

Food System Dynamics and Food Insecurity in Humla, Nepal Himalaya

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Scientific Environment

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Summary

This study examines the challenges underlying food security of the Himalayan smallholder farmers focusing on three interrelated dimensions: the impact of multiple environmental and socio-economic stressors on food system, access to and role of non-farm income sources, and the role of humanitarian and development interventions on food security and livelihoods. The results suggested that the food systems are driven by synergistic impacts of climate change and changes in forest governance through community forestry (CF) program. The CF regulated the use of forest directly affecting the livestock population. Since livestock is the sole source of soil fertility and the backbone of the traditional salt-grain trade, its population decrease has had direct impact on food production and household income. In addition, decreasing winter precipitation and increasing dry spell synergized the impacts of the CF resulting in negative food production. Adoption of off-farm income activities and utilization of food support from food assistance programs (FAPs) were the main factors that cushioned the farmers' food deprivation to some extent.

A locally disaggregated analysis revealed that there were high caste/ethnic disparities in food insecurity prevalence as well as the capacity to excel strategies to reduce it. Having too little productive land the low caste *Dalits* were the most food insecure group of all. Due to their little human, financial and social capital, they also failed to diversify livelihoods into high return sectors to reduce food insecurity as did their high caste counterparts. Moreover, food assistance programs being highly influenced by local politics and power failed to benefit this most food insecure group while the high caste households and those powerful in local politics reaped disproportionately higher amount of food aid. In this context, the *Dalits* ended up with low return activities, such as providing wage labor to the farms of high castes or serving them with their caste based skills such as smithing or tailoring in a patron-client exchange system. Since the exchange system is controlled by high caste clients, *Dalits* are kept in dependency, which gets intensified when environmental and socio-economic changes stress their livelihoods. Arguably, caste relation discriminated against some group and resulted

into the evolution and persistence of their marginalization and food insecurity and therefore food insecurity is inherently a political problem.

The insights provided by this study do not downplay the significance of critical challenges such as climate change impacts on food systems and therefore the need of agricultural production approach to enhance food system resilience. However, the focus only on technical interventions to increase production and the capacity of the production systems to adapt to change do not alter the social and political drivers that make some groups vulnerable to food insecurity. Since local social, political and economic inequities are the primary factors underlying the vulnerability of some groups, social equity should be one of the primary goals of targeted interventions so that they can ensure their ability to enhance food security through farming or through the access to profitable non-farm activities as well as from accessing humanitarian support. Conceptually, this insight corresponds to a recent call made by social scientists to invigorate social-ecological system (SES) approach by giving a stronger emphasis on social factors of system vulnerability, which the conventional SES studies largely lack.

Acronyms and abbreviations

| | |
|---------|---|
| AFD: | Agence Française De Développement |
| APP: | Agriculture Perspective Plan |
| CBS: | Central Bureau of Statistics |
| CF: | Community Forestry |
| DDC: | District Development Committee |
| FAO: | Food and Agriculture Organization (of the United Nations) |
| FAP: | Food Assistance Program |
| FFW: | Food for Work |
| FGD: | Focus Group Discussion |
| FY: | Fiscal Year |
| GDP: | Gross Domestic Product |
| GON: | Government of Nepal |
| HDI: | Human Development Index |
| IFAD: | International Fund for Agricultural Development |
| IPCC: | Intergovernmental Panel on Climate Change |
| JTA: | Junior Technical Assistant |
| KDC: | Karnali Development Commission |
| KEP: | Karnali Employment Program |
| LAPA: | Local Adaptation Plan of Action |
| NAPA: | National Adaptation Program of Action |
| NGO: | Non-Government Organization |
| NPC: | National Planning Commission |
| NPR: | Nepali Rupees |
| NTFP: | Non-Timber Forest Products |
| SES: | Social-Ecological System |
| SL: | Sustainable Livelihood |
| UNDP: | United Nations Development Program |
| UNFCCC: | United Nations Framework Convention on Climate Change |
| USAID: | United States Agency for International Development |
| VDC: | Village Development Committee |

Co-author Declaration

24.02.2017

The authors hereby certify the following summary of their contribution to the three published research articles.

Paper 1 Rural livelihood diversification and household well-being: Insights from Humla, Nepal.

-YG designed the study, conducted fieldwork, analyzed data, wrote the paper and revised for publication.

-PA participated in the initial fieldwork, study design and edition of the paper.

Paper 2 Multiple stressors, food system vulnerability and food insecurity in Humla, Nepal.

-YG designed the study, conducted fieldwork, analyzed data, wrote the paper and revised for publication.

-PA participated in the initial fieldwork, study design and edition of the paper.

Paper 3 Aid or abyss? Food assistance programs (FAPs), food security and livelihoods in Humla, west Nepal.

-YG designed the study, conducted fieldwork, analyzed data, wrote the paper and revised for publication.

-PA participated in the initial fieldwork, study design and edition of the paper.

Yograj Gautam

Peter Andersen

List of Publications

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CHAPTER 1

Introduction

Global food security: challenges and opportunities

There is a stark contradiction inherent in the global food system; it produces more than enough food to feed the entire population of the world, yet around 800 million people are still chronically undernourished (FAO, 2016). Although the last three decades or so have witnessed an encouraging food security trend, with a 21% reduction in global undernourishment between 1990 and 2015 (FAO *et al.*, 2015), new challenges are also emerging. Global population growth continues to increase aggregate food demands and economic growth, relentless urbanization and trade liberalization are all changing dietary patterns towards more resource-intensive diets such as meat, fish, fat and sugar (Kearney, 2010). This, in addition to the increasing practice of diverting food resources in order to meet non-food needs (e.g. biofuel production), is increasing pressure on land and freshwater resources (Ewing and Msangi, 2009; Strzepek and Boehlert, 2010; HLPE, 2013). Furthermore, due to climate change, land degradation and biodiversity loss, productive resources are dwindling, which signals increased global food security challenges for the future (Gregory *et al.*, 2005; Schmidhuber and Tubiello, 2007; Godfray *et al.*, 2010; Steffen *et al.*, 2015; Gomiero, 2016). In the face of climate change and the socio-economic changes associated with globalization, food security remains one of the pressing concerns of our time, and is therefore currently the focus of much policy and research (Lang and Heasman, 2015; Yu *et al.*, 2015; Barrett and Palm, 2016).

The global distribution of current food insecurity, as well as the socio-economic and environmental trends that are pertinent to it, show that some regions and countries will be more vulnerable than others in the future. South Asia and Africa represent the hub of current global food insecurity (FAO *et al.*, 2015). The vast majority of the population in these regions lives in rural areas, practices subsistence farming and also

represents a great majority of the global population under poverty (IFAD, 2010). The farms are small, largely lack modern technology and are run mainly by family labor (AFD, 2014). Neoliberal policies adopted in most developing countries have evidently had negative impact on small farms, which in turn has directly affected the food security of their smallholders (Young, 2004; Walker, 2008; Moseley and Becker, 2010). The projected impact of climate change on crop yields is even more concerning (Reilly, 1996; Lobell *et al.*, 2008; Ray *et al.*, 2015), as it will directly destabilize the farmers' food access in these regions and thereby further threaten the food security of the already vulnerable population. Since most of the future population growth will also take place in these regions, eradicating global poverty and food insecurity depends on success being achieved there.

Recently prioritized approaches to food security focus on small farms with a wide range of technical interventions and institutional reforms to increase their productivity as well as their resilience to socio-economic and environmental changes (FAO, 2010; Garnett *et al.*, 2013; Lipper *et al.*, 2014). However, despite earning their livelihoods primarily from agriculture, the smallholder farmers also often adopt various non-farm employment opportunities (Ellis, 1998; Barrett *et al.*, 2001). Globally more than half of these farmers' total income comes from outside farming (IFAD, 2010), and because most of them are net food purchasers (van Vliet *et al.*, 2015), both income and food prices play an important role in securing food and meeting other subsistence needs. In addition, such involvement in off-farm employment sectors has implications on many different aspects of local farming (Evans and Ngau, 1991; Bayissa, 2010; Babatunde, 2013; Paudel *et al.*, 2014; Adhikari and Hobley, 2015). Understanding and addressing poverty and food insecurity therefore need a broader focus that incorporates different dimensions of the smallholder farmers' livelihoods, including off-farm activities, the effects of environmental and socio-economic changes in the production and distribution of food and also the role of social and economic institutions (and changes) in both farming and non-farm sectors.

This thesis finds its point of departure in these contemporary challenges to global food security and assesses food system dynamics in the face of climatic and socio-economic changes that affect food production and distribution, and also shape the contexts of off-farm income opportunities among the smallholder farming communities in Nepal Himalaya. The following section contextualizes the specific research questions in broader food security issues and challenges in Nepal.

Food security in Nepal: issues and the research problem

Poverty and food insecurity remain key development concerns in Nepal, with 25% of the population living in poverty and over 35% chronically food-insecure (NPC, 2013; GON and UNDP, 2014). Rurality and associated livelihood features characterize the fundamentals of poverty and food insecurity. An overwhelming share of the country's population (>80%) lives in rural areas, earns its livelihood from subsistence farming and represents around 90% of the population living in poverty (CBS, 2011, 2012). Despite its decreasing contribution to Nepal's total gross domestic product (GDP) over the decades (World Bank, 2016), agriculture therefore still remains the mainstay of the livelihoods of the most food-insecure population.

In the context of this high reliance on agriculture for food security, agricultural features such as small landholdings, low levels of modern technology and a lack of capital accumulation can be understood as the basic causes of food insecurity. A lack of technology and proper infrastructure has characterized rather sluggish agricultural growth throughout the last several decades. Only 30% of the cultivated land is irrigated at present, and fertilizer consumption and crop yield are among the lowest in South Asia (USAID, 2016). Most of the land is held in small family farms which are undergoing continuous fragmentation into smaller holdings. Moreover, rapid population growth has led to the halving of land availability per capita in the last five decades, making it one of the lowest in the world (World Bank, 2015). As a result of these changes, Nepal transitioned from a food surplus and thus a food exporter until

the late 1970s to becoming a net food importer by the early 1980s (Pyakuryal *et al.*, 2010).

The population, technology and environment nexus has provided an important framework for early food security studies. Applying neo-Malthusian approaches, these studies focused on population growth, the struggle to earn livelihoods amidst resource constraints, the resultant ecological deterioration and its impact on food production and food security (Eckholm, 1976; Blaikie *et al.*, 1980; Bajracharya, 1983; Bishop, 1990; Shrestha *et al.*, 1999). More recent studies have not dismissed the neo-Malthusian worry; rather, new dimensions have been realized in the wake of climate change. Considering the high dependence of South Asian agriculture including that of Nepal on the Himalayan ecosystem services (Rasul, 2014), the climatic changes that have recently been observed in the region have led to greater challenges for food production and food security (Akhtar *et al.*, 2008; Bhutiyani *et al.*, 2010; Immerzeel *et al.*, 2010). In this context, recent studies assess the impacts of climate change and farmers' responses to them, and also analyze the agricultural avenues for reducing food insecurity and livelihood vulnerabilities (Aase *et al.*, 2010; Chhetri *et al.*, 2012; Gaire *et al.*, 2014; Pant *et al.*, 2014; Pandey and Bardsley 2015).

In addition, unprecedented socio-economic and institutional changes pertinent to agriculture-based livelihoods have also added new dimensions to food security. One of the most significant of these socio-economic changes relates to the previously mentioned increase in off-farm activities, mainly in the form of wage migration, both internal and international (Kollmair *et al.*, 2006; Maharjan *et al.*, 2013; Childs *et al.*, 2014). Studies suggest that this has had notable effects on agriculture, household economies and food security (Khanal and Watanabe, 2006; Gartaula *et al.*, 2012; Sunam and Adhikari, 2016). Nepal adopted neo-liberal policies after the 1980s (Roka, 2004), which also had an impact on the country's agriculture and food security (Adhikari, 2004; Pyakuryal *et al.*, 2010). Subsequently, institutional efforts to reduce poverty and food insecurity have been exceeded through a series of plans and policies aimed at agricultural development.

Although agriculture has remained a top priority in all periodic development plans in Nepal (NPC, 2016), the Agriculture Perspective Plan (APP) marked a breakthrough in agricultural development policy. It was implemented in 1995 and emphasized investment in the diversification and commercialization of agriculture and on rural infrastructure in order to increase the farmers' market access. Other policies, such as the National Agricultural Policy (2006) and the Food and Nutrition Security Plan of Action (2013) also emphasize the need for investment in agricultural development as a means of strengthening rural livelihoods and thereby both reducing poverty and promoting food security. In addition, the most recent programs implemented to foster climate change adaptation¹ also identify food security and livelihood resilience as the most important part of adaptation, and agriculture and rural infrastructure as the major axes for intervention (GoN, 2011). In addition to the agricultural interventions, areas with high chronic food insecurity, such as the Karnali region (Appendix 2), have also been targeted with food aid and assistance programs (FAPs), which have been providing direct food support to the most food-insecure populations for the last several decades (Adhikari, 2008; Bishokarma, 2012). In addition to direct food support, some FAPs have also been funding integrated rural development projects, including agricultural projects.

An agricultural approach focusing on increasing production and diversity of food crops as well as that of cash crops as exemplified by the above discussed policies and programs, is important to address low agricultural growth, decreasing food self-sufficiency, and low income in order to ensure food security. However, such an approach cannot fully guarantee access to food for all communities and individuals because food security is enhanced by multiple sources. Smallholder communities confront multiple livelihood stressors (Turner *et al.*, 2003; Tschakert, 2007) and therefore food insecurity has multiple causes (Misselhorn, 2005). Although some of

¹ Under the guidelines of the United Nations Framework Convention on Climate Change (UNFCCC), Nepal developed the National Adaptation Program of Action (NAPA) in 2010, followed by other supplementary policies such as the Local Adaptation Plan of Action (LAPA) and Climate Change Policy the following year.

these underlying causes are directly pertinent to agriculture, they may have more significant implications on non-agricultural dimensions of livelihoods. Even when stressors are most significant to agriculture, they do not produce linear causality. For example, food insecurity in a community exclusively reliant on agriculture is not driven by the linear impact of climate change; rather, climate change interacts with socio-economic and institutional changes, which in turn interact with preexisting social and political relations in a complex manner and produce contextual food security and livelihood outcomes (Ericksen, 2008; Ingram *et al.*, 2012). Climate change adaptation studies suggest that the conceptualization of a linear impact of a single driver leads to sectoral responses, which downplay the role of other factors. More importantly, such responses neglect the socio-political contexts and therefore risk addressing the needs of one section of the community while generating *food insecurity and livelihood vulnerability* for others (O'Brien *et al.*, 2007; Eriksen *et al.*, 2011; Tanner *et al.*, 2015, emphasis added).

In this context, the general agriculture-to-food-security causality is limited in accounting for the complexity of food security. National level empirical data from Nepal shows that some forms of food insecurity and malnutrition are in fact highest in areas producing a large surplus of food. For example the most fertile south eastern region, which has relatively more developed physical infrastructure (CBS *et al.*, 2003) and produces a large food surplus actually has the highest prevalence of low body mass among women (Appendix 3). This in addition to the caste and ethnic dimension of poverty and food insecurity (summarized in Appendix 1) indicates that agriculture alone cannot fully account for food security; rather food security should be analyzed in the social, economic and political contexts of land and agriculture.

There are ample historical analyses that contextualize the disparity in land distribution and hence in the socio-economic condition among the subsistence farming communities in Nepal. Landlessness and economic marginality are rooted in a long history of feudal land governance characterized by a highly discriminatory hierarchical social structure that largely excluded women, ethnic groups and particularly low caste

communities from having land entitlement (Caplan, 1970; Regmi, 1976; Levine, 1987; Aahuti, 2004; Bennett *et al.*, 2006). The eradication of malaria in the lowland region of Tarai and the subsequent migration from the hills after the 1950s marked one of the most significant socio-economic transitions in Nepal. However, this process did not significantly alter preexisting inequalities, and therefore the resulting upward mobility materialized only for those who were already relatively better-off in the hills (Shrestha *et al.*, 1993). The current trend of taking a wide range of off-farm employment opportunities as a means of improving livelihoods and food security are also arguably guided by social relations and economic conditions (see for e.g. Sunam, 2015).

In this context, the concept of *diversification by choice* and *diversification by need* become relevant (Ellis, 2000). Diversification by choice is a type of diversification where the diversifier freely chooses one or more off-farm activity that provides high economic return. However; this type of activity requires initial investment capacity in terms of human, social or economic capital. Therefore those who cannot meet the investment requirement are forced to choose other activities that comparatively require less investment but also offer low return, making no substantial contribution on the economic condition of the diversifiers or sometimes even worsening the condition they previously had (Ellis, 1999; Barrett *et al.*, 2001). The later type of diversification is conceptualized as necessity driven diversification. This indicates that livelihood transitions in farming communities and their economic impacts are strongly shaped by the social and economic structure that exist before diversification actually takes place and therefore social dimensions should be given due consideration in such analyses.

The discussion on food security issues and the research and development approaches presented so far have highlighted three major aspects of food security. First, despite the fact that agriculture provides the mainstay of the Nepal's economy and is the primary source of food security, livelihoods are evidently undergoing transitions and employment in non-farm sectors has become significant for food security. Second, even the drivers that are regarded as significant for agriculture, such as climate change, do not have linear impacts on food security, but rather they interact with other non-

climatic factors and induce complex impacts. This makes it necessary to reconsider our approach of climate vulnerability analysis so that climate-related policies and practices can be incorporated into integrated approaches that will bring more realistic and efficient outcomes. Third, despite a large number of highly prioritized agricultural and food security programs, agricultural growth remains stunted, and poverty and food insecurity persistent. This warrants research to assess how such programs are designed and implemented, and thereby to gain insights into how their efficiencies can be improved. There is currently a paucity of integrated studies that cover both agriculture and the off-farm sector, and analyze the mechanisms through which climate-based impacts affect livelihoods in the context of multiple stressors. Yet the most significant gap remains in our understanding of how social factors shape all of these dimensions of food security and livelihoods.

This study attempts to fill these gaps by examining the role of caste- and ethnicity-based social relations as underlying factors of persistent food insecurity in Humla, a high mountain district in the Nepalese Himalaya. In particular, it analyzes how caste and ethnic relations lead to highly differential food insecurity and livelihood outcomes by determining the agricultural impacts of socio-economic, institutional and environmental changes, and access to off-farm economic opportunities. Considering the importance of institutional interventions specifically in this area, this study also analyzes how the management of FAPs affects the short- and long-term food security of the farming communities, and how social factors guide their management. These aims have been framed into the following three research objectives:

- i. to examine the determinants and role of the non-farm sector on food security and wellbeing;
- ii. to analyze the impacts of external socio-institutional and environmental changes on local food systems and food security, and;
- iii. to evaluate how and to what degree food assistance programs contribute to current and future food security.

This study recognizes that livelihoods are gradually transforming due to changes in the socio-economic, institutional and environmental aspects of farming and non-farm sectors. In this context, the need for an integrative framework that accommodates both social and environmental aspects and analyzes the multifaceted outcomes is warranted. To this end, the food system approach has been used as an integrative framework in a multitude of contexts and research objectives (Ericksen, 2008; Ingram *et al.*, 2012; Miller and Welch, 2013). In this context, in addition to these three empirical objectives, this study also attempts to scrutinize the food system approach in terms of its analytical rigor to account for the social and political factors underlying local food security. This has been fulfilled by making a brief discussion of the findings in the context of major tenets of food system as a Social-Ecological System, which has been presented in the discussion section.

1.1. Organization of the thesis

This is an article-based thesis and has two parts. The second part compiles three articles written for publication in academic journals. This section comprises the first part of the thesis and presents the analysis of the papers' findings organized into an overarching theme and theoretical perspective. **Chapter 1** gives an overview of the global food security trends and challenges, discusses the food security issue in the context of Nepal and presents the research problem and specific objective of this thesis. **Chapter 2** presents the theoretical framework of the study. First it gives an outline of the development of food security concept and then frames the concept into recent conceptual developments in social-ecological system analysis. A detailed discussion on the methodology has been presented in **Chapter 3**. In **Chapter 4** the findings are discussed and conclusions presented.

CHAPTER 2

Food Security: Theoretical Considerations

Development of the concept

Food security entails access to sufficient and nutritious food for healthy and productive lives (FAO, 1996). It is conceptualized as resting on four pillars: *availability*, *access*, *utilization* and *stability* (Barrett, 2010). This conceptualization is the result of global hunger experiences and subsequent anti-hunger policies spanning the last four decades. The unfavorable weather conditions and ensuing food production shortfalls and food crises claimed over two million lives in Africa and Asia in the early 1970s (Devereux and Berge, 2000). This led to the convening of the World Food Conference in 1974, which conceptualized food insecurity in terms of a problem of food availability caused primarily by environmental hazards. The subsequent food policies emphasized *food availability* by building and maintaining adequate food stocks at national and/or regional and international levels by increasing food production and facilitating trade to ensure food security (FAO, 2000).

By emphasizing external hazards as the main driver of food security, the availability approach however failed to explain the role of socio-political and economic relations in producing vulnerability¹ (Turner *et al.*, 2003). From a food security perspective, the varying prevalence of hunger within a single region and population raised questions over the validity of the food availability thesis. Studies revealed that most of the historical famines had coexisted with substantial regional and local stocks of food, indicating “hunger as the characteristics of some people not *having* enough food but not that of there not *being* enough food” (Sen, 1981b:1). This led to the entitlement approach to food security. According to Sen (1981a), there are two elements of entitlement: *personal endowments* and *exchange entitlement*. *Personal endowments*

¹ Here I use ‘vulnerability’ as a generic term to imply the failure of an individual or system to achieving or maintaining a desired state that ensures the sufficient condition for guaranteed and stable access to adequate food.

are the resources that an individual owns and *exchange entitlement* comprises the set of commodities that they can claim through production, trade and exchange. Food insecurity (or hunger in Sen's terms) results from the decline in endowments or its exchange entitlement (Sen, 1981a:435-36). The entitlement approach therefore shifted the focus from *availability* to *access*, the second pillar of food security.

Although the entitlement approach acknowledged the social factors of food insecurity and thus shifted attention from environmental factors to social and economic institutions, it "provided only 'conjunctural' analysis of the short-term mechanisms while ignoring the long term structural and historical processes by which specific patterns of entitlements and property rights come to be distributed" (Watts, 2013). Watts and Bohle's (1993) *Space of Vulnerability* gave a more comprehensive analysis of vulnerability to hunger by identifying three aspects: vulnerability as an entitlement problem, vulnerability as powerlessness and vulnerability through appropriation and exploitation. Each of these factors is situated on three analytical axes. Their first axis, *entitlement and capability*, is congruent with Sen's entitlement theory, and food insecurity from this perspective results from the loss or lack of entitlement. The second axis, *empowerment and enfranchisement*, is linked with politics and power and conceptualizes vulnerability in terms of the lack of political rights for making claims on resources. *Class and crises*, the third axis, embraces political economy and the social relations of production, which favor appropriation and exploitation by the powerful at the expense of the poor and powerless (Watts and Bohle, 1993; Bohle *et al.*, 1994).

The main focus of food security, in both the *availability* and *access* paradigms, is on fulfilling food needs. However, this view has been challenged by studies that find food to be only one of the many needs in a household. A household sometimes prioritizes non-food goods and services over food, such as school fees or housing (Pinstrup-Andersen, 2009), or may deliberately avoid any form of entitlement during a food crisis if the use of the entitlement is perceived as risking future deprivation (de Waal, 2005). In this context, Drèze and Sen (1989) explain that entitlement is only

instrumentally important, and that the focus has to be on human capabilities to avoid undernourishment and escape hunger-associated deprivations (cited in Burchi and De Muro, 2016:14-15). In addition to guaranteed food access, the capability approach also concerns how food *utilization* can be enhanced. The utilization of food for a healthy life depends on a number of non-food factors, such as sanitary conditions, water quality, infectious diseases and access to primary healthcare (Pinstrup-Andersen, 2009). Therefore, the conditions and processes through which food is accessed and utilized are better contextualized by focusing more broadly on livelihood security rather than just food security. Maxwell (1996) terms this paradigm shift in food security as ‘food first perspective to livelihood perspective’.

The focus on livelihoods provides rigor to the conceptualization of the *stability* dimension of food security. *Stability* recognizes the long-term need to maintain consumption level, which is enhanced when availability, access and utilization are maintained for prolonged periods. In this context, the sustainability and vulnerability of livelihoods become relevant. A livelihood is defined as the means of living, comprising assets, capabilities and activities. A sustainable livelihood “can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation” (Chambers and Conway, 1992). Food insecurity from a livelihood perspective, then, is the result of vulnerable livelihoods. A livelihood is vulnerable when it cannot effectively absorb or attenuate different socio-economic and environmental shocks. This highlights two aspects of vulnerability: an external side of risks, shocks and stresses, and an internal side of defenselessness (Chambers, 2006:1). The vulnerability conditions in subsistence farming communities can include, for example, crop failure due to drought, livestock loss, and price hikes, or can also include the loss of jobs in off-farm sectors, which directly limits the asset endowment and/or exchange entitlement.

The sustainable livelihood (SL) approach has provided an important framework for the design and implementation of poverty reduction and rural development programs.² With regards to food security analysis, the value of the SL approach lies in its consideration of endowments and entitlement, and the social, political and environmental structures and processes that shape vulnerability patterns (DFID, 1999; Krantz, 2001). However, the SL approach has been applied largely to rural settings, and the consideration of the structures and processes seldom considers macroeconomic issues (Burchi and De Muro, 2016). At the same time, the commercialization and industrialization of agriculture, rise in food trade and the significance of international actors in the food system have all had a profound impact on the ways in which food is accessed and utilized (Maxwell and Slater, 2003). In addition, the increase in technology intensive-farming and rapid changes in dietary patterns have also raised concerns regarding the environmental implications of the changing food system, as well as the impact of the changing environment on food systems (Popkin, 2004; Liu & Savenije, 2008; Ingram *et al.*, 2012). Even in the smallholder farming communities, agricultural commercialization, off-farm activities and economic changes have all added new dimensions to food security. Trade liberalization and global environmental changes have connected local livelihoods to distant structures and processes, and therefore their vulnerability is nested and tele-connected (Ericksen, 2008a; Adger *et al.*, 2009).

Food insecurity therefore cannot be conceptualized in terms of the vulnerability of a single sector, because this view does not adequately capture the complex spatial and temporal interdependencies and feedbacks that characterize the contemporary mode of achieving food security (Eakin, 2010:78). In this context, the food system approach has been proposed as a holistic framework to account for the interactions between the

² The SL approach has been adopted by many donor institutions, such as OXFAM International, the Department of International Development (DFID), the Overseas Development Institute (ODI), the Swedish International Development Cooperation Agency (SIDA), the Swiss National Centers of Competence in Research (NCCRs) and various UN agencies.

biophysical and socio-economic structures and processes that are pertinent to food production, distribution and consumption.

The Food system approach to food security

A food system is a coupled social-ecological system (SES) which is sustained by the interaction between the biophysical and human environments that make possible the activities of food production, from its initial processing and distribution to its ultimate consumption (Ericksen, 2008a). The natural environment is linked to human environments through different resources and ecological services. Social dimensions such as technology and governance in turn shape the way in which natural resources are utilized. The technology and governance are also affected by the changes that occur in the natural resources. This two-way linkage shapes the dynamic of a social-ecological system (Liu *et al.*, 2007; Anderies *et al.*, 2004; Chapin *et al.*, 2009). From an SES perspective, food security is conceived of as an outcome of a food system, and therefore food insecurity results from its vulnerability. The discussion of the conceptual underpinnings of ‘vulnerability’ is therefore of particular importance for food insecurity analysis.

According to the Intergovernmental Panel for Climate Change (IPCC), vulnerability is the extent to which a natural or social system is susceptible to external stressors *such as climate change* (McCarthy *et al.*, 2001). Vulnerability is the function of *sensitivity*, *exposure* and *adaptive capacity*. *Sensitivity* is the degree to which a system will respond to the stressor; *exposure* is the amount of stress placed upon a particular unit of analysis; and *adaptive capacity* is the degree to which adjustments in practices, processes, or structures can either moderate or offset the potential for damage, or else take advantage of opportunities created by a given stress (McCarthy *et al.*, 2001; O’Brien *et al.*, 2004). Adger (2006) identifies two traditions in vulnerability research, which he terms the ‘antecedent’ and ‘successor’ traditions. Parallel to the conceptual development of food security, the antecedent tradition includes two main approaches: hazards and entitlements. The risk-hazard (RH) approach conceptualizes vulnerability

as the function of a system's exposure to hazard and its sensitivity (Adger, 2006). As presented in the previous section, studies particularly in the field of hunger and famine led to the political economy approach (Sen, 1981b; Watts and Bohle, 1993), which considered vulnerability in terms of social and economic institutions, in order to analyze how entitlements are defined and distributed, how they determine access to resources and opportunities and how they shape differential vulnerability.

Adger's *successor* vulnerability tradition relates to system-oriented research attempting to understand vulnerability in a holistic manner in natural and social systems (Adger, 2006:272). The understanding that all resources used by humans are embedded in complex SESs brings vulnerability and the effective management of SESs to the forefront of research and policy. An SES has different drivers of change. The endogenous drivers are characterized by changes in the socio-economic and environmental properties that are internal to the system. Examples include changes in human population, technological change, changes in predator-prey populations in the forest etc. (Chapin *et al.*, 2009). Exogenous drivers, on the other hand, are external to the system, such as changes in national and regional governance or regional and global climate change. When the SES is exposed to external drivers, three outcomes are possible: the persistence of the current system through adaptation, the transformation of the system to a fundamentally new and more desirable state, and lastly vulnerability, which is characterized by the degradation of the system to a less favorable state (Turner *et al.*, 2003; Walker *et al.*, 2004; Kates *et al.*, 2012). In other words, an SES is vulnerable when the impacts of external shocks exceed its capacity to absorb them in order either to maintain its core properties and functions, or else to shift to a more beneficial state. Resilience is another widely used concept in vulnerability literature, which is regarded as the flip side of vulnerability (McCarthy *et al.*, 2001) and is defined as the ability to absorb shocks or adapt to change through self-organization (Walker *et al.*, 2004; Miller *et al.*, 2010). The key aspects of vulnerability reduction therefore include increasing adaptive capacities and resilience so that the impact of external shocks can be either absorbed, attenuated or effectively transformed to a better state.

Several recent studies underscore that rather than a single driver such as climate change, multiple interacting stressors underlie the vulnerability of SESs (Reid and Vogel, 2006; Tschakert, 2007; Ribot, 2009; McCubbin *et al.*, 2015). The effects of stressors on the exposed SESs are highly differential, in that one component can suffer negative impacts and be degraded, while another component of the system may become more resilient as a result of the same stressor (Adger *et al.*, 2002). As a result, such stressors can create *winner*s and *loser*s within a community that is exposed to changes (O'Brien and Leichenko, 2000). In addition, when the exposed system adapts to one set of disturbances, it may become vulnerable to others. For example, replacing low quality but winter-hardy French hybrid grapes with more tender varieties enhanced the Canadian wine industry's domestic and international competitiveness, but also increased grape producers' vulnerability by increasing the sensitivity of the new varieties to damage during the winter (Belliveau *et al.*, 2006). The multiple interacting stressors, differentiated impacts and tradeoffs in outcome of such responses to changes all serve to illustrate the dynamic and multidimensional nature of vulnerability. The complexity in the nature of vulnerability increases when institutional interventions unfold to moderate vulnerability to changes.

Climate change adaptation scholarship has provided critical insights into how vulnerability, such as food insecurity is induced by social factors. It is becoming increasingly clear that external changes take place in a social system that is inherently stratified in terms of the distribution of resources, the spread of social and political power, and its internal value systems (Ribot, 2009; O'Brien and Wolf, 2010). Therefore not only the changes themselves but also the responses made to these changes can create *winner*s and *loser*s. This is because the ways in which risk is perceived and response priorities endorsed and applied are embedded in the web of political and power relations, and therefore any interventions may serve the needs and interests of some while creating risks to others (Marino and Ribot, 2012; Yates, 2012). In this context, O'Brien *et al.* (2007) call for a shift from the *outcome vulnerability* approach to the *contextual vulnerability* approach. The outcome vulnerability approach conceptualizes vulnerability as the negative linear impact of climate change on an

exposure unit; treats natural and social dimensions as separate entities and focuses more on the natural aspect; and believes that vulnerability can be best reduced through technical and sectoral adaptation measures, as well as by reducing greenhouse gas emissions (O'Brien *et al.*, 2007:76). The contextual vulnerability approach, on the other hand, regards climate change as only one of multiple factors contributing to vulnerability, and therefore focuses on the role of mutually interacting dynamic institutional, political and social structures in shaping the impacts of climate change. It considers that vulnerability reduction can be enhanced by enabling individuals and communities to better respond to changes by addressing social and power asymmetries and thereby altering the context in which changes take place (O'Brien *et al.*, 2007; Inderberg *et al.*, 2014; Nagoda, 2015a).

In order to analyze food security against this backdrop, we must first establish what exactly constitutes a food system, and what characterizes its dynamics. According to Ericksen (2008a), a food system includes a set of activities involved in the production, distribution and consumption of food. A food system is driven by the interactions between and within biophysical and human environments. Just as human-environmental interactions at local scale are nested with higher-scale interactions (Cash *et al.*, 2006), the food system at the local scale is also interconnected with the socio-economic activities and environmental dynamics taking place at national, regional or global scale (Ericksen, 2008a). Food security is the major outcome of a food system, but a vulnerable food system cannot fulfill this. As highlighted by the discussion of SES dynamics presented above, the drivers create synergies, mitigating effects and countervailing influences on the vulnerability of particular components in the food system (Eakin, 2012). Food system vulnerability is therefore not the summation of the discrete impact of drivers on food system (minus the responses). Rather, it also includes the stressors, their interactions and feedbacks, as well as the sensitivity and responses of the food system, and its capacity to adapt or transform while maintaining its ability to provide food security (Misselhorn *et al.*, 2012).

Eakin (2012:80) notes two approaches to identifying vulnerable food system: through the manifestation of negative outcomes, such as the prevalence of food insecurity, or by innate characteristics of the system itself, whether or not the harm is yet to occur. In this regard, the innate characteristics of the system parallel what the contextual vulnerability approach terms *contextual conditions*. These contextual conditions include *local biophysical as well as* political, institutional, economic and social structures and changes, meaning that the contextual condition influences both exposure and potential responses (O'Brien *et al.*, 2007:76).

In this line, my approach is to map the relevant stressors to the local food system, both endogenous and exogenous, and to analyze how they interact both within themselves and with the contextual conditions. I then analyze how the local farmers respond to them, and the way in which local social relations determine the efficiency of the responses. All the three papers compiled in this thesis conceptualize food security not only in terms of food needs but on a broader perspective of livelihood needs. The first and the third paper analyze the roles of farming and off-farm activities, and humanitarian interventions on local livelihoods. The second paper applies a food system approach and bridges social and environmental factors by looking into how the impacts of external changes are shaped by social relations. Finally, the findings of the papers are discussed in light of the system approach and theoretical inputs are provided.

CHAPTER 3

Study Area and Methodology

Study area: the district of Humla, Nepal

The district of Humla was chosen as the study site (Fig 1). Humla lies at the upper part of the Karnali zone in the north-west corner of the country, sharing an extensive border with Tibet. The choice of study area was guided by the socio-economic features of the district, which are highly relevant to the critical food security issues that this study has raised in the research questions. It is a remote, highly food-insecure district where subsistence farming remains the mainstay of local livelihoods, and the local socio-ecological system is undergoing rapid socio-economic and environmental change (Bishop, 1990; Onta and Resurreccion, 2011). Table 2 depicts the geographical disparity in socio-economic development in Nepal, where the condition in the Karnali region, of which Humla district is a part, is staggeringly precarious. However, the poor situation in Humla exists in the context of a number of place-based development interventions including food aid and assistance programs that have been implemented in this region over the last four decades (Adhikari, 2008; Bishokarma, 2012). These offer scope for research to explore why there is mismatch between a long institutional interventions and socio-economic development outcomes.

Located in a high-altitude area of Nepal, Humla is the most inaccessible district in the country as it is yet to be connected into the national highway network. Although subsistence agriculture is the mainstay of local livelihoods, only 0.9% of the total land is cultivable. This leaves on average less than one hectare of land per household, and of which only around 10% is irrigated (DDC, 2011). One of the key characteristics of the highland environments such as the Himalaya is the high variation in altitude-determined belts and habitats having different eco-systems and farming suitability. Consequently, human livelihood activities exploit the eco-zones by complementary activities. Transhumance, which is the seasonal geographic mobility of farming and

pastoralism between the higher and lower elevation belts is the most common pattern (Bishop, 1990). Trade is also very common in Himalayan communities that facilitates exchange of complementary needs produced in different eco-zones (Goldstein and Messerschmidt, 1980; Zurick, 1989).

Table 1

Humla vis-à-vis Nepal in socio-economic indicators (2011)

| Indicators | Nepal | Karnali* | Humla |
|---|-------|----------|--------|
| Life expectancy | 69 | 64 | 64 |
| Undernourishment rate of children under 5 years (%) | 41 | 55 | 66 |
| Poverty prevalence (%) | 25 | 50 | 55 |
| Adult illiteracy rate (%) | 40 | 57 | 63 |
| Households without modern facilities (%) ** | 14 | 35 | 25 |
| Population without safe drinking water (%) | 17 | 31 | 30 |
| Toilet coverage (%) *** | 43 | 26 | 29 |
| Human Development Index | 0.541 | 0.445 | 0.432 |
| Development budget per capita (NPR) (FY 2013/14) | 3,081 | 11,760 | 17,459 |

*Karnali is a zone (a larger administrative unit than district) and includes five districts: Humla, Mugu, Dolpa, Jumla and Kalikot.

**Refers to households without any of the following household facilities: radio, cable TV, computer, internet, telephone, mobile phone, motor car, motorcycle, bicycle, other vehicle and refrigerator.

***Percent not adjusted for the number of households in Karnali.

Source: Author's compilation of data from World Bank (2011b), GON and UNDP (2014), CBS (2012) and GON (2011).

The Karnali region, of which Humla is a part, features both of these livelihood strategies. Due to scarcity of cultivable land and its sporadic distribution at various altitudes, most of the households undertake *transhumance*, whereby the whole family moves seasonally up and down the belts with their livestock to perform farming and pastoralism (Bishop, 1990). Historically, the same process also marked the development of the salt-grain trade between Tibet and Nepal. The mid-hills and Tarai region of Nepal produce a surplus of food but suffer from a shortage of salt. The arid Tibetan plateau region, on the other hand, has extensive availability of natural salt but lacks adequate food production. This complementarity served as the

basis of the salt-grain trade which was enjoyed by the farmers, mainly the Tibetan speaking *Lama* from upper Humla. The salt-grain trade also provided opportunities for the trade of other items, such as wool, pashmina, yak tails, timber, spices and all kinds of manufactured goods (Saxer, 2013). In recent years there has also been a surge in the trade of non-timber forest products, including various natural herbal products (Roy, 2010). Households lacking trade networks and investment capacity migrate seasonally to India for wage labor during the winter when they are not engaged in farming activities

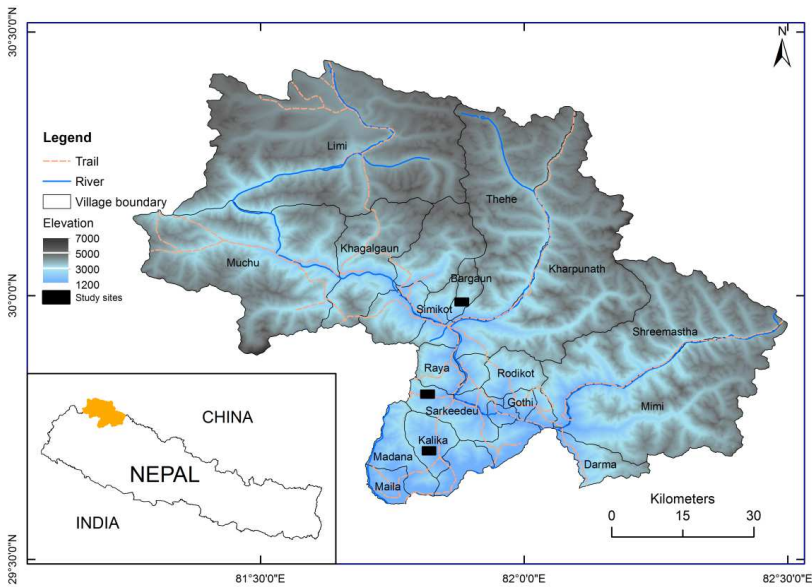


Fig.1 The district of Humla (Courtesy: Madan K. Suwal)

The current intra-community variation in both livelihood patterns and socio-economic wellbeing is based on the historical processes through which settlement, political development and livelihood patterns evolved in the region. Originally inhabited by the aborigines known as *Bhilla*, *Kinnar*, *Pilinda* and the *Kirats* (Pandey, 1970), the western region of Nepal has witnessed a large amount of cultural infiltration as a result of numerous waves of migration. Between 2nd and 14th century of the Christian era, the migrants came from various places and cultures, and included Mongoloid groups, Tibetans, non-Vedic Aryans, Rajput and Hindus (Zurick, 1989). Subsequently, this

region witnessed the reigns of various rulers of Tibetan and Aryan origin before it was annexed to Nepal in 1789. The *Malla* rule under the name of *Khash Rajya* was established in the 12th century. Historically this was one of the most important periods for Karnali because during the *Malla* rule, it became the most powerful and prosperous region in the area (see Pandey, 1970). After the annexation of Karnali (and hence Humla) into Nepal, it underwent profound transformations in social and cultural relations, ethnic identities and political participation under *Sanskritization* (for Sanskritization see: Srinivas, 1956; Jones, 1976). These changes all contributed to establishing the political and social dominance of the Hindu religion and the high-caste group (Levine, 1987; Adhikari, 2008; Lama and Rokaya, 2015). Several scholars posit that the principal factor behind the underdevelopment of the Karnali region its deliberate suppression, neglect and exclusion by the central government for having been the most resistant of the principalities during the annexation operations (Subedi, 2015; Adhikari, 2008). The local communities are also socially hierarchical in terms of caste and religious affiliation. Currently, two distinct groups represent the bulk of the population (Nepali-speaking Hindu caste groups and the Tibetan-speaking Buddhist ethnic group). Caste/ethnicity is an important factor of the social and economic dimension of livelihoods in Humla (Jones and Boyd, 2011; Onta and Resurreccion, 2011; Nagoda, 2015b).



Fig. 2 Inter cropping of finger millet (*Eleusine coracana*) with foxtail millet (*Setaria italica*) (left), and with rice bean (*Vigna umbellata*) (right) in Humla.

The fact that Karnali region has historically lagged behind the rest of the country's socio-economic development actually carried strong political appeal in the post-1990 democratic era, particularly after the so-called *second people's revolution* (2006). In that very year the Karnali Employment Program (KEP) was implemented by the government of Nepal with a mandate of providing 100 days of guaranteed wage employment to at least one unemployed family member of every household. In addition to the long-term food assistance programs (FAPs), the Karnali Development Commission (KDC) was established in 2012 to specifically target Karnali with integrated development plans and programs from an independent institution. The 2006 post-republican period has consistently targeted Karnali with a per capita development budget several times higher than the national average (Table 2). In addition, KDC has prepared a 10-year integrated plan with an estimated budget of \$30 billion in 2017. Since one of its primary aims is to analyze the management of the external institutional interventions, this study can arguably provide insights into how the effectiveness of the development programs can be enhanced.

Methodology

Research approach

How we conceptualize *reality* or *truth* guides how we strive to understand a phenomenon's underlying causes. Research methodology has a coherent link with theories and philosophies, as they guide our perspective on *truths* and our systematic efforts to enhance them (Aitken and Valentine, 2006). The question 'what is real' has remained one of the central philosophical questions that has engaged scholars throughout history. Contemporary philosophers are engaged in four broad theories of truth that include *correspondence*, *coherence*, *pragmatist* and *deflationary* theories. The first two of these have a substantial conception of *truth*, in that they hold a proposition to be true when it possesses a certain property (Young, 2015). The property of the proposition in the *theory of correspondence* is its correspondence with facts. In other words, a claim, belief or proposition can be true only if it corresponds to

real objects, facts or state of affairs in the real world (Marian, 2016). In contrast, for a proposition to be true in the *theory of coherence*, it should be logically consistent with other propositions that form the comprehensive system of explaining reality or truth (Young, 2015).

The *theory of correspondence* aligns with positivism, which attempts to discover objective laws that can be directly observed, measured and thereby generalized as a system of explanation. In this context, not only does the observed (such as environmental attributes, including the social actors and their activities) exhibit objective behavior, but the observer (e.g. a researcher) also maintains objectivity as the main standard of scholarly behavior (Peet, 1998). The objectivity view has, however been critiqued under post-positivist philosophy, which subscribes to the *theory ladenness of facts* and *value ladenness of inquiry*, and thus holds reality as constructed and relative in contexts. The contextual nature of reality implies that it cannot be captured, but rather can only be approximated (see Reiss and Sprenger, 2016). Since the *theory of coherence* sees a proposition's coherence within a larger system of propositions as the principal criteria for truth, it is consistent with post-positivist philosophy because the *theory ladenness of facts* and *value ladenness of inquiry* imply socially guided knowledge production and a relative understanding of the real world.

The focus on objectivity makes the positivistic approach more aligned to quantitative data and analysis (Denzin and Lincoln, 2000). On the other hand, by placing emphasis on the social construction of knowledge, the post-positivistic paradigm focuses on qualitative data to unravel meanings, human experiences, the quality of entities, and mechanisms and processes of events, while also critically reflecting on how the social situation of the observer and the observant help to shape the knowledge production process (Mansvelt and Berg, 2005; Winchester, 2005). The positivistic and post-positivistic *paradigm war*, and the subsequent methodological dualism, has led to the *incompatibility thesis*, which means that quantitative and qualitative research employ different methods, use and create different types of data and focus on different

dimensions of the real-world phenomenon. For this reason they cannot have any complementarity or productive dialogues (cf:Tashakkori and Teddlie, 1998).

However, some scholars have provided insights that the dualism is rather arbitrary. Cupchik (2001) argues that both quantitative and qualitative research deal with data which aims at understanding the real world. They are, by virtue of dealing with data, deconstructive because somehow the flow of events in the real world is selected, isolated and made the subject of research. This selectivity adds subjectivity to the supposed objectivity of quantitative data. Olsen (2004) argues that the design of instruments to collect quantitative data, such as structured questionnaires, also follows qualitative inquiry such as a pilot survey or literature review, which involves qualitative practices. In addition, in both descriptive and inferential statistics what variables or their relation with other variables mean or say about the real world or the social structure of which they are part, is possible only when an interpretative element is added. It can thus be argued that building a strong binary opposition between quantitative and qualitative methods is not logical and that they are therefore not mutually exclusive. At the operational level, one of the major arguments for the complementarity of the quantitative and qualitative methods is that of triangulation (Jick, 1979). Both qualitative and quantitative data have their own strengths and weaknesses. A combination of both in the examination of a single phenomenon can result in complementary strengths and non-overlapping weaknesses (Currall and Towler, 2003), which renders the findings more robust.

Quantification plays an important role in finding the patterns and the extent of food security prevalence. In this study, quantitative methods have been applied mainly to measure the pattern and distribution of food insecurity and also to trace its general association with other relevant socio-economic categories. In particular it has been applied to trace variables such as income, agricultural production, environmental attributes and some variables relevant to quality of life which serve as indicators and determinants of food in/security (Webb *et al.*, 2006; Barrett, 2010). These tentative and proxy measures, however, lack the explanatory power of the why some people are

food insecure and what mechanisms are involved in their situation. The manifest food security prevalence has a complex underlying structure including social, environmental, political and bio-physical factors of food production, distribution and consumption that drive food security in highly contextual manners (see Misselhorn, 2005 for an empirical review). Therefore, if research has to inform of actions that are effective at improving food security, it should unravel the phenomenon's underlying structure and capture the process through which it leads to outcomes in a particular context. This perspective accords with the tenets of critical realism.

Critical realism suggests that the real is stratified into three different layers of reality: *real*, *actual* and *empirical*. The empirical is the observable experiences of the manifest phenomena, which is successively rooted in and emergent from the *real* through the *actual* (Bhaskar, 1978). Our knowledge of the objects in the real world (such as food security) is socially constructed and relative for two philosophical reasons. First, all objects have *necessary* causal powers and a causal susceptibility to certain change, but whether or not they actualize depends on other *contingent* conditions (Sayer, 2006). Even when these contingent conditions are satisfied, the result depends on other contexts, which leads the same causal mechanism to produce different outcomes, or different causal mechanisms to bring about the same result (Sayer, 2006). Therefore, the emergence of the phenomenon from the underlying deep structures is not deterministic (Gregory, 2000). The contingent, multidirectional and non-deterministic causality makes the real world only approximately comprehensible, and hence our knowledge of it relative. Second, because we can only approximate reality, we cannot employ objective positivistic laws as a means of understanding the world. For this reason, theories and concepts are more appropriate, as they are inherently capable of only approximating the real world. Our approach to and understanding of the world is therefore socially constructed and relative. The implication for research approaches is to adhere to relativistic epistemology and qualitative in-depth exploration of the phenomena being studied.

Drawing upon the realist epistemology, this study applies qualitative techniques such as interviews and group discussions in order to examine the structures, mechanisms and processes that underlie the evolution and persistence of food insecurity in Humla. As informed by the contextual vulnerability approach, these structures and processes include the historical social relations, political and institutional changes in the region, and also the agency of the individuals and communities that collectively determine the ability to combat and alter negative environmental and socio-institutional circumstances. In turn, the pattern, extent and distribution of food security, which have been taken as the entry point for examining the underlying factors, have been analyzed using quantitative methods. The use of both qualitative and quantitative data has therefore complemented the breadth and depth of the study (Tashakkori and Teddlie, 1998; Johnson and Onwuegbuzie, 2004; Olsen, 2004). The thesis has been organized into three separate research papers. Each of the papers provides details on the specific techniques used to collect and analyze data. Since the papers are compiled in the last section of the thesis, I opt to avoid the redundancy of the specifics of the methods here. Rather, the next section includes a discussion of broader consideration of the socio-cultural context of the study, the subjectivity inherent in my positionality as a researcher, and also a discussion of how subjectivity has been dealt with and has shaped the analysis of food security.

Negotiating access, maintaining ethics: critical reflections

A social constructivist epistemology implies that social research, irrespective of any methodological approach, is inherently value-laden. Power and subjectivity arise from the researcher's socio-cultural background, research motivation and the social relations involved in the research process, and have critical links to the accountability and the validity of knowledge claims. In addition, social relations and social implications that are intrinsic to any research process and outcome, make the question of research ethics very important. This brings *critical reflexivity* to the fore of research practice. *Critical reflexivity* is "a process of constant, self-conscious scrutiny of the self as a researcher and of the research process" (England, 1994:82). To comply with ethical values, we

critically reflect upon power and subjectivity, consistently monitor our own position in the research process and our relation with the members of the researched communities. More importantly, reflexivity places “the outcomes of the research process not as characteristics of objects and existing realities but highlight its constructed nature that originates in the various choices and decisions researchers undertake during the process of researching” (Mruck and Breuer, 2003). The following section gives a brief sketch of my reflections upon the access to the community, the social relations involved in the research process and the knowledge that has subsequently been produced.

The researcher’s positionality in the community being researched (*insider/outsider*) is taken as an epistemological principle that characterizes the “patterned differentials [...] in access to certain types of knowledge” (Merton, 1972:11). An *insider* is one who shares identities based on social attributes such as culture, nationality, gender, sex, race, religion and so on with the community that s/he is researching. In the insider-outsider debate, the insider view claims to have better access to knowledge as they share the worldview with the community. On the other hand, the outsiders, not being influenced by the situated knowledge, claim purer objectivity which, they argue, the insider lacks (Griffith, 1998). I placed myself as an insider with the people of Humla due to our shared nationality and language. More importantly, my farming family background from east Nepal and familiarity with subsistence farming-based livelihoods would make my concerns not too *naïve* for them.

The fieldwork was organized into three different phases, the first of which was a pilot survey. Surprisingly, however, I encountered a *cultural shock* in the very first visit to Humla as I had difficulties making sense of the local dialect; living conditions were very different from the area in which I grew up (Ilam, east Nepal) and a lot of other cultural differences were evident (related mainly with gender and caste relations). Here, my positionality signified that culture is more than a monolithic entity and is characterized by internal variations (Merriam *et al.*, 2001) and I had to strive to overcome some of these variations in order to get started. I made extensive visits to the

farmlands where the farmers were harvesting crops, and provided them with labor assistance. I also participated in various community functions, such as local festivals. All of these factors helped me to gain some familiarity with the local community, but not to the extent that in-depth discussions about the research issue could be made.

More importantly, my student *status* that I presented to them, as per informed consent, deviated from the *role* expectations attached to it. *Status* is an individual's position in the society whereas *role* is the corresponding behavior expected of the status (Linton, 1936). My travel to a faraway place like Humla as a student with the intention of learning about local livelihoods and equipped with modern items (such as a big rucksack, my own mattress, sleeping bag, laptop and soil auger) contrasted with the local status inventory that would associate a student status with activities like regularly attending school classes and taking exams etc. Therefore, the pilot survey was utilized as a means of adapting to the local dialect, gaining a basic understanding of the annual farming cycle and complementary livelihood activities and, more importantly, getting to know as many people as possible so that they could be approached again. During the harvesting activities, I also directly measured crop production and land productivity in 20 farm plots in two villages.

The time at which I came closest to the local communities was in *Dasain*, the great Hindu festival during which all outsiders leave Humla and return to their own homes. This was not only because my stay during this period was indicative of my commitment to engaging with the local communities for my study, but also for some of the social incidents in which my participation was highly valued. One of the most ethically valued part of Nepali culture (and perhaps all cultures) is to bestow emotional (and also material (see Gautam, 2011)) support to families in the event of the death of a family member. Strongly guided by this cultural norm, I attended a funeral procession in *Sarkideu* that raised my profile within the community, and meant that I was able to speak to several individuals and establish a rapport that would form the basis for later interviews. In *Kalika*, another village inhabited predominantly by *Dalits*, the need for extensive rapport-building was associated with divisive caste norms that

made a “high caste” *Bahun* like me an outsider for the *Dalits* (see also Nightingale, 2011). Despite being a man of the so-called “high caste”, I lived with a *Dalit* family for the duration of the fieldwork, ate with them (a taboo for the high caste) and participated in their daily lives. I was therefore able to attain the position of *Niko Mantha*, (nice man, despite being a *Bahun*) and be affectionate with them (the so-called *low caste*).

My casual involvement on the daily lives of the locals featured an *insider* position. However, the outsider positionality was partly reproduced by my commitment to engage in-depth with some *naïve* questions, such as the specifics of land and labor allocation, farming activities and dietary patterns. This was also the case with some of my behavior, such as helping the hostess to fetch water, chop firewood and pound grain, as these are exclusively the female domain of work in Humla. This signifies that we have overlapping social characteristics and have a dynamic relation with the researched community. Some of the common issues may bring us together while others may distance them from us (see also Dwyer and Buckle, 2009). Therefore, a researcher’s role is better conceptualized on a continuum rather than on a sharp insider/outsider dichotomy (Breen, 2007). Keeping a certain distance or maintaining a balance on this continuum may actually benefit our access to local knowledge by preventing the insider from taking everyday life activities for granted and get sucked into the perspective of the local (Hellowell, 2006). There are many culturally and socially sensitive issues and secrets that people are more likely to share with a stranger than with their acquaintances (Simmel, 1921 cited by Naples, 1996:84). Assuming the position of an outsider while maintaining a constant awareness of the local context created *impartiality* (Mullings, 1999:340), a space in which the interviews and discussions unfolded and the local community members began to share information freely.

Just as the local knowledge negotiation process is important to the accountability and validity of knowledge, adhering to research ethics at the same time is equally important in order to minimize social, cultural, economic and psychological costs to

the research participants (Christians, 2005; Dowling, 2005). Research ethics “refers to the moral deliberation, choice and accountability on the part of the researcher throughout the research process” (Edwards and Mauthner, 2012:14). It is not confined only to how well the participants have been treated, but also encompasses the broader questions about the ethics of the knowledge itself, i.e. the political role played by research findings (Gillis and Alldred, 2012).

In the entire data collection and analysis process *minimization of harm*, *informed consent*, and *confidentiality* (Dowling, 2005) have all been ensured. Prior to the data collection, all participants were clearly informed about the content and the nature of the topic, including the intended use of the data. They were assured of their right to withdraw from the interview any time, which some respondents opted for in household surveys. With regards to confidentiality, although the farmers tended to be in favor of original attribution and the use of their photographs, their names have been anonymized and attribution of the comments (where appropriate) has also been disguised. The recording of interviews was denied by the officials of various institutions, and therefore in some cases notes were taken. All of the photos taken were shared with the local people and permission sought for using them in the publications.

Do no harm is another code of research. This should be contextualized in the type of relationship that the researcher maintains with the researched community. England (1994) notes three types of relations between the researcher and the researched: *reciprocal*, *asymmetrical* and *potentially exploitative*. The risk of harm is highest in the potentially exploitative relationship, in which the researcher is in a position of greater power. The exercise of the power in order to proceed the research may induce different types of costs to the community. As I have reflected earlier, I attempted to minimize such an asymmetrical relationship and to avoid any potential exploitation of the community by embedding the research into their freely chosen time and style. All of the interviews and household surveys were conducted during the late afternoon or early evening and off-farm hours. Several interviews were conducted on-farm while assisting the farmers with their work. Appropriate fees for any food and

accommodation that was provided to the research team were paid to the respective hosts.

Accuracy of the data and *avoidance of fabrications, fraudulent materials, and omissions and contrivances* are also important codes of ethics (Christians, 2005). Accuracy is linked with the internal and external validity of the study, which the next section will discuss in more detail. The research has been organized into a paper-based thesis. Each of the papers has been subject to peer-review. This process evaluates the research findings and their presentation by placing them into both a larger conceptual landscape and a more general empirical understanding that other studies have made on the same theme. This ensures the transparency of the research and warrants its accuracy.

More importantly, the ethics or political implications of the knowledge are a critical aspect of any scientific research (Twine and Warren, 2000; Miller *et al.*, 2012). A piece of scientific research diagnoses the dynamics of social phenomena and has the potential to reconfigure institutions and social relations, and thereby the ways in which such social problems are conceptualized and acted upon. This study unravels the political nature of food insecurity. It finds caste inequality as the fundamental driver of disparity in resource entitlement and food security. The disparity proliferates asymmetry in the capacity to benefit from external institutional interventions and socio-economic changes, and thereby also in the capacity to combat or alter the negative stresses of environmental changes.

The caste system is a resilient social system that provides a normative template for everyday lives as well as the ways in which formal institutions function (Bista, 1991; Bennett *et al.*, 2006; Jones and Boyd, 2011; Nightingale, 2011). It is implausible to assert that the findings of this research can have a significant contribution in contesting and altering the unequal caste relation. However, it may have implications for the redefinition of the social relations involved in the design and implementation of the development programs. Locating the incompatibility of the external programs with

local concerns and needs, this study calls for a bottom-up approach in the design and implementation of the projects. To this end, it also considers intra-community power asymmetry and therefore advocates for an improvement in targeting of the programs by prioritizing the sector that is most relevant to the most vulnerable sub-population. It can therefore be argued that the study maintains its political ethics by genuinely articulating the concerns of the marginalized population.

Study design and methods

This study applies a mixed-method research approach that combines qualitative and quantitative methods of data collection. The main periods of fieldwork lasted for four months between September and December 2013, and April and May 2014. The preliminary discussions with some of the NGO staff and extensive pilot visits to several villages provided a basic understanding of the socio-economic and institutional aspects of the local livelihoods, which revealed a geographical bias in the concentration of research and development activities in Humla. The remote villages were the subject of both far less research and NGO activities than the villages in the proximity to the headquarters. I draw upon the existing literature that notes high levels of intra-community variation in socio-economic characteristics of the Himalayan communities. The differences are associated mainly to caste/ethnicity-based resource entitlement distribution and historically differentiated livelihood patterns (especially off-farm activities), and the altitude-determined farming variations (Fürer-Haimendorf, 1975; Goldstein and Messerschmidt, 1980; Adhikari, 2008; Onta and Resurreccion, 2011). In addition to caste/ethnicity and altitudinal variation, access to markets and public service institutions, and thereby livelihoods and food security, also vary according to a settlement's distance from the district headquarters (Bishop, 1990; Jones and Boyd, 2011; Nagoda, 2015b).

Considering the need to incorporate communities that feature key socio-economic differences, three community clusters were sampled. These clusters featured all three caste and ethnic groups, were located at varying distances from Simkot, from a few

miles to several days' walk, and lay at varying altitudes, ranging from 1800m asl to as high as 3200m asl. The first community cluster chosen was *Bargaon* Village Development Committee (VDC), which is the nearest region to *Simkot*; the district headquarters (Fig. 1). The village is inhabited predominantly by the Tibetan speaking Buddhist *Lama* community. The second village cluster was *Sarkideu*, situated an intermediate distance from *Simkot*. Most of the informants from *Sarkideu* were *Chhetri*. The third village cluster was *Kalika*, the most distant cluster among the three from *Simkot*.

Table 2

Number of informants by caste/ethnicity and gender

| Methods | Caste and ethnicity | | | Gender | | Total |
|------------------|---------------------|----------------|--------------|--------|--------|------------|
| | <i>Lama</i> | <i>Chhetri</i> | <i>Dalit</i> | Male | Female | |
| FGD* | 25 | 34 | 15 | 41 | 33 | 74 |
| Interview** | 3 | 4 | 2 | 7 | 2 | 9 |
| Household Survey | 87 | 152 | 74 | 290 | 23*** | 313 |

*Total FGDs=10

**Six more interviews were conducted with officials of different institutions.

***Female-headed households.

The data collection started with several informal interviews with farmers and the observation of various farming activities and communal agricultural development projects. I also participated in a Food for Work (FFW) program funded road construction project to observe how FFW programs are operationalized. Over the course of the fieldwork, I was assisted by nine local field assistants. Two of them had at least 12 years of school education and were actively involved in local farming. Another three had a vocational agricultural education and either previously or currently worked as Junior Technical Assistants (JTA) in Humla. Based on the preliminary information gained from the interviews and field visits, a household survey questionnaire was designed and administered in 25 households as a pilot survey. A workshop organized with the field assistants evaluated the compatibility of the issues included in the questionnaire and the relevant responses made by the

informants, which led to the amendment of the questionnaire before it was administered to a total of 335 households. The household survey collected socio-economic quantitative data related to various aspects of food security and livelihoods. After error checks (incomplete responses, high discrepancies in reported data etc.), data from 313 households have been used in the analysis.

Another principal method included focus group discussions (FGDs). FGDs comprise a small group of informants, in which the participants discuss the issues specified by the researcher. They interact within the group, debate with one another and elaborate on the issues, which leads to synergistic information mining. This also enables the unravelling of different perspectives, which can seldom be achieved through individual interviews (Kamberelis and Dimitriadis, 2005; Cameron, 2010). The group participants were selected to represent all three caste/ethnic groups. Since caste/ethnicity is the pivotal aspect of local power relations, it could also affect the ability of the informants, mainly those in the subordinate power position, to actively participate in the discussion and to articulate their opinions and concerns within the group. The focus groups were therefore composed to maintain homogeneity within groups and heterogeneity between groups (Bedford and Burgess, 2001). This led to separate FGDs for the *Dalit*, *Chhetri* and *Lama* (Table 2). The size of the groups ranged from five to ten participants, and we drew on the concept of *theoretical saturation* to determine the total number of FGDs to be conducted. Theoretical saturation is in the point at which the sampling of further cases ceases to produce new data and insights (Agar, 1996; Bryman, 2004). This resulted into 10 FGDs with 74 participants, including 33 female participants (Table 2).

The major issues discussed in the FGDs included the local variations in livelihood activities, including the off-farm activities and food security. The local concepts of wellbeing or quality of life and their components were elicited through the discussions. Following the food system framework (see the theory section), the major stressors affecting the local food and subsistence systems were discussed. In particular, local perceptions of environmental changes such as climate change were discussed in detail,

including the ways in which they interact with the local food and subsistence systems, how the local communities cope with the impacts and what determine their coping capacities. Drawing on the contextual vulnerability approach, the social and political drivers of food insecurity were drawn through the discussion of local social and political relations and the asymmetrical access to various development and humanitarian projects, including the food assistance programs (FAPs).

Considering the importance of development and public service institutions to local food security and livelihoods, interviews with government and NGO personnel were also conducted. The interviews ranged from 45 to 60 minutes and focused on the broad range of issues relating to the agriculture, institutional interventions and food security nexus. Focus was given to understanding the status and constraints of agriculture from policy practitioners' perspective, their priorities in terms of the selection and targeting of development projects and beneficiaries, and the overall operationalization of the projects and their effectiveness. The range of techniques applied to analyze data has been detailed in the papers.

Reliability and validity

The issue of validity and reliability is one of the central issues to be assured so as to warrant the knowledge claim made by a research finding. The concept of validity can be defined as the extent to which the findings made in a research match the reality. For Kirk and Miller (1986), validity is the question of —whether the researcher sees what he/she thinks he/she sees whereas, reliability is concerned about the replicability of the research. The concept of validity and reliability comes from natural sciences under positivistic epistemology and has been transferred to post positivistic sciences.

The concept of validity and reliability has direct links with the epistemological position of the study. As noted in the beginning of this chapter, positivistic epistemology regards the world as observable and measurable facts. Relativistic epistemology, on the other hand, assumes that reality is constructed, contextual and ever-changing so there is no single truth to be captured. Having a relativistic

epistemological position, this study regards validity and reliability not completely compatible with that as conceptualized in positivistic or hard science, rather *credibility, dependability and transferability* of the research (Guba and Lincoln, 2005, emphasis in original) has been discussed within the epistemological and methodological framings that reflect upon science-society relation and emphasize context-specific science (Gibbons, 2000).

Gibbons *et al.* (1994) notes a shift in research environment in terms of a shift from curiosity driven research to application based research, increased commercialization amidst decreasing public funding for research, trans-disciplinary engagement in research and high reflexivity on the overall research process that has invigorated the concerns on the accountability of science in terms of its impact on society. In this context, science transcends its traditional disciplinary boundary and incorporates many different types of practitioners and public of different background who view science from a wider perspective of its societal effectiveness. Therefore, reliable science should also be socially robust science (Gibbons, 1999). As social attributes are dynamic due to dynamic human behavior, and diverse in terms of interests and orientation of different groups, science and scientific findings are inherently contextual, and therefore reliability and validity should be reconsidered accordingly. In this context, Merriam (1995) provides a worthwhile discussion on the reliability and validity of a social research having relativistic epistemology. In this line, I present a brief note on reliability and validity of this study in the following section.

Merriam (1995) advocates various strategies, such as triangulation, member check, peer examination and reflexivity to maintain validity and reliability of a research. Prior to the survey instrument design, extensive pilot work including informal interviews and in-situ measurement of land holding size, crop harvest and fertility management was done to gain a basic understanding of the farming systems. Moreover, the survey instruments were finalized locally with constant *member check* (Merriam, 1995) by the local assistants which continually placed the data collection process into scrutiny. The use of mixed method design in itself meets a criterion of

triangulation. A wide range of qualitative and quantitative methods were applied to collect data pertinent to related themes of food security in Humla. The findings of the multi-method data have demonstrated significant congruence. The conflation of different food security constructs has shown high statistical correlation.¹ The external validity, on the other hand is warranted by locating the findings within a larger conceptual landscape. The findings unraveled by this study such as the interaction of socio-institutional and environmental changes, social relation and resource dynamics in creating differential vulnerability are consistent with studies taking place in other contexts. In this regard, all the papers published within this study have been subject to peer-review which also assures the broadly defined reliability and validity of the study.

¹ For example the quantitative measurement of food security based on respondents' experiences (paper 1) and that based on income and food production (paper 3) produced a co-efficient of determinant (R^2) of 0.63 ($p < 0.01$).

CHAPTER 4

Results and Discussion

Farming, off-farm activities and food security

Due to its location in a high-altitude area with extreme topography and environment, Humla has little cultivable land. Agricultural production is therefore inherently incapable of providing food security and other subsistence needs. One of the most considerable aspects of local food security is the caste/ethnic dimension. Having too little cultivable land at their disposal, the low caste *Dalits* meet on average only 46% of their total food need from self-production, whereas the high caste *Chhetri* and *Lama* ethnic groups meet up to 64% and 75% respectively. The income of these groups is also consistent with their caste/ethnic affiliations; the *Lama* have the highest income, which is double that of the *Chhetri* and nearly five times that of *Dalits*. Beyond farming, all groups exploit several off-farm opportunities in order to supplement their household subsistence needs.

The household survey traced six major off-farm livelihood activities: wage labor, small-scale trade, salaried jobs, seasonal migration, NTFP collection and handicraft and tool making. A household was involved in an average of three activities including agriculture. The role of off-farm activities on household food security was analyzed using statistical techniques. In doing so, I drew from the concept of “livelihood security rather than food security” (Maxwell, 1996) and developed from the survey data a quantitative composite index (‘well-being index’) for each household. In addition to food needs, the composite index also encapsulated a broader set of local subsistence priorities, such as proper housing arrangements, the saving of cash and other assets, and the possession of large-scale properties, which would together meet food and material needs, enable culturally and socially dignified lives and also make locals more resilient to contingencies.

The fundamental aspect of the off-farm activities was that they could be classified into two classes: one, those activities *diversification by choice* and the other *diversification by need* (Ellis, 2000). The former is a desired and pro-active diversification as it substantially contributes to household well-being. Characterized by a significant positive contribution to well-being, the adoption of trade and salaried job indicated *diversification by choice*. All of the other activities had negative impacts on well-being and therefore reflected need-driven diversification. This type of diversification, due to its non-significant or negative effects on household well-being, may lead the household to end up in a more vulnerable livelihood system. Therefore, considering the importance of the specific type of off-farm sectors (and not others) for household well-being, socio-economic determinants of the high-return sectors were also assessed.

The results found that the socio-demographic variables most crucial in determining access to the high-return sectors (namely trade and salaried jobs) were the dependency ratio, education, access to institutions such as banks and agricultural institutions and social and political networks. Since households vary in their access to these prerequisites, their diversification patterns sharply contrasted with each other. High-caste households and those that were already relatively better-off in terms of these assets adopted high-return activities and reaped significant benefits to their well-being. The low-caste, poorer households, on the other hand, were forced to continue with low levels of diversification that would keep them trapped into socio-economic deprivation. In this way off-farm sectors, despite being one of the crucial aspects of local food security and livelihoods, contributed to the economy of already well-off households but not significantly to the poorest and most food insecure households.

In addition to the empirical insights, the analysis of the findings (Paper 1 which includes this finding) also makes a methodological contribution. Studies on issues such as poverty, quality of life and well-being confront the challenge of operationalizing the concept of well-being (Griffin, 1986; Kingdon and Knight, 2006; McGillivray and Clarke, 2006). High subjectivity and, contextual and cultural specificity in its definitions are some of the critical points, but despite this the need of addressing

poverty and well-being make the operationalization of the concept really important. In this context, the methodology applied in this study takes into consideration the local people's criteria to define wellbeing. It then traces associated material assets and develops therefrom a quantitative household well-being index. This insight does not relate to the development of a generalizable index as such, but rather a generalizable method that can capture the cultural, social and economic specificity (in which people define their well-being) and operationalize it.

Multiple stressors and food insecurity

Food insecurity and livelihood vulnerability in Humla were attributed to multiple socio-economic and environmental stressors relevant to both farming and the off-farm sector (Appendix 4). Applying a food system approach, I analyzed how the multiple stressors interact and drive food insecurity. The interaction of three major external changes with the local food system marked the most significant aspect of the process through which food insecurity advanced. The institutional changes include the community forestry (CF) program, school attendance of the young farm population and NGO and humanitarian interventions. The major environmental changes were climatic variability, soil degradation and crop disease. The CF in the district and beyond imposed strong regulations on access to the forest for local livestock and also for those used in the traditional caravan trade. This served to decrease manure supply to the farmland and thus reduce food productivity, and also the source of household income by affecting the traditional trade. This was exacerbated by a recent trend of school attendance among the young population that led to a shortage in farm labor. Agricultural production was also hampered by climatic variabilities, including increased dry-spells, the delayed monsoon and more frequent extreme events.

Although the overall systemic impact of these interacting stressors was negative on food production and household income, they were felt disproportionately by different caste/ethnic groups and associated preexisting socio-economic conditions. For example, households involved in the traditional caravan trade, mainly *Lama*, were

already relatively better-off and could therefore effectively curb the impacts of the CF regulations by turning from many sheep to few but larger animals (so that the grazing pressure reduced), and changing the salt-grain trade to NTFP trade. The *non-Dalit* high caste groups and mainly the *Chhetri*, having better educational conditions, were able to exploit the newly-emerging jobs proliferated by the increasing NGO activities in the district. The low caste *Dalits*, however, were less able to effectively cope with the stresses due to their comparatively weak economic and social conditions. Most of their responses to the stressors were therefore based on an unequal *Balighare* relation with the high castes, in which they provided labor and caste-based services, such as shoe making, tailoring etc. in exchange for grain. They also engaged in low-return diversification practices such as seasonal migration, which could not substantially help them to move out of food insecurity. In addition, some of the other common coping strategies among the poorest and most food-insecure households actually increased their vulnerability rather than curving it, for instance borrowing food and selling livestock. Overall, these findings highlighted the strong role of social relations and antecedent socio-economic deprivation in shaping the impacts of climatic variabilities and socio-institutional changes.

Food assistance programs, food insecurity and livelihoods

Two separate humanitarian institutions operate distinct food assistance programs in Humla. The first and the oldest is the Nepal Food Corporation (NFC), and the other is the Food for Work (FFW) program under the World Food Program (WFP). The NFC sells subsidized rice on a household-size basis. FFW is more generally an employment program which requires the beneficiary households to provide labor that is applied to construct various pieces of infrastructure to support local livelihoods, such as roads and irrigation canals. The combined food transfer from these two programs meets 20% of the total annual food need of the beneficiary households, which was nearly half of the total deficit in 2013. More importantly, the transfers work as a safety net for the poorest households and therefore reduce their need to make counterproductive coping strategies such as selling livestock or borrowing food from the well-off. The result is

their reduced likelihood of being food-insecure in the face of unpredictable livelihood shocks.

However, these programs' distribution of food is not equitable in view of intra-community socio-economic variations and food security needs. The NFC rice sale was highly unreliable and involved much smaller amounts than the mandates of 5 kg per person per month. It was also conducted within a strong web of local social and political relations. This led to the richer people, mainly living in close proximity to the district headquarters, and those with political networks with the NFC officials having much easier access to the NFC assistance. This was substantiated by a high and significant correlation coefficient between household income and the amount of NFC support received by the households ($R^2=0.329$, $P<0.001$). Therefore, while the assistance covered only 2% of the total food need in the most food-insecure *Dalit* households, the comparatively more food-secure *Lama* households used it to meet around 10% of their food need. Although the amount of rice distributed in the FFW scheme was much higher (160 kg per household in 2013), all households were provided with the same amount, irrespective of their needs. This moderated the potential impacts that could be achieved if the assistance were targeted only to the genuinely needy households.

Another aspect of the FFW programs, the community development projects, was even more discouraging from a food security perspective. One of the main problems of the projects was that the WFP mandated a discrete program to be completed with each episode of the assistance. This meant that FFW projects failed to attract effective local participation because they were required to develop construction projects without any logistical and technical support. Moreover, the development aid was exclusively in the form of rice and did not include any non-food items needed to operationalize development projects. This led to projects incompatible with the needs, priorities and capacities of local communities. Consequently, the FFW operations were exploited only as a resource to secure free rice to fill the current household food gap. This finding serves to critique the widespread claim that FFW's integration of food or cash

assistance into local development projects has significant potential role for future food security in the most vulnerable parts of *Nepal's rural communities* (WFP, 2013; emphasis added).

Discussion

Subsistence farming is generally barely sufficient to meet the food and non-food needs of the farming households because it has inherent resource and technical limitations that lead to lower outputs compared to larger, more modern farms that reap the economies of scale. While a few households can consistently meet food and subsistence needs, most households have chronic or *composite food insecurity*, especially when they have to respond to shocks. The concept of composite food insecurity was suggested by Deveruex (2006) to refer to the realities of many households that have generally low or moderate hunger, but which occasionally fall far below the subsistence threshold when they are exposed to unexpected shocks. As recent studies on poverty, food insecurity and vulnerability reveal, the shocks are multidimensional and include socio-economic and biophysical structures and changes, both endogenous and exogenous to the livelihood systems (Misselhorn, 2005; Tschakert, 2007; Ingram *et al.*, 2012). However, farming is not the only sector on which these smallholder farmers rely for their livelihoods. Non-farm sectors have infiltrated the economy of the worldwide farming communities, and now contribute more than half of their income (IFAD, 2010). This has fostered opportunities for subsistence farmers to enhance their income and improve both the access to and utilization of food and non-food items (Ellis, 1998; Barrett, *et al.*, 2001).

With this in mind, this study raised three research questions to consider: the role of the non-farm sector on food security, the role of multiple stressors on food production and livelihoods, and the contribution of food assistance programs to current and future food security. The results relating to the research questions presented in brief in the previous section have been detailed in the self-contained, peer-reviewed, academic articles compiled in the second part of the thesis. In this section, I discuss the common

theme that emerges from the findings. First I discuss them from a broad perspective of marginality and go on to give a more in-depth analysis of how social relations reconfigure marginalization and reproduce poverty, food insecurity and other socioeconomic deprivation. Finally I reflect upon the food system approach to analyzing food security.

Marginality and food insecurity

The general pattern of livelihood in Humla fits into Nepal's spatial division of labor and economy, in which the commercialization of agriculture and access to non-farm employment sector, both instrumental for local incomes, are much more prevalent in areas close to the cities (Fafchamps and Shilpi, 2003). Socio-economic deprivation is very high in Humla, arguably due to its disadvantaged position in terms of marginal environment and limited natural resource base, as well as its geographical remoteness, lack of physical infrastructure and consequent limited access to economic activities. Added to this is the historical exclusion of the local communities from participation in mainstream politics and decision-making (Adhikari, 2008; Subedi, 2015). The overall context therefore indicates marginality as the root cause of the local communities' deprivation (Gatzweiler *et al.*, 2011; Von Braun and Gatzweiler, 2014; Husmann, 2016). Marginality is conceptualized as the condition of being excluded or having limited access to social and economic services, resources and decision-making processes (Maru *et al.*, 2014). Communities that are marginalized in the social, political, economic and biophysical systems are prevented from having reliable access to resources, have limited freedom of choice and restrained development of capabilities, all of which can eventually lead to extreme poverty (Gatzweiler *et al.*, 2011:3).

Gurung and Kollmair (2005) note two conceptual frameworks of marginality: societal and spatial marginality. Societal marginality is related to the social conditions reflected in the poor livelihood options available to the marginalized communities and their exclusion from decision-making processes. The staggeringly low socio-economic

indicators, such as education, health and other dimensions of human development, reflect poor livelihood options in Humla (CBS *et al.*, 2003; World Bank, 2011a; GON and UNDP, 2014). Moreover, the local communities of Humla are largely excluded from mainstream politics (Basnet, 2016), and from participation in decision-making, even when such decisions relate to the design and implementation of institutions that will directly affect their livelihoods. The community forestry (CF) project illustrates this. The CF is praised for reflecting highly inclusive and democratic forest governance and for being efficient in livelihood promotion and environmental conservation (Gautam *et al.*, 2002; Dev *et al.*, 2003; Pokharel *et al.*, 2007). This has led the CF to enhance a hegemonic normative policy status for rural livelihoods in Nepal. Essentially detrimental to the local livelihoods, its implementation in Humla reflects *agency vulnerability*, a condition when the local farmers have no control over the socio-institutional change and therefore development actually becomes the source of their vulnerability (Kosko, 2013).

Some studies also relate the agency vulnerability of the local farmers to the communist reform in China in the 1950s and the subsequent changes in the border regulations that came into effect in the early 1960s (Saxer, 2013). In addition to the primary role of providing manure and draught power, and being the main vehicle for the caravan trade, livestock was also an important source of direct income and a major source of nutrition, by supplying meat and dairy. After Tibet was integrated to China, new border regulations restricted the Humli farmers' access to the extensive pastureland across the border, which also had an important bearing on pastoralism based livelihoods (Saxer, 2013)¹.

Even other institutions apparently more supportive of local livelihoods such as the FAPs and the rural development schemes also attract thin (weak) local participation. Crocker (2007) presents a spectrum of participation in local development, ranging

¹ The local farmers were also elicited to shed light on the impacts of this political change on their livelihoods. Apparently because more recent forces are more pertinent, the farmers stressed the CF and climate change to be main problem than the political change in Tibet.

from thin (weak) to thick (strong). The thinnest end of the spectrum is considered to offer the lowest quality of participation, with the decisions being made exclusively by elites. The thickest level of participation, on the other hand, is deliberative participation, in which “non-elites deliberate together, engage in practical reasoning, and scrutinize proposals and reasons in order to forge agreements on policies for the common good, ones which at least a majority can accept” (Crocker, 2007:433). Since the means of development that are channeled through the FAPs are controlled exclusively by external agencies, with the locals being bound to set priorities and goals within the limits set externally, local participation reflects thin, low-quality participation which does not fully address agency vulnerability in Humla (see also Scott, 1998; Mosse, 2001).

The societal marginality in Humla overlaps with the second framework: spatial marginality (Gurung and Kollmair, 2005). Spatial marginality is related to the economic concept of space, and is defined in terms of locations’ relative distance from the centers of economic activity, with greater distances tending to be characterized by a lack of or limited infrastructure and connectivity. In addition to spatial (dis)connectivity to the institutional and economic centers, Gatzweiler *et al.* (2011:3) add *the first nature geography* to spatial marginality, which includes biophysical and ecological attributes, such as altitude, terrain and soil type (Kanbur and Venables, 2005). The consideration of biophysical and ecological attributes is crucial because in addition to institutions and policies, they also directly shape “the forces that people face” (Dasgupta, 2009:139). The social and political marginalization of the local farmers in Humla therefore complements first nature geographical attributes (the poor endowment of their resource base), and collectively lead to food insecurity and a poverty trap.

The marginality perspective offers a general explanation of the food insecurity and socio-economic deprivation of a community, group or place such as Humla, and may also provide insight into policies to help curb them. However, as the results of this study illustrate, these communities and places cannot be treated as a single

homogeneous entity because there is high intra-community variation in local political power and structures, as well as in livelihood conditions. In this context, policy efforts insensitive to such local variation risk having highly differentiated local impacts, being ineffective and even increasing inequality (Jones and Boyd, 2011; Nagoda and Eriksen, 2014; Tanner *et al.*, 2015). Applying more effective practices therefore requires a better understanding of the local relations and processes within which different attributes of the livelihood systems operate, and result into the marginalization of some subgroups takes place from within the marginalized communities. The most apparent aspect of food security and its associated socio-economic characteristics is their variation by caste and ethnicity in Humla. Therefore, bearing in mind the need to consider the historical development to understand current social and economic structures (Farmer, 2005), the historical and contemporary caste ethnic relations and their role in shaping different dimensions of food security and livelihoods have been discussed in the next section.

Caste/ethnic relation and food security

Throughout history, caste/ethnicity has remained a central factor underlying the social, economic and, most importantly, political dynamics of Nepal (Sharma, 1977; Bista, 1991; Bennett *et al.*, 2006). Caste/ethnic relations arguably shape all of the major cross-cutting issues pertinent to food security in Humla, such as *land distribution and farming, access to off-farm income opportunities* and *access to development and humanitarian institutions*. The hierarchical caste system is a foreign importation which entered Nepal with the immigrants from India around the first century of the Christian Era (Aahuti, 2004). The major turning point of the caste system becoming firmly established in Nepali society and politics was its utilization in legitimizing the Rana regime.² Through the Legal Code of 1854, the Ranas imposed hierarchical caste norms

²A sustained power struggle immediately following the death of Prithivi Narayan, the founder of modern Nepal, culminated in a massacre resulting in the establishment of Rana rule in 1846. The Ranas belonged to the *Kunwar* clan, which was socially inferior to the clans belonging to the ruling and administrative class. Since they were not a ruling class and their power was

as a means of guiding the country's legal and civil administrative systems (Regmi, 1975; Bista, 1991). The legal code firmly institutionalized caste hierarchy as it brought all non-Hindu ethnic groups, who followed Shamanism, into a caste category, ranked them lower than the high caste *Bahun* and *Chhetri* and imposed varying punishments for offenses according to an individual's caste (Sharma, 1977; Gurung, 2004). Another key aspect of the legal code was the deliberate imposition of caste-based occupational boundaries, in which the low caste *Dalits* were largely denied land entitlement and education, let alone entry to politics, administration and salaried jobs (Bista, 1991; Aahuti, 2015). Consequently, they were obliged to organize caste-based occupations such as tailoring, shoemaking and blacksmithing into the patron-client exchange system called *Balighare*.

The collection of revenue was one of the central functions of the early civil administration. Since forest and cultivated land used to be the main sources of revenue, the economy and politics were driven specifically by land tenure arrangements and bureaucracy administering it. During the Rana rule, *Raikar* tenure which denoted private land liable to tax comprised less than half of the total land. Other types of land tenure included *Birta*, which included large parcels of land granted to priests, the army and bureaucrats for their loyalty to the rulers or *Jagir*, a form of salary for their jobs. Since the class receiving *Jagir* and *Birta* comprised mainly the high caste *Bahun* and *Chhetri*, they were the people directly benefitting from the legal provision (Regmi, 1976; Bista, 1991; Adhikari, 2006). The low caste *Dalits*, on the other hand, earned their livelihoods mainly from labor and services provided to the high castes, organized in the patron-client systems, the terms of which were defined and controlled exclusively by the clients.

The direct ramifications of these historical caste/ethnic relations can be seen in the differential food security in Humla (see also Zurick, 1989; Lama and Rokaya, 2015;

based neither on property ownership and inheritance, nor on the right of conquest like the then royal Shahs, the fundamental problem that the Ranas had with their rule was the lack of legitimacy of their authority. The legal code was therefore used as the most effective instrument to establish their new title (Rana) as a ruling class (Regmi, 1975).

Ramtel, 2015). The most fertile and irrigated land in the river valleys continues to be owned by the high castes (Levine, 1987). Nightingale (2003) links some of the land and forest ownership in the adjacent district of Mugu to the historical land grants described above.³ The control of land and forest arguably gave them higher food self-sufficiency and better food security than other groups (Sanders and McKay, 2014). The low caste *Dalits*, on the other hand, own very little fertile land on the slopes. This provides the most basic explanation for the underlying differential food insecurity among the various groups in Humla.

Although caste institutions provided the basis for the high caste to control large amounts of land and thereby achieve better food security than others, in some ways they have also limited their capacity to benefit from the traditional non-farm income sectors, which are the second dimension of food security in Humla. Dietary conduct is one of the most important aspects that has restricted the high castes from properly integrating with other groups because commensality with inferior castes, as well as eating taboo foods, according to caste code, are both punishable offenses (Sharma, 1977). This was also restrictive for the *Dalits* since they are untouchables, and therefore cannot enter the houses of the members of the higher castes and eat with them. On the other hand, the freedom of commensality enabled the *Lama* ethnic group to move extensively and interact with other communities, which made trading activities much easier (Fürer-Haimendorf, 1975). Two other cultural factors that are unique to the *Lama* ethnic group also facilitated their trading opportunities. First, the *Lama* are a Tibetan-speaking Buddhist community, which enabled them to interact with Tibetan communities, build trade networks and engage in the trans-border salt-grain trade. Second, the *Lama* community practices fraternal polyandry, in which the male siblings in a family share a common wife. Demographically, the family would

³ Resource mobilization in the present context is largely controlled by party cadres in the party patronage networks (see Hachhethu, 2007). In an informal interview, a local cadre of a political party in Humla revealed an unusual case of his ownership of land in the Tarai district of Kailali. He and several other party members secured land in Kailali district when it was distributed to the (freed) bonded laborers called *Kamaiya* in the early 2000s.

therefore not split up, landholding sizes would not shrink upon inheritance and more labor would be available to engage in various economic activities, such as farming, pastoralism and trade (Goldstein, 1976, 1981; Ross, 1981).

Caste-ethnicity-based social and political relations also have a large impact on the role of salaried jobs, which are another key factor contributing to household well-being. This sector is the one that compensated for the *Chhetris'* inability to establish themselves in trade to the same extent as the *Lama*. Much like formal education, access to salaried jobs has historically required a good social network with members of government and non-governmental institutions and political parties, an area in which the high-caste *Chhetris* have tended to be well privileged (Gautam and Andersen, 2016). This, however, prevented the politically and socially subordinate *Dalits* from accessing and benefiting from the recent surge in salaried jobs. Here the concept of *access qualifications* becomes relevant (Wisner *et al.*, 2004). Access qualification is the demand to access such high-return activities. Having too little social, human and financial capital to satisfy the access qualifications, the *Dalits* diversified into low-return sectors, reflecting the process of *diversification due to push factors*. In contrast to *diversification due to pull factors* (Reardon *et al.*, 2007), the former offers low returns to household economies and therefore serves to maintain the economic deprivation of the diversifiers.

The implications of this caste/ethnic structure on the third dimension of food security (access to institutions) are the most critical aspect of food security, since addressing food insecurity and other economic deprivations has been and will ultimately be achieved through institutional interventions. The modality of development programs (such as the FAPs in Humla) shapes all three aspects of food system resilience: stability, flexibility and change (Béné *et al.*, 2016). The inherent social and political power asymmetry in the community creates differential access and capacities to benefit from the institutions (Jones and Boyd, 2011; Kruks-Wisner, 2011). It is therefore plausible to assert that such institutions help certain groups and systems to maintain stability and flexibility, with those not benefiting from such support tending

to be already in subordinate positions of power. Consistent to other studies (Adhikari, 2008; Jones and Boyd, 2011; Nagoda, 2015b), the results of this study reveal differential access to institutions according to caste-associated political networks. The assistance from the NFC, for example, indicates elite capture since the individuals and groups who are influential in local politics have been shown to exploit their power in order to access disproportionately high volumes of food assistance. The implication of this finding is crucial in view of prospective socio-economic development, environmental changes and planned institutional change. Planned governance, for instance relating to forest governance, already clearly shows the bypassing of marginalized communities in Nepal (Nightingale, 2002; Iversen *et al.*, 2006; Mulepati, 2012). The caste structure in Humla may therefore moderate the efficiency of future developments and institutions if they are insensitive to the local power relations and differential livelihood conditions (Nagoda, 2015a).

The caste-ethnic perspective in analyzing food security in Humla and linking it to its historical roots should, however, not imply that the caste system is universally static. Caste-ethnic relations are undergoing profound changes (Caplan, 1972; Nightingale, 2011; Nagoda, 2015b), as are the political and economic conditions of the various caste and ethnic groups in Nepal (Khanal *et al.*, 2012; Sunam, 2014). The political and economic changes that Nepal underwent during the post-1950 democratic era (including the *Panchayat* system) evidently induced positive political and economic impacts on the *Dalits* (see Caplan, 1972:85-96). In many other areas of the country, the *Dalits* have recently managed to fight access qualification and adopt economically promising overseas jobs, which have enabled them to contest caste institutions by mobilizing financial, human and symbolic capital accumulated through migration (Sunam, 2014). The aftermath of recent political changes, such as the Maoist war (1996-2006) and the so-called *People's Movement II*, have increasingly made the *Dalits* aware of their oppression and also enabled them to negotiate it to some extent, even in Humla (Nightingale, 2011; Nagoda, 2015b).

Nevertheless, my argument is that the *Dalits*' ability to contest caste ideologies is low in Humla when compared to the situation at national level. The caste norms and the social disparity have been so strongly internalized by the *Dalits* that caste has gained ontological social status, meaning that it continues to shape social interactions and sustain inequalities (Bista, 1991; Nightingale, 2011). Moreover, the *Dalits* in Humla are confronted with economic circumstances that circumscribe their ability to effectively use their knowledge and awareness to challenge these caste norms. Unlike those who have fought the access qualification elsewhere to get overseas jobs, the *Dalits* in Humla have too low human and financial capital to make such moves. Moreover, Humla's increasing link to market and industrial goods has risked the *Dalits*' *agency vulnerability* by gradually replacing their traditional caste-based occupations, such as tailoring and shoemaking, which would otherwise cushion the food shortage through the local traditional exchange system. The educational dimension has also worked negatively against the *Dalits*. Although they traditionally possess special skills as mentioned above, these skills have not well been exceeded through the formal educational system in Nepal in general (Bista, 1991). Moreover, *Dalits*' exclusion from the formal education systems in Nepal has largely deprived them to innovate, hone their skills and meet the changing demand of the society (Aahuti, 2015). Added to this *agency vulnerability* is the negative impact of climate change on agriculture, which has intensified the *Dalits*' dependency on the high castes (Onta and Resurreccion, 2011). Caste relations and the associated inequality are arguably more resistant in areas remote from political and economic centers, where some groups face multifaceted marginalization, than in the areas where political and socio-economic changes have helped to promote social and economic mobility.

The finding of this study on *Dalits*' poverty and food insecurity is consistent with the situation at the national level. In a country having a poverty rate of 25%, the poverty rate among the *Dalits* is 44% (GON and UNDP, 2014). At the national level, the socio-economic condition of ethnic groups in the hills is better compared to the *Dalits* (28% poverty) but still higher than the national average and much higher compared to the high castes (10%). The national scenario has led to a tendency of universally

portraying high castes as the most affluent communities and the ethnic groups as marginalized and poor in terms of income and material assets (Lama, 2012; Bennett et al., 2006). Contrary to this, however, the deprivation of the historically dominant and privileged high caste *Chhetris* and the economic mobility of the historically marginalized *Lama* in Humla indicate the risks of such generalized assumption. The economic mobility of *Lama* does not automatically suggest the result of negotiated caste relations and is apparently linked to a more complex process which is linked to the culturally-induced demographic flexibility (polyandry and surplus labor). It may also be linked with gender relation, where the women in ethnic groups enjoy a better economic freedom and are more likely to invest on household welfare and assets⁴. Nevertheless, consistent with the findings of Adhikari (2001), this finding questions the dominant poverty narrative that considers specific caste and ethnic groups as a single entity and applies a generalized conclusion about their poverty or well-being.

Social relations, food systems and food security: critical reflections

This study theoretically drew upon a food system approach to food security. This approach conceptualizes food security as an outcome of the combination of different food system components and considers how food is produced, distributed and consumed, as well as how relevant changes drive the food system (Ericksen, 2008a). The components of food system include socio-economic, bio-physical and ecological factors, with food insecurity occurring not due to the vulnerability of the discrete components, but rather as a result of the vulnerability of the system as a whole (Paloviita *et al.*, 2016). Corresponding with recent studies, the findings from Humla highlighted the combined impacts of institutional change as well as environmental changes as the major drivers of food insecurity (Reid and Vogel, 2006; Tschakert, 2007; Ericksen, 2008b; Ingram *et al.*, 2012). The CF program, which is generally highly successful at promoting local livelihoods in Nepal, induced predominantly negative livelihood impacts in Humla. Moreover, only modest and socially

⁴ See Garikipati (2008) and Thapa's (2009) review of related literature.

differentiated impacts of the external humanitarian and rural development interventions suggested that the impacts of external institutional changes are determined by the antecedent contextual socio-economic, political and *geographical* structure (O'Brien *et al.*, 2007, emphasis added). The findings suggest that institutional practices to reduce *food insecurity* may not only have differential impacts on the targeted communities, but may actually increase inequality and *food insecurity* (Eriksen *et al.*, 2011; Tanner *et al.*, 2015, emphasis mine). This warrants some reflections on the current approaches to understanding and addressing vulnerability.⁵

Füssel and Klein (2006) outline a transition in the conceptualization of vulnerability in climate change literature, in which vulnerability analysis has shifted the focus from bio-physical and environmental impacts to the role of inherent social factors. The central social aspect pertinent to vulnerability (and resilience) relates to a set of assets and resources that determine adaptive capacity. Arguably, endowments of material assets, human capital and access to institutions are important factors in reducing vulnerability. The focus on material assets and institutions highlights vulnerability (e.g. food insecurity) as a condition which can be understood by paying particular attention to specific characteristics that are inherent within vulnerable populations (Mosse, 2010). For example food-insecure communities in Humla can be mapped in terms of their lack of access to institutions, too little land, large food deficits, little or no education and poor social and political networks which characterizes their inability to utilize income opportunities in diverse economic sectors.

However, the conceptualization of inherent vulnerability masks the dynamic context and drivers that place a specific individual or community into the disadvantaged conditions, while at the same time neglecting what and who make them vulnerable (Brown and Westaway, 2011; Tschakert *et al.*, 2013; Fabinyi *et al.*, 2014). In other words, it offers little understanding of why the *Dalits* have inadequate land and lack access to relevant institutions or why they are less likely to benefit from the FAPs that

⁵ Since food system is an SES, I use the term *vulnerability* in the broader sense to refer to food system vulnerability and hence food insecurity.

are implemented to assist them. By offering bare *descriptions* or proximate correlates of vulnerability, this approach fails to capture the underlying causes, and therefore offers little guidance for action (Dasgupta, 2009). As suggested by Farmer (2005), tracing the historical development of immediately apparent characteristics of the food-insecure groups in Humla, this study clearly reveals that their deprivation is determined by their historically established unequal relations with other caste groups. Since this relationship is sustained by everyday interactions, it is likely to continue to perpetuate their deprivation, as they are unable to fully utilize future opportunities while others exercise such control over them (Wood, 2003 cited by Mosse, 2010). The findings therefore suggest the need to take a relational standpoint, which conceptualizes *food insecurity* as something shaped and reshaped by everyday social processes, and not simply as something inherent to the *food insecure group*, or the *food system*, amenable to categorization as the product of the certain form of (or lack of) assets, attributes or capabilities (Mosse, 2010, emphasis added).

An example of how social relations affect *Dalits'* capacity to benefit from external institutions was clearly shown by the impact their settlement pattern had on their access to development institution and capacity to benefit from them. In the first and the second sample clusters (Bargaon and Sarkideu), *Dalits* have settlements mixed with that of higher caste whereas those in the third cluster (Kalika) have completely separate settlement. The separate settlement gave the *Dalits* of Kalika a better opportunity for political representation and participation in formal institutions and their programs, which they attributed to their freedom from having to compete with high castes. As a result, almost all *Dalit* households have access to latrine and drinking water (heavily subsidized by NGOs, see McKay *et al.*, 2007) whereas almost all *Dalits* in the mixed settlement lack those facilities. In the latter case, the bypassing of the *Dalits* is consistent with the argument of Neupane (2004), which relates to the flaws of the apolitical *participatory social development* widespread in Nepal in which local social relation favors the rich and powerful households in expense of the most vulnerable ones.

From a systemic perspective, the relational approach offers an important ‘social’ input that the conventional social-ecological system approach lacks (Brown and Westaway, 2011; Cote and Nightingale, 2012; Tschakert *et al.*, 2013; Fabinyi *et al.*, 2014). It gives a deeper understanding of the factors that drive disparities in *agency*, *opportunity structure* and *access* within society, the ways in which they are shaped by power relations and how they have a critical bearing on the impacts of change as well as on the efforts in adapting to change and enhancing food security. Opportunity structure constitutes institutions, policies, and values systems (Bennett, 2005), which enable or constrain individuals and groups’ *agency*, which is the ability to freely choose and undertake activities for their benefit (Brown and Westaway, 2011). Access, on the other hand is defined as the ability to benefit from things (Ribot, 2014) and is channeled through opportunity structures.

The ‘social’ part in the early SES studies was occupied by economic and easily quantifiable variables (Stojanovic *et al.*, 2016). While social difference in terms of access and the capacity to work was recognized, it was subsumed in social institutions that provided an important theoretical framework to analyze resource utilization and management (Anderies *et al.*, 2004; Olsson *et al.*, 2004; Folke *et al.*, 2005). Institutions are conceptualized as organized social units (Ostrom, 2005). In order to develop institutional theory, the vast social differentiations are therefore reduced to a few variables relating to heterogeneity (Wollenberg *et al.*, 2007; Fabinyi *et al.*, 2014), while the myriad of factors that underlie agency and access get far less attention. In this respect, the focus on difference in agency, interest and access enriches the understanding that power can be invested in institutions, and that collective action may therefore be give voice to the privileged few while at the same time silencing the powerless (Fabinyi *et al.*, 2014).

This understanding also has important implications on the conceptualization of resilience. Resilience (the flip side of vulnerability, with food system resilience therefore being the opposite of food insecurity) focuses on the capacity to absorb shocks and maintain core properties and functions (Anderies *et al.*, 2004). Recent

environmental change studies, including those on food security, recognize the need to be able to maintain not only *robustness*, but also the capacity to transform the function to adapt to rapid and unpredictable changes (Kates *et al.*, 2012; Béné *et al.*, 2016). If both of these conceptualizations are not informed by social differences in agency and access, they risk putting minorities, the marginalized and vulnerable populations at stake. Resilience as robustness conceptually assumes the existing state to be a desirable one, which may in fact not be favorable to some groups. For example, land ownership, farming opportunities and external institutions in their existing form are of more benefit to high caste groups as opposed to the *Dalits* in Humla, and their persistence is therefore arguably not desirable for the *Dalits*. Even when active transformation is planned, power can be invested in the selection, priority setting and management goal, and thus the same issue becomes recurrent.

The adaptive transition management concept provides the best example of an apolitical and power-blind approach to transformation in the food system. To address the persistent food insecurity in Humla, Pant *et al.* (2014) propose *adaptive transition management* with a focus on participatory technology development, which is characterized by the integration of local and indigenous practices with expert knowledge systems. Therefore, technology, knowledge, skills and innovations in the farming system, combined with better arrangements for local resource use, are all emphasized as a means of rendering subsistence farms more resilient, sovereign, and productive (pp: 1173-79). Such transformations clearly have the potential to enhance resilience at farm-level and increase production output and diversity; however they will have no impact on the social relation of production, which is the driving force for the food insecurity of the most marginalized groups. In other words, resilience and transformation navigated within existing social relations does nothing more than proliferate the same configuration of relations. The contribution that our discussion therefore seeks to make on the system approach to vulnerability analysis aligns with the recently heralded social dimension of the subject (Bohle *et al.*, 2009; Tschakert *et al.*, 2013; Brown, 2014). This advocates promoting various social dimensions such as agency, power and social relations as inherent attributes of SESs, in order to address

the normative questions regarding whose vulnerabilities are to be addressed, how and at what cost to others (Cote and Nightingale, 2012).

Conclusion

This study examines the challenges underlying high food insecurity in Humla, a socially and geographically marginalized district of Nepal. The local farming systems have inherent technical and resource limitations and are therefore hardly capable of providing food and subsistence needs to the local population. In addition, they are confronting negative impacts of climatic as well as institutional changes and the food security has been further challenged. The adoption of off-farm income activities and utilization of food support from food assistance programs (FAPs) are the primary resources and strategies that substantially cushion the local farmers' food deprivation.

A contextual analysis, with a focus on local social, political and institutional structures and relations revealed the political nature of food insecurity. It found caste inequality as the fundamental driver of disparity in resource entitlement and food security. The disparity proliferates asymmetry in the capacity to benefit from external institutional interventions and socio-economic changes, and thereby also in the capacity to combat or alter the negative stresses of environmental changes. Therefore, a major conclusion of this study is that although challenges such as climate change make agricultural approaches imperative to transform the subsistence farms into more resilient and productive farms, local social and political marginalization should be considered and equity should be incorporated as one of the major goals in implementing targeted programs for effective and sustainable food security outcomes

Another important insight this study has provided relates to the poverty narrative dominant in Nepal. Recent poverty discourse in Nepal concentrate around the historical caste based political and economic discrimination of the ethnic groups and *Dalits*, and tends to universally portray high caste as the privileged, and the ethnic groups and *Dalits* as the deprived groups. Caste and ethnic dimension of poverty and food insecurity is clear in Humla too. However, the results show its dynamic nature

and shifting along caste/ethnic lines. The substantial economic mobility of the Buddhist *Lama* ethnic group shows this. Portrayed as one of the most marginalized in Nepal's economic and political discourses, *Lama* actually had the highest well-being in Humla. The economic condition of majority of the high caste *Chhetri* was not substantially different from that of *Dalits*, although the former enjoys some caste based social and political privilege. This finding does not downplay the need of considering the historical caste based social structure in analyzing current poverty, but also qualifies the dominant poverty narrative by highlighting the social and economic dynamics that has changed the historical caste-poverty equation in many instances.

References

- Aahuti. (2004). Hindu Samaajma Jalit Jatiya Mukti Prasna. In M. D. Chen & P. Onta (Eds.), *Nepalko Sandharbhamaa Samajastriya Chintan* (pp. 475-521). Kathmandu: Social Science Baha.
- Aahuti. (2015). *Nepalma barnabyawasthamaa aadharit pujibaad aai raheko chha*. Mulyankan (Nov 28): <http://emulyankan.com/2015/11/28/>.
- Aase, T. H., et al. (2010). Farming Flexibility and Food Security Under Climatic Uncertainty: Manang, Nepal Himalaya. *Area*, 42(2), 228-238.
- Adger, W. N. (2000). Social and Ecological Resilience: Are They Related? *Progress in Human Geography*, 24(3), 347-364.
- Adger, W. N. (2006). Vulnerability. *Global Environmental Change*, 16(3), 268-281.
- Adger, W. N., et al. (2009). Nested and teleconnected vulnerabilities to environmental change. *Frontiers in Ecology and the Environment*, 7(3), 150-157.
- Adger, W. N., et al. (2002). Migration, remittances, livelihood trajectories, and social resilience. *AMBIO: A Journal of the Human Environment*, 31(4), 358-366.
- Adhikari, J. (2001). Mobility and agrarian change in central Nepal. *Contributions to Nepalese Studies*, 28(2), 247-267.
- Adhikari, J. (2004). Khadyasurakshya Biswabyapikaranko Sandharbhama. In M. D. Chen & P. Onta (Eds.), *Nepalko Sandharbhamaa Samajastriya Chintan* (pp. 217-249). Kathmandu: Social Science Baha.
- Adhikari, J. (2006). *Land reform in Nepal: Problems and prospects*. Kathmandu: Action Aid.
- Adhikari, J. (2008). *Food Crisis in Karnali: A historical and Politico-economic Perspective*. Kathmandu: Martin Chautari.
- Adhikari, J., & Hobley, M. (2015). "Everyone is leaving. Who Will Sow Our Fields?" The Livelihood Effects on Women of Male Migration from Khotang and Udaypur Districts, Nepal, to the Gulf Countries and Malaysia. *HIMALAYA, the Journal of the Association for Nepal and Himalayan Studies*, 35(1), 7.
- AFD. (2014). *Family farming*. Paris: AFD (AGENCE FRANÇAISE DE DÉVELOPPEMENT). Available at: <http://www.afd.fr/webdav/site/afd/shared/PUBLICATIONS/THEMATIQUES/AFD-agriculture-familiale-VA.pdf>.

- Agar, M. H. (1996). *The Professional Stranger: An Informal Introduction to Ethnography*. New York: Academic Press.
- Aitken, S., & Valentine, G. (2006). Ways of Knowing and Ways of Doing Geographic Research. In S. Aitken & G. Valentine (Eds.), *Approaches to Human Geography* (pp. 1-12). London, Thousand Oaks, Delhi: Sage Publication.
- Akhtar, M., *et al.* (2008). The impact of climate change on the water resources of Hindukush–Karakorum–Himalaya region under different glacier coverage scenarios. *Journal of hydrology*, 355(1), 148-163.
- Anderies, J. M., *et al.* (2004). A Framework to Analyze the Robustness of Social-ecological Systems from an Institutional Perspective. *Ecology and society*, 9(1), 18.
- Babatunde, R. O. (2013). *On-farm and off-farm works: Complement or substitute? Evidence from rural nigeria*. Paper presented at the 4th international conference of the African Association of Agricultural Economists.
- Bajracharya, D. (1983). Fuel, food or forest? Dilemmas in a Nepali village. *World Development*, 11(12), 1057-1074.
- Barrett, C. (2010). Measuring food insecurity. *Science*, 327(5967), 825-828.
- Barrett, C., *et al.* (2001). Income diversification, poverty traps and policy shocks in Côte d'Ivoire and Kenya. *Food Policy*, 26(4), 367-384.
- Barrett, C., *et al.* (2001). Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. *Food policy*, 26(4), 315-331.
- Barrett, C. B., & Palm, C. (2016). Meeting the global food security challenge: Obstacles and opportunities ahead. *Global Food Security*.
- Basnet, M. (2016). Sadhain Asamabeshi. *Nepal*, Accessed from: <http://nepal.ekantipur.com/news/2016%AD12%AD05/20161205132502.html>.
- Bayissa, F. W. (2010). *Does off-farm income compete with farm income? Evidence from Malawi*. Ås: MSc thesis, Norwegian University of Life Sciences.
- Bedford, T., & Burgess, J. (2001). The focus-group experience. In M. Limb & C. Dwyer (Eds.), *Qualitative Methodologies for Geographers: Issues and Debates*. London: Edward Arnold.

- Belliveau, S., *et al.* (2006). Multiple exposures and dynamic vulnerability: evidence from the grape industry in the Okanagan Valley, Canada. *Global Environmental Change*, 16(4), 364-378.
- Béné, C., *et al.* (2016). Is resilience a useful concept in the context of food security and nutrition programmes? Some conceptual and practical considerations. *Food Security*, 8(1), 123-138.
- Bennett, L. (2005). *Gender, caste and ethnic exclusion in Nepal: following the policy process from analysis to action*. New Frontiers of Social Policy, Arusha. <http://siteresources.worldbank.org/INTRANETSOCIALDEVELOPMENT/Resources/Bennett.rev.pdf>.
- Bennett, L., *et al.* (2006). *Unequal citizens: Gender, caste and ethnic exclusion in Nepal*. Kathmandu: The World Bank and Department for International Development.
- Bhaskar, R. (1978). *A Realist Philosophy of Science*. Hassocks: The Harvester Press
- Bhutiyani, M., *et al.* (2010). Climate change and the precipitation variations in the northwestern Himalaya: 1866–2006. *International Journal of Climatology*, 30(4), 535-548.
- Bishokarma, M. (2012). *Assessing Dependency: Food security and the impacts of food aid on livelihoods in Mugu*. Kathmandu: Vajra Publication.
- Bishop, B. C. (1990). *Karnali under stress: livelihood strategies and seasonal rhythms in a changing Nepal Himalaya*. Chicago: University of Chicago Geography Research Papers.
- Bista, D. B. (1991). *Fatalism and Development: Nepal's Struggle for Modernization*. Calcutta: Orient Longman.
- Blaikie, P., *et al.* (1980). *Nepal Crisis: Growth and Stagnation at the Periphery*. Delhi: Oxford University Press.
- Bohle, H.-G., *et al.* (2009). Resilience as Agency. *IHDP Update*, 2(2009), 8-13.
- Bohle, H. G., *et al.* (1994). Climate Change and Social Vulnerability: Toward a Sociology and Geography of Food Insecurity. *Global Environmental Change*, 4(1), 37-48.
- Breen, L. J. (2007). The researcher 'in the middle': Negotiating the insider/outsider dichotomy. *The Australian Community Psychologist*, 19(1), 163-174.

- Brown, K. (2014). Global environmental change I: A social turn for resilience? *Progress in Human Geography*, 38(1), 107-117.
- Brown, K., & Westaway, E. (2011). Agency, capacity, and resilience to environmental change: lessons from human development, well-being, and disasters. *Annual Review of Environment and Resources*, 36, 321-342.
- Bryman, A. (2004). *Social Research Methods*. Oxford: Oxford University Press.
- Burchi, F., & De Muro, P. (2016). From food availability to nutritional capabilities: Advancing food security analysis. *Food Policy*, 60, 10-19.
- Cameron, J. (2010). Focusing on the Focus Group. In I. HAY (Ed.), *Qualitative Research Methods in Human Geography* (Third Edition ed.). Ontario: Oxford University Press.
- Caplan, A. P. (1972). *Priests and Cobblers: A study of social change in a Hindu village in western Nepal*. Kathmandu: Mandala Publication.
- Caplan, L. (1970). *Land and social change in east Nepal*. Berkeley: University of California Press.
- Cash, D., et al. (2006). Scale and cross-scale dynamics: governance and information in a multilevel world. *Ecology and society*, 11(2).
- CBS. (2011). *Nepal Living Standard Survey 2010/2011*. Kathmandu: National Planning Commission.
- CBS. (2012). *National Population and Housing Census 2011 (National Report)*. Kathmandu: National Planning Commission.
- CBS, et al. (2003). *Districts of Nepal: Indicators of Development*. Kathmandu: ICIMOD (International Center for Integrated Mountain Development).
- Chambers, R. (2006). Vulnerability, coping and policy (editorial introduction). *IDS bulletin*, 37(4), 33-40.
- Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: practical concepts for the 21st century*: Institute of Development Studies (UK).
- Chapin, F. S., et al. (2009). A framework for understanding change. In F. S. Chapin, G. P. Kofinas, C. Folke & M. C. Chapin (Eds.), *Principles of ecosystem stewardship: resilience-based natural resource management in a changing world* (pp. 3-28). New York: Springer Science & Business Media.

- Chhetri, N., *et al.* (2012). Institutional and technological innovation: Understanding agricultural adaptation to climate change in Nepal. *Applied Geography*, 33, 142-150.
- Childs, G., *et al.* (2014). Depopulating the Himalayan Highlands: education and outmigration from ethnically Tibetan communities of Nepal. *Mountain Research and Development*, 34(2), 85-94.
- Christians, C. G. (2005). Ethics and politics in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (Vol. III, pp. 139-164). Thousand Oaks, London, New Delhi: Sage Publications.
- Cote, M., & Nightingale, A. J. (2012). Resilience thinking meets social theory: situating social change in socio-ecological systems (SES) research. *Progress in Human Geography*, 36(4), 475-489.
- Crocker, D. A. (2007). Deliberative participation in local development. *Journal of Human Development*, 8(3), 431-455.
- Cupchik, G. (2001). Constructivist realism: an ontology that encompasses positivist and constructivist approaches to the social sciences. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 2(1).
- Currall, S. C., & Towler, A. J. (2003). Research methods in management and organizational research: Toward integration of qualitative and quantitative techniques. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of Mixed Methods in Social and Behavioural Research* (pp. 513-527). Thousand Oaks, London, New Delhi: Sage Publication.
- Dasgupta, P. (2009). Poverty Traps: Exploring the Complexity of Causation. In J. Von Braun, R. E. Hill & R. Pandya-Lorch (Eds.), *The poorest and hungry: Assessments, analyses, and actions* (pp. 129-145). Washington DC: Intl Food Policy Res Inst.
- DDC (2011). *District Profile of Humla*. Simikot: District Development Committee.
- De Waal, A. (2005). *Famine that Kills: Darfur, Sudan*. New York: Oxford University Press.
- Denzin, N. K., & Lincoln, Y. (Eds.). (2000). *Handbook of Qualitative Research* (Second ed.). Thousand Oaks: Sage Publication.
- Dev, O. P., *et al.* (2003). Impacts of community forestry on livelihoods in the middle hills of Nepal. *Journal of Forest and Livelihoods*, 3(1), 64-77.

- Devereux, S., & Berge, K. (2000). *Famine in the twentieth century* (Vol. 105): Brighton: Institute of Development Studies.
- Deveruex, S. (2006). *Identification of Methods and Tools for Emergency Assessments to Distinguish between Chronic and Transitory Food Insecurity and to Evaluate the Effects of Various Types and Combinations of Shocks on these Different Livelihood Groups*. Rome: World Food Program and Emergency Needs Assessment Branch (ODAN).
- DFID. (1999). *Sustainable livelihoods guidance sheets*. London: DFID. Available at: <http://www.eldis.org/vfile/upload/1/document/0901/section2.pdf>.
- Dowling, R. (2005). Power, Subjectivity and Ethics in Qualitative Research. In I. Hay (Ed.), *Qualitative Research methods in Human Geography* (Vol. Second, pp. 19-29). Melbourne: Oxford University Press.
- Dwyer, S. C., & Buckle, J. L. (2009). The space between: On being an insider-outsider in qualitative research. *International Journal of Qualitative Methods*, 8(1), 54-63.
- Eakin, H. (2010). What is vulnerable? In John Ingram, P. Ericksen & D. Liverman (Eds.), *Food Security and Global Environmental Change* (pp. 78-86). London, Washington DC: Earthscan.
- Eckholm, E. (1976). *Losing Ground: Environmental Stress and World Food Prospects*. New York: W.W Norton.
- Edwards, R., & Mauthner, M. (2012). Ethics and feminist research: theory and practice. In T. Miller, M. Birch, M. Mauthner & J. Jessop (Eds.), *Ethics in qualitative research* (Vol. II, pp. 14-28). Los Angeles, London, New Delhi, Singapore, Washington DC: Sage Publication.
- Ellis, F. (1998). Household strategies and rural livelihood diversification. *The Journal of Development Studies*, 35(1), 1-38.
- Ellis, F. (1999). *Rural livelihood diversity in developing countries: Evidence and policy implications*. London: Overseas Development Institute.
- Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, 51(2), 289-302.
- England, K. V. (1994). Getting personal: Reflexivity, positionality, and feminist research*. *The Professional Geographer*, 46(1), 80-89.
- Ericksen, P. J. (2008a). Conceptualizing food systems for global environmental change research. *Global Environmental Change*, 18(1), 234-245.

- Ericksen, P. J. (2008b). What is the vulnerability of a food system to global environmental change. *Ecology and Society*, 13(2), 14.
- Eriksen, S., *et al.* (2011). When not every response to climate change is a good one: Identifying principles for sustainable adaptation. *Climate and Development*, 3(1), 7-20.
- Evans, H. E., & Ngau, P. (1991). Rural-Urban Relations, Household Income Diversification and Agricultural Productivity. *Development and Change*, 22(3), 519-545.
- Ewing, M., & Msangi, S. (2009). Biofuels production in developing countries: assessing tradeoffs in welfare and food security. *Environmental Science & Policy*, 12(4), 520-528.
- Fabinyi, M., *et al.* (2014). Social-ecological systems, social diversity, and power: insights from anthropology and political ecology. *Ecology and Society* 19(4), [:http://dx.doi.org/10.5751/ES-07029-190428](http://dx.doi.org/10.5751/ES-07029-190428).
- Fafchamps, M., & Shilpi, F. (2003). The spatial division of labour in Nepal. *The Journal of Development Studies*, 39(6), 23-66.
- FAO. (1996). Rome Declaration on World Food Security and World Food Summit Plan of Action. <http://www.fao.org/docrep/003/w3613e/w3613e00.HTM>
- FAO. (2000). *The state of food and agriculture 2000*. Rome: FAO.
- FAO. (2010). *Climate-Smart agriculture: policies, practice and financing for food security, adaptation and migration*. Rome: FAO.
- FAO. (2016). FAOSTAT. Retrieved 07.12, 2016, from http://fenixservices.fao.org/faostat/static/syb/syb_5000.pdf
- FAO, *et al.* (2015). *The State of Food Insecurity in the World 2015. Meeting the 2015 international hunger targets: taking stock of uneven progress*. Rome: FAO.
- Farmer, P. (2005). *Pathologies of power: Health, human rights, and the new war on the poor* (Vol. 4). Berkeley: University of California Press.
- Folke, C., *et al.* (2005). Adaptive governance of social-ecological systems. *Annu. Rev. Environ. Resour.*, 30, 441-473.
- Fürer-Haimendorf, C. V. (1975). *Himalayan Traders: Life in Highland Nepal*. London: John Murray.

- Füssel, H.-M., & Klein, R. J. (2006). Climate change vulnerability assessments: an evolution of conceptual thinking. *Climatic Change*, 75(3), 301-329.
- Gaire, K., Beilin, R., & Miller, F. (2014). Withdrawing, resisting, maintaining and adapting: food security and vulnerability in Jumla, Nepal. *Regional Environmental Change*, 15(8), 1667-1678.
- Garnett, T., *et al.* (2013). Sustainable intensification in agriculture: premises and policies. *Science*, 341(6141), 33-34.
- Garikipati, S. (2008). The impact of lending to women on household vulnerability and women's empowerment: evidence from India. *World Development*, 36(12), 2620-2642.
- Gartaula, H., *et al.* (2012). Shifting perceptions of food security and land in the context of labour out-migration in rural Nepal. *Food Security*, 4(2), 181-194.
- Gatzweiler, F. W., *et al.* (2011). *Marginality: Addressing the Root Causes of Extreme Poverty*. Bonn: Center for Development Research, University of Bonn.
- Gautam, A. P., *et al.* (2002). GIS assessment of land use/land cover changes associated with community forestry implementation in the Middle Hills of Nepal. *Mountain Research and Development*, 22(1), 63-69.
- Gautam, Y. (2011). *Food security in the context of agricultural commercialization in Ilam, east Nepal*: Unpublished M.Phil Thesis. University of Bergen.
- Gautam, Y., & Andersen, P. (2016). Rural livelihood diversification and household well-being: Insights from Humla, Nepal. *Journal of Rural Studies*, 44, 239-249.
- Gibbons, M. (1999). Science's new social contract with society. *Nature*, 402, C81-C84.
- Gibbons, M. (2000). Mode 2 society and the emergence of context-sensitive science. *Science and Public Policy*, 27(3), 159-163.
- Gibbons, M., *et al.* (1994). *The new production of knowledge: The dynamics of science and research in contemporary societies*. London, Thousand Oaks, New Delhi: Sage.
- Gillis, V., & Alldred, P. (2012). The ethics of intension: research as a political tool. In T. Miller, M. Birch, M. Mauthner & J. Jessop (Eds.), *Ethics in qualitative research* (Vol. II, pp. 43-60). Los Angeles, London, New Delhi, Singapore, Washington DC: Sage Publication.

- Godfray, H. C. J., *et al.* (2010). The future of the global food system. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 365(1554), 2769-2777.
- Goldstein, M. C. (1976). Fraternal polyandry and fertility in a high Himalayan valley in northwest Nepal. *Human Ecology*, 4(3), 223-233.
- Goldstein, M. C. (1981). High-altitude tibetan populations in the remote Himalaya: social transformation and its demographic, economic, and ecological consequences. *Mountain Research and Development*, 5-18.
- Goldstein, M. C., & Messerschmidt, D. A. (1980). The significance of latitudinality in Himalayan mountain ecosystems. *Human Ecology*, 8(2), 117-134.
- Gomiero, T. (2016). Soil degradation, land scarcity and food security: Reviewing a complex challenge. *Sustainability*, 8(3), 281.
- GoN. (2011). *Adaptation to Climate Change: NAPA to LAPA*. Kathmandu: Ministry of Environment.
- GON, & UNDP. (2014). *Nepal Human Development Report 2014*. Kathmandu: National Planning Commission.
- Government of Nepal. (2011). *Sanitation and hygiene master plan*. Kathmandu: Steering committee for national sanitation action.
- Gregory, D. (2000). Realism. In R. J. Johnston, D. Gregory, G. Pratt & M. Watts (Eds.), *The Dictionary of Human Geography* (Vol. 4th, pp. 673-676). Malden, Oxford, Melbourne, Berlin: Blakwell Publishing.
- Gregory, P. J., *et al.* (2005). Climate change and food security. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 360(1463), 2139-2148.
- Griffin, J. (1986). *Well-being: Its Meaning, Measurement and Moral Importance*. Oxford: Clarendon Press.
- Griffith, A. I. (1998). Insider/outsider: Epistemological privilege and mothering work. *Human Studies*, 21(4), 361-376.
- Guba, E. G., & Lincoln, Y. S. (2005). Paradigmatic controversies, contradictions, and emerging confluences. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (Vol. III, pp. 191-215). Thousand Oaks, London, New Delhi: Sage Publications.

- Gurung, G. S., & Kollmair, M. (2005). *Marginality: Concepts and their limitations*. IP6 Working Paper no. 4: NCCR:North-South.
- Gurung, H. (2004). Rastriyata ra Janajaati. In M. D. Chen & P. Onta (Eds.), *Nepalko Sandharbhamaa Samajsastriya Chintan* (pp. 418-447). Kathmandu: Social Science Baha.
- Hachhethu, K. (2007). Nepali politics: People-parties interface. In D. Gellner (Ed.), *Resistance and the State: Nepalese Experiences* (pp. 133-176). New Delhi: Social Science Press.
- Hellawell, D. (2006). Inside–out: analysis of the insider–outsider concept as a heuristic device to develop reflexivity in students doing qualitative research. *Teaching in Higher Education*, 11(4), 483-494.
- HLPE. (2013). *Biofuels and food security. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security*. Rome. Available at: http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Report_s/HLPE-Report-5_Biofuels_and_food_security.pdf.
- Husmann, C. (2016). Marginality as a Root Cause of Poverty: Identifying Marginality Hotspots in Ethiopia. *World Development*, 78, 420-435.
- IFAD. (2010). *Rural poverty report 2011*. Rome: International Fund for Agricultural Development
- Immerzeel, W. W., et al. (2010). Climate change will affect the Asian water towers. *Science*, 328(5984), 1382-1385.
- Inderberg, T. H., et al. (2014). *Climate change adaptation and development: Transforming paradigms and practices*: Oxford, New York: Routledge.
- Ingram, J., et al. (Eds.). (2012). *Food security and global environmental change*. London and Washington DC: Earthscan.
- Iversen, V., et al. (2006). High value forests, hidden economies and elite capture: Evidence from forest user groups in Nepal's Terai. *Ecological Economics*, 58(1), 93-107.
- Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, 24(4), 602-611.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher*, 33(7), 14-26.

- Jones, L., & Boyd, E. (2011). Exploring social barriers to adaptation: Insights from Western Nepal. *Global Environmental Change*, 21(4), 1262-1274.
- Jones, R. L. (1976). Sanskritization in eastern Nepal. *Ethnology*, 15(1), 63-75.
- Kamberelis, G., & Dimitriadis, G. (2005). Focus groups: Strategic Articulation of pedagogy, politics and inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (Vol. III, pp. 887-907). Thousand Oaks, London, New Delhi: Sage Publications.
- Kanbur, R., & Venables, A. J. (2005). *Spatial inequality and development*. New York: Oxford University Press.
- Kates, R. W., et al. (2012). Transformational adaptation when incremental adaptations to climate change are insufficient. *Proceedings of the National Academy of Sciences*, 109(19), 7156-7161.
- Kearney, J. (2010). Food consumption trends and drivers. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1554), 2793-2807.
- Khanal, K., et al. (2012). *Dalit Representation in National Politics of Nepal*. Kathmandu: Nepal National Dalit Social Welfare Organisation (NNDSWO).
- Khanal, N. R., & Watanabe, T. (2006). Abandonment of agricultural land and its consequences. *Mountain Research and Development*, 26(1), 32-40.
- Kingdon, G. G., & Knight, J. (2006). Subjective well-being poverty vs. income poverty and capabilities poverty? *The Journal of Development Studies*, 42(7), 1199-1224.
- Kirk, J., & Miller, M. L. (1986). *Reliability and validity in qualitative research*. Newbury Park, London, New Delhi: Sage Publication.
- Kollmair, M., et al. (2006). New figures for old stories: Migration and remittances in Nepal. *Migration Letters*, 3(2), 151-160.
- Kosko, S. J. (2013). Agency vulnerability, participation, and the self-determination of indigenous peoples. *Journal of Global Ethics*, 9(3), 293-310.
- Krantz, L. (2001). *The Sustainable livelihood Approach to Poverty Reduction: an introduction*: SIDA: Division for Policy and Socio-Economic Analysis.
- Kruks-Wisner, G. (2011). Seeking the local state: gender, caste, and the pursuit of public services in post-tsunami India. *World Development*, 39(7), 1143-1154.

- Lama, C. B., & Rokaya, D. (2015). Karnalika Janajati ra Tinko Bastabikta In S. Ghimire & T. Bhattarai (Eds.), *Sambridha Karnaliko Dukha* (pp. 216-240). Kathmandu: Sangrila Books.
- Lang, T., & Heasman, M. (2015). *Food wars: The global battle for mouths, minds and markets*: Oxford: Routledge.
- Levine, N. E. (1987). Caste, state, and ethnic boundaries in Nepal. *The Journal of Asian Studies*, 46(01), 71-88.
- Linton, R. (1936). *The Study of Man: An Introduction*. New York: Appleton-Century Crofts, Inc.
- Lipper, L., et al. (2014). Climate-smart agriculture for food security. *Nature Climate Change*, 4(12), 1068-1072.
- Liu, J., et al. (2007). Complexity of coupled human and natural systems. *Science*, 317(5844), 1513-1516.
- Liu, J., & Savenije, H. (2008). Food consumption patterns and their effect on water requirement in China. *Hydrology and Earth System Sciences Discussions*, 12(3), 887-898.
- Lobell, D. B., et al. (2008). Prioritizing climate change adaptation needs for food security in 2030. *Science*, 319(5863), 607-610.
- Maharjan, A., et al. (2013). International migration, remittances and subsistence farming: Evidence from Nepal. *International Migration*, 51(s1), e249-e263.
- Mansvelt, J., & Berg, L. D. (2005). Writing qualitative geographies, constructing geographical knowledge. In I. Hay (Ed.), *Qualitative Research methods in Human Geography* (Vol. Second, pp. 248-265). Melbourne: Oxford University Press.
- Marian, D. (2016). The correspondence theory of truth. *The Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/entries/truth-correspondence/>.
- Marino, E., & Ribot, J. (2012). Special issue introduction: adding insult to injury: climate change and the inequities of climate intervention. *Global Environmental Change*, 22(2), 323-328.
- Maru, Y. T., et al. (2014). A linked vulnerability and resilience framework for adaptation pathways in remote disadvantaged communities. *Global Environmental Change*, 28, 337-350.

- Maxwell, S. (1996). Food security: a post-modern perspective. *Food Policy*, 21(2), 155-170.
- Maxwell, S., & Slater, R. (2003). Food policy old and new. *Development Policy Review*, 21(5-6), 531-553.
- McCarthy, J. J., et al. (Eds.). (2001). *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Cambridge: Cambridge University Press.
- McCubbin, S., et al. (2015). Where does climate fit? Vulnerability to climate change in the context of multiple stressors in Funafuti, Tuvalu. *Global Environmental Change*, 30, 43-55.
- McGillivray, M., & Clarke, M. (2006). Human well-being: Concepts and measures. In M. McGillivray & M. Clarke (Eds.), *Understanding Human Well-Being* (pp. 3-16). Tokyo: United Nations University Press.
- McKay, K. H., et al. (2007). Responses to innovation in an insecure environment in rural Nepal. *Mountain Research and Development*, 27(4), 302-307.
- Merriam, S. (1995). What Can You Tell From An N of 1?: Issues of validity and reliability in qualitative research. *PAACE Journal of lifelong learning*, 4, 50-60.
- Merriam, S. B., et al. (2001). Power and positionality: Negotiating insider/outsider status within and across cultures. *International Journal of Lifelong Education*, 20(5), 405-416.
- Merton, R. K. (1972). Insiders and outsiders: A chapter in the sociology of knowledge. *American Journal of Sociology*, 9-47.
- Miller, D. D., & Welch, R. M. (2013). Food system strategies for preventing micronutrient malnutrition. *Food Policy*, 42, 115-128.
- Miller, F., et al. (2010). Resilience and vulnerability: complementary or conflicting concepts? *Ecology and Society*, 15(3), 1-25.
- Miller, T., et al. (2012). *Ethics in qualitative research*: London, Thousand Oaks, New Delhi, Singapore: Sage.
- Misselhorn, A. A. (2005). What drives food insecurity in southern Africa? A meta-analysis of household economy studies. *Global environmental change*, 15(1), 33-43.
- Moseley, W. G., et al. (2010). Neoliberal policy, rural livelihoods, and urban food security in West Africa: A comparative study of The Gambia, Côte d'Ivoire, and Mali. *Proceedings of the National Academy of Sciences*, 107(13), 5774-5779.

- Mosse, D. (2001). People's knowledge', participation and patronage: Operations and representations in rural development. In B. Cook & U. Kothari (Eds.), *Participation: The new tyranny* (pp. 16-35). New York: Zed Books.
- Mosse, D. (2010). A relational approach to durable poverty, inequality and power. *The Journal of Development Studies*, 46(7), 1156-1178.
- Mruck, K., & Breuer, F. (2003). Subjectivity and reflexivity in qualitative research—The FQS issues. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 4(2), Retrieved from: <http://www.qualitative-research.net/index.php/fqs/article/viewArticle/696>.
- Mulepati, A. (2012). *Participation of Marginalized Groups in REDD+ Pilot Project, Dolakha District, Nepal*. University of Oslo, Oslo.
- Mullings, B. (1999). Insider or outsider, both or neither: some dilemmas of interviewing in a cross-cultural setting. *Geoforum*, 30(4), 337-350.
- Nagoda, S. (2015a). New discourses but same old development approaches? Climate change adaptation policies, chronic food insecurity and development interventions in northwestern Nepal. *Global Environmental Change*, 35, 570-579.
- Nagoda, S. (2015b). *Reproducing Vulnerability Through Climate Change Adaptation? Policy Processes, Local Power Relations and Food Insecurity in North-Western Nepal*. Norwegian University of Life Sciences, Ås.
- Nagoda, S., & Eriksen, S. (2014). The role of local power relations in household vulnerability to Climate Change in Humla, Nepal. In T. H. Inderberg, S. Eriksen, K. O'Brien & L. Sygna (Eds.), *Climate Change Adaptation and Development: Transforming Paradigms and Practices* (pp. 200-218). New York: Routledge.
- Naples, N. A. (1996). A feminist revisiting of the insider/outsider debate: The "outsider phenomenon" in rural Iowa. *Qualitative Sociology*, 19(1), 83-106.
- Neupane, G. (2004). Sahabhagitamulak Samajik Bikas. In M. D. Chen & P. Onta (Eds.), *Nepalko Sandharbhamaa Samajastriya Chintan* (pp. 364-391). Kathmandu: Social Science Baha.
- Nightingale, A. (2003). Nature–society and development: social, cultural and ecological change in Nepal. *Geoforum*, 34(4), 525-540.
- Nightingale, A. J. (2002). Participating or just sitting in? The dynamics of gender and caste in community forestry. *Journal of Forest and Livelihood* vol, 2, 1.

- Nightingale, A. J. (2011). Bounding difference: Intersectionality and the material production of gender, caste, class and environment in Nepal. *Geoforum*, 42(2), 153-162.
- NPC. (2010). *Food Security Atlas of Nepal*. Kathmandu: Nepal Planning Commission, World Food Program and Nepal Development Research Institute.
- NPC. (2013). *Nepal Thematic Report on Food Security and Nutrition* Kathmandu: National Planning Commission
- NPC. (2016). Periodic Plans. Retrieved 19 December, 2016, from http://www.npc.gov.np/en/category/periodic_plans
- O'Brien, K., et al. (2007). Why different interpretations of vulnerability matter in climate change discourses. *Climate Policy*, 7(1), 73-88.
- O'Brien, K. L., & Leichenko, R. M. (2000). Double exposure: assessing the impacts of climate change within the context of economic globalization. *Global Environmental Change*, 10(3), 221-232.
- O'Brien, K. L., & Wolf, J. (2010). A values-based approach to vulnerability and adaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 1(2), 232-242.
- O'Brien, K., et al. (2004). Mapping vulnerability to multiple stressors: climate change and globalization in India. *Global Environmental Change*, 14(4), 303-313.
- Olsen, W. (2004). Triangulation in social research: qualitative and quantitative methods can really be mixed. *Developments in Sociology*, 20, 103-118.
- Olsson, P., et al. (2004). Adaptive comanagement for building resilience in social-ecological systems. *Environmental management*, 34(1), 75-90.
- Onta, N., & Resurreccion, B. P. (2011). The role of gender and caste in climate adaptation strategies in Nepal: emerging change and persistent inequalities in the far-western region. *Mountain Research and Development*, 31(4), 351-356.
- Ostrom, E. (2005). *Understanding institutional diversity*. Princeton: Princeton University Press, 17(34), 8.
- Paloviita, A., et al. (2016). Vulnerability matrix of the food system: Operationalizing vulnerability and addressing food security. *Journal of Cleaner Production*, 135, 1242-1255.

- Pandey, R., & Bardsley, D. K. (2015). Social-ecological vulnerability to climate change in the Nepali Himalaya. *Applied Geography*, 64, 74-86.
- Pandey, R. N. (1970). The Ancient and Medieval History of Western Nepal. *Ancient Nepal*, 11, 45-60.
- Pant, L. P., et al. (2014). Adaptive Transition Management for Transformations to Agricultural Sustainability in the Karnali Mountains of Nepal. *Agroecology and Sustainable Food Systems*, 38(10), 1156-1183.
- Paudel, K. P., et al. (2014). Transforming Land and Livelihoods: Analysis of Agricultural Land Abandonment in the Mid Hills of Nepal. *Journal of Forest and Livelihoods*, 12(1), 11-19.
- Peet, R. (1998). *Modern Geographic Thought*. Oxford and Malden: Blackwell Publisher.
- Pinstrup-Andersen, P. (2009). Food security: definition and measurement. *Food security*, 1(1), 5-7.
- Pokharel, B. K., et al. (2007). Community forestry: Conserving forests, sustaining livelihoods and strengthening democracy. *Journal of Forest and Livelihood*, 6(2), 8-19.
- Popkin, B. M. (2004). The nutrition transition: an overview of world patterns of change. *Nutrition Reviews*, 62(suppl 2), S140-S143.
- Pyakuryal, B., et al. (2010). Trade liberalization and food security in Nepal. *Food Policy*, 35(1), 20-31.
- Ramtel, R. (2015). Karnalimaa Dalitko Awasthaa. In S. Ghimire & T. Bhattarai (Eds.), *Sambridha Karnaliko Dukha* (pp. 175-215). Kathmandu: Sangrila Books.
- Rasul, G. (2014). Food, water, and energy security in South Asia: A nexus perspective from the Hindu Kush Himalayan region. *Environmental Science & Policy*, 39, 35-48.
- Ray, D. K., et al. (2015). Climate variation explains a third of global crop yield variability. *Nature Communications*, 6.
- Reardon, T., et al. (2007). Household income diversification into rural nonfarm activities. In S. Haggblade, P. Hazell & T. Reardon (Eds.), *Transforming the rural nonfarm economy: Opportunities and threats in the developing world* (pp. 115-140). Baltimore: John Hopkins University Press.

- Regmi, M. C. (1975). Preliminary Notes on the Nature of Rana Law and Government. *Contributions to Nepalese Studies*, 2(2), 103-115.
- Regmi, M. C. (1976). *Land Ownership in Nepal*. Berkeley , Los Angeles, London: University of California Press.
- Reid, P., & Vogel, C. (2006). Living and responding to multiple stressors in South Africa—Glimpses from KwaZulu-Natal. *Global Environmental Change*, 16(2), 195-206.
- Reilly, J. (1996). Climate change, global agriculture and regional vulnerability. In F. A. Bazzaz & W. G. Sombroek (Eds.), *Global climate change and agricultural production: direct and indirect effects of changing hydrological, pedological, and plant physiological processes*. Chichester New York Brisbane Toronto Singapore: FAO and, John Wiley and Sons.
- Reiss, J., & Sprenger, J. (2016). Scientific Objectivity. *The Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/entries/scientific-objectivity/#TheLadInc>.
- Ribot, J. (2009). Vulnerability does not just fall from the sky: Toward multiscale, pro-poor climate policy. In R. Measrns & A. Norton (Eds.), *Social dimensions of climate change: Equity and vulnerability in a warming world* (pp. 47-74). Washington DC: The World Bank.
- Ribot, J. (2014). Cause and response: vulnerability and climate in the Anthropocene. *Journal of Peasant Studies*, 41(5), 667-705.
- Roka, H. (2004). Udarbaad, Udarikaran tatha Sanrachanagat Samayojan Karyakram. In M. D. Chen & P. Onta (Eds.), *Nepalko Sandharbhamaa Samajsastrिया Chintan* (pp. 155-176). Kathmandu: Social Science Baha.
- Ross, J. L. (1981). *Hindu and Tibetan reproduction and fertility in northwestern Nepal: a study of population ecology and economics*. Ph. D. Dissertation. Department of Anthropology. Case Western Reserve University.
- Roy, R. (2010). Contribution of NTFPs [Non-Timber Forest Products] to livelihood in Upper Humla, Nepal. *PhD Dissertation*, Asian Institute of Technology.
- Sanders, C., & McKay, K. (2014). Where Have All the Young Men Gone?: Social Fragmentation during Rapid Neoliberal Development in Nepal's Himalayas. *Human Organization*, 73(1), 25-37.
- Saxer, M. (2013). Between China and Nepal: Trans-Himalayan Trade and the Second Life of Development in Upper Humla. *Cross-Currents: East Asian History and Culture Review*, 2(2), 424-446.

- Sayer, A. (2006). Realism as the Basis for Knowing the World. In S. Aitken & G. Valentine (Eds.), *Approaches to Human Geography* (pp. 98-106). Los Angeles, London, New Delhi, Singapore, Washington DC: Sage Publication.
- Schmidhuber, J., & Tubiello, F. N. (2007). Global food security under climate change. *Proceedings of the National Academy of Sciences*, 104(50), 19703-19708.
- Scott, J. C. (1998). *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*: New Heaven, London: Yale University Press.
- Sen, A. (1981a). Ingredients of famine analysis: Availability and entitlements. *The Quarterly Journal of Economics*, 433-464.
- Sen, A. (1981b). *Poverty and famines: An essay on entitlement and deprivation*. New York: Oxford University Press.
- Sharma, P. R. (1977). *Caste, Social Mobility and Sanskritization: A Study of Nepal's Old Legal Code*. Available at: <https://www.repository.cam.ac.uk/handle/1810/227126>.
- Shrestha, N. R., et al. (1999). Population pressure and land resources in Nepal: A revisit, twenty years later. *The Journal of Developing Areas*, 33(2), 245-268.
- Shrestha, N. R., et al. (1993). Frontier migration and upward mobility: The case of Nepal. *Economic Development and Cultural Change*, 41(4), 787-816.
- Srinivas, M. N. (1956). A note on Sanskritization and Westernization. *The Journal of Asian Studies*, 15(04), 481-496.
- Steffen, W., et al. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), 1259855.
- Stojanovic, T., et al. (2016). The “social” aspect of social-ecological systems: a critique of analytical frameworks and findings from a multisite study of coastal sustainability. *Ecology and Society*. 21 (3):15
- Strzepek, K., & Boehlert, B. (2010). Competition for water for the food system. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 365(1554), 2927-2940.
- Subedi, J. (2015). Karnaliko simantikaran: Itihasik Pprakriyabata niyalda. In S. Ghimire & T. Bhattarai (Eds.), *Sambridha Karnaliko Dukha* (pp. 11-34). Kathmandu: Sangrila Books.

- Sunam, R. (2014). Marginalised Dalits in International Labour Migration: Reconfiguring Economic and Social Relations in Nepal. *Journal of Ethnic and Migration Studies*, 40(12), 2030-2048.
- Sunam, R. (2015). In Search of Pathways out of Poverty: Mapping the Role of International Labour Migration, Agriculture and Rural Labour. *Journal of Agrarian Change*, 17(1).
- Sunam, R., & Adhikari, J. (2016). *How does Transnational Labour Migration Shape Food Security and Food Sovereignty? Evidence from Nepal*. Paper presented at the Anthropological Forum.
- Tanner, T., et al. (2015). Livelihood resilience in the face of climate change. *Nature Climate Change*, 5(1), 23-26.
- Tashakkori, A., & Charles, T. (1998). *Mixed methodology: Combining qualitative and quantitative approaches*: Thousand Oaks, London, New Delhi: Sage.
- Thapa, G. S. (2009). *How Gender Affects Decision Making - A Case Study of Tibeto-Burmese Women in Kobang VDC, Mustang, Nepal*: Unpublished M.Phil Thesis. University of Bergen.
- Tschakert, P. (2007). Views from the vulnerable: Understanding climatic and other stressors in the Sahel. *Global Environmental Change*, 17(3), 381-396.
- Tschakert, P., et al. (2013). Inequality and transformation analyses: a complementary lens for addressing vulnerability to climate change. *Climate and Development*, 5(4), 340-350.
- Turner, B. L., et al. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences*, 100(14), 8074-8079.
- Twine, F. W., & Warren, J. W. (2000). *Racing Research, Researching Race: Methodological Dilemmas in Critical Race Studies*: NYU Press.
- USAID. (2016). *Nepal (USAID database)*. Available at: <https://idea.usaid.gov/cd/nepal/hunger-and-food-security>.
- van Vliet, J. A., et al. (2015). De-mystifying family farming: features, diversity and trends across the globe. *Global Food Security*, 5, 11-18.
- Von Braun, J., & Gatzweiler, F. W. (Eds.). (2014). *Marginality: Addressing the nexus of poverty, exclusion and ecology*. Dordrecht/Heidelberg/New York/London: Springer

- Walker, B., *et al.* (2004). Resilience, adaptability and transformability in social-ecological systems. *Ecology and society*, 9(2), 5.
- Walker, K. L. M. (2008). Neoliberalism on the ground in rural India: predatory growth, agrarian crisis, internal colonization, and the intensification of class struggle. *The Journal of Peasant Studies*, 35(4), 557-620.
- Watts, M. J. (2013). *Silent violence: Food, famine, and peasantry in northern Nigeria* (Vol. 15): Athens and London: University of Georgia Press.
- Watts, M. J., & Bohle, H. G. (1993). The space of vulnerability: the causal structure of hunger and famine. *Progress in Human Geography*, 17(1), 43-67.
- WFP. (2013). *The World Food Programme's Achievements in 2013*. Rome: WFP <<http://www.wfp.org/content/wfp-achievements-2013>>.
- Webb, P., *et al.* (2006). Measuring household food insecurity: why it's so important and yet so difficult to do. *The Journal of Nutrition*, 136(5), 1404S-1408S.
- Winchester, H. P. M. (2005). Qualitative research and its place in human geography. In I. Hay (Ed.), *Qualitative Research methods in Human Geography* (Vol. Second, pp. 3-18). Melbourne: Oxford University Press.
- Wisner, B., *et al.* (2004). *At Risk: Natural Hazards, People's Vulnerability and Disasters* (Second ed.). London and New York: Routledge.
- Wollenberg, E., *et al.* (2007). Fourteen years of monitoring community-managed forests: learning from IFRI's experience. *International Forestry Review*, 9(2), 670-684.
- World Bank. (2011a). Nepal poverty map for all districts. Retrieved 30, August, 2015, from <http://data.worldbank.org/indicator/AG.LND.ARBL.HA.PC/countries?display=default>
- World Bank. (2011b). Nepal poverty map for all districts. Retrieved 30 Aug 2015 from: http://dataviz.worldbank.org/t/SASEP/views/NepalTargetLevelFinal/NepalPovertyMap2011?:embed=y&:display_count=no
- World Bank. (2015). Arable Land (hectrae per person). Retrieved 31, March, 2015, from <http://data.worldbank.org/indicator/AG.LND.ARBL.HA.PC/countries?display=default>

- World Bank. (2016). *Agriculture, value added (% of GDP)*. Available at: <http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=NP>.
- Yates, J. S. (2012). Uneven interventions and the scalar politics of governing livelihood adaptation in rural Nepal. *Global Environmental Change*, 22(2), 537-546.
- Young, E. (2004). Globalization and food security: novel questions in a novel context? *Progress in Development Studies*, 4(1), 1-21.
- Young, J. O. (2015). The coherence theory of truth. *The Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/entries/truth-coherence/>.
- Yu, W., *et al.* (2015). Food security policies in India and China: implications for national and global food security. *Food Security*, 7(2), 405-414.
- Zurick, D. N. (1989). Historical links between settlement, ecology, and politics in the mountains of west Nepal. *Human Ecology*, 17(2), 229-255.

Appendix 1

Poverty, food insecurity and Human Development Index (HDI) by caste/ethnicity, 2010/11

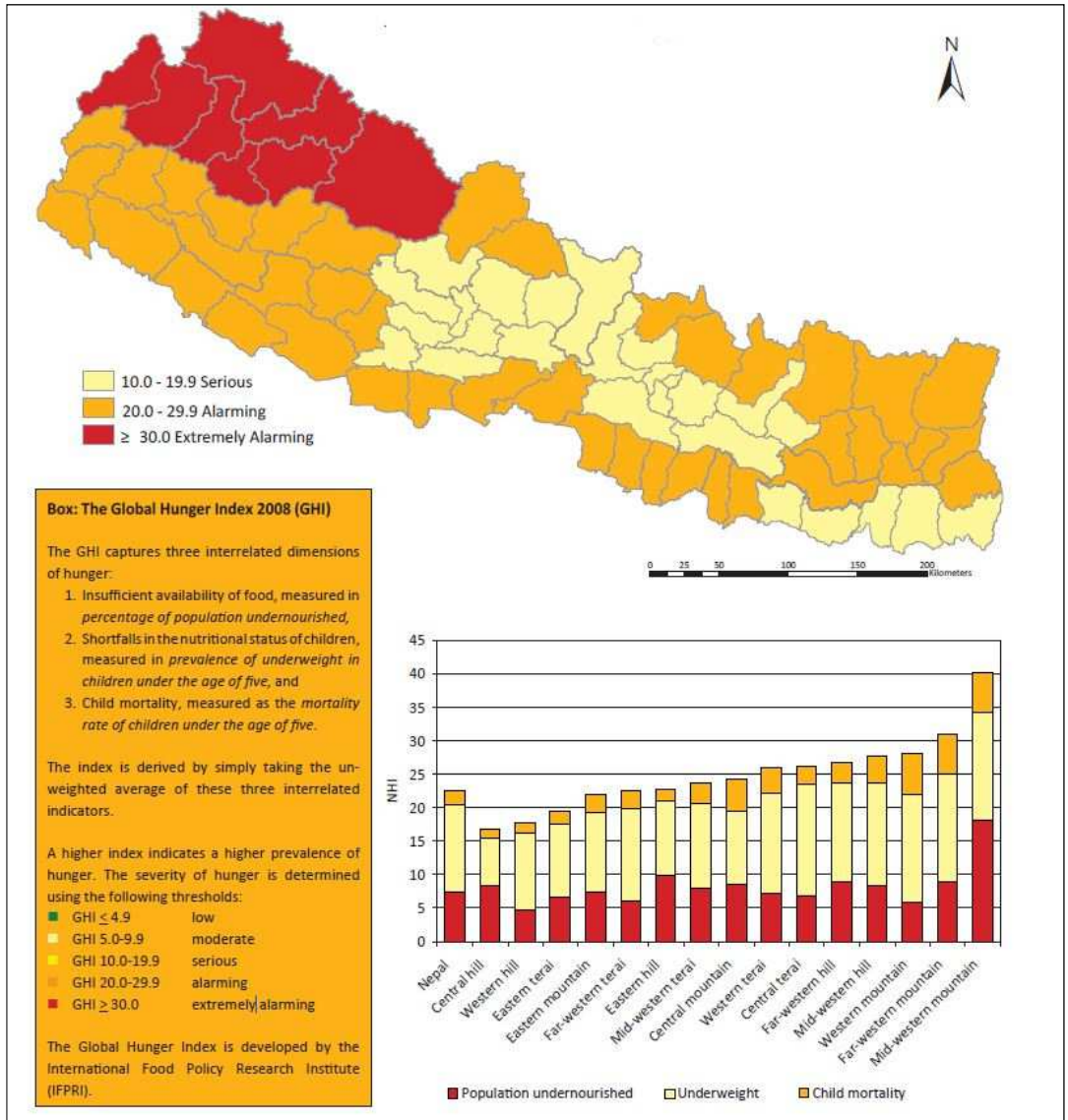
| Caste/Ethnicity | Food insecurity* | Poverty | HDI |
|--------------------|------------------|------------|--------------|
| Brahman | 5% | 11% | 0.557 |
| Chhetri | 14% | 23% | 0.507 |
| Tarai Middle caste | 14% | 29% | 0.460 |
| Dalit | 35% | 42% | 0.434 |
| Newar | 14% | 10% | 0.565 |
| Hill ethnic group | 30% | 28% | 0.482 |
| Tarai ethnic group | 30% | 26% | 0.473 |
| Nepal | 20% | 25% | 0.541 |

*Refers to the frequency of consumption of various food groups. Since it does not take into account the serving size it may not correspond with calorie based calculations.

Source: NPC (2013:29), GON and UNDP (2014).

Appendix 2

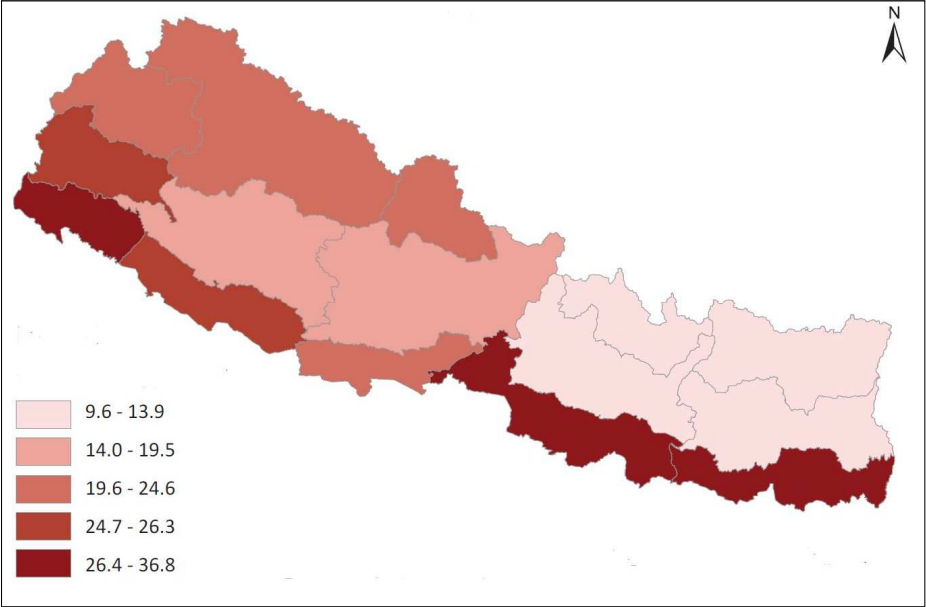
Sub regional hunger index, Nepal



Most of the districts with extremely alarming hunger situation fall into Karnali region. Source: NPC (2010:2)

Appendix 3

Low Body Mass Index (BMI<18) among women



Source: NPC (2010:21). The low land (the east west southern block) contains the most fertile land that produces large food surplus.

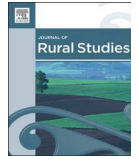
Appendix 4

Livelihood stresses: prevalence and responses (n=313)

| Domain | Stresses (reported frequency) | Description, prevalence and coping strategies |
|---|-------------------------------|--|
| Socio-economic and Institutional | Food scarcity (81%) | - Only 10% of households produce adequate food. -Most severe among the low caste <i>Dalits</i> . - FAPs meet approximately half of the deficit. |
| | Labor Shortage (68%) | -Seasonal wage migration, obtaining credit, borrowing food and eating less are common coping strategies. -Primarily induced by increased schooling in the previous two decades. -Sharecropping has relaxed labor problems; however, land abandonment has increased recently. |
| | Land Shortage (45%) | -Most common among <i>Dalit</i> households. -Sharecropping with <i>Lama</i> households has facilitated land entitlement distribution. Some households have extended cultivation to fertile forest lands. |
| | Drinking water shortage (40%) | -44% of households rely on natural sources of water. -Water availability is critical during the dry spring season, which leads to increased labor demand. |
| | Lack of employment (31%) | -Women and children take the sole labor burden. -High seasonality in farming makes winter a lean season for labor. Male members from many households seasonally migrate to the Tarai, Kathmandu or India. |
| | Lack of credit (26%) | -Only 8% of households have obtained credit from banks and co-operatives. Sale of livestock, remittance from seasonal migration and NTFP collection are strategies to meet cash needs. |
| | Poor housing conditions (25%) | -Elementary facilities, such as latrines, drinking water, and improved stoves, are widely lacking. Some NGOs have been targeting latrines and stoves with apparent positive results. |
| | Lack of seed (21%) | -Traditional seed breeding is widely practiced. Some NGOs promote projects on seed breeding. |
| | Poor health services (14%) | -Because moving to the cities for treatment is expensive, many individuals are confined to basic health services available only at the headquarters. -Sale of livestock and obtaining loans with high interest rates are the main strategies to meet the treatment expenses, which often exacerbate the household's economic deprivation. |
| | Accidents of livestock (12%) | -Cattle are transported daily to the forest and pastures from the stables. Steep topography and narrow trails lead to a high rate of cattle accidents. |
| Climatic and Environmental | Increasing drought (63%) | -Most severe in high altitude sloping lands. Irrigation development constrained by topographic, technical and logistical limitations. -Land abandonment is increasing. - Seasonal wage migrants prolong their wage labor in India. |
| | Extreme weather events (55%) | -Bear the damaging effects. |
| | Soil degradation (45%) | - Abandonment of the severely degraded land patches (12%). Extension of cultivation into fertile forest areas is also taking place that has compensated 20% of land abandonment. |
| | Crop disease (15%) | -Despite increasing NGO interventions, access to agricultural services is limited, e.g., extension coverage is only 19%. |

Paper I

Rural Livelihood Diversification and Household Well-being: Insights from Humla, Nepal



Rural livelihood diversification and household well-being: Insights from Humla, Nepal



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ABSTRACT

Diversification of livelihoods is a commonly applied strategy for coping with economic and environmental shocks and instrumental in poverty reduction. In this paper, we have assessed the role of livelihood diversification in household well-being in Humla, a remote mountain district in west Nepal. Employing the data produced from household surveys, we developed a composite household well-being index incorporating four components and 15 indicators, and measured the effect of diversification on it. Results suggested a uniform pattern of diversification in terms of the number of activities undertaken for livelihoods but a highly varying degree of resultant well-being across households. Analysis showed that well-being was not associated with diversification *per se* but rather on a households' involvement in 'high return sectors' such as trade or salaried job. Because involvement in these remunerative sectors is determined by various financial, social and human capitals, poor households were unable to combat the entry barrier and were prevented from getting access to them. In this way, livelihood diversification was found to have a highly skewed effect leading to inequality of income and well-being. This, in turn, is likely to risk depriving the poor households from exploiting new economic opportunities even in the future.

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1. Introduction

Subsistence producers and small farm wage laborers in the rural areas of low-income countries constitute over two thirds of the global poor and food insecure populations (IFAD, 2010; FAO et al., 2014). In addition to various idiosyncratic risks, the subsistence farmers confront various structural and transitory environmental and institutional stresses and shocks that frequently make them vulnerable to falling below subsistence thresholds (Eakin, 2005; Morton, 2007; Tschakert, 2007; Harvey et al., 2014). Arguably, the most significant gains in global poverty reduction can be achieved by interventions targeted at rural livelihoods to address these vulnerabilities. The understanding of local livelihood context, the sources and nature of risks and the coping behavior of the communities and their efficiencies is important for the success of anti-poverty policies because vulnerability is highly contextual to political, social, economic and historical realities of specific places (Turner et al., 2003; Wilbanks, 2003; O'Brien et al., 2009). In this

paper, we assess the role of livelihood diversification on the well-being of subsistence farmers in Nepal.

Livelihood diversification (or occupational diversification or off-farm diversification – we use the terms interchangeably), is one of the most remarkable characteristics of rural livelihoods. It is defined as “the process by which rural families construct a diverse portfolio of activities and social support capabilities in order to survive and to improve their standards of living” (Ellis, 1998 p.4). More than 50% of income in rural farming communities in developing countries comes from non-farm sources (IFAD, 2010). The context of various risks implies that diversification is primarily a risk management strategy; both risk mitigation in anticipation of shock and coping after actual shock. Viewed thus, it is a general compromise made against high output high risk to favor low output low risk (Ellis, 2000). However, there are contexts where diversification can have ‘economy of scope’ effect when the rural households invest resources across multiple scopes and reap higher per-unit returns (Barrett et al., 2001a).

Empirical studies consistently show that diversification to non-farm livelihood strategies rather than relying only on subsistence farming enables households to have better incomes, enhance food security, increase agricultural production by smoothing capital

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constraints and also to better cope with environmental stresses (Barrett et al., 2001a; Liu et al., 2008; Babatunde and Qaim, 2010; Bezu et al., 2012; Hoang et al., 2014). In addition, there is substantial evidence for the role of diversification in building household capacities to stabilize income and food consumption over time (Reardon et al., 1992; Block and Webb, 2001). Diversification tendencies are not unique to developing countries. Farmers even in the developed countries diversify not only for risk mitigation but also for enhancing better financial returns (Barbieri and Mahoney, 2009). This has led poverty reduction policies to emphasize the creation of opportunities for enabling the rural households for diversification.

However, once scrutinized in the context of basic asset entitlements of the diversifiers and the causal origin of diversification, the generally touted pro-poor aspect of diversification becomes puzzling. Ellis (2000) classifies the factors of diversification decision into two broad categories: necessity vs choice. Diversification by choice is related to voluntary decision of a household to diversify. In this case, a household chooses to diversify not for survival *per se* but also for accumulation. This is a proactive decision and leads to upward well-being mobility. The necessity driven diversification, on the other hand, is the result of desperation, the last resort of vulnerable households for survival. In this case, diversification may lead the household to end up in a more vulnerable livelihood system than the one adopted previously (Davies, 1996 cited in Ellis, 2000).

Different off-farm sectors demand different level of investment and offer differential returns. The high return sectors offer higher returns to livelihoods but demand higher resource investment capacities in terms of human, social or financial capital to start up. Therefore, the poor households are less likely to get involved in high return sectors. So diversification may not substantially help them move out of poverty. In Uganda, Smith et al. (2001) found off-farm diversification tendency highest in middle income households, whereas the low and high income households diversified the least. The high income households, however, diversified into more lucrative sectors, whereas the low income households were confined to low return sectors such as wage labor. This pattern least benefitted the poor and increased income inequality. A similar context of entry barriers for poor households and the dominance of the most lucrative non-farm activities by the relatively wealthy households was evident in Ethiopia (Woldenhanna and Oskam, 2001). Despite limited benefits for poor households from overall growth in non-farm earnings, a sharp rise in local income inequality was evident in Ghana and Uganda due to differential capacities of households to diversify (Canagarajah et al., 2001). In addition, Dzanku (2015) finds that the welfare impact of off-farm diversification is low in Ghana because off-farm diversification in rural areas is transitory because there is a wide variation between livelihood activities and professional vocation development. Some studies also highlight the importance of social capital as instrumental for accessing and securing non-farm activities, implying that poorer households lacking networks and other forms of social capital are least able to diversify into non-farm sectors that could otherwise aid their income and well-being (Zhang and Li, 2003; Guang and Zheng, 2005).

These cases indicate that off-farm sectors have not only fostered hope but also pose inherent challenges in terms of their potential for poverty reduction. In this context, if the non-farm sectors are to be utilized as an effective economic niche for poverty reduction, anti-poverty policies should be backed-up by proper understanding of their characteristics, the patterns of people's access to them and their roles in household economies. Against this backdrop, this paper attempts to scrutinize rural livelihood diversification in terms of its role in household well-being in Nepal.

2. Livelihood transition in Nepal

Nepal has an agrarian economy with over 80% of the population in rural areas, the majority adopting subsistence agriculture as the mainstay of their livelihoods (CBS, 2012). Subsistence farming is characterized by a mixed crop-livestock production system with rudimentary technology in small landholdings under continuous fragmentation. Arable land per capita decreased by more than 50% from 0.19 ha in 1960 to 0.09 ha in 2010 making it among the lowest in the world (World Bank, 2015). The share of agriculture in GDP has been decreasing gradually over the years. The share of non-farm income to total income was around 54% in 2010 (CBS, 2011). Recent studies indicate that livelihoods are undergoing rapid social-economic and environmental changes (Barnett et al., 2005; Chaudhary et al., 2007; Xu et al., 2009). Moreover, a gradual recession of farming activities is also being evident (Khanal and Watanabe, 2006; Aase et al., 2010; Bhandari, 2013; Paudel et al., 2014) signifying a transition where an increasing proportion of the population is shifting out of agriculture or undertaking various off-farm income opportunities in tandem.

Livelihood diversification, illustrated by shifting activities away from customary farming to other sectors offers flexibility and well-being to livelihoods by widening the subsistence options. Recent trends in poverty prevalence consistently illustrate the promise of this transition. A nationally representative survey shows a decrease in poverty prevalence from 42% to 25% between 1995–96 and 2009–10 (CBS, 1996, 2011). However, there are wide regional and caste/ethnic disparities in this trend. In the mid-west and far-west regions of the country poverty prevalence is still over 35%. By caste/ethnicity, the Brahman and Newar have the lowest poverty prevalence of 10%, whereas the figures reach up to 44% for low caste Dalits. For the latter group, poverty prevalence has actually increased in the last decade in the far-west region (CBS, 1996, 2011). Therefore, the complex linkage between livelihood dynamics, poverty and food insecurity offers scope for further research.

Only a limited number of studies exist on livelihood diversification in Nepal. Most of the existing studies on this theme have focused on figuring out the factors that enable households to diversify (see, Blaikie and Coppard, 1998; Adhikari, 2008b; Ghimire et al., 2014; Rahut et al., 2014). These studies thereby inform input for policies that would foster enabling environments for diversification. Although these issues are crucial, key issues regarding to what extent and in what socio-economic conditions diversification enhances poverty reduction are missing. This study attempts to fill this gap by measuring the impact of off-farm diversification on household well-being and identifying the socio-economic conditions in which diversification functions the best. In so doing, we first develop a composite well-being index and identify the 'high' and 'low' return livelihood activities in terms of their contribution to well-being. Next, we analyze economic, social and demographic characteristics of households that determine their involvement into different classes of off-farm sectors.

3. Materials and method

3.1. Study area

This study was conducted in Humla, a high Himalayan district located between 29° 35' to 30° 70'N and 81°18' to 82°10'E in the upper Karnali region of west Nepal (Fig. 1). Mixed crop-livestock subsistence agriculture has historically remained the mainstay of livelihoods here. Being in a high altitude area, Humla has rough terrain, poorly developed soil and a short growing season which limit agricultural production. Agricultural farms are sporadically distributed in largely varying areas throughout the valleys and

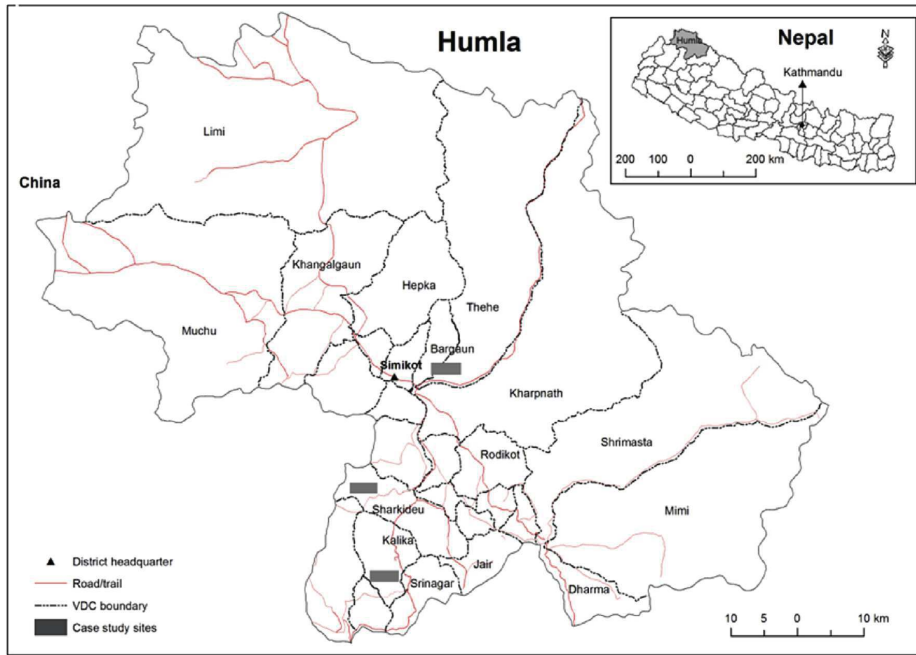


Fig. 1. Map of Humla district, Nepal.

slopes between the altitudes of 1000–4000 m above sea level. This has led to a wide variation in agricultural niches and subsequently high production diversity. Climate regulated agro-pastoral transhumance is a common characteristic in which the farming activities and livestock follow seasonal movements in high altitude areas in the summer and in lower areas in the winter.

One of the most remote districts of the country, Humla is not connected by road network. Access to the nearest motorable road takes three days to a week on foot. Intra-district connectivity depends on narrow trails, some just large enough for small pack animals. The distances to farmland and forests take a few minutes to several hours to reach from the compact settlement areas. As a result, the market and trade are limited, and agricultural technology is rudimentary and labor intensive. Only around 12% of the total cultivated land is irrigated (DDC, 2011) and most of the agriculture relies on natural precipitation, which ranges from 800 mm to 1200 mm/year. Therefore agriculture is highly vulnerable to variations in the weather/climatic pattern. The total local production is not adequate to meet the total food need which makes food scarcity a common phenomenon (Adhikari, 2008a).

There are three predominant caste/ethnic groups in Humla. Thakuri/Chhetri (hereafter Chhetri)¹ is a Nepali speaking Hindu caste group that shares nearly 50% of the population. This group is has traditionally high social and political status because it is at the top of the caste hierarchy and also has historical links to the ruling class in Karnali. In addition to farming, the Chhetris have been able to access public service sectors and other salaried jobs to a limited

extent. Being at the bottom of the caste hierarchy, Dalits are the weakest in political and social power relations. Therefore, they are most underprivileged in terms of socio-economic well-being such that they own much smaller landholdings than the high castes, have the lowest income and high food insecurity (Nagoda and Eriksen, 2014). The Dalit group makes up 14% of the total population. The Tibetan speaking Buddhist ethnic group called 'Lama' shares about 16% of the population. This group traditionally practices fraternal polyandry (two or more brothers sharing wife) which has not only enabled them to avert land fragmentation upon inheritance but also to enhance efficiency in the use of family labor by regulating the dependency ratio (see also Ross, 1981). The overall food security situation of this group is relatively better than other two groups.

3.2. Data collection

The data on which this paper is based were produced from household surveys between October and December, 2013, and April and June 2014. The design and administration of the survey questionnaire followed extensive preliminary qualitative inquiries. First, we visited many villages to conduct a series of informal discussions and several in-depth interviews with local farmers. Next, we conducted ten group discussions ($n = 74$) to get information on various aspects of the local livelihoods such as agricultural practices, food security and the pattern and processes of livelihood diversifications. In addition, we also elaborated a local wealth classification employing locally valued asset criteria for household well-being (described in more detail in the next section). Considering caste and gender the major factors shaping local power relation, the groups were composed to maintain homogeneity within groups and heterogeneity between groups (Bedford and

¹ Thakuri claims to remain superior to the Chhetri in Humla. However, our statistical analyses did not mark significant well-being difference between these groups which allowed us to mix these groups for analysis.

Burgess, 2001). The total number of group discussions was based on the concept of 'theoretical saturation' (Agar, 1996; Bryman, 2004) which resulted into 10 groups with 74 participants from three major caste/ethnic groups including 33 female participants.

Before the household surveys were conducted, a workshop including local field assistants finalized the survey questionnaire. We followed stratified sampling methods in order to incorporate caste/ethnicity and altitudinal locations of the settlements which are the major dimensions of farming and livelihoods in Humla. This led to the selection of three villages: Bargaon, Sarkideu and Kalika (Fig. 1). These villages are inhabited by all the three major caste/ethnic groups and are located at altitudes ranging from 1800 m asl to 3100 m asl. Because physical access is highly limited throughout the district due to the lack of road; data collection limited to these three villages not only minimized the associated time, logistical and technical problems, but also adequately incorporated the major issues shaping local livelihoods. The survey questionnaire was administered in 313 households which included statistically sizable population of all the major caste/ethnic groups roughly proportional to the district population composition (Lama = 27%, Chhetri = 49% and Dalit = 24%).

3.3. Data analysis

3.3.1. Selection of well-being indicators

Given well-being of the subsistence farmers the major desirable outcome of livelihood diversification, the concept and indicators of well-being remain central to analysis. In its most common parlance, well-being refers to positive and desirable life condition. The Stanford Encyclopedia of Philosophy defines well-being as a condition of how well a person's life is going for that person (Crisp, 2015). Having a good life is associated with having things or resources of 'prudential values' (Griffin, 1986) that enables meeting various elementary needs of life such as being adequately nourished and escaping morbidity as well as more complex needs such as having a life of dignity, self-respect and taking part in the life of the community (Sen, 1993). The idea of a good life, therefore, makes well-being a relative concept defined according to material circumstances as well as individual preferences and social and cultural contexts. This has led to the shift from money-metric measures of well-being to subjective well-being that take into account subjective aspects such as the perception of satisfaction, happiness, security and freedom (see Kingdon and Knight, 2006; Costanza et al., 2007).

Narayan-Parker and Patel's (2000) study made an extensive analysis of poverty and well-being bringing together data from 60 countries. One of the most recurrent themes of the study was the location and social group specificity of well-being (and conversely poverty) across the countries. This highlighted the importance of local worldviews and criteria in defining well-being (see also Chambers, 1995). To operationalize the concept in the context of rural livelihoods, we drew from these studies and based on extensive qualitative inquiries to trace the local worldview of well-being and thereby to identify the associated key components. Although most of these components include tangible/quantifiable assets, they inherently capture the values intrinsically desirable for the local people because they are derived according to the functional links with their 'well-being'.

First, we asked the group discussants to free-list key components that characterize a 'quality of life' or household well-being. Next, they were asked to classify these components into categories that would represent households at different levels of well-being. The concept of different degrees of well-being was elicited by asking them to figure out the major differences between the wealthy and poor households in their communities. This resulted in

a well-being continuum ranging from low to high well-being with a corresponding set of household characteristics (Fig. 2). Next, we selected 15 indicators associated with these components according to their functional importance in the local context (Table 1).

We selected food security as the first component of household well-being. We used the six-item short form of the food security survey (USDA, 2015) with one year reference period to measure food insecurity. Because the questions asked in the survey relate to the experience of having food insecurity; total number of negative answers was calculated as the indicator of food security. The total answers ranged from 0 indicating food insecure to 6 indicating food secure households. Our second set of components is related to housing arrangements in terms of basic household facilities and goods. Because different goods and facilities are accumulated or built over a relatively longer time; they better reflect well-being than other indicators such as income for example; which fluctuates within shorter time periods. Moreover, McKay et al. (2007) also find that the local people describe some of these housing related assets as their most urgent needs.

The third component is related to the stability of subsistence. Contingencies such as acute illness of any family members or loss of crops due to extreme weather events incur additional economic burden. The normal subsistence resources are not enough to remain above the subsistence threshold during such circumstances. In addition, it is also important for households to be able to take part in the 'life of the community' (see also Sen, 1993) such as the ability to afford social functions such as festival and wedding celebrations or mortuary rites to a socially acceptable standard. In the local people's classification, a household with a high level of well-being has an adequate disposable store of resources, especially cash savings, so that they can meet contingencies as well as stabilize the desired level of subsistence including the participation in the 'life of the community'.

The poor households, however, reported that their subsistence stability often gets upset, especially when they fail to meet contingencies. They considered livestock to be the most critical of stores because it was the only thing that could be sold to get cash. Many households allocated a certain number of livestock, mainly sheep, as their stores not only to meet contingent needs but also to maintain social and community lives. Around 18% of households

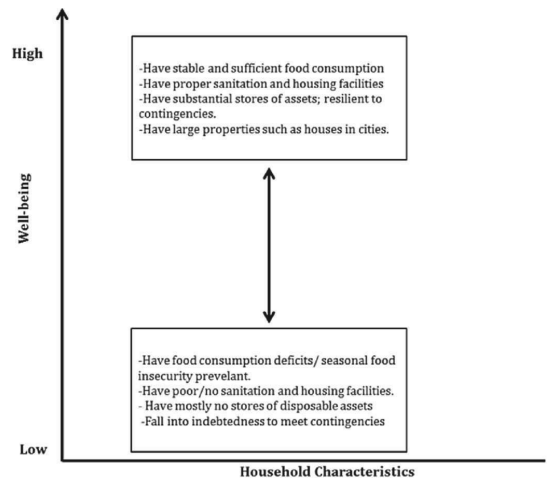


Fig. 2. The perceived well-being continuum and associated household characteristics.

Table 1
Variables used for calculating composite well-being index.

| Component | Sub-component | Indicators | Measurement unit | Max and min |
|----------------------|------------------|---------------------------------|--|---------------------|
| Food consumption | | Food security | Inverse of food insecurity score | Min = 0, max = 6 |
| Housing arrangements | Sanitation | Access to latrine | Yes = 1; 0 otherwise | Min = 0, max = 3 |
| | | Access to improved stove | Yes = 1; 0 otherwise | |
| | Household assets | Access to safe drinking water | Yes = 1; 0 otherwise | Min = 0, max = 5 |
| | | Possesses television | Yes = 1; 0 otherwise | |
| | | Possesses radio | Yes = 1; 0 otherwise | |
| | | Possesses telephone | Yes = 1; 0 otherwise | |
| | | Has accessed electricity | Yes = 1; 0 otherwise | |
| | | Has purchased solar light panel | Yes = 1; 0 otherwise | |
| Stores and claims | Savings | Cash savings | Nepali rupees (in thousand) ^a | Min = 0, max = 350 |
| | | Livestock | Number of livestock owned | Min = 0, max = 29 |
| Large scale property | Claim | Accessed NFC rice last year | Yes = 1; 0 otherwise | Min = 0, max = 1 |
| | | Has house in Simkot | Yes = 1; 0 otherwise | Min = 0, max = 6.45 |
| | | Has house in Nepalgunj/Surkhet | Yes = 1, 0 otherwise | |
| | | Has house in Kathmandu | Yes = 1; 0 otherwise | |

^a NPR 1000 = US\$ 9.84 as of 27.05.2015.

that owned livestock reported to have sold livestock at least once in the previous 12 months to meet emergency expenses. We therefore used cash savings and the number of livestock as indicators for stores. In addition, Nepal Food Corporation (NFC) based subsidized rice distribution scheme was the key resource accessed by the people to meet acute household food deficit. We included dummies of access to NFC (1 if they purchased the subsidized rice in the last 12 months; 0 otherwise) as an asset that contribute to the stability of subsistence.

The fourth component was the large scale properties in possession of only a few households. This set of components includes buildings or housing plots in economically strategic places such as Simkot, the district headquarters, regional cities in the Tarai or even Kathmandu, indicating variation in their value according to their locations. However, no official and timely updated standard valuation for real estate across the country could be found. Moreover, there are high discrepancies between the actual real-estate transaction values and the officially rated valuation (see Shrestha, 2012). We developed a conversion scale from the self-reported valuation of the properties by the respective owners ($n = 26$). Mean reported values (in million rupees) were 1.20, 3.58 and 7.75 for properties in Simkot, regional cities (Nepalgunj and Surkhet) and Kathmandu respectively. We assigned a value of 1 for the property in Simkot as our reference value. Proportionately, properties in the regional cities got a value of 3 and in Kathmandu a value of 6.45.

3.3.2. Calculation of well-being score

Because the components selected for calculating household well-being are measured into different scales, we created indices for each of the components and aggregated them into a composite index. To standardize the indicators measured on different scales into indices, we adopted the following equation from UNDP (2014) which is used in calculating human development indices:

$$IndexA_i = \frac{A_i - A_{min}}{A_{max} - A_{min}}$$

where A_i is the actual value of an indicator of a sub-component (e.g. food self-sufficiency) and A_{max} and A_{min} are the maximum and minimum values of the indicator in the whole data set (6 and 0 respectively for food security, Table 1). After standardization, the indices range from 0 to 1 to indicate low to high score respectively and are free of measurement unit. After each of these indicators was standardized, the value for the components having more than 1 indicator was derived by averaging the sub-component values

using the following equation:

$$C_i = \frac{\sum_{i=1}^n Index A_i}{n}$$

where C_i is one of the four major components for household i , (Food consumption, Housing arrangements, Stores and claims and Large scale property), $Index A_i$ is the sub-component(s) that make up the major component and n is the number of sub-components in each component. After the values of all three major components were calculated, the composite well-being score was calculated by averaging all the components using the following equation:

$$W_i = \frac{\sum_{i=1}^4 C_i}{N}$$

where W_i is the composite well-being-score of the household i and C_i is one of the four components and N is the total number of components that make up the well-being index (=4). The composite household well-being score range from a value of 0–1. A score around 0 indicates low level of well-being, whereas around the value of 1 high well-being.

3.3.3. Analysis

The role of non-farm diversification on well-being was analyzed using multivariate regression models. Among the six reported off-farm activities (wage labor, trade, wage migration, salaried job, NTFP collection and handicraft and tool making); six occupations (except NTFP collection) scored statistically significant correlation coefficients with household well-being. To identify the best livelihood activity(ies) in predicting wellbeing; we entered them into stepwise regression models. The coefficients of determinant (R^2) consistently increased with the addition of the first to the fifth independent variables from 0.358 in Model 1 to 0.721 in Model 5 (Appendix A). The final model (Model 5) is statistically significant ($F_{5, 307} = 158.303$, $R^2 = 0.721$, $p < 0.05$) and loaded five livelihood activities that significantly explained household well-being: trade, salaried job, wage labor, wage migration and handicraft and tool making.

For validation of the model; we randomly split the data set into a 75% training sample and a 25% validation sample. The stepwise regression of the training sample produced the same subset of predictors as produced by the regression model of the full data set. Moreover, R^2 for both the validation sample and training sample were approximately equivalent, underscoring the robustness and validity of our model. Having determined the most important of

livelihood activities, we assessed the socio-economic determinants of these activities using logistic regression models. By socio-economic determinants we refer to resources such as labor available at households, social and political network, and education and skills which can be invested in various ways to diversify into off-farm sectors.

4. Results

4.1. Household characteristics and livelihood strategies

Households in Humla hold 0.7 ha of cultivable land on average and meet 63% of the total food need by self-production (Table 2). Measuring food insecurity using food security scale revealed that only 15% households were food secure that met all three criteria of food security: adequacy, access and food preference. All other households were found to be food insecure to some degree. The bottom 28% households had very high food insecurity. Food scarcity in terms of availability was reported to occur mainly between March and July when the food harvested in the previous summer has been consumed and the winter crops are not ready for harvest. The disaggregated socio-economic indicators by caste/ethnicity show that households belonging to the low caste have far smaller landholdings than those in the other two groups (Table 2). This group produces only 47% of its total food need and has the most severe case of chronic food insecurity. The average income of the Dalit households was 55 thousand in Nepali Rupees whereas the Chhetri households had nearly double this figure and the Lama group almost five times higher. Moreover, Dalits are found to be the most disadvantaged in terms of other socio-economic indicators such as education. Although education is overall low in Humla, only 10% Dalit households had any member having secondary education (≥ 10 years education) against the corresponding figures of 24% Chhetri and 20% Lama households ($\chi^2 = 7.026$ $df = 2$, $p < 0.05$). In terms of composite household wellbeing index, the Dalit scored the lowest 0.32, the Chhetri had better score of 0.40 whereas the Lama

the highest score of 0.67 (Fig. 3). This difference is statistically significant ($F_{2, 310} = 106.078$, $p < 0.001$).

With regards to livelihood strategies, the most common occupation was agriculture, reported by almost all households. In addition to cultivating their own farms, many households that have a small parcel of land and surplus labor work as farm wage laborers locally. Wage labor was the second most common activity practiced by 76% of the households (Table 2). However, farming is a highly seasonal activity in Humla. The long and cold winter is generally a lean season for agriculture. This season, therefore, offers a window of opportunity to attempt off-farm income sources in extra-local settings. Many young men particularly from the low income and most food insecure households migrate to India for wage labor.

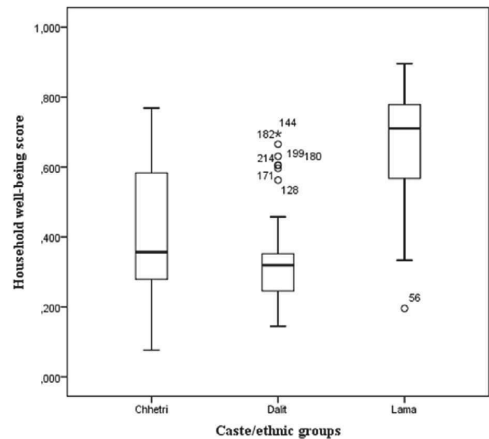


Fig. 3. Household well-being score by caste/ethnic group.

Table 2
Household characteristics and livelihood diversification (n = 313).

| | Caste/ethnic groups | | | Total |
|---|---------------------|---------|-------|-------|
| | Lama | Chhetri | Dalit | |
| Household size | 6.7 | 6.1 | 6.3 | 6.3 |
| Number of working age members (age: 15 y–64 y) | 4.6 | 3.5 | 3.4 | 3.8 |
| Dependency ratio ^a | 55 | 89 | 103 | 82 |
| Family type (%) (Polyandrous = 1; 0 otherwise) | 72 | 0 | 0 | 20 |
| Education | | | | |
| Household head's education (years of schooling) | 3.4 | 4.5 | 3.1 | 3.9 |
| Household with member having > 10 years schooling (%) | 19.3 | 23.7 | 9.6 | 19.2 |
| Landholding size (ha) | 1.2 | 0.6 | 0.4 | 0.7 |
| Irrigation coverage (% cultivated land) | 5.7 | 23.8 | 14.1 | 16.5 |
| Extension visit (% of households) | 18.4 | 22.4 | 12.2 | 18.8 |
| Livestock (Cattle equivalent) ^b | 8.0 | 5.9 | 3.4 | 5.9 |
| Food production sufficiency (%) | 75 | 64 | 47 | 63 |
| Food security score ^c | 4.18 | 1.84 | 1.12 | 2.32 |
| Income (NPR'000) | 268 | 104 | 55 | 137 |
| Household well-being score | 0.67 | 0.39 | 0.31 | 0.43 |
| Off-farm diversification (% of households involved) | | | | |
| Wage Labor | 43.7 | 82.9 | 98.6 | 75.7 |
| Wage migration | 11.5 | 36.2 | 45.9 | 31.6 |
| NTFP collection | 57.7 | 40.1 | 9.5 | 37.7 |
| Salaried job | 26.4 | 22.4 | 4.1 | 19.2 |
| Trade | 37.9 | 9.2 | 5.4 | 16.3 |
| Handicraft and tool making | 5.7 | 12.5 | 27 | 14.1 |
| Total Number of livelihood activities | 2.83 | 3.03 | 2.89 | 2.94 |

^a Ratio of number of dependent population (<15 y+> 64 y) to the working-age population (15 y–64 y).

^b Conversion scale for small animals to cattle was based on local prices (derived from group discussions).

^c (0–1) = Very low food security, (2–4) = Low food security, (5–6) = High or marginal food security.

They return before the beginning of the next farming season with small amounts of cash and consumer goods. Around 32% households had involved in wage migration.

Trade is also an important off-farm activity in Humla. Our survey data shows that 16% households involved in trade. Those households unable to get involved in trade also earn some money through the collection of non-timber forest products (NTFP) mostly medicinal herbs such as *Atis* (*Delphinium himalayai*) and more mushrooms which they can sell to local traders. NTFP collection was reported by around 38% households. Handicraft and tool making is also an important source of income for some households. All agricultural tools in Humla are locally produced, so tool making is particularly related to making spade, sickles and other agricultural tools. In recent decades, Humla has witnessed a mushrooming of non-governmental organizations (NGOs) that have created a local niche for salaried jobs adopted at present by 19% of households particularly but not exclusively in the NGO sector. Overall, the average number of livelihood activities for all the households was 2.94 and the mean difference is not statistically significant across caste/ethnic groups.

4.2. Livelihood strategies and household well-being

Table 3 shows the results for regression estimates predicting the effects of different livelihood activities on household well-being. Overall, the model explains over 72% of the variation on the predicted variable: household well-being ($F_{5, 307} = 158.303$, $R^2 = 0.721$, $p < 0.05$, Appendix A). Among the independent variables, trade and salaried job positively explained household well-being as expected. The most instrumental of them was trade. Holding all other off-farm activities constant, trade increased household well-being by 0.294 units ($p < 0.001$). The correlation coefficients in Table 3 show that trade made a 44% shared contribution (partial correlation = 0.663) to well-being. Even when all other activities were controlled for, it explained around 22% of the variance (semi-partial correlation = 0.469). After trade, salaried job was found to be the most promising off-farm activity. Holding other activities for constant, the adoption of salaried job made a 0.25 unit contribution on household well-being ($p < 0.001$, Table 3). It explained around 20% of variance in well-being when all other variables were controlled for.

The remaining three livelihood activities, however, did not make positive contribution. The adoption of wage labor as a livelihood strategy uniquely explained about 3.6% variance (semi-partial correlation = -0.19), marking a 0.106 unit moderation in the household well-being ($p < 0.001$). Similarly, seasonal wage migration was another livelihood activity that negatively predicted well-being. Holding all activities for constant, it moderated well-being by 0.049 units explaining around 1% variability (semi-partial correlation = -0.102), which is statistically significant ($p < 0.01$). The last statistically significant predictor in the well-being model was handicraft and tool making. It uniquely explained less than 1%

variance on well-being which was statistically significant ($p < 0.05$).

Conceptually, the motivation for diversification lies in the attempt of households to support their livelihood and improve well-being. Trade and salaried job have played this desired role by positively contributing to well-being. Therefore, they can be classified as high return livelihood activities. On the other hand, wage labor, wage migration and handicraft and tool making that have negative coefficients and moderate well-being can be labeled low return sectors. Despite this moderation effect, Table 2 illustrates that these low return activities are the most frequently reported livelihood strategies in Humla. In the next section, keeping the positive livelihood outcomes of off-farm diversification in context, we analyze the factors that determine households' involvement in high return sectors.

4.3. Socio-economic determinants of high return diversification

We entered relevant household socio-economic variables into logistic regression models for predicting the high return sectors (Table 4). Model 1 predicts the adoption of high return livelihood activities (hereafter high return sector). High return sector, the outcome variable is a binary variable derived by assigning a value of 1 if the household adopted at least one of trade or salaried job. If none was adopted a value of 0 was assigned. The results in the other models; Model 2 and Model 3 predict salaried job and trade, the two high return livelihood activities separately so that any significant predictors to the high return sectors could be analyzed more in depth in terms of their causality.

In Model 1, six factors significantly explained high return off-farm activity. Having strong network outside the district was a significant determinant of high return sector. We define this type of network as the one that has economic transactions involved. Holding for all other factors, households having such networks were nearly six times more likely to involve in high return sector than the household that did not have such network (odds ratio, OR = 5.75; $p < 0.001$, Model 1). A disaggregated analysis showed that although such networks significantly and highly predicted trade (OR = 6.69, $p < 0.001$, Model 3), their role in salaried job was not significant (Model 2). We will discuss the network and trade causality in the next section in detail.

Being politically active by having affiliation in political parties or other locally important formal institutions was another key factor enabling households to access high return sector. Measured by the affiliation of a household in any political party or other formal institutions, political network increased the log odds of high return sectors by 0.876 units ($p < 0.05$). A look at Model 2 and Model 3 shows that the political network and high return sector nexus can be explained in light of its association with salaried job but not with trade. Political affiliation increased the log odds of salaried job by 2.21 units ($p < 0.001$) when all other factors were held constant. In addition to the institutional network in terms of direct involvement in party politics, another form of political/institutional network was

Table 3
Coefficients of independent variables included in the well-being models.

| | Unstandardized coefficients | | Standardized coefficients | t | Correlations | |
|----------------------------|-----------------------------|------------|---------------------------|--------|--------------|--------------|
| | β | Std. Error | β | | Partial | Semi-partial |
| Constant | 0.465*** | 0.017 | | | | |
| Trade | 0.294*** | 0.019 | 0.513 | 15.532 | 0.663 | 0.469 |
| Salaried job | 0.252*** | 0.017 | 0.468 | 14.678 | 0.642 | 0.443 |
| Wage labor | -0.106*** | 0.017 | -0.214 | -6.335 | -0.34 | -0.191 |
| Wage migration | -0.049** | 0.014 | -0.107 | -3.381 | -0.189 | -0.102 |
| Handicraft and tool making | -0.045* | 0.019 | -0.073 | -2.372 | -0.134 | -0.072 |

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table 4
Logistic regression results for the predicting high return sectors.

| Measures | Model 1: High return sector | Model 2: Salaried job | Model 3: Trade |
|---|-----------------------------|-----------------------|-----------------|
| Household size | -0.100 (0.90) | -0.148 (0.86) | -0.023 (0.97) |
| Female headed household (=1) | 0.356 (1.42) | -0.196 (0.82) | 0.575 (1.77) |
| Age of the household head (years) | 0.045 (1.05)** | 0.033 (1.03) | 0.031 (1.03)* |
| Number of working age members (15–64 years) | 0.440 (1.55)** | 0.525 (1.69)* | 0.131 (1.14) |
| Education of the household head (years of schooling) | 0.307(1.35)*** | 0.526(1.69)*** | -0.020 (0.98) |
| Network outside the district (=1) ^a | 1.749(5.75)*** | 1.047(2.84) | 1.902 (6.69)*** |
| Membership in any institution (=1) ^b | 0.876(2.40)* | 2.221 (9.21)*** | -0.393 (0.67) |
| Strong network in formal institutions (=1) ^c | 0.859(2.36) | 1.959 (7.09)** | -0.658 (0.51) |
| Bank credit (has got bank credit in the past = 1) | 0.587 (1.79) | -0.402 (0.67) | 1.363 (3.90)* |
| Per capita food production | 0.004 (1.00) | 0.001 (1.00) | -0.001 (0.99) |
| Access to forest in the village proximity (=1) | -1.140(0.32)** | -0.984 (0.37) | -0.901 (0.40)* |
| Constant | -6.936 | -8.198 | -5.171 |
| Nagelkerke R ² | 0.571 | 0.735 | 0.259 |
| Model χ^2 | 165.19*** | 191.85*** | 51.77*** |
| Degrees of freedom | 11 | 11 | 11 |

Figures in parenthesis indicate odds ratios (OR).

Significance for β : *** $P < 0.001$. ** $P < 0.01$. * $P < 0.05$.

^a Question in the survey: Do you have any close relative/s, friend/s or business partner/s outside the district with whom you have regular contacts in connection with commodity or financial transactions?

^b Is any of your family member actively affiliated to political parties or other formal institutions in or outside Humla?

^c Do you have close relatives or friends in government or non-governmental institutions working in Humla or outside?

also consistently iterated in the group discussions. A particular type of network in terms of having close relatives in the NGO and/or government institution as employee was also traced through surveys (see Table 4) which significantly predicted salaried job. Because most of the salaried jobs reported in Humla were related to NGO sector, the prediction of latter type of network implied that securing job in Humla is more likely for people having relatives or other types of close connection with NGO or government institutions in local or extra local settings.

The most basic factor for high return sector, mainly salaried job is related to educational qualification. Education of the household head significantly predicted high return sectors. A one year increase in the education of the household head increased the log odds of salaried job by 0.526 units ($p < 0.001$, Model 2). Interestingly albeit unexpectedly, education had a moderation effect in trade with negative coefficient, but this was not statistically significant (Model 3) which allows us to explain that this association has occurred by chance.

Age of the household head was also a positive contributor to high return sector. Holding all other factors constant, a one year increase in the age of the household head increased the log odds of high return off-farm activity by 0.045 units ($p < 0.001$). This implies that younger household heads are less likely to get involved in high return sectors than their older counterparts. Interestingly, household size did not have a statistically significant contribution on high return sector; rather it was the number of working age members in a family that statistically significantly predicted it. An increase of working age member by one person in a household increased the log odds of its involvement in high return sector by 0.44 units ($p < 0.01$, Model 1) when all other factors were held constant.

In addition to social and human capital, we measured financial capital of a household as a dummy variable in terms of access to bank credits. It was statistically significant factor of trade but not salaried job which is quite plausible. Households with access to bank credits were nearly four times more likely to involve in trading than household not having credit access (OR = 3.90, $p < 0.05$, Model 3). Surprisingly, access to forest in the village proximity had a negative impact on high return sectors. The log odds of the high return sectors decreased by 1.14 units for households having forest resources compared with the ones not having forest access in the proximity ($p < 0.01$). This may apparently be explained in terms of the increased motivation of households

rather to involve in NTFP collection for cash income which is comparatively easier to access than other more resource demanding activities. This may also be the case induced by the correlation of caste/ethnic locational distribution and access to forest. For example, the Lama households, involved more in trade (explained later) live in Bargaon which has limited access to forest compared with other villages such as Sarkideu.

Having determined the household level factors of high return activities, we further disaggregated the data on diversification to high return sectors by caste ethnicity. Again, we assigned a value of 1 if the household adopted at least one of trade or salaried job. If none was adopted a value of 0 was assigned. Unlike the general data on livelihood diversification in Table 2, the figures thus derived traced caste/ethnic diversification only into the high return sectors. Results suggested that only 9.5% low caste Dalits got into the high return sectors against the corresponding figures of 30.3% Chhetri and 57.5% Lama households which marked a statistically significant association ($\chi^2 = 42.68$ $df = 2$, $p < 0.001$). Involvement into high return sector in the latter two groups can also be clearly differentiated. The majority of the Lama households (64.7%) that diversified into high return sectors were involved in trade whereas the majority of the Chhetri households (56.7%) in salaried job. This implies that the primary high return sector for the Chhetri is salaried job whereas that for the Lama is trade.

5. Discussions and conclusion

Our findings qualify the general understanding in rural livelihood diversification and well-being by demonstrating that a household can enhance well-being only when it pulls into its livelihood portfolio the high return sector(s) among various off-farm opportunities available. However, pulling the high return sectors is not a matter of free choice. This can be better explained using a schematic framework (Fig. 4) which recognizes that off-farm sector for diversification is rooted into and differentiated by background pre-conditions reflecting various assets: both tangible and intangible assets at the household's disposal. In this context, when the well-endowed households diversify, they diversify for 'good reasons' (Von Braun and Pandya-Lorch, 1991) not for survival but for accumulation. So they are more likely to get into high return sectors and achieve wealth or well-being (Woldenhanna and Oskam, 2001). The asset poor households, on the other hand, are

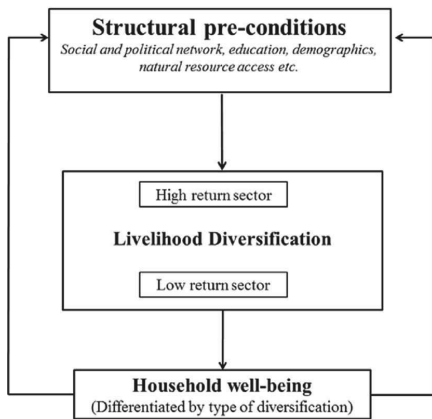


Fig. 4. Livelihood diversification and well-being nexus.

less likely to overcome the entry barriers and are confined to low return sectors which make insignificant contribution to well-being. There is also a positive feedback effect in this nexus that reinforces the well-being conditions: already rich households accumulate assets that form the basis for further lucrative diversification. The poorer households, on the other hand, are trapped in the same low return sectors resulting in overall widening of inequality (Reardon et al., 2000; Barrett et al., 2001b; Canagarajah et al., 2001).

The characteristics of the off-farm sectors as well as the configuration of the pre-conditions are contextual to socio-economic, institutional and geographical contexts of places. In Humla, we found trade and salaried job the key off-farm activities instrumental for well-being. Trade is one of the sectors in which the Himalayan farmers have diversified their livelihood activities for centuries (Fisher, 1987; Bishop, 1990). The present day trade primarily includes the trans-border trade of NTFP and secondarily that of food and other commodities that are procured both from Tibet and cities like Nepalgunj and Kathmandu. Another sector; salaried job; is a recently developed economic niche. Most of the jobs are related to clerical jobs in NGO offices or field work for their development projects. In addition, the increased number of both private and public schools has also increased the number of teaching jobs. However, involvement in both these sectors is determined by various assets such as education, good social and political networks and financial investment capacities. Caste and ethnicity most notably reflect the distribution of these assets and the resultant pattern of livelihood diversification in Humla. Therefore, the overall livelihood dynamics necessitate a more in-depth analysis of local socio-economic and historical dimensions of caste/ethnicity.

The inefficiency of local production to sustain the communities marked the origin of trade in the Himalaya (Füer-Haimendorf, 1975 p. 286). Households with agricultural success and a higher level of food security are evidently less likely to invest in new technologies or ideas aimed at economic diversification (Sanders and McKay, 2014 p. 29). The Tibetan speaking Lamas have been historically located in the higher altitudinal areas, whereas the Chhetris occupy more productive land in the valley-bottoms that offers better food self-sufficiency (Levine, 1987). Dalit originally comprised landless laborers and artisans who performed a wide range of tasks to the high castes (Bishop, 1990). Arguably, this variation in land ownership and food security can explain why Lama households are more likely to be involved in trade. Moreover,

polyandrous family structure and the associated household demographics, with more working age members than monogamous families, not only offered motivation but also some necessity for the Lama households to become involved in different activities (see Ross, 1981). Their cultural similarity with the Tibetan communities in terms of religion and language also facilitated their mobility and trade networks. The Hindu caste system has strong concepts for purity and untouchability which pose strict sanctions on mobility, interaction and dietary conducts for both the high and low castes. Füer-Haimendorf (1975, pp. 286–305) argues that freedom for commensality facilitated Lamas' mobility and interaction with other communities also in the southern regions which made strong trade networks possible for them. Trade performance is strongly determined by social capital in the form of trade network (Fauchamps and Minten, 2002), and arguably Lama has benefited as successful trader from the strong network which they have historically built and maintained (see also Nagoda and Eriksen, 2014).

The determinants of salaried job, another high return off-farm activity, are also related to human and social capitals. The prospects for salaried jobs are meagre for the majority of people with low education and the opportunity skews heavily toward households with better educated members. In addition, NGOs which provide the biggest job niche in Humla are embedded into a highly politicized structure of local power relations. The NGOs at all levels have evidently remained major instruments for the political parties to strengthen their patronage network (Hachhethu, 2007; UNRCHCO, 2013). For more than the last fifteen years, an absence of elected local institutions has led to the political patronage to transcend NGOs and dominate the resource mobilization and functioning of all government institutions (Harris et al., 2013; Sharrock, 2013). In this context, the access to the local institution for job is processed through the channel of party politics which makes it difficult for the people who are subordinate in local power relations and disassociated from party politics to negotiate and claim their access. Our findings are consistent with other studies (Jones and Boyd, 2011; Nagoda and Eriksen, 2014) that highlight an unequal distribution of resources of all kinds favoring the high caste by virtue of their historical social and political dominance whereas making it difficult for the low caste Dalits who have the lowest level of education and social and political power to claim access to various development and humanitarian institutions and to find salaried jobs.

The poor subsection of the population, unable to get involved in lucrative non-farm sectors are forced to adopt activities that do not require high investment capacities and special skills. One of them is wage labor which is based mainly on an unequal patron-client type of relation between the high and the low caste which contributes no more than a little relief for the laborers' families in situations of acute food crisis (Adhikari, 2008a). The second choice, seasonal labor migration, also ends up with low paying wage labor in India (Bruslé, 2008). The Karnali region remains off the beaten track from foreign labor migration which marks a general trend for all the rest of the country. Foreign labor migration from other parts of Nepal has contributed a huge share in the national economy (Seddon et al., 2002; Kollmair et al., 2006; Maharjan et al., 2013) and has also created opportunities for the socially and economically underprivileged subpopulation like the Dalits to move out of poverty and contest caste institutions by mobilizing financial, human and symbolic capital accumulated through migration (Sunam, 2014). The lack of a foreign migration trend in Humla can supposedly be explained in light of the migrant's lack of necessary social network to get information, low education and other skills and also the lack of financial capital to meet the start-up expenses for high return foreign employment.

Like wage labor, the Dalits serve the high castes with various

occupation related tasks and services such as metal works and tailoring under patron-client exchange systems such as 'Lagi' or 'Balighare' (Adhikari, 2008a). The most common is the making of a wide range of simple agricultural tools for use on farms belonging to high castes who offer a certain amount of grain in exchange. Because the majority of the low caste Dalits have inadequate land and low food insecurity; handicraft and tool making reflects a need driven diversification which is a strategy to meet or maintain survival but cannot make substantial contribution on accumulation and upward well-being mobility (Ellis, 2000) which means what we call 'low return sector'.

We draw two main conclusions from this study. First, diversification as such does not contribute to well-being; but rather a household's ability to pull high return sectors into its livelihood portfolio is more instrumental in enhancing well-being. Second, a household's ability to diversify into a high return sector is dependent on antecedent level of resources and assets: both tangible and intangible assets. Because these resources are unequally distributed; the resource rich households diversify into high return sectors and substantially improve their well-being. The resource poor households, on the other hand, lack the investment capacity and are forced to continue their low return diversification. In this way, off-farm diversification can increase local wealth inequality. A prospective look at future livelihoods in the context of widening inequality informs that low caste and poor households that lack resources and diversify into low return sectors at present are equally unlikely to be able to exploit new economic opportunities effectively even in the future. This highlights the need for rural poverty reduction interventions to be sensitive to local inequalities and direct targeted opportunities to the most underprivileged ones.

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Appendix A

Summary of the well-being models (derived by stepwise regression).

| Model | R | R ² | Adjusted R ² | Std. error of the estimate | Change statistics | | | | |
|-------|--------------------|----------------|-------------------------|----------------------------|-----------------------|---------|-----|-----|-------|
| | | | | | R ² change | F | df1 | df2 | Sig. |
| 1 | 0.598 ^a | 0.358 | 0.356 | 0.170283 | 0.358 | 173.115 | 1 | 311 | 0.000 |
| 2 | 0.813 ^b | 0.660 | 0.658 | 0.124038 | 0.303 | 276.133 | 1 | 310 | 0.000 |
| 3 | 0.840 ^c | 0.705 | 0.702 | 0.115711 | 0.045 | 47.220 | 1 | 309 | 0.000 |
| 4 | 0.846 ^d | 0.715 | 0.712 | 0.113889 | 0.010 | 10.967 | 1 | 308 | 0.001 |
| 5 | 0.849 ^e | 0.721 | 0.716 | 0.113043 | 0.005 | 5.628 | 1 | 307 | 0.018 |

^a Predictors: (Constant), Trade.

^b Predictors: (Constant), Trade, salaried job.

^c Predictors: (Constant), Trade, salaried job, Wage labor.

^d Predictors: (Constant), Trade, salaried job, Wage labor, Wage migration.

^e Predictors: (Constant), Trade, salaried job, Wage labor, Wage migration, Handicraft and tool making.

References

Aase, T.H., Chaudhary, R.P., Vetaas, O.R., 2010. Farming flexibility and food security under climatic uncertainty: Manang, Nepal Himalaya. *Area* 42 (2), 228–238.

- Adhikari, J., 2008a. Food Crisis in Karnali: a Historical and Politico-economic Perspective. Martin Chautari, Kathmandu.
- Adhikari, J., 2008b. Changing Livelihoods. Essays on Nepal's Development Since 1990. Martin Chautari, Kathmandu.
- Agar, M.H., 1996. The Professional Stranger: an Informal Introduction to Ethnography. Academic Press, New York.
- Babatunde, R.O., Qaim, M., 2010. Impact of off-farm income on food security and nutrition in Nigeria. *Food Policy* 35 (4), 303–311.
- Barbieri, C., Mahoney, E., 2009. Why is diversification an attractive farm adjustment strategy? Insights from Texas farmers and ranchers. *J. Rural Stud.* 25 (1), 58–66.
- Barnett, T.P., Adam, J.C., Lettenmaier, D.P., 2005. Potential impacts of a warming climate on water availability in snow-dominated regions. *Nature* 438 (7066), 303–309.
- Barrett, C., Bezuneh, M., Aboud, A., 2001a. Income diversification, poverty traps and policy shocks in Côte d'Ivoire and Kenya. *Food Policy* 26 (4), 367–384.
- Barrett, C., Reardon, T., Webb, P., 2001b. Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. *Food Policy* 26 (4), 315–331.
- Bedford, T., Burgess, J., 2001. The focus-group experience. In: Limb, M., Dwyer, C. (Eds.), *Qualitative Methodologies for Geographers: Issues and Debates*. Edward Arnold, London.
- Bezu, S., Barrett, C.B., Holden, S.T., 2012. Does the nonfarm economy offer pathways for upward mobility? Evidence from a panel data study in Ethiopia. *World Dev.* 40 (8), 1634–1646.
- Bhandari, P.B., 2013. Rural livelihood change? Household capital, community resources and livelihood transition. *J. Rural Stud.* 32, 126–136.
- Bishop, B.C., 1990. Karnali under Stress: Livelihood Strategies and Seasonal Rhythms in a Changing Nepal Himalaya. University of Chicago Geography Research Papers, Chicago.
- Blaikie, P., Coppard, D., 1998. Environmental change and livelihood diversification in Nepal: where is the problem? *Himalaya J. Assoc. Nepal Himal. Stud.* 18 (2), 11.
- Block, S., Webb, P., 2001. The dynamics of livelihood diversification in post-famine Ethiopia. *Food Policy* 26 (4), 333–350.
- Bruslé, T., 2008. Choosing a destination and work: migration strategies of Nepalese workers in Uttarakhand, northern India. *Mt. Res. Dev.* 28 (3), 240–247.
- Bryman, A., 2004. *Social Research Methods*. Oxford University Press, Oxford.
- Canagarajah, S., Newman, C., Bhattamishra, R., 2001. Non-farm income, gender, and inequality: evidence from rural Ghana and Uganda. *Food Policy* 26 (4), 405–420.
- CBS, 1996. Nepal Living Standard Survey 1995/96. National Planning Commission, Kathmandu.
- CBS, 2011. Nepal Living Standard Survey 2010/2011. National Planning Commission, Kathmandu.
- CBS, 2012. National Population and Housing Census 2011 (National Report). National Planning Commission, Kathmandu.
- Chambers, R., 1995. Poverty and livelihoods: whose reality counts? *Environ. Urban.* 7 (1), 173–204.
- Chaudhary, R.P., Aase, T.H., Vetaas, O.R., Subedi, B.P. (Eds.), 2007. *Local Effects of Global Changes in the Himalayas: Manang, Nepal*. Trubhuvan University and University of Bergen, Kathmandu.
- Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., et al., 2007. Quality of life: an approach integrating opportunities, human needs, and subjective well-being. *Ecol. Econ.* 61 (2), 267–276.
- Crisp, R., 2015. Well-being. In: Zalta, E.N. (Ed.), *Stanford Encyclopedia of Philosophy*. <http://plato.stanford.edu/entries/well-being/>.
- DDC, 2011. District Profile of Humla. District Development Committee, Simikot.
- Dzanku, F.M., 2015. Transient rural livelihoods and poverty in Ghana. *J. Rural Stud.* 40, 102–110.
- Eakin, H., 2005. Institutional change, climate risk, and rural vulnerability: cases from central Mexico. *World Dev.* 33 (11), 1923–1938.
- Ellis, F., 1998. Household strategies and rural livelihood diversification. *J. Dev. Stud.* 35 (1), 1–38.
- Ellis, F., 2000. The determinants of rural livelihood diversification in developing countries. *J. Agric. Econ.* 51 (2), 289–302.
- Fafchamps, M., Minten, B., 2002. Returns to social network capital among traders. *Oxf. Econ. Pap.* 54 (2), 173–206.
- FAO, IFAD, WFP, 2014. *The State of Food Insecurity in the World*. FAO, Rome.
- Fisher, J.F., 1987. *Trans-Himalayan Traders: Economy, Society, and Culture in Northwest Nepal*. University of California Press, Berkeley, Los Angeles, London.
- Fürer-Haimendorf, C.V., 1975. *Himalayan Traders: Life in Highland Nepal*. John Murray, London.
- Ghimire, R., Huang, W.-C., Shrestha, R.B., 2014. Factors affecting nonfarm income diversification among rural farm households in central Nepal. *Int. J. Agric. Manag. Dev.* 4 (2), 123–132.
- Griffin, J., 1986. *Well-being: Its Meaning, Measurement and Moral Importance*. Clarendon Press, Oxford.
- Guang, L., Zheng, L., 2005. Migration as the second-best option: local power and off-farm employment. *China Q.* 181, 22–45.
- Hachbethu, K., 2007. Nepali politics: people-parties interface. In: Gellner, D. (Ed.), *Resistance and the State: Nepalese Experiences*, pp. 133–176.
- Harris, D., Wales, J., Jones, H., Rana, T., Chitrakar, R.L., 2013. *Human Resources for Health in Nepal – the Politics of Access in Remote Areas*. Overseas Development Institute, London.
- Harvey, C.A., Rakotobe, Z.L., Rao, N.S., Dave, R., Razafimahatratra, H., Rabarjohn, R.H., et al., 2014. Extreme vulnerability of smallholder farmers to

- agricultural risks and climate change in Madagascar. *Philos. Trans. R. Soc. B Biol. Sci.* 369 (1639), 20130089.
- Hoang, T.X., Pham, C.S., Ulubaşoğlu, M.A., 2014. Non-farm activity, household expenditure, and poverty reduction in rural Vietnam: 2002–2008. *World Dev.* 64, 554–568.
- IFAD, 2010. *Rural Poverty Report 2011*. International Fund for Agricultural Development, Rome.
- Jones, L., Boyd, E., 2011. Exploring social barriers to adaptation: insights from western Nepal. *Glob. Environ. Change* 21 (4), 1262–1274.
- Khanal, N.R., Watanabe, T., 2006. Abandonment of agricultural land and its consequences. *Mt. Res. Dev.* 26 (1), 32–40.
- Kingdon, G.G., Knight, J., 2006. Subjective well-being poverty vs. income poverty and capabilities poverty? *J. Dev. Stud.* 42 (7), 1199–1224.
- Kollmair, M., Manandhar, S., Subedi, B., Thieme, S., 2006. New figures for old stories: migration and remittances in Nepal. *Migr. Lett.* 3 (2), 151–160.
- Levine, N.E., 1987. Caste, state, and ethnic boundaries in Nepal. *J. Asian Stud.* 46 (01), 71–88.
- Liu, C., Golding, D., Gong, G., 2008. Farmers' coping response to the low flows in the lower Yellow River: a case study of temporal dimensions of vulnerability. *Glob. Environ. Change* 18 (4), 543–553.
- Maharjan, A., Bauer, S., Knerr, B., 2013. International migration, remittances and subsistence farming: evidence from Nepal. *Int. Migr.* 51 (s1), e249–e263.
- McKay, K.H., Zahnd, A., Sanders, C., Nepali, G., 2007. Responses to innovation in an insecure environment in rural Nepal. *Mt. Res. Dev.* 27 (4), 302–307.
- Morton, J.F., 2007. The impact of climate change on smallholder and subsistence agriculture. *Proc. Natl. Acad. Sci.* 104 (50), 19680–19685.
- Nagoda, S., Eriksen, S., 2014. The role of local power relations in household vulnerability to climate change in Humla, Nepal. In: Inderberg, T.H., Eriksen, S., O'Brien, K., Sygna, L. (Eds.), *Climate Change Adaptation and Development: Transforming Paradigms and Practices*. Routledge, New York, pp. 200–218.
- Narayan-Parker, D., Patel, R., 2000. *Voices of the Poor: Can Anyone Hear Us?*, vol. 1. World Bank Publications.
- O'Brien, K., Quinlan, T., Ziervogel, G., 2009. Vulnerability interventions in the context of multiple stressors: lessons from the southern Africa vulnerability initiative (SAVI). *Environ. Sci. Policy* 12 (1), 23–32.
- Paudel, K.P., Tamang, S., Shrestha, K.K., 2014. Transforming land and livelihoods: analysis of agricultural land abandonment in the Mid Hills of Nepal. *J. For. Livelihoods* 12 (1), 11–19.
- Rahut, D.B., Ali, A., Kassie, M., Marenja, P.P., Basnet, C., 2014. Rural livelihood diversification strategies in Nepal. *Poverty Public Policy* 6 (3), 259–281.
- Reardon, T., Delgado, C., Matlon, P., 1992. Determinants and effects of income diversification amongst farm households in Burkina Faso. *J. Dev. Stud.* 28 (2), 264–296.
- Reardon, T., Taylor, J.E., Stamoulis, K., Lanjouw, P., Balisacan, A., 2000. Effects of non-farm employment on rural income inequality in developing countries: an investment perspective. *J. Agric. Econ.* 51 (2), 266–288.
- Ross, J.L., 1981. *Hindu and Tibetan Reproduction and Fertility in Northwestern Nepal: a Study of Population Ecology and Economics*. Ph.D. Dissertation. Department of Anthropology, Case Western Reserve University.
- Sanders, C., McKay, K., 2014. Where have all the young men gone?: social fragmentation during rapid neoliberal development in Nepal's Himalayas. *Hum. Organ.* 73 (1), 25–37.
- Seddon, D., Adhikari, J., Gurung, G., 2002. Foreign labor migration and the remittance economy of Nepal. *Crit. Asian Stud.* 34 (1), 19–40.
- Sen, A., 1993. *Capability and well-being*. In: Hausman, D.M. (Ed.), *The Philosophy of Economics: an Anthology*. Cambridge University Press, New York.
- Sharrock, J., 2013. Stability in transition: development perspectives and local politics in Nepal. *Eur. Bull. Himal. Res.* 42, 9–38.
- Shrestha, P.M., 2012. **Government Moves against Undervaluing Land Transactions**. *The Kathmandu Post*. Retrieved 02 February, 2015, from <http://www.ekantipur.com/the-kathmandu-post/2012/08/20/money/government-moves-against-undervaluing-land-transactions/238642.html>.
- Smith, D.R., Gordon, A., Meadows, K., Zwick, K., 2001. Livelihood diversification in Uganda: patterns and determinants of change across two rural districts. *Food Policy* 26 (4), 421–435.
- Sunam, R., 2014. Marginalised dalits in international labour migration: reconfiguring economic and social relations in Nepal. *J. Ethn. Migr. Stud.* 40 (12), 2030–2048.
- Tschakert, P., 2007. Views from the vulnerable: understanding climatic and other stressors in the Sahel. *Glob. Environ. Change* 17 (3), 381–396.
- Turner, B.L., Kasperson, R.E., Matson, P.A., McCarthy, J.J., Corell, R.W., Christensen, L., et al., 2003. A framework for vulnerability analysis in sustainability science. *Proc. Natl. Acad. Sci.* 100 (14), 8074–8079.
- UNDP, 2014. *Human Development Report 2014 (Technical Note)*. United Nations Development Program, New York.
- UNRCHCO, 2013. *Independence of the NGO Sector? A Case Study from Selected Eastern Districts*. United Nations Resident and Humanitarian Co-ordinator's Office. Field Bulletin, Issue no: 32.
- USDA, 2015. **Six-item Short Form of the Food Security Survey Module**. Retrieved 2 Feb, 2015, from <http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/survey-tools.aspx>.
- Von Braun, J., Pandya-Lorch, R., 1991. *Income Sources of Malnourished People in Rural Areas: Microlevel Information and Policy Implications*. International Food Policy Research Institute (IFPRI).
- Wilbanks, T.J., 2003. Integrating climate change and sustainable development in a place-based context. *Clim. Policy* 3 (Suppl. 1), S147–S154.
- Woldenhanna, T., Oskam, A., 2001. Income diversification and entry barriers: evidence from the Tigray region of northern Ethiopia. *Food Policy* 26 (4), 351–365.
- World Bank, 2015. **Arable Land (hectare per person)**. Retrieved 31, March, 2015, from <http://data.worldbank.org/indicator/AG.LND.ARBL.HA.PC/countries?display=default>.
- Xu, J., Grumbine, R.E., Shrestha, A., Eriksson, M., Yang, X., Wang, Y., Wilkes, A., 2009. The melting Himalayas: cascading effects of climate change on water, biodiversity, and livelihoods. *Conserv. Biol.* 23 (3), 520–530.
- Zhang, X., Li, G., 2003. Does guanxi matter to nonfarm employment? *J. Comp. Econ.* 31 (2), 315–331.

