless of their remoteness. Similarly, the lack of access to vehicles to use on the road to Ingla has partly been overcome by the buyers coming to collect produce instead of community members going to the market to sell it. However, these mechanisms limit their bargaining power. Also, the government and NGOs are influencing livelihood adaptation decisions, both through actual programmes and through the discontent in the communities for not providing enough support. As mentioned earlier in the findings, the role of NGO is important in provision of basic facilities in Khumjung, supporting livelihood work through *Chiraito* and *Bachat* system in Ingla.

Conclusion

This study shows that livelihoods are shifting not only from subsistence towards income generation but also from diversification towards specialisation, which is the opposite of what has been dominantly advocated in adaptation policy prescriptions for decades. Regardless of the number of livelihood activities, which has been reduced for many while increased for the few, the dependence on one livelihood activity or on several livelihood activities within the same sector has increased significantly. Hence, aggravating the vulnerability to shocks may impact on entire sector. This is not to homogenously label agriculture in a crisis state but rather the need to understand trajectory of livelihood adaptation from a historical standpoint, as communities adapt differently shaped by their socio-economic contexts (Aase and Chapagain, 2005; Chapagain, 2006). Furthermore, the trajectory towards specialisation should not be judged too quickly, or be automatically considered maladaptive, as it has also facilitated increased access to crucial services and reduced vulnerability of a range of everyday risks, which altogether are seen by people as significant improvements. It has been tried and tested in severe shocks, and after an initial period of significant losses of the affected livelihoods, it appears like the dominant livelihood activity comes out as the most viable option after all.

This main trajectory of livelihood adaptation has not been shaped by climate change alone but by a complex combination of political, economic, social and cultural processes from both within and outside communities. Failing to grasp this complexity is largely behind the overall failure of the advocacy for livelihood diversification, regardless of purpose. Future attempts to understand or improve the livelihoods of mountain communities in Nepal would benefit from addressing the issue from the vantage point of society instead of climate change, and considering long-term changes in a range of non-climatic factors as the main drivers of livelihood adaptation so far. This would be a first step for tailoring adaptation policies embedded in the contextual understanding of mountain livelihoods.

References

Aase, T. H., & Chapagain, P. S. (2005). Nepali agriculture in crisis. *Studies in Nepali History and Society*, *10*(1): 39-56.

Adler, P. S., & Kwon, S. (2009). Prospects for a new concept. *The Academy of Management Review*, *27*(1), 17–40.

Agnew, R. (1981). The individual and values in human ecology: An examination of the adaptive processes. *Sociological Quarterly*, *22*(1): 105–117.

Agrawal, A. (2008). *The role of local Institutions in adaptation to climate change.* World Bank Social Dimensions of Climate Change Workshop. Washington, DC: Social Development Department, The World Bank.

–. (2010). Local institutions and adaptation to climate change. In Mearns, R.;& A. Norton (Eds.), *Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*. Washington, DC: The World Bank.p.173-198.

Agrawal, A., & Perrin, N. (2008). Climate adaptation, local institutions, and rural livelihood*s*.In. Adger, W.N.; I.Lorenzoni; K.L. O'Brien (Eds.), *Adapting to climate change: Thresholds, values, governance*. Cambridge, U.K : Cambridge University Press. p.350-367.

Barrett, C. B., Bezuneh, M., & Aboud, A. (2001). Income diversification, poverty traps and policy shocks in Côte d'Ivoire and Kenya. *Food Policy*, *26*(4): 367–384.

Bassett, T. J., & Fogelman, C. (2013). Déjà vu or something new? The adaptation concept in the climate change literature. *Geoforum*, *48*: 42–53.

Batterbury, S. (2001). Landscapes of diversity: A local political ecology of livelihood diversification in south-western Niger. *Ecumene*, *8*(4): 437–464.

Bauman, Z. (2004). *Wasted lives: Modernity and its outcasts*. Cambridge: Polity Press.

Bebbington, A. (1999). Capitals and capabilities: A framework for analyzing peasant viability, rural livelihoods and poverty. *World Development*, 27(12): 2021–2044.

Becker, P. (2014). *Sustainability science: Managing risk and resilience for sustainable development.* Amsterdam: Elsevier Science Ltd.

Bhattari, T. (2016). Efficacies and impediments in large cardamom farming in Ilam, Nepal. *Economic Journal of Development Issues*, Vol. 21 & 22. No. 1: 42-54.

Bista, D. B. (1991). Fatalism and development: Nepal's struggle for modernization. Hyderabad, India: Orient Blackswan.

Brower, B. (1991). Crisis and conservation in Sagarmatha national park, Nepal. *Society & Natural Resources*, Vol *4*. No.2: 151-163.

Bryceson, D. F. (1996). Deagrarianization and rural employment in sub-Saharan Africa: A sectoral perspective. *World Development*, *24*(1): 97–111.

Cannon, T. (2013). Rural livelihood diversification and adaptation to climate change. In Ensor.J.; R. Berger, & S. Huq (Eds.), *Community based adaptation to climate change: Emerging lessons* .Warwickshire, U.K: Practical Action Publishing Lt. p 55-6.

Chambers, R., & Conway, G.R. (1991). *Sustainable rural livelihoods: Practical concepts for the 21st century.* IDS Discussion Paper 296. University of Sussex: Institute of Development Studies

Chapagain, P. S. (2006). Involution or evolution? Conceptualizing the changes in farming system of eastern Nepal. *The Himalayan Review, 37:* 1-17 .

Chhetri, N., Chaudhary, P., Raj, P., & Baran, R. (2012). Institutional and technological innovation : Understanding agricultural adaptation to climate change in Nepal. *Applied Geography*, *33:*142–150.

Davidson, A. P. (1998). Women and the household economy : The case of Punjab, Pakistan. *Spring*, *20*(1): 30–36.

Dhakal, K. R. (2014). An analysis of the tourism in Nepal trend of tourist arrivals. *The Third Pole: Journal of Geography Education*, *13*: 46–53.

Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries, *Journal of Agricultural Economics,*51(2): 289–302.

–(2005). Small farms, livelihood diversification, and rural-urban transitions: Strategic issues in Sub-Saharan Africa. *Conference Paper*. Retrieved from http://www.value-chains.org/dyn/bds/docs/616/IFPRI Future of Small Farms 2005.pdf#page=142

Flyvbjerg, B. (2001). *Making social science matter: Why social inquiry fails and how it can succeed again.* Cambridge: Cambridge University Press.

Forsyth, T., & Evans, N. (2013). What is autonomous adaptation? Resource scarcity and smallholder agency in Thailand. *World Development,* Vol43: 56–66.

Gentle, P., & Maraseni, T. N. (2012). Climate change, poverty and livelihoods: Adaptation practices by rural mountain communities in Nepal. *Environmental Science & Policy*, *21*: 24–34.

Guillet, D., Godoy, R. A., Guksch, C. E., Kawakita, J., Love, T. F., Matter, M., & Orlove, B. S. (1983). Toward a cultural ecology of mountains: The Central Andes and the Himalayas compared. *Current Anthropology*, Vol.*24 No.*5: 561-574.

Government of Nepal.(2017). State of conservation report. Sagarmatha national park (Nepal) (N120). Government of Nepal. Ministry of Forests and Soil Conservation Department of National Parks and Wildlife Conservation Kathmandu, Nepal. Retrieved from https://whc.unesco.org/document/165027

Halstead, P., & O'Shea, J. (1989). Introduction: Cultural responses to risk and uncertainty. In Halstead, P.;& J.O'Shea (Eds), *Bad year economics : Cultural responses to risk and uncertainty.* Cambridge: Cambridge University. Press.

Hurni, H., Liniger, H., & Wiesmann, U. (2005). Research partnerships for mitigating syndromes of global change in mountain regions. In U. M. Huber, H. K. M. Bugmann, & M. A. Reasoner (Eds.), *Global change and mountain regions: An overview of current knowledge* (593–604). Netherlands: Springer Science & Business Media.

Hussein, K., & Nelson, J. (1998). *Sustainable livelihoods and livelihood diversification*. IDS Working Paper,69,32.University of Sussex: Institute of Development Studies

Jodha, N. S. (2005). Adaptation strategies against growing environmental and social vulnerabilities in mountain areas. *Himalayan Journal of Sciences*, *3*(5): 33–42.

K.C., S, & Upreti, B. R. (2017). The political economy of cardamom farming in eastern Nepal: Crop disease, coping strategies, and institutional innovation. *SAGE Open*.7(2):1-15.

Kelly, P. F. (2012). *Landscapes of globalization: Human geographies of economic change in the Philippines.* London and New York: Taylor & Francis.

Khadka, C. B. (2011). *Impacts of climate change on production of cash crops in Annapurna conservation area (a case study from Lwang Ghalel village development committee, Kaski district)*. Pokhara: Pokhara Campus, Tribhuwan University.

Khadka, N. (1998). Challenges to developing the economy of Nepal. *Contemporary South Asia* , 7(2): 147–166.

Kohler, T., Giger, M., Hurni, H., Ott, C., Wiesmann, U., Wymann von Dach, S., & Maselli, D. (2010). Mountains and Climate Change: A Global Concern. *Mountain Research and Development*, *30*(1): 53–55.

Lama, P. D., Becker, P., & Bergström, J. (2017). Scrutinizing the relationship between adaptation and resilience: Longitudinal comparative case studies across shocks in two Nepalese villages. *International Journal of Disaster Risk Reduction*, *23*: 193–203.

LAPA. (2015). *Khumbu local adaptation plan of action*. Sagarmatha National Park, Solukhumbu district.Technical Report.Engility Corporation and The Mountain Institute. https://www.climatelinks.org/resources/khumbu-nepal-local-adaptation-plan-action-lapa

Lawoti, M. (2007). *Looking back, looking forward: Centralization, multiple conflicts, and democratic state building in Nepal.* Washington, DC: East-West Center.

Leichenko, R., & O'Brien, K. (2008). *Environmental change and globalization: Double exposures*. Oxford: Oxford University Press.

Lipton, M. (1980). Migration from rural areas of poor countries: The impact on rural productivity and income distribution. *World Development*, *8*(1): 1–24.

MacLellan, L. R., Dieke, P. U. C., & Thapa, B. K. (2000). Mountain tourism and public policy in Nepal. *Tourism and Development in Mountain Regions*: 173–198.

Nepal INDC. (2016).*Intended nationally determined contribution (INDC) Nepal.* (2016) Retrieved from http://www4.unfccc.int/Submissions/INDC/Published Documents/Nepal/1/Nepal_INDC_08Feb_2016.pdf

Nepal, S. K. (1997). Sustainable tourism, protected areas and livelihood needs of local communities in developing countries. *The International Journal of Sustainable Development & World Ecology*, *4*(2): 123–135.

–(2015). Irish pubs and dream cafes: Tourism, tradition and modernity in Nepal's Khumbu (Everest) region. *Tourism Recreation Research*, 40(2): 248–261. https://doi.org/10.1080/02508281.2015.1047625

Niehof, A. (2004). The significance of diversification for rural livelihood systems. *Food Policy*, *29*(4): 321–338.

Olsson, L., Opondo, M., Tschakert, P., Agrawal, A., & Eriksen, S. E. (2014). Livelihoods and poverty. In Field.C.B.; V.R. Barros; D.J. Dokken; K.J. Mach; M.D. Mastrandrea; T.E. Bilir; M. Chatterjee; K.L. Ebi; Y.O. Estrada; R.C. Genova; B. Girma; E.S. Kissel; A.N. Levy; S. MacCracken; P.R. Mastrandrea; L.L. White (Eds.), *Climate Change 2014: Impacts, Adaptation and Vulnerability - Contributions of the working Group II to the fifth assessment report.*.Cambridge: Cambridge University Press. p 793–832

Ortner, S. B. (1989). *High religion : A cultural and political history of Sherpa Buddhism*. Princeton, N.J : Princeton University Press.

Pant, B. (2005). Nepal's trade sector: Review, repercussions and recommendations. *Economic Review*, *17*: 89–115.

Parsons, M., & Nalau, J. (2016). Historical analogies as tools in understanding transformation. *Global Environmental Change*, *38*: 82–96.

Polanyi, K. (2001). *The great transformation: The political and economic origins of our time.* (2nd ed). Boston, MA : Beacon Press.

Rai, D. (2017). Tourism development and economic and socio-cultural consequences in Everest Region. *Geographical Journal of Nepal*, 10: 89-104.

Rijal, S. (2014). Impact of climate change on large cardamom-based livelihoods in Panchthar district, Nepal. *The Third Pole: Journal of Geography Education*, *13*: 33-38.

Saldana, J. (2009). *The coding manual for qualitative researchers* . London: SAGE Publications Ltd.p.1-31.

Scoones, I. (2009). Livelihoods perspectives and rural development. *The Journal of Peasant Studies*, *36*(1): 171–196.

Sen, A. K. (1997). From income inequality to economic inequality. *Southern Economic Journal*, *64*(2): 383.

Sharma, S. (1997). Agricultural transformation processes in the mountains of Nepal: Empirical evidence from Ilam district. *ICIMOD discussion paper*. No.MFS 97/3. Kathmandu: ICIMOD.

Sherpa, P. Y. (2015). Institutional climate change adaptation efforts among the Sherpas of the Mount Everest Region, Nepal. In D. C. Wood (Ed) *Climate change, culture, and economics: Anthropological investigations*.35: 1-2. Bingley,U.K: Emerald Group Publishing Limited.

Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global environmental change*, 16(3): 282-292.

Spoon, J. (2011). The heterogeneity of Khumbu Sherpa ecological knowledge and understanding in Sagarmatha (Mount Everest) national park and buffer zone, Nepal. *Human Ecology*, *39*(5): 657–672.

Stevens, S. F. (1993). Tourism, change, and continuity in the Mount Everest region, Nepal. *Geographical Review,*83(4): 410–427.

Stringer, L., Quinn, C., Berman, R., & Dixon, J. (2016). Livelihood adaptation and climate variability in Africa. In Grugel. J & Hammett. D (Eds.), *The Palgrave Handbook of International Development* (pp. 695–711). London, U.K: Palgrave Macmillan

Thapa, G., Kumar, A., & Joshi, P. K. (2017). *Agricultural diversification in Nepal: Status, determinants, and its impact on rural poverty.* 1634 International Food Policy Research Inst.

Thornton, T. F., & Manasfi, N. (2010). Adaptation—Genuine and spurious: Demystifying adaptation processes in relation to climate change. *Environment and Society: Advances in Research*, *1*(1) :132–155.

UNDP. (2014). Nepal Human Development Report 2014: Beyond geography unlocking human potential. Kathmandu: Government of Nepal National Planning Commission.

http://www.hdr.undp.org/sites/default/files/nepal_nhdr_2014-final.pdf

UNCSD. (2012). *The future we want. New York:* United Nations. Outcome of Rio+20.

Wamsler, C., & Lawson, N. (2012). Complementing institutional with localised strategies for climate change adaptation: Asouth-north comparison. *Disasters*, *36*(1): 28–53.