Withdrawning, Resisting, Maintaining and Adapting: Food Security and Vulnerability in Jumla, Nepal

Kamal Raj Gaire

Submitted in total fulfilment of the requirements of the degree of Doctor of Philosophy
January 2015

School of Ecosystem and Forest Sciences
The University of Melbourne
Abstract

Food security discourse, since the inception of the term in 1974, has shifted from a narrow focus on food supply to a greater consideration of access, entitlements and sustainability. An emphasis on vulnerability has coincided with increased recognition that the causes of food insecurity are the result of a complex interaction between ecological, social, political and economic events and processes. Vulnerability has been used differently within various theoretical traditions and especially in food security literature. Key theoretical perspectives and approaches applied to the concept of food insecurity and vulnerability include: productivism, sustainable livelihoods (Chambers & Conway 1992), entitlements (Sen 1981) and political ecology (Blaikie & Brookfield 1987; Bohle, Downing & Watts 1994; Watts & Bohle 1993). In recent times, there have been attempts to utilise concepts from a social-ecological systems approach in describing vulnerability to food insecurity (for example see Ericksen 2008). In this research study, an entitlements perspective is applied to identify and describe inequalities and how power structures and processes of marginalisation are operating in communities. Ideas from the sustainable livelihoods approach were drawn upon to understand how and why people can or cannot combine resources, and how strategies are adapted to opportunities and to the nature of risks and hazards. Political ecology further enabled an analysis of vulnerability and issues of power at multiple scales. Finally, a social-ecological lens provided an opportunity to examine relationships between society and ecology. Thus, an integrated and differentiated perspective on food security is developed and applied in this study.

Understanding the strategies that people employ to respond to multiple risks and hazards is critical to identifying pathways for change towards greater food security. In this research study, people’s explanations of and responses are explored in the context of changes to their livelihoods and the wider social-ecological system in which they are embedded. The integrated vulnerability framework, drawing on a social-ecological systems approach, was applied to structure data collection, analysis and discussion in the food insecure region of Jumla in Nepal. Jumla is a rugged high altitude mountainous landscape in the poorest region of Nepal located in the mid-west.
Livelihoods in Jumla are largely subsistence oriented, made up of small family farms. Society is historically stratified according to caste, livelihoods, gender and place. With the recent construction of a road connecting Jumla to the rest of the country, there is an increasing trend towards integration of local, regional, national and international economies of food and agriculture.

Using in-depth interviews, focus groups and historical data, this study examined negotiation processes, decision-making, actions and interactions within social-ecological practices and processes. I began with the lived experiences of people within the context of a multi-scale social-ecological system. I considered coping, adaptation, and vulnerability as defined by farmers, residents, government officials and extension workers in the rural mountains of Jumla. Four distinct narratives and responses emerge from the diverse risks and social-ecological conditions that expose the complexity of coping and adaptation to food insecurity, each with different implications for individual and collective long-term well-being and sustainability.

People are variously and sometimes concurrently withdrawing, resisting, maintaining and/or adapting to food insecure situations. These stories reveal the complexity of managing the lived experience of food insecurity. The evidence presented in this research is that Jumla is food insecure but this is so only for some people, in certain places and at certain times. Government policies consider Jumla’s food insecurity as being only a problem of too little production and focus on improving agriculture as ‘the sole solution’ to food insecurity. Food security is also mistakenly understood by many department policies as food preference.

It is through understanding the diverse narratives and practices of coping with and adapting to food insecurity that opportunities which resonate more strongly with local social-ecological relations can emerge. These narratives highlight the need for adaptive policy responses and point towards pathways that are likely to contribute to greater food security. A paradigm shift in current food security thinking and practices is required for improving food security as part of a national integrated rural development program with context based implementation practices in local settings like Jumla. This thesis argues for policies and resources that support negotiated, differentiated and diverse coping and adaptation strategies. Specifically, Jumla
requires differentiated extension support for small farmers, dalits and women farmers. This could encourage diversity in farms, support improving livelihood options off the farm and at a national level—the implementation of a land reform program for fair and just access to land resources. Further institutional changes in this vein could ensure certainty of access to resources. These would contribute to a more sustainable use of ecological resources. Government policy could integrate divergent programs to make explicit possible interconnections among food security, climate change, agriculture, biodiversity, social security, gender, health and education outcomes. The importance of moving beyond a simple interpretation of food insecurity is that real food security reflects a whole of system, integrated landscape approach.
**Declaration**

This is to certify that:
- the thesis comprises only my original work towards the PhD,
- due acknowledgement has been made in the text to all other material used,
- the thesis is fewer than 100 000 words in length, exclusive of tables, maps, and appendices.

Kamal Raj Gaire

**Publications**


**Gaire, K**, Beilin, R & Miller, F, ‘It’s the policy, stupid? Exploring Nepal’s food security policies and their ability to address changing social-ecological systems’ (under review)
Dedication

For my father
Late Buddhi Sagar Gaire

who has been my constant source of inspiration
Acknowledgement

There were so many who readily offered their time and support to me during my candidature that I must pass on thanks to all and in the following I personally acknowledge a few.

First and foremost, I would like to extend my special thanks to my supervisors: principal supervisor Professor Ruth Beilin and co-supervisor Dr. Fiona Miller for their enormous support, insights and guidance in shaping this work to completion. I am indebted to them for their generous allocation of time to read my numerous drafts and for constant encouragement. They not only provided continuous guidance and advice, administrative and logistical support but also allowed me to develop a personally fulfilling topic of research. I more than appreciate Ruth’s forewarning in February 2011 about efforts, dedication and commitment required during a PhD journey. I would also like to thank Ruth for inviting me and my family to join her during Christmas and other family celebrations; by this you created a homely environment for me and my family. This made it easy for us to live in Australia—far away from and in a far different place to Nepal.

Thanks are due to the Australia Awards Program of the Government of Australia for providing the scholarship to pursue my PhD research at the University of Melbourne. I would not have been able to undertake this study without this financial assistance for which I feel incredibly privileged. I would also like to thank the Ministry of Agriculture Development, Government of Nepal for granting me the study leave. I am thankful to the department cartographer, Chandra Jayasuriya, for generously allocating time to help me in producing maps. I am grateful to Dr. Tamara Sysak for helping me in proofreading this thesis, without whom there would be many more typing errors and other flaws.

Thank you to all the people of Jumla. Especially to those who participated in interviews and focus group discussions to share your views, experiences, and practices. Government and non-government agencies working at local, regional and national
levels in Nepal also deserve a special ‘thank you’ for giving me the time and generously sharing the information that made this research possible. I cannot express how grateful I am for their generosity with time and information about experiences and practices that were not always easy to discuss. This research was only possible because of their insights. The extensive and often arduous field work would not have been possible without the help of Kamalesh Tiwari, Luma Nidhi Pandey, Bed Prasad Chaulagain, Tej Narayan Gaire, Aita Singh Gurung, Dhan Bahadur Kathayat, Kamal Mahat, Balak Ram Devkota and Dhan Devkota.

I am extremely grateful to my colleagues here in the Department of Resource Management and Geography who provided support during different stages of this research. I would particularly like to thank Nikki, Tarnya, Johanna, Basundhara, Prativa, Lisa and Rebecca for discussions regarding the different aspects of my thesis, sharing frustrations on some unfathomable theories and providing welcome distractions.

Finally, I would like to thank my family; my wife Bhumika, daughter Anushka and son Anurag. Their bearing, patience, support and sharing of pressure during the course of study have been instrumental in completing this thesis. Thank you Bhumika for the unfathomably boundless support and encouragement you provided through one of the greatest and most rewarding challenges of my life. I would like to remember my father who passed away just a month before I commenced my post-graduate studies. You have been a constant source of my inspiration to work hard; I have not yet come across anyone who understands the value of education more than you. I am also thankful to my mother and other family members back in Nepal for their love and moral support.
Table of Contents

Abstract ............................................................................................................................ i
Declaration ...................................................................................................................... v
Dedication ..................................................................................................................... vii
Acknowledgement ......................................................................................................... ix
Table of Contents ........................................................................................................... xi
List of Figures ............................................................................................................... xv
List of Tables .............................................................................................................. xvii
Acronyms ..................................................................................................................... xix

Chapter 1: Overview of the context and rationale for the research ............................... 1
  1.1 Background ........................................................................................................... 1
  1.2 Research questions and methodology ................................................................... 7
  1.3 Purpose of the study .............................................................................................. 9
  1.4 Thesis outline ...................................................................................................... 10

Chapter 2: Framing food: towards a systems approach to the political ecology of food security .......................................................................................................................... 13
  2.1 Introduction ......................................................................................................... 13
  2.2 Evolution of paradigms in food security studies ................................................. 14
  2.3 Vulnerability paradigms in food security analysis .............................................. 22
      2.3.1 Productivism and vulnerability to food insecurity ....................................... 23
      2.3.2 Sustainable livelihoods perspective ............................................................. 25
      2.3.3 Entitlements perspective .............................................................................. 31
      2.3.4 Political ecology perspective ........................................................................ 35
      2.3.5 Resilience thinking ....................................................................................... 39
  2.4 Integrating approaches: Theoretical framework of the study ............................. 45
  2.5 Summary ............................................................................................................. 47

Chapter 3: Research approach and methodological framework: a qualitative case study ...................................................................................................................................... 51
  3.1 Introduction ........................................................................................................... 51
  3.2 A qualitative approach ........................................................................................ 51
  3.3 Case study ........................................................................................................... 54
## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1.1</td>
<td>Framework for understanding risks and hazards and coping and adapting to food insecurity within Jumla social-ecological systems</td>
<td>9</td>
</tr>
<tr>
<td>Figure 2.1</td>
<td>The causal structure of vulnerability</td>
<td>37</td>
</tr>
<tr>
<td>Figure 3.1</td>
<td>Map showing mid-western hills and mountain districts of Nepal visited during scoping visits</td>
<td>60</td>
</tr>
<tr>
<td>Figure 3.2</td>
<td>A dalit respondent in a remote Jumli village of Kanakasundari, Jumla</td>
<td>65</td>
</tr>
<tr>
<td>Figure 3.3</td>
<td>Mixed gender focus group discussion in a remote village of Taliyum, Jumla</td>
<td>68</td>
</tr>
<tr>
<td>Figure 3.4</td>
<td>List of key social-ecological changes produced from a women only focus group discussion</td>
<td>69</td>
</tr>
<tr>
<td>Figure 3.5</td>
<td>Observations while having tea at a nearby tea shop</td>
<td>70</td>
</tr>
<tr>
<td>Figure 3.6</td>
<td>Farmer participant from a remote and higher altitude village of Guthichaur, Jumla</td>
<td>73</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>Map of Nepal showing three ecological zones</td>
<td>81</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>Map of Jumla showing 30 villages in four daras</td>
<td>103</td>
</tr>
<tr>
<td>Figure 4.3</td>
<td>Topographic map of Jumla district showing altitude and villages</td>
<td>104</td>
</tr>
<tr>
<td>Figure 4.4</td>
<td>Production of major cereal crops (in ton) in Jumla</td>
<td>114</td>
</tr>
<tr>
<td>Figure 4.5</td>
<td>Jumla’s relationship with the rest of the ‘world’</td>
<td>116</td>
</tr>
<tr>
<td>Figure 5.1</td>
<td>Total winter rainfall in Khalanga meteorological station, Jumla</td>
<td>122</td>
</tr>
<tr>
<td>Figure 5.2</td>
<td>Total annual rainfall in Khalanga meteorological station, Jumla</td>
<td>122</td>
</tr>
<tr>
<td>Figure 5.3</td>
<td>Cabbage butterfly infestation in Jumla</td>
<td>123</td>
</tr>
<tr>
<td>Figure 5.4</td>
<td>Variation of mean annual maximum temperature of Jumla</td>
<td>124</td>
</tr>
<tr>
<td>Figure 5.5</td>
<td>Variation of mean annual minimum temperature of Jumla</td>
<td>125</td>
</tr>
<tr>
<td>Figure 5.6</td>
<td>Woman carrying bedding materials for livestock from far away forest in Tatopani, Jumla</td>
<td>128</td>
</tr>
<tr>
<td>Figure 5.7</td>
<td>Women at work in Jumla</td>
<td>137</td>
</tr>
<tr>
<td>Figure 6.1</td>
<td>Framework for understanding coping and adaptation to food insecurity within Jumla’s social-ecological system</td>
<td>146</td>
</tr>
</tbody>
</table>
Figure 6.2  Cultivation on encroached forestland in \textit{Kudigaun} village of Jumla

Figure 6.3  Brand Jumla Apples

Figure 6.4  Visiting guest welcomed with apple garland in Jumla

Figure 6.5  Women performing agronomic operation in apple orchard

Figure 6.6  Women selling vegetables in the local market

Figure 7.1  \textit{Dalit} man performing his traditional job of sewing cloth in a remote village of \textit{Kanakasundari}

Figure 7.2  \textit{Guchchichya}u in natural habitat

Figure 7.3  \textit{Yarchagumba} in processed (dried) form

Figure 7.4  An old person preparing yarn for blanket making while caring for his grandchildren in a remote village of Jumla

Figure 7.5  Carpenters making wooden doorframes for a new school building in \textit{Sinja}, Jumla

Figure 7.6  Wooden bridge build by the community in a remote village of \textit{Urthu}, Jumla

Figure 7.7  Members of women farmers groups on an apple orchard management training program

Figure 7.8  Improved cooking stove in a Jumli house
List of Tables

Table 2.1 A food regime/food movement framework 21
Table 2.2 Evolution of coping capacity and adaptive capacity definitions 28
Table 2.3 Key concepts drawn from each of five vulnerability perspectives associated with food security studies 48
Table 3.1 Flow diagram summarizing connection among theory, research aim, methods and data needs in this research 57
Table 3.2 Breakdown of community members interviewed by gender, caste groups and by location of their neighbourhoods 74
Table 3.3 Breakdown of service providers interviewed 74
Table 3.4 Codebook 76
Table 4.1 Key features of agriculture and food security in Nepal 85
Table 4.2 Key statistics on Nepal’s poverty, education, health and income situation 86
Table 4.3 Comparison of key human development indicators among different caste groups and gender 88
Table 4.4 Nepal’s key policies related to food security enhancement 92
Table 4.5 Comparison of Mid-west Mountain region’s key socio-economic indicators with national averages 100
Table 4.6 Key human development indicators of Jumla in comparison to national figures 105
Table 4.7 Population by caste groups in Jumla 108
Table 4.8 Time line of key historical events that have potential implications in Jumla’s food security situation 110
Table 5.1 Nature of risks/hazards in their order of importance according to Jumli respondents that interact with their food security 120
Table 5.2 Change in population of Jumla 126
Table 5.3 Seasonal food security calendar for Jumla 129
Table 5.4 Change in cropping seasons in Jumla showing planting and harvesting time of major crops in different altitudes 133
Table 6.1 Classification of coping and adaptation strategies 144
| Table 6.2 | Areas of spending by an average Jumli household | 148 |
| Table 6.3 | Number of people living with disability by types of disability and gender in Jumla | 155 |
| Table 6.4 | A representative cropping calendar for irrigated land in low altitude areas of Jumla | 182 |
| Table 7.1 | Amount of subsidized food grains provided to Jumla through NFC | 191 |
| Table 7.2 | Major sources of food, food items and mode of obtaining these sources in Jumla | 196 |
| Table 7.3 | Reasons for abandoning cultivation of *chino* and *kaguno* with their order of importance | 198 |
| Table 7.4 | List major wild food people in Jumla consumed at some points in their lives | 199 |
| Table 7.5 | Major sources of income and participants’ perception on their overall performance in recent time in Jumla | 201 |
| Table 7.6 | Major NTFPs that people involved in collection and selling in Jumla | 203 |
### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APP</td>
<td>Agricultural Perspective Plan</td>
</tr>
<tr>
<td>ARP</td>
<td>Agricultural Resource Persons</td>
</tr>
<tr>
<td>DADO</td>
<td>District Agriculture Development Office</td>
</tr>
<tr>
<td>DLSO</td>
<td>District Livestock Service office</td>
</tr>
<tr>
<td>DFO</td>
<td>District Forest Office/Officer</td>
</tr>
<tr>
<td>DDC</td>
<td>District Development Committee</td>
</tr>
<tr>
<td>DOHM</td>
<td>Department of Hydrology and Meteorology</td>
</tr>
<tr>
<td>FED</td>
<td>Food Entitlement Decline</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>GON</td>
<td>Government of Nepal</td>
</tr>
<tr>
<td>HDI</td>
<td>Human Development Index</td>
</tr>
<tr>
<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
</tr>
<tr>
<td>JT</td>
<td>Junior Technician</td>
</tr>
<tr>
<td>JTA</td>
<td>Junior Technical Assistant</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MOAD</td>
<td>Ministry of Agriculture Development</td>
</tr>
<tr>
<td>MOF</td>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>MOFSC</td>
<td>Ministry of Forest and Soil Conservation</td>
</tr>
<tr>
<td>MSLE</td>
<td>Melbourne School of Land and Environment</td>
</tr>
<tr>
<td>NARC</td>
<td>National Agriculture Research Council</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-government Organization</td>
</tr>
<tr>
<td>NFC</td>
<td>Nepal Food Corporation</td>
</tr>
<tr>
<td>NPC</td>
<td>National Planning Commission</td>
</tr>
<tr>
<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
</tr>
<tr>
<td>PRA</td>
<td>Participatory Rural Appraisal</td>
</tr>
<tr>
<td>SES</td>
<td>Social-Ecological Systems</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations International Children’s Emergency Fund</td>
</tr>
<tr>
<td>UNOCHA</td>
<td>United Nations Office for the Coordination of Humanitarian Affairs</td>
</tr>
<tr>
<td>VDC</td>
<td>Village Development Committee</td>
</tr>
</tbody>
</table>
Chapter 1: Overview of the context and rationale for the research

1.1 Background

Motivation to pursue this research study arises from my career as an extension worker working with small farmers living in remote areas of Nepal. While working as an extension worker, I witnessed people’s desperation in a bid to secure their livelihoods. I have listened to life stories of people speaking of their inability to provide meals to their hungry and ailing children. Stories of how they walked a whole day to get just ten kilograms of rice being distributed by the government in the form of food aid. I have also met and listened to the story of people embarking on local buses headed for Indian states for casual job opportunities and understand how it feels leaving loved ones alone, as I have done it before. Working with these ‘voiceless’ people also resonates with a bold decision my father made some 50 years ago. It made me think of the real reasons why my father would have decided to abandon the beautiful, cool hills of his birthplace and migrate to live in the hot, humid and malaria-prone plains of the country. I never bothered to talk to him about this when he was alive.

As an extension worker, I have also come across a number of food security plans and programs, formulated one after another to improve the dire food security situation in many parts of the country. I do not recall any budget speeches read in Parliament by the country’s finance ministers that failed to mention the Government’s commitments to enhance the food security situation. However, I have witnessed these plans, programs and actions failing to bring about their intended changes in people’s lives in Nepal’s remote areas. While writing this thesis, the Government of Nepal has made yet another reiteration in Parliament of their high level commitment to food security (GON 2014).

Apart from feeling guilty that the programs I have helped implement failed to bring about the intended changes in people’s lives, I have continuously asked myself why some people are food insecure while others are not. As I continued working at different places that bestowed me with opportunities to listen to the life stories of even
more people, I became more and more convinced that until I have an answer to this question I cannot ‘help’ others realise their food security.

Undernourishment and chronic and acute hunger are widespread in many parts of the world (FAO 2011, 2012). Over 900 million people were identified as hungry on our planet in 2013 (FAO 2013), with the latest Intergovernmental Panel on Climate Change (IPCC) report identifying food insecurity as the greatest risk facing humankind today (IPCC 2014). Conservative estimates from 2008 indicate some 6.9 million, out of close to 27 million, people in Nepal are food insecure (UNOCHA 2008) and that over 49% of Nepalese children under the age of five are malnourished (NPC 2010c). The latest IPCC report has warned that the regions with already high food insecurity and high inequality are at greater risk from the impacts of climate change (IPCC 2014). This is so despite tremendous gains in the productivity and efficiency of food systems in recent decades that have contributed to the world having more than enough food in aggregate to feed its population (Ericksen 2008; Millstone 2010). The recent global food crisis experienced in 2008 has further exposed the failure of current approaches (thinking, policies and practices) in addressing the problem of food insecurity and has provided a fresh impetus to sharpen our attention on food security issues (McMichael & Schneider 2011).

The term ‘food security’ was reportedly first used by US President Roosevelt in his State of the Union speech in 1941, however, the term really only came into the spotlight after the World Food Conference in 1974 (Devereux et al. 2004; Maxwell 2001). Since its inception in 1974, the focus and emphasis on the definitions of ‘food security’ have undergone several twists and turns. A number of advances have been made both in theory and practice to understand and address this issue of food security. There is an increasing recognition in theory (both in food security and other related bodies of literature such as vulnerability) that production alone is not a sufficient precondition for food security. Scholars are increasingly emphasising access to food (Sen 1981) and sustainability (Chambers & Conway 1992) as core aspects of food security following the emergence of entitlement and sustainable livelihoods approaches, respectively. With empirical evidence that the global process of climate
change is threatening food security (IPCC 2014), scholars are arguing that ecology needs to be one of the ‘cores’ in food security enhancement endeavours as recognised in political ecology’s attempt to address this gap in food security studies (Blaikie & Brookfield 1987; Bryant 1992; Robbins 2012). Changes to the climate system are resulting in an increase in the frequency and intensity of extreme weather events such as droughts, storms, floods and heat waves, leading to food insecurity as a key risk facing humankind today (IPCC 2014). In addition to extreme events are processes and phenomena likely to be affected by climate change including sea level rise, glacier melting, polar ice melting, changes in morphology, plant physiology, species distribution, community structure, ecosystem and species evolutionary processes in marine, freshwater and terrestrial biological systems, crop production patterns, infectious diseases and pests (Pachauri & Reisinger 2007). A recent development in theory and practice has seen the emergence of the idea of social-ecological resilience with an enhanced emphasis on ecological systems, their processes and relationships. Scholarship in this field advocates a social-ecological systems (SES) approach (Berkes & Folke 2000; Gunderson & Holling 2002; Walker et al. 2002), providing a lens by which to understand and address food insecurity in the context of coupled social and ecological processes.

These theoretical advancements have shaped the way food security is now conceptualised guiding subsequent food security planning. In practice, a global effort to combat hunger, as part of the Millennium Development Goal (MDG), has been implemented (Lal 2011). Most countries, especially developing ones, have formulated and/or reformulated their national development goals to include food security. With the conceptual development of food security and other related theories and practices, a number of theoretical approaches (such as sustainable livelihoods, entitlements) have been utilised to guide government and non-government policies in order to better understand and address food insecurity. Yet, these policies have had uneven outcomes in terms of achieving food security; food insecurity is still rampant in the world.

---

1 See especially Chapter 7 of the Working Group Two Volume on Impacts, Adaptation and Vulnerability
Leaders of the Himalayan country of Nepal consider that achieving food security is one of the country’s key development goals and have pursued a number of policies and plans to achieve this goal. Most of these plans, since the start of planned development in Nepal in 1956 with the launch of the first periodic (five year) plan, see the development of agriculture and providing food aid as solutions to food insecurity in Nepal. For example, the Ninth Five Year Plan (1997-2002) document states that ‘targets are set to provide food security by developing [the] agriculture sector’ (NPC 1997, Chapter 2, p. 34). Setting such targets in development plans has largely been the only action to address food insecurity in Nepal since the term food security entered the development lexicon despite expectations that the plans will transform into action on-going. Food insecurity in the Nepalese context is generally about skipping meals, reducing protein and fresh vegetable content, and a reliance on particular grains. It is also about uncertainty, debt, a request for handouts and a threat to people’s self-respect. Importantly food insecurity in Nepal is a gendered and frequently a caste based issue.

With advancement in food security and other associated theories, Nepalese food security related plans and policies have variously attempted to incorporate ideas from entitlements and livelihoods theory with the provision of food aid as a prime entitlement enhancement activity. For instance, the government categorised districts based on whether or not they were self-sufficient in food production. Many food deficit districts, including Jumla—where this research takes place - were then provided with food aid in different forms such as direct subsidies on food grains, transportation subsidies, and/or food for work (Adhikari 2008). A number of land reform programs were implemented; many of them were aimed at providing the landless and land-poor population with access to land (Willy, Chapagain & Sharma 2008). Nepalese policies similarly attempted to prioritise issues of poverty and livelihood improvement; although they continued to conceptualise food security as availability of food (NPC 2003). Later, and commendably, the Three Year Interim Plan (2007/8-2009/10) accepted in principle that food security is more than just availing food and promised to ‘outline necessary policies and programs…to reform the four main aspects of food security, which are, food availability, accessibility of food, proper use of food and food stability’ (NPC 2007, p. 86). However, despite such efforts, Nepal is ranked low in the
global human development index ladder (UNDP 2013) with food insecurity rampant in many parts of the country (NPC 2010a).

Despite the high level focus on improving agricultural production and productivity in Nepal, most of the subsistence family farms are not capable of supporting farm families. In 2013, for 60% of farming households, annual farm production was not sufficient to feed their household up until the next harvest, 40% of farming households were deficient for up to six months, while 20% of farming households were deficient in food production for more than half a year (CBS 2013c). In addition to this, food security is highly uneven across the country; the food security situation in remote, mountainous and rugged areas within Nepal is further deteriorating (NPC 2010a). For example, the Jumla landscape (the case study site) is a high altitude mountainous area experiencing extreme weather events and limited livelihood options, and is largely isolated from mainstream Nepalese society and economy. This region experiences many of the challenges mountainous regions confront in terms of remoteness, ecological and climatic change, and the transition from semi-subsistence to market oriented production (Beniston 2003; Shrestha & Aryal 2011). The Nepalese government regards it as one of the most food insecure parts of the country (NPC 2010a, 2010b). Historically rooted class, caste and gender based discriminations are entrenched, inhibiting people’s equal access to productive resources. Government policies that mainly focus on achieving agricultural growth and providing food aid to address food insecurity have not been able to bring about intended changes in the lives of people vis-a-vis food insecurity in Nepal. Flagship programs such as the 20 year Agriculture Perspective Plan (APP) implemented by the Ministry of Agriculture Development with financial and technical support from the World Bank and Asian Development Bank, land reform programs implemented by the Ministry of Land Reforms, food aid programs spearheaded by the World Food Program (WFP) and other donors have largely failed to address Nepal’s food insecurity situation (NPC 2010c); there has, nonetheless, been some improvements. The policies appear to have been unsuccessful in Nepal as they are not able to accommodate the social-ecological complexity shaping food insecurity. These policies have so far failed to comprehend the reality that people are often concurrently responding to multiple stresses; not only one. The compartmentalised nature of such policies is not able to address root causes
of food insecurity or understand the interaction of changing social-ecological processes at multiple scales. Policy and decision-makers and practitioners require an understanding and recognition that social and environmental systems together shape the context of food insecurity and that in order to be able to capture the complex relations between social and environmental systems an integrated approach to vulnerability analyses (Eakin & Luers 2006; Miller & Bowen 2013; Turner et al. 2003) associated with food insecurity is required. Such analyses, often termed a systems approach, are thus important to provide a nuanced understanding of the processes that influence vulnerability to food insecurity which ultimately assist in effectively anticipating, addressing and resolving the issue.

On a global scale, many food security experts have been arguing that global price rises (McMichael 2009; McMichael & Schneider 2011), land grabbing (Borras Jr et al. 2011; De Schutter 2011), bio-fuel production (Lang 2010; Naylor et al. 2007; Pickett et al. 2008) and climate change (Barnett 2011; Ericksen, Ingram & Liverman 2009; IPCC 2014) are the key processes influencing food security in recent times; others argue population growth and declining agricultural productivity (Beddington 2010; Funk & Brown 2009; Rosegrant et al. 2001; Trostle 2010) are the main culprits. However, Godfray and others (2010, p. 817) argue that production maximisation alone is not a solution to global food insecurity, but rather a more appropriate strategy is “to optimize across a far more complex landscape of production, environmental and social justice outcomes”. All these factors influence food security but to varying degrees depending on the context, and in this thesis I intend to lay out the complexity of the on-ground reality against the background of the literature.

Through this research study I aim to bring out issues concerning the pace of social-ecological change, power, inequality and discrimination that are at play in Jumla and contribute to an holistic understanding of the processes influencing vulnerability to food insecurity from the perspective and experience of local communities in the remote district of Jumla, Nepal. A better appreciation of this problem is crucial not only to improve Nepal’s food security situation, but also to contribute to the existing body of knowledge on food security.
1.2 Research questions and methodology

This research study aims to answer the following research questions:

1. According to local communities, what social and ecological processes influence their vulnerability to food insecurity?
2. How do local people describe/understand ‘vulnerability’ and ‘food insecurity’?
3. In the context of historical experience, how have changes to the food security situation influenced processes and interactions within the Jumla social-ecological system?
4. How do people (individuals, households, community leaders) cope with and respond to food insecurity?
5. What are the main factors people identify as differentiating their vulnerability?
6. How do local communities’ relationships with social-ecological systems influence the coping and response strategies that they employ and how have these changed over time?

In order to explore these questions I developed a vulnerability framework based on an integrated understanding of SES to structure data collection and analysis of food security in the mountainous landscape of Jumla, Nepal (Fig 1.1). In this framework, changes in the relationship between human and biophysical systems at multiple scales are investigated through a social-ecological lens underpinned by key concepts from vulnerability perspectives. Ideas from an entitlement perspective are utilised to identify and describe structural inequalities around food security and how power structures and processes of marginalisation operating in the community influence vulnerability to food insecurity. Ideas from a sustainable livelihoods perspective are utilised to understand how and why people can or cannot combine resources, and how strategies adapt to opportunities and the nature of shocks, trends and/or seasons. Finally, political ecology enabled an analysis of issues around power and vulnerability at multiple scales.

In order to integrate these issues in this research study, I begin with the lived experience of people within the context of a multi-scale SES. I consider coping,
adaptation, and vulnerability as defined by farmers, residents, government officials and extension workers in the rural mountains of Jumla. Understanding the coping and adaptation strategies that people employ to respond to risks and hazards is considered a critical part of providing a richer understanding of food insecurity (Barrett & Carter 2000; Chambers & Conway 1992; de Waal 1991; Ericksen 2008; Lambert 1994; Maxwell 1996; Maxwell 2001; Sen 1981). Four narratives emerge from the diverse risks and social-ecological conditions that expose the complexity of coping and adaptation to food insecurity, each with different implications for individual and collective long-term well-being and sustainability. These narratives show that people are variously, and sometimes concurrently, withdrawing, resisting, maintaining, and/or adapting to food insecure situations.

A case study methodology employing qualitative analysis of semi-structured interviews and focus group discussions with local community members and other stakeholders, together with participant observation and analysis of historical records, was employed to develop an historically informed, participatory and integrated understanding of social-ecological change. From in-depth interviews, focus group discussions, and meteorological and historical data, I analysed negotiation processes, decision-making, actions and interactions relevant to social-ecological processes and practices.
Fig 1.1: Framework for understanding risks and hazards and coping and adapting to food insecurity within Jumla social-ecological systems
(Note: global, regional and local pressures do not correspond to trends, seasonal changes and shocks respectively; a trend may be local and a shock may be global)

1.3 Purpose of the study

Maxwell (1996) distinguishes between three purposes for research projects: personal, practical and research. The personal motivation for this study arises from my career as an extension worker working with small farmers living in remote parts of Nepal. In those places I witnessed ‘food insecurity’. I saw families failing in their attempts to secure food for themselves to live dignified and healthy lives. This research provides an opportunity to understand processes influencing food insecurity of one of the most underprivileged populations of the world.

The practical purpose of this study is to contribute to the existing body of knowledge on food security by providing a better understanding of the issues. Information from
this thesis can be used to identify vulnerabilities in the community. This can inform policies and programs to help communities adapt to changing conditions. Implementation of such informed policies is critical in addressing this global problem of food insecurity.

The research aim is to present a case study analysis of processes influencing vulnerability to food insecurity from the perspective and experience of local communities. I do this by using a vulnerability approach integrating a social-ecological systems perspective to analyse the relationship between human and bio-physical aspects of the system.

### 1.4 Thesis outline

Following this introductory overview of the context and rationale for the research, **Chapter Two** reframes food through a systems approach to the political ecology of food security. It reviews conceptual developments in food security and related theories and identifies key gaps in the literature that underpin the research questions. The chapter starts by reviewing the evolution of the concept of food security. It then reviews a parallel and related body of literature on vulnerability to appreciate how different paradigms in vulnerability studies have been utilised to study food security at different scales; strengths and weaknesses of five different vulnerability perspectives are highlighted as a way of understanding and appreciating the ability of these in unraveling the complexity associated with food security. The chapter identifies important structural and contextual issues that influence food security, concluding with the presentation of the social-ecological framework that captures the political ecology of food applied in this case study research.

**Chapter Three** extends the theoretical stance of this research and demonstrates how this informs the study’s methodology. The chapter outlines the multiple methods used in data collection including in-depth interviews, focus group discussions and historical analyses. Rationale for the selection of the case, choosing particular methods used in collecting and analysing data and research participant selection is described followed by my data analysis process. An integrated vulnerability framework, drawing on a
social-ecological systems approach, is applied in this research to structure data
collection, analysis. Using in-depth interviews, focus groups and historical data, I
examine negotiation processes, decision-making, and interactions within social-
ecological practices.

Chapter Four provides the context for this research. It introduces both Nepal, as the
wider context of the study, and the case study area, in terms of wider structural issues
that are influencing the food security situation. Geography, political ecology, political
economy including livelihoods and entitlement, local food systems and food and
agricultural policies of Nepal with particular attention to Jumla are discussed. It
highlights how particular aspects of ecology, climate, and political economy are
influencing the food security situation in Jumla.

Chapter Five discusses how people in Jumla are negotiating vulnerability to food
insecurity. This chapter describes the key social-ecological processes that locals think
influence their vulnerability to food insecurity and analyses how these identified
processes are changing over time. It attempts to draw out links and interconnections
among these social-ecological risks and hazards. It is apparent that wider scale climatic
changes and local social changes as well as food insecurity emerge as the most
prominent risks in people’s everyday lives. Changes in these social-ecological
processes are transforming the risk landscape in Jumla. Since the extent to which
people are able to anticipate, prepare, cope, and adapt to change largely determines the
level of vulnerability people experience, this chapter also examines the main factors
people identify as differentiating their vulnerability to food insecurity. I argue that the
risk landscape in Jumla is changing as a result of wider climatic changes as well as
more local social changes. Historically persistent social structures have produced
multidimensional inequalities in the Jumla social landscape and such inequalities, in
turn, have contributed to the creation of uneven conditions of vulnerability.

Chapter Six revisits some earlier works (in the literature) in coping and adaptation to
food insecurity and reframes key concepts from this literature within the context of a
changing social-ecological system. In this chapter I argue that a more nuanced
appreciation through an integrated analysis of different strategies people pursue is
important to refining responses to food insecurity in ways that address its causes within the context of their social-ecological systems. This chapter outlines four narratives of coping and adapting to food insecurity and details the first two narratives, withdrawing and resisting, in terms of how people respond to food insecurity. It identifies the social groups who employ these strategies and why. The chapter unravels complexities around food security and how local communities’ relationships with social-ecological systems influence their coping and response strategies. It also investigates how changes to food security situations, in turn, have influenced processes and interactions within local social-ecological systems.

Chapter Seven discusses the remaining two narratives, maintaining and adapting to food insecurity. Taken singly or together, these coping and adaptation strategies highlight the complexities around and within the Jumli food system and locate the food system within the wider Jumli landscape of the forest and district. The chapter describes people’s endeavours to fight food crises both in individual and collective ways and how their strategies have changed concurrently with changes in local social-ecological realities. It investigates why certain strategies are helpful to certain groups of people but not sufficient, and sometimes even disadvantageous, to others. Given the fact that people are reliant on off-farm ecological resources for their livelihoods and that availability of these off-farm resources is declining as a result of changes in regional social-ecological processes and multi scalar interactions, I argue that considering food security from a wider social-ecological systems perspective, rather than a farming systems perspective alone, is important in Jumla.

The concluding Chapter Eight reviews and further elaborates on the key findings from the research. The primary theoretical contribution of the research is presented—integrating ideas from vulnerability with a social-ecological systems approach in food security studies. It proposes a framework for food security analysis that takes better account of changing social-ecological systems. The chapter concludes by discussing limitations of the finding as well as potential avenues for future research.
Chapter 2: Framing food: towards a systems approach to the political ecology of food security

2.1 Introduction

Different paradigms generate different theoretical perspectives and frameworks and these have been utilised to understand and address food insecurity at different scales. Despite efforts both in theory and practice, global food insecurity is one of the most striking problems humankind currently faces. The recent global food crisis in 2008 exposed the failure of current approaches in addressing food insecurity (McMichael & Schneider 2011). Food insecurity is generally regarded as a problem of developing countries but even in industrialized countries certain demographic groups still experience food insecurity (Tansey 2002). Some parts of the world struggle with responding to diseases associated with over-consumption, other parts of the world deal with problems of under-consumption. In this chapter, I begin with a review of the attention food security has received internationally in contemporary development efforts followed by a discussion of the evolution of the concept. Alternative conceptualizations of food security from food justice and food sovereignty perspectives are discussed to appreciate the constructive and empowering way food is considered, coupling food with wider issues of power, control and justice, within food movements.

I then review how food security, hunger and famine have been studied locally, regionally and globally, with a focus on vulnerability analysis. Five different perspectives are identified. The strengths and weaknesses of each of these different perspectives on vulnerability are explored as a way of understanding and appreciating the ability (and inability) of these perspectives in unraveling the complexity of food insecurity. I then discuss the interaction of these ideas with the concepts informing resilience (a social-ecological systems approach) in social science. The section concludes by deriving a social-ecological framework that takes an integrated and systems based approach whilst capturing the political ecology of food for application in the case study research.
2.2 Evolution of paradigms in food security studies

Increased productivity and efficiency of food systems in recent decades have contributed to the world having more than enough food in aggregate to feed its population (Ericksen 2008; Millstone 2010; Nellemann et al. 2009). Despite this fact, food insecurity is still widespread in many parts of the world and the experience of food insecurity is highly uneven (FAO 2011, 2012, 2013). The latest IPCC report identifies food insecurity as the greatest risk facing humankind today (IPCC 2014). Consequently, halving hunger by 2015 has been an important part of the first Millennium Development Goal (Rossouw & Webber 2011), as agreed upon at the United Nations Millennium Summit in 2000 by some 192 countries. Although food security is firmly embedded within the global development agenda, competing explanations and approaches persist within this literature at a number of scales. It is important to draw out the potential of existing approaches, and highlight possibilities for a more comprehensive understanding of interactions contributing to food insecurity at local levels. This will better inform interventions if they are responding to the complexity inherent to all levels of engagement.

Food security, as a concept, has evolved since the mid-20th century after the World Food Conference in 1974 (Devereux et al. 2004; Maxwell 2001). The focus and emphasis within definitions of the term ‘food security’ has undergone several twists and turns since its inception (Devereux et al. 2004; Maxwell 2001). Such evolution, as described by Maxwell (2001), encompasses three main changes: i) a shift from global and national food security to the household and individual scale; ii) a shift from a ‘food first’ perspective to a livelihood perspective, and iii) a shift from objective indicators to subjective perception (p. 14). Each of these shifts in thinking has had implications for policies and programs associated with food insecurity. These ideas influenced this research study as from the beginning I focused on exploring people’s perception and understanding of food security in order to gain an holistic understanding of people’s relations with food. Consistent with these ideas, I argue that food security can only be addressed if we tackle wider inequalities present in society.
Food security definitions before 1980 focused on food supply, national food self-sufficiency and maintaining food stocks (Devereux et al. 2004). For example, the United Nations (UN) defined food security in 1975 as the availability:

…at all times of adequate world supplies of basic food-stuffs…., to sustain a steady expansion of food consumption….and to offset fluctuations in production and prices (UN 1975 cited in Maxwell 2001, p. 14)

This definition lost currency with the findings that hunger could occur amidst adequate food supply at the national and global level (Sen 1981). After 1981, the emphasis broadened from ‘food availability’ to include ‘access to food’ and refocused from the global and national scales to that of the household and individual (Devereux et al. 2004). This rescaling was important in order to better understand the differentiated nature of food security, rather than analysis of food security in aggregate terms, thus allowing inequality and particular circumstances to be revealed. This paradigm shift places access to food at centre stage and can be seen in this oft cited definition from the World Bank: ‘Food security is access by all people at all times to enough food for an active, healthy life’ (World Bank 1986, p. 1).

The second marked shift in understanding the meaning of ‘food security’ can be seen after 1985 when scholars, for example de Waal (1991), demonstrated that ‘people are quite prepared to put up with considerable degrees of hunger, in order to preserve seed for planting, cultivate their own field or avoid having to sell an animal’ (p. 68). The conventional view within food security policy to that point—that food is the most primary need—was questioned. This change largely recognised that enhancing food security is only one of the many livelihood objectives that people pursue (Chambers 1989). Oshaug (1985 pp. 5-13) cited in Maxwell 1996, p. 158) reflects these concerns when they write:

…a society which can be said to enjoy food security is not only one which has reached (a) food norm, … but which has also developed the internal structures that will enable it to sustain the norm in the face of crises threatening to lower the achieved level of food consumption.
A further shift is an increasing scholarly interest shown towards subjective food security analyses recognising the role of culture in influencing individual preferences. Some scholars focused on the subjective dimensions of food security (Maxwell 2001) because the objective dimension of ‘rating’ food security could not accommodate issues of cultural acceptability, human dignity, self-respect or even autonomy and self-determination in their analyses highlighting the importance of socio-economic, cultural and political contexts (Watts & Bohle 1993). The traditional food security analyses had relied totally on objective indicators, such as the calorie target of consumption. According to this measure, food security was confined to a particular level of calorie intake per person (Frankenberger 1992). Evaluations of food security situations from 1990 onwards began to include subjective issues as mirrored in local understandings and perceptions of food security problems, lack of choice, feelings of deprivation and social acceptability (Frankenberger 1992). Parallel work on participatory processes also enabled advancement in subjective food security indicators (Chambers & Conway 1992). As a result the ‘quality of food entitlement’ not just its quantity begins to emerge in food security discourse (Frankenberger 1992).

This entry of subjective evaluation triggered a paradigm shift, which according to Maxwell (2001), changed the food security agenda and by implication food security policy and priority setting. Including access, acknowledging the complexities of livelihood strategies in uncertain environments, food preferences, and food security perceptions enriched understandings of local differences and directed attention to the most vulnerable within each site. The implication of this is the need for stronger engagement with food in its social and cultural context. According to one influential definition, food security is achieved when:

…all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (FAO 1996, p. 1)

Food is thus defined as any substance that people eat and drink to maintain life and growth. From this definitional point of view, food security entails four dimensions: availability, access, utilisation and stability (FAO 1996). Households may become food insecure through one or more failures in these four dimensions (Maxwell 2001).
Food availability refers to the physical existence of food, be it from one’s own production or through the markets (Barnett 2011). On a national level, food availability is a combination of domestic food production, commercial food imports, food aid, and domestic food stocks. The term ‘availability’ is often used confusingly, since it can refer to food supplies available at both the household level and at a regional or national level. However, the term is applied most commonly in reference to food supplies at the regional or national level (Maxwell 2001).

For a population to be food secure, available food has to be accessible physically and economically (Sen 1981). Access is ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods for a nutritious diet. Physical access largely depends on the distribution network of the market while economic access is dependent on level of income and price structure (Barnett 2011; Riely et al. 1995). Access on the whole is dependent on the level of household resources—capital, labour, and knowledge—and on price. As mentioned above, access can be achieved without households being self-sufficient in food production. Riely and others argue that the ability of households to earn sufficient income is becoming increasingly important in order to meet their food needs (Riely et al. 1995). Food utilisation is about the ability of a person to utilise the food she/he consumes. It encompasses food safety, preparation/processing of food and general health status of the individual (Ericksen 2008; FAO 2011).

The ‘at all times’ aspect of the concept of food security refers to the stability or sustainability of the other three food security factors, i.e. it’s temporal dimension. A distinction is made between chronic food insecurity—the inability to meet food needs on an ongoing basis—and transitory food insecurity—the inability to meet food needs is a temporary phenomenon (Barnett 2011; Maxwell & Frankenberger 1992). Transitory food insecurity is sometimes divided into two subcategories: cyclical—when there is a regular pattern to food insecurity, e.g. the ‘lean season’ that occurs before harvest, and temporary—which is the result of a short-term, exogenous shock such as droughts or floods (Maxwell 2001) or debt or ill-health. This suggests that to realise a food secure situation, all these—availability, access and utilisation—need to be present in a stable and enduring environment. Food security therefore, may depend
on policies and practices that strive for ways to maintain stability and absorb shocks as part of the food system. Wider scale processes that influence social-ecological systems such as environmental, political and economic changes also shape it.

Despite efforts to highlight the ‘access’ aspect of the concept of food security, the term has been dismissed by some scholars as a neoliberal project to control world food systems and promote market-based solutions to food needs (for example see Holt-Gimenez & Shattuck 2011). Others do not see a problem in the terminology as such but in the way it is applied (Carolan 2013). These scholars advocate alternative approaches to address food insecurity (Andrée et al. 2014; Boyer 2010; Carolan 2013; Holt-Giménez & Altieri 2012; Holt-Gimenez & Shattuck 2011; McMichael 2005; McMichael & Schneider 2011; Patel 2009; Schanbacher 2010). In their food regime/food movement framework (Table 2.1), Gimenez & Shattuck (2011, p. 117) argue that the current food security discourse, as presented in the Millennium Development Goal project, is a reformist agenda that reinforces the corporate food regime and associated political economic interests. They describe four discourses in contemporary food regime/food movement analyses corresponding with four trends, namely, neoliberal, reformist, progressive and radical. Each possesses different language, orientations, models and approaches. To briefly précis their argument: the four food regime/food movement discourses, which correspond to these trends, are: food enterprises, food security, food justice, and food sovereignty. They claim that the food security discourse has a development/aid orientation and inherently entails the maintenance of Northern agricultural subsidies. For example, the approach to the food crisis arising from this discourse is tilted toward genetically modified organisms ‘(GMOs)’ and ‘bio-fortified’ crops (Holt-Gimenez & Shattuck 2011). The food enterprise discourse has a corporate/global market orientation with focus on corporate concentration, unregulated markets; and promotion of monocultures in agriculture, GMOs and mass global consumption. As demonstrated in sections 6.5 (Chapter Six) and 7.2 (Chapters Seven) of this thesis, elements of these regimes are apparent in food security policies/programs in Nepal. On-ground evidence from this research indicates that the practical realities of Holt-Giminez and Shattuck’s (2011) concerns are present in many of the villages in Jumla—research site for this research.
The discourses of ‘food justice’ and ‘food sovereignty’ on the other hand highlight structural inequalities within the food system with the phrase ‘food justice’ focusing attention on local level inequalities such as caste, race, socio-economic status, and land ownership structure; and in ‘food sovereignty’ emphasis is on global or regional structural inequalities such as corporatisation of the food system, and the North-South divide. These discourses reflect empowerment and entitlement orientations respectively (Holt-Gimenez & Shattuck 2011). The emphasis on power and agency was highlighted earlier by McMichael (2005, p. 286) who argued that alternative ideas form the ‘premise for a genuine food security’. This enables people to have agency over their food and programs to respect the diversity of people and their choices (ibid). Politics of empowerment, however, are complex and the reception of new ways of responding requires capacity building. These discourses are overtly political in their analysis and orientation. They reveal the politics of food production, consumption and access, and the politics of efforts to address food security. This discourse strongly connects food to the ideology countering or underpinning development—a tension Nepal currently faces.

The food justice discourse is about empowering the poor, oppressed and under-served so that they can assert their rights over food, while also making explicit links to the concerns of environmental justice (Alkon & Norgaard 2009). It ‘links food insecurity to institutional racism and racialised geography, reshaping thinking within the fields of sustainable agriculture and environmental justice’ (ibid p. 300). Whereas the discourse of food sovereignty is about the ‘rights of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems’ (Via Campesina 2007, no pagination). Embracing agro-ecology and local/community based food systems (Holt-Gimenez & Shattuck 2011), food justice advocates for the protection of small farmers as a social-ecological need in promoting food security (McMichael & Schneider 2011). The orientation to the local scale is an explicit rejection of the global food economy on the grounds that globalisation is inherently inequitable and unsustainable (ibid).

These new discourses of food advocate a multifunctional role for agriculture as a key source of social-ecological sustainability (McMichael & Schneider 2011). In these
discourses, the right to food—locally and sustainably produced—is championed as the approach to address vulnerability to food insecurity (Andrée et al. 2014; Holt-Gimenez & Shattuck 2011; McMichael & Schneider 2011). The ‘right to food’ sounds like an easy solution to the complex realities on-ground in Nepal. Even the definition of ‘local’ and what it is to provide ‘sustainable’ food changed during the research process as the multiple ways that the respondents dealt with food insecurity emerged. In recognising this multiplicity of strategies I began to see how vulnerability itself needs redefining in the context of an integrated approach to the people and place. Food insecurity is not in isolation from other policies and actions of government or people and I discuss this further in Chapter Six, Seven and the Conclusion to this thesis.
Table 2.1: A food regime/food movement framework

<table>
<thead>
<tr>
<th>Politics</th>
<th>Corporate food regime</th>
<th>Food movements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neoliberal</td>
<td>Food Enterprise</td>
<td>Food Justice</td>
</tr>
<tr>
<td>Reformist</td>
<td>Food security</td>
<td>Empowerment</td>
</tr>
<tr>
<td>Discourse Orientation</td>
<td>Corporate/Global market</td>
<td>Development/Aid</td>
</tr>
<tr>
<td>Model</td>
<td>Overproduction; corporate concentration; unregulated markets and monopolies; monocultures; GMOs; agro-fuels; mass global consumption of industrial food; phasing out of peasant &amp; family agriculture and local retail</td>
<td>Mainstreaming/certification of niche markets; maintaining northern agricultural subsidies; ‘sustainable’ roundtables for agro-fuels, soy, forest products; market led land reform; microcredit</td>
</tr>
<tr>
<td>Appraoch to the food crisis</td>
<td>Increased industrial production; unregulated corporate monopolies; land grabs; expansion of GMOs; liberal markets; microenterprise; international sourced food aid; GAFSPF-the global Agriculture and Food Security Program</td>
<td>Same as neoliberal but with increased middle peasant production &amp; some locally sourced food aid; microcredit; more agricultural aid, but tied to GMO &amp; ‘bio-fortified/climate-resistant’ crops; Comprehensive Framework for Action (CFA)</td>
</tr>
</tbody>
</table>

Source: Adapted from Gimenez & Shattuck (2011, p. 117)
This review highlights that food security is a concept that has evolved over time. Historically, food security was understood as overall national, regional, or even global, food supply compared with requirements at varying scales. However, the increase in theoretical and empirical research using the concept of vulnerability has resulted in a shift from this conventional explanation to consideration of access and sustainability as core to ideas of ‘vulnerability’ (Blaikie et al. 1994; Chambers 1989; Maxwell 1996; Sen 1981). The emphasis on vulnerability in food security studies coincided with the increased recognition that the causes of food insecurity are not only natural but also social, political and economic (Burg 2008). This more complex, multi-dimensional understanding of vulnerability may assist in reframing the applicability and efficacy of the concept within assessments at all scales. Vulnerability has been used differently within various theoretical traditions (McLaughlin & Dietz 2008) and especially in the food security literature (Vogel et al. 2007), resulting in different emphases in analysis and action. The next section discusses the various vulnerability paradigms associated with food security studies in more detail in order to appreciate the ability (and inability) of these paradigms to unravel the complexity of food insecurity.

2.3 Vulnerability paradigms in food security analysis

The related and parallel body of literature on vulnerability contributes to shaping recent approaches to food insecurity (Miller et al. 2010; Vogel et al. 2007). Ideas from vulnerability have been frequently utilised in understanding food security issues and advancement in the theory of vulnerability has helped enrich the understanding of food security (Burg 2008). Key theoretical perspectives and approaches linked to the concept of vulnerability as it relates to food insecurity include: productivism, sustainable livelihoods (Chambers 1989; Chambers & Conway 1992), entitlements (Sen 1981) and political ecology (Blaikie & Brookfield 1987; Bohle, Downing & Watts 1994; Watts & Bohle 1993). Vulnerability perspectives have placed emphasis on the role of wider political economic factors, such as the development ideologies underpinning global and national food regimes and in shaping food insecurity. Importantly this has led to documenting the highly differentiated nature of food insecurity by class, gender, age, ethnicity, caste and other social cleavages that shape people’s (often highly unequal) access to food. Miller and Bowen (2013, p. 191) note
that each of these perspectives ‘allots different explanatory emphasis to the role of environmental processes, culture, power and political economic structures’ in vulnerability studies. As such, works in the area of disaster, livelihoods and poverty, food security and climate change have contributed to the concept of vulnerability (Miller & Bowen 2013). The next section discusses the strengths and weaknesses of these perspectives on vulnerability analysis; and also considers a relatively recent paradigm, resilience, as it relates to food security.

2.3.1 Productivism and vulnerability to food insecurity

Lowe et al. (1993, p. 221) conceptualise productivism as:

A commitment to an intensive, industrially driven and expansionist agriculture with state support based primarily on output and increased productivity. The concern [of productivism] was for modernization of national farms, as seen through the lens of increased production.

The productivist perspective largely views hunger and famine as the consequence of a decline in food availability and therefore food insecurity and hunger are primarily considered a natural phenomenon (Beddington 2010; Funk & Brown 2009; Rosegrant et al. 2001; Trostle 2010). Proponents of this view assume that millions of people are hungry because there is insufficient food available to feed everyone. This assumption has historically been associated with Thomas Malthus’s 1798 ‘Essay on the Principle of Population’ who argued that the pace of population growth would be higher than the pace of growth in agricultural production (Malthus 1798 cited in Maxwell 2001).

However food production has since grown faster than population growth (Millstone 2010), although the sustainability of current food production levels raises concerns about the interactions between food production and population growth, particularly as productivity gains have begun to slow.

The argument in the productivist explanation, as observed by Blaikie et al. (1994) is that natural events such as droughts, pests and floods cause crop failure or reduction in livestock production reducing the aggregate amount of food availability. The only way
to enhance food security, according to this explanation, is through an increase in agricultural production and productivity and controlling population growth. Such a perspective has led technical interventions that focus on: crop and livestock improvement, smarter use of water and fertilizers, new pesticides, reduction of post-harvest loss, use of biotechnology and nanotechnology (Beddington 2010). McLaughlin & Dietz (2008), in their discussion of vulnerability theory and assessment, parallel this productivist explanation to the biophysical perspective in vulnerability analysis².

This biophysical perspective on vulnerability is defined as one that ‘focuses only on the vulnerability or degradation of biophysical conditions and extrapolates directly from these estimates to the impact on the human occupants of a landscape’ (Liverman 1990, p. 29). This was the dominant approach to the study of vulnerability in the 20th century (Pelling 2001) and has evolved primarily within the natural hazard literature and from hazard characterization (Eakin & Luers 2006). This perspective was influential in agencies such as the Intergovernmental Panel on Climate Change (IPCC) and other development agencies (ibid).

The productivist perspective has been criticized for having a narrow biophysical focus neglecting the social, economic and political factors that play an important role in exposure to, and impact from, threats and shocks (Blaikie et al. 1994). It neglects access and utilisation aspects of food security by focusing primarily only on food availability. In food security analysis, this explanation has been criticized for its naive assumption that ‘food availability is shared equitably among the population, and that its members have no other source of income than food production’ (Blaikie et al. 1994, p. 83). It has also been criticized for neglecting the role played by individual and corporate actors in producing vulnerability (Lambert 1994). Furthermore, this approach has also been criticized for not being able to deal with differences within populations (differentiation of populations, for example, by ethnicity, gender, socio-economic status, age) and to explain why some people starve while their neighbours do not (Blaikie et al. 1994). Liverman (1990) cautioned that this approach can lead to an

² McLaughlin and Dietz (2008) identify five key theoretical perspectives on vulnerability, including: biophysical, human ecology, political economy, constructivism and political ecology.
excessive reliance on expert knowledge and technological solutions that neglect the political and moral questions that must be answered in relation to vulnerability. Some scholars suggest that such excessive reliance on technology and expert knowledge to hazards in this approach actually increases vulnerability (Pelling 2001). This suggests that proper attention to the social drivers and institutional conditions that shape differential sensitivity and capacity of people to respond to stresses is needed for a vulnerability study associated with food security. Despite this perspective being widely critiqued, it still holds sway globally in food and agricultural policies, as well as educational and training institutions (Eakin & Luers 2006).

2.3.2 Sustainable livelihoods perspective

Unlike the productivist perspective, the sustainable livelihoods perspective takes a more holistic approach to food and the role of agriculture in people’s lives and their economies. It tries to incorporate social aspects into food security analyses. It refutes a conventional view of food security that food is the most primary need (food first perspective), and argues that food is only one of the objectives people pursue. This perspective approaches the complex issue of livelihoods through the lens of particular assets (or capitals) that people have and/or gain access to (Chambers & Conway 1992). It also gives attention to how and what strategies are being pursued at individual, household and community levels (ibid) thus expanding the scope of concern from production issues to other processes influencing society-food relations.

Challenging the ideas of productivism, this perspective argues that vulnerability is more than just an exposure to a hazard (such as droughts, pests or floods). It defines vulnerability as:

‘…exposure to contingencies and stress, and difficulty in coping with them. Vulnerability thus has two sides: an external side of risk, shocks and stress to which an individual or household is subject, and an internal side which is defenseless, meaning a lack of means to cope without damaging loss.’ (Chambers 1989, p. 1)

Contrasting vulnerability with poverty, Chambers argues:
‘Vulnerability is not lack or want, but defenselessness, insecurity, and exposure to risk, shocks and stress and emphasises that vulnerability stands out as recurrent concerns of poor people’ which ‘professional definitions of poverty overlook’ (1989, p. 1)

Poverty, on the other hand, is often defined by professionals in terms of what can be conveniently counted and in terms of flows of income or consumption. Development interventions against poverty are largely concentrated on raising income or consumption with the help of access to credit and investment programs (Chambers 1989) whereas a livelihoods perspective expands the scope of consideration to include other aspects of overall wellbeing of people such as independence, mobility, security and self-respect (Chambers & Conway 1992). The focus of a livelihoods perspective is on people: what people are able to do with the resources they have, the different opportunities and obstacles they face and the outcomes they are able to achieve.

The asset-based approach developed by Chambers and Conway in 1991 and extensively used by different development organizations around the world, starts from understanding how resources are mobilised at the local level, rather than predicting impacts of specific changes at a regional, national or even global level (Knutsson & Ostwald 2006). It focuses on strategies such as income diversification in the event of possible resource shortfalls or other threats to household well-being (Torry 1979 in McLaughlin & Dietz 2008). Understanding such coping and adaptive strategies provides insights into developing better food security monitoring systems (Lambert 1994), bringing the discussion back to the diverse ways people perceive and manage risk.

Coping capacity is commonly understood as the short-term responses such as selling assets or reducing the number of meals to ensure survival in the near future. This explanation of coping capacity highlights that active strategies to manage resources along with access to resources are important in reducing vulnerability (Barrett & Carter 2000). The vulnerability perspective introduces an idea that is directly useful in the food security area: attention to the most vulnerable (as in children and elderly), as shocks tend to impact upon the weakest, and frequently, disproportionately so. The notion of adaptive capacity however, means longer term changes in behaviour and
livelihood strategies for the maintenance of income or food security in future (Berkes & Jolly 2001). These concepts will be discussed in more detail in Chapter Six. The IPCC’s (2007) attention to adaptive capacity within a system has contributed to the literature on coping and points to the importance of temporal scales in decision-making by the most affected (e.g. choosing to go hungry and to give water and food to animals to ensure long-term well-being of their tribe). To Ericksen (2008) coping capacity is conceptualised in relation to managing current stresses or shocks and is often reactive, whereas adaptive capacity is the potential to adapt to future uncertain changes without increasing vulnerability and is thus more proactive. The difference between coping and adaptive capacity is not always clear (Berman, Quinn & Paavola 2012) and these terms have been used differently within different vulnerability perspectives. Table 2.2 summarizes changes in the definitions of coping and adaptive capacities. Common differences apparent in these definitions are that unlike coping, adaptation involves long-term responses and focuses on planning for change with anticipation of benefits in future. This subtlety of difference that in fact has temporal implications, diminishes the opportunities for a clear demarcation between these two concepts; and according to Nelson (2011) is a key challenge in transforming coping capacity into adaptive capacity.
Table 2.2: Evolution of coping capacity and adaptive capacity definitions

<table>
<thead>
<tr>
<th>References</th>
<th>Coping capacity or coping strategies</th>
<th>Adaptive capacity or adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davis (1993)</td>
<td>Short-term response to an immediate and non-habitual decline in access to food</td>
<td>Permanent changes in the ways in which food is acquired</td>
</tr>
<tr>
<td>Kelly and Adger (2000)</td>
<td>Ability to respond to an occurrence of harm and to avoid its potential impacts</td>
<td>Ability to transform structure, functioning or organization to survive under hazards’ threatening existence</td>
</tr>
<tr>
<td>Yohe and Tol (2002)</td>
<td>Range of actions available to respond to the perceived climate change risks in a given policy context</td>
<td>Ability to change the set of available inputs that determine the level of coping capacity</td>
</tr>
<tr>
<td>Eriksen et al. (2005)</td>
<td>The responses that people employ to maintain wellbeing in the face of environmental stress within the existing structures</td>
<td>Changing the framework within which coping takes place</td>
</tr>
<tr>
<td>IPCC (2007, 2001)</td>
<td>‘Coping Range’ (2001 TAR) The variation in climatic stimuli that a system can absorb without producing significant impacts</td>
<td>Adaptation: adjustment in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits benefits. Adaptive capacity: the ability of a system to adjust to climate change to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.</td>
</tr>
<tr>
<td>Birkmann et al. (2009)</td>
<td>Immediate responses to hazards such as a specific flood event</td>
<td>Medium and long term strategies for changes in institutional frameworks</td>
</tr>
<tr>
<td>Lemos and Tompkins (2008)</td>
<td>Design and implementation of risk management institutions—such as disaster preparedness plans—that can mitigate the most immediate climate impacts</td>
<td>Socioeconomic and political reforms that addresses the inequalities at the root of differential vulnerabilities</td>
</tr>
<tr>
<td>Pelling (2011)</td>
<td>The strategies used by those living with rapid onset disasters such as flash floods, and chronic disasters, including drought and food insecurity</td>
<td>Change in those practices and underlying institutions that generate the root and proximate causes of risk, frame capacity to cope and further rounds of adaptation to climate change</td>
</tr>
</tbody>
</table>

(Adapted from Berman, Quinn & Paavola 2012, p. 90)
Sustainable livelihoods can be achieved by accessing a range of livelihood resources or capitals (natural, physical, economic, human and social capitals) that are combined in the pursuit of different livelihood strategies (for example; agricultural intensification, livelihood diversification, migration etc.). A sustainable livelihood is the well-being of a person or household and encompasses the capabilities, assets and activities leading to such well-being (Chambers & Conway 1992). Central to this perspective is that it facilitates the analysis of the range of formal and informal organisational and institutional factors influencing sustainable outcomes. It focuses on the links between sectors, on highlighting the tensions between different levels of analysis and calls for an investigation of the relationships among the different activities constituting livelihoods while focusing on social relations (Serrat 2008). A sustainable livelihoods approach introduces an integrated analysis of different components/assets and relationships—all of which constitute the basis of people’s lives and economic activities.

Vulnerability, combined with the sustainable livelihoods approach in particular contexts, could help in understanding what combination of resources (assets/capital) result in the ability to follow a particular combination of livelihood strategies with particular outcomes (such as improved food security). This approach cuts across the traditional boundaries of looking at rural development with a sectoral and/or discipline-based lens. It focuses instead, and facilitates, analyses on strategies affecting peoples’ livelihood pathways (Scoones 2009). Such an approach to vulnerability analysis is regarded as ‘instrumental’ in providing an improved understanding of the types of risks and hazards that are important to particular populations and ‘how these [risks and hazards] combine to affect response strategies’ (Eakin & Luers 2006, p. 379). The types of risks that people face may include: drought, flooding, landslide, market failure, war, epidemics and the effects of these will depend on the livelihoods of the affected people and their alternative strategies. However, because of existing social differentiation in the society, the same risk or hazard will have different effects on different people. For example, a resource rich person can easily cope with the failure of one crop, for example, as she/he can fall back on other resources she/he commands whereas the resource poor person cannot, and she/he does not have the luxury of falling back on any other resources. Likewise, a person with good social
connections and networks can draw upon these when needed unlike a person who is socially marginalised or not well established within a community, such as someone who has recently migrated to an area.

Further, the contribution to research that this approach has made in developing methods and tools, has yielded improved insight and understanding in regards to vulnerability assessment (Adger 2006). Key methods and tools developed within livelihoods research include seasonal food security calendar, historical timelines, resource mapping, and ranking. Short descriptions of these Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA) methods and tools are presented in Table 3.1 in Chapter Three. While increasingly used by governments and development agencies around the world, and providing important insight on vulnerability mainly through the concept of coping and adaptive capacity, this approach has, however, been criticised for a number of reasons.

The most important critique is about the inability of this approach to anticipate long-term environmental changes. Scholars highlight the insufficient attention on the environment in the concept (Adger 2006; McLaughlin & Dietz 2008) and this is despite using the word ‘sustainability’ (Scoones 2009). Another problem identified with this approach concerns the de-emphasis of elements associated with the context of vulnerability (i.e. shocks, seasonality and critical trends), ignoring the fact that enhancing the livelihoods of one group may undermine those of another. The context could be the most important factor ‘over-riding the micro-negotiations around access to assets and finely-tuned strategies of differentiated actors’ (Scoones 2009, p. 181). Risk of maladaptive responses will always be there if such strategies do not pay attention to issues such as inequality of power and a disproportionate burden on the vulnerable (Barnett & O’Neill 2010; Serrat 2008). Bonnin & Turner (2012) note recognition of context-specific cultural, historical, gender and power dynamics of livelihoods, and not just economic opportunity, is equally necessary to understand the complexity around food insecurity.

Despite these critiques, understanding how and why people can or cannot access and combine resources, and how strategies change in response to opportunities and
shocks/stress/seasons may be useful to help appreciate the processes that influence vulnerability to food insecurity, especially at the household and community levels. Similarly, methods and tools developed within livelihoods research have proven particularly relevant to studies seeking to document and influence people’s vulnerability to food insecurity.

2.3.3 Entitlements perspective

The livelihoods perspective helps highlight the importance of access to different assets and how they are related. The entitlements perspective enriches the understanding of how critical rights of access are to food security. The latter views famine and hunger as the result of not just food availability or decline but more importantly, of entitlement failure (Sen 1981). In his seminal work, Sen (1981) argues that it is the failure of ‘effective demand’ that causes famine not market failure, as suggested by dominant economic theories. An entitlement is a legal and customary right to exercise command over food and other necessities of life (Sen 1981). Further elaborating on this concept, Sen (1983, p. 754) defines entitlements as:

…[a] set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces.

A person can acquire ‘entitlement sets’—a full range of goods and services, by transforming his or her endowments i.e. their assets and resources (Sen 1981). Sen’s contribution, encapsulated in entitlement theory, is the understanding that famine was more than just a crisis in overall food supply; rather, a famine could result from a failure in people’s ability to have access to food (Sen 1981). He explained why certain groups of people were unable to obtain food even if food was present in the market. People get food through five different types of ‘entitlement relationships’ in private-ownership market economies. These are:

a) production-based entitlement which is the right to own the food that one produces with one’s own or hired resources;

b) trade-based entitlement which describes the rights associated with ownership when they are transferred through commodity exchange;
c) **own labour entitlement** which is the trade-based and production-based entitlements when one sells one’s labour power;

d) **inheritance and transfer entitlement** which is the right to own what is given by others and transfer by the State such as pensions; and

e) **extended entitlements** which exist outside legal rights and are based on legitimacy and expectations of access to resources.

(Sourced from Sen 1981, p. 2)

If the full range of a persons’ entitlements does not provide them with adequate food they face starvation. Hunger is thus not always or only caused by a decline in food availability but can be by a result of a food entitlement decline. Sen’s work demonstrated that famine can occur in the absence of food scarcity when changes in wage structures and commodity markets leave large numbers of people with an inadequate entitlement (McLaughlin & Dietz 2008). As such, this approach focuses on factors that impact food demand not just the ones that impact the supply of food. Hildyard (2010, p. 154) asserts that only those who have the income to translate their biological needs into ‘effective demand’ get to eat.

This perspective emphasises social structures and power relations in its analysis. Existing social structures and power relations influence people’s capacity to cope with and recover from food insecure situations (Blaikie et al. 1994). Entitlement approaches do not explicitly talk about vulnerability *per se* but Sen’s arguments ‘have influenced works on coping strategies as well as subsequent work in the political economy of vulnerability’ (McLaughlin & Dietz 2008, p. 102). Watts and Bohle’s (1993) conceptualisation of vulnerability as a multi-dimensional space and Adger’s (1999) work on Vietnamese coastal communities indicate the influence and applicability of an entitlements perspective. Emphasising political economic aspects, Blaikie et al. (1994, p. 48) argue that less access to resources, social structure (such as caste, class and gender) and power lead to increased vulnerability. These authors, in the case of natural disaster, defined vulnerability as:

> Characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard. (ibid, p. 9)
This definition added ‘sensitivity’ to the definition of vulnerability highlighting the fact that the same hazard may affect different people differently depending upon their susceptibility.

Hildyard (2010), explains how power imbalances systematically disturb entitlement relations and thereby some people lose their entitlements. He lists a range of power imbalances that lie at the root of food insecurity, including: the enclosure of commons, lack of access to land, unequal gender relations, ethnic and racial discrimination, intra-household inequalities, political exploitation of famine, denial of human rights, sexism, agricultural modernization, market liberalization, and ecological degradation (2010). As will be demonstrated in this thesis many of these power relations influence vulnerability to food insecurity in Jumla. It is the power structure that lies behind the paradox of people going hungry despite abundant harvests (or exporting grains while receiving grains in food aid in Ethiopia in the 1980s) (Hildyard 2010). There is a connection here to food justice ideas around inequality and discrimination. This perspective opposes the Malthusian view with the argument that hunger is an artifact of social, economic and political processes not just a natural phenomenon (Millstone 2010). Proponents of entitlement perspective claim that in aggregate, there is more than enough food in this world for everyone but the institutions of ownership and relationships of trade and commerce result in it not being distributed equitably (ibid) advocating ideas of food justice and food sovereignty as discussed in sections 2.2.

To sum up, Sen’s entitlement analysis is considered an important advancement on food availability or decline theories for the following main reasons (adopted from Blaikie et al. 1994, p. 87):

- it acknowledges the importance of changes in purchasing power;
- it disaggregates regional food production and availability and examines how food is actually distributed; and
- it involves regional, national and global scales in the analysis making it easier to identify the potential need for food imports.
Thus, the concept of entitlements moves some way from the productivist thinking of early theorists, allowing a more socially nuanced and politically sensitive reading of society-food relations. However, whilst entitlement theory is widely accepted as an important advancement in understanding food insecurity, there have also been some criticisms. Although decline in availability of food was not an important cause, there have been instances where some food insecure situations in the world were preceded by a decline in food supply (Blaikie et al. 1994). In some cases of famine in Africa, ‘effective demand’ was not met by supply because of high transportation costs and either a lack of information reaching traders, or their unwillingness to risk distributing small lots of grain to scattered markets (ibid). This indicates that while small producers still need distribution systems that are well connected to local markets, total reliance on a market mechanism for food availability may be a risky idea and that promoting locally based small-holder agriculture is important in such cases.

Watts and Bohle (1993, p. 48) criticised Sen’s (1981) entitlement analysis for only providing a ‘conjunctural’ analysis of the short-term triggering mechanisms of famine and ignoring the ‘long-term structural and historical processes by which a specific pattern of entitlements and property rights come to be distributed’. They (ibid) argue that the way entitlements are distributed and fought over in society, how they are defined by particular rights, and embedded into the broader political economy cannot be explained solely by the entitlement approach. For instance, concerns with gender, inter-generational equity, age, caste and ethnicity received less attention than occupational status and the market in original applications of an entitlements approach (ibid). For an entitlements-informed analysis of famine and hunger to provide more than ‘conjunctural analysis’, Watts and Bohle (1993, p. 48) maintain that it must account for:

i) the particular distribution of entitlements and how they are reproduced in specific circumstances; ii) the larger canvas of rights by which entitlements are defined, fought over, contested and won and lost; and iii) the structural properties of the political economy which precipitates entitlement crises.

Watts and Bohle (1993) in their earlier work developed a model of vulnerability analysis that conceptualises vulnerability as a multi-dimensional space encompassing
three interrelated processes namely; i) entitlement, ii) empowerment/enfranchisement, and iii) political economy. Environmental influences, dismissed in this work are later incorporated in the revised model as one of the four causal dimensions of food insecurity (McLaughlin & Dietz 2008).

Despite these criticisms, the focus of the entitlements perspective on inequality, injustice and marginalisation as phenomena of vulnerability is widely accepted by scholars as important to the vulnerability assessments associated with food insecurity. The next section discusses the political ecology perspective which retains the strength of the entitlements perspective but extends this by addressing some of the above criticisms.

2.3.4 Political ecology perspective

Utilising political ecology allows vulnerability to be seen as a situation, encompassing the ‘characteristics of exposure, susceptibility, and coping capacity shaped by dynamic historical processes, differential entitlements, political economy and power relations’ (Miller et al. 2010, p. no pagination). Political ecology has its origins in critiques of ecological anthropology and cultural ecology in the 1970s (Brown 1998). Bryant (1992) calls it an offshoot of the political economy approach and argues that politics should be ‘put first’ in attempting to understand how human-environment interactions may be linked. Blaikie & Brookfield (1987, p. 17) explain that political ecology combines the ‘concerns of ecology with political economy’. Yet there are concerns raised by some scholars about political ecology failing to provide justice to ecological issues in practice. This will be elaborated later in this section.

Political ecology focuses on the social relations that shape resource management with an emphasis on historical and cross scale analyses and narrative methods—the rich stories of relationships between people and their environments (GECAFS 2010). It retains the concerns of political economists such as the role played by political and economic power, class conflict and processes of marginalisation in producing vulnerability (McLaughlin & Dietz 2008). When combined with a food security analysis, both local level structural inequalities such as caste, race, socio-economic
status, land ownership structure and regional or global inequalities, such as corporatisation of food systems and North-South divisions, can be analysed within political ecology. According to Bryant (1992), the major areas of inquiry in political ecology are: i) the contextual sources of changes in environment, ii) contention over who accesses resources, and iii) the political consequences of changes in the environment. Scholars of political ecology recognise and give due consideration to the influence of the broader context (i.e. state, interstate and global levels) (Brown 1998, p. 74). For example, Neuman’s (1992) study of wildlife conservation, identifies three areas important in the political ecology approach: i) historical analysis to understand current condition, ii) tracking the links between local relations and their social and geographical settings, and iii) a focus on the land users and the social relations in which land users are entwined (Brown 1998, p. 74).

Vulnerability is often increased by external forces that affect the capacity of local communities to cope with shocks such as drought, crop failure or cash shortages. Such external forces might include conflict, government policies, global environmental changes (GECAFS 2010), unequal gender relations, and ethnic and racial discrimination (Hildyard 2010). Political ecology contextualises vulnerability at the local scale with an understanding of wider scale or local drivers that may have an influence on it, such as, access to food or viable seed. It employs an historic mode of analysis which makes it able to inform the genealogy of narratives concerning the environment, and identifying power relationships supported by such narratives (Stott & Sullivan 2000). Moreover, many political ecology studies explicitly consider how colonial and post-colonial processes account for contemporary environmental and development problems, as outlined in the classic text by Blaikie (1985) *Political Economy of Soil Erosion in Developing Countries*.

One of the main differences of this perspective compared with others discussed in previous sections, is that it considers the environment as an independent variable (Blaikie & Brookfield 1987). In his seminal work, Blaikie (1985) criticised the conventional wisdom that viewed soil erosion in Third World countries as an environmental problem caused by irrational land uses and overpopulation, with the solution found in involving small farmers in market economies. He demonstrated that
‘surplus is extracted from cultivators who then in turn are forced to extract ‘surpluses’….from the environment…and this in time and under certain physical circumstances leads to degradation and/or erosion (Blaikie 1985, p. 124).

Adopting Downing’s (1992) definition of vulnerability as an aggregate measure of human wellbeing that integrates environmental, social and political exposure to a range of potentially harmful perturbations, Bohle et al. (1994) developed a causal structure for vulnerability that sees vulnerability as a multi-layered and multidimensional social space i.e. dimensions that determine risk exposure, coping capacity and recovery potential (Figure 2.1). They view such a space as encapsulating three distinctive processes namely: i) human ecology; ii) expanded entitlements; and iii) political economy, presented as three axes of a triangle (ibid). They suggest that the intersections of these three axes produce three parallel analytical concepts which they think are important as an explanation of food security: i) endowments; ii) class relations and empowerments; and iii) political ecology (ibid). They included ecological parameters that acknowledge environmental status within the concept of endowment along with physical assets, human resources, informal rights and networks.

Figure 2.1: The causal structure of vulnerability (Sourced from Bohle et al. 1994 p. 39)
Despite being influential in critiquing the technocratic focus of biophysical approaches to vulnerability analysis and making efforts to accommodate the concerns of human ecology, cultural ecology and political economy, the political ecology perspective has also been criticised. The main criticism is that, in most current political ecology research, it lacks ‘ecology’ and focuses more on structures of human systems in both theoretical and empirical terms (Peterson 2000). Peterson goes further by saying that it is not political ecology but the ‘political economy of natural resources’ where more of a focus on structures than on the environment is evident (Peterson 2000, p. 324). A key point here is the lack of systems thinking evident in many vulnerability analyses.

Examination of dynamic interactions between social and ecological processes is often compartmentalised in vulnerability assessments, even those underpinned by ideas from political ecology and its purported engagement with ecological thinking. The compartmentalised nature of vulnerability analyses often fail to appreciate the dynamic ecological considerations—this is a concern later taken by Turner et al. (2003).

This review indicates that these approaches to the concept of vulnerability have contributed to an enriched understanding of complex issues associated with food security (Miller et al. 2010; Vogel et al. 2007). As discussed in previous section, vulnerability perspectives have placed a greater emphasis on the role of wider political economic factors in shaping food insecurity and that this has led to the documentation of the differentiated nature of food insecurity in terms of the way class, gender, age, ethnicity, and caste shape people’s (often highly unequal) access to food. In recent times, there have been attempts to utilise concepts from a SES perspective in describing vulnerability to food insecurity (for example see Ericksen 2008).

Vulnerability analyses have largely focused on actors within systems and associated ‘processes of negotiation, decision-making and action’ whereas SES approaches investigating resilience can potentially complement this by ‘examining the interaction of social and ecological processes’ (Miller et al. 2010 no pagination). A social-ecological lens therefore, provides the opportunity to integrate social and ecological considerations of a systemic nature in the study of and response to food insecurity with an appreciation of the agency of actors and political economic structures. Yet, an outstanding challenge remains how to capture and explain these multiple interacting
processes and structures. What follows is a review of the concept of resilience, and key elements of this body of work that may usefully inform this challenge and the current study.

### 2.3.5 Resilience thinking

Resilience is a relatively new addition to efforts to understand food insecurity with a different epistemological underpinning to that of the vulnerability discourse. From the resilience perspective, vulnerability is seen as a ‘dynamic property’ of a system in which humans are ‘constantly interacting’ with the biophysical environment (Eakin & Luers 2006, p. 371). This idea portrays vulnerability as a property of SES (Adger 2006) and emphasises the impossibility of eliminating all vulnerabilities (Walker & Salt 2006). Resilience theory is a concept arising from systems ecology which aims to offer an alternative view of the dynamics of social and environmental change: challenging the notions of order, stasis and equilibrium. It highlights the inevitability of cycles of creative destruction and renewal over time, persistence of unpredictable change, and the necessity of considering linked ecological and social systems (Holling & Gunderson 2002; Walker et al. 2002; Walker & Salt 2006). A heuristic device employed by resilience thinkers is the adaptive cycle, a general model of systemic change that reflects the internal dynamics of systems’ cycle through four phases: i) growth or exploitation (r); ii) conservation (K); iii) collapse or release (Ω); and iv) reorganization (α). Holling (1986) first applied this model to ecological systems, and Gunderson et al. (1995) extended it to SES to examine the overall resilience of a system (Peterson 2000).

Central to a resilience perspective is the idea of social-ecological systems (Berkes & Folke 2000; Gunderson & Holling 2002; Walker et al. 2002), which seeks to give equal weight to social and ecological systems and understands them as an integrated whole (Berkes, Colding & Folke 2003; Widgren 2012). It envisions social and ecological systems as a coupled system with problems in one system affecting the other and that drawing a demarcation between social and ecological systems is ‘artificial and arbitrary’ (Berkes, Colding & Folke 2003, p. 3). The core ideas are that SES can exist in more than one stable state, they change over time, and operate over different scales of time and space. Similar to political ecology, and its concern with
multi-scale processes, resilience is concerned with the links between scales as important to the dynamics of the whole system. In the context of ecological resilience, a deficit in resilience increases the probability that a given regime will need to adapt, or transform into a new regime (Davidson 2010). The qualities of resilience which determine the overall function and meaning of the SES are diversity, redundancy, modularity, and tightness of feedback loops (Walker & Salt 2006). Diversity refers to the different kinds of components that make up a system. In resilience theory, there are two types of diversity that are of particular importance: functional diversity and response diversity. Functional diversity refers to the range of species and people within a SES. It is posited that SES with higher diversity present are more able to cope with change (Walker & Salt 2006). Response diversity is the range of different response types (such as institutions) existing within a functional group. Resilience is enhanced by increased response diversity within a functional group (Walker & Salt 2006). In his analysis of vulnerability of food systems, Fraser (2006) highlighted the importance of maintaining diversity to preserve options in a crisis. At a very basic level diversity of crops and maintenance of genetic diversity are no longer decisions that are made at just a local scale but may depend on the integration of a particular community and place with external markets. As such, vulnerability may be exacerbated by external shocks to inputs, markets and general ability to withstand economic imperatives as a key factor in decision-making for production (ibid). In this way the social resilience of a community may depend on diversity of interests as well as physical access to and choices by which food security is defined and enacted.

Redundancy refers to the different ways of doing the same function (Walker & Salt 2006). According to resilience theory, in the conservation phase of the adaptive cycle, when connectedness increases, the system becomes more rigid and redundancy is eliminated in favour of doing the function in the most efficient way. In social systems, subsidies and safety nets may be introduced to maintain the status quo. Introduction of such subsidies and other methods of economic distortion may mask the feedback mechanism of the system, as identification of such feedback is important for better understanding of the interactions and relations within SES (Miller et al. 2010). A resilience perspective promotes the idea of learning to live with change and developing the capacity to deal with it instead of trying to block it out (Miller et al. 2010). The
issue in relation to vulnerability and food security may be that this idea is nothing new for locals who are marginalized in the overall society or system. They are already used to dealing with change but it may be that their mechanisms for doing so are structurally rigid (i.e. depending on elders or elites; or government handouts) and/or the change has been so rapid that coping mechanisms that worked in the past are now no longer so effective. So the capacity may be found in historical and material structures within a community as much as it may be about individuals coping. Overall, the idea of redundancy highlights the importance of having multiple options open to living with change, and this is a point I return to when discussing different ways of making claims over food in Chapter Seven.

Likewise, modularity refers to how the elements of a system are linked. A system with loose connections of elements and stronger internal links is said to have a modular structure. It is suggested that connectedness determines the degree to which a system can control its future (Holling 2001) and that connectivity can have both positive and negative effects. High modularity exists when the networks within a system have several tightly linked groups within it that are loosely connected with other groups. This increases the likelihood of groups generating and using their own knowledge. Conversely, as connectedness increases, the system becomes more rigid, and resilience declines (Walker & Salt 2006). On the other hand, a more connected system may be more responsive and therefore facilitate recovery after a disturbance. But highly connected systems are quickly affected by shocks traveling throughout the system at a faster pace. However, if there is some degree of modularity in the system, individual modules will continue functioning even if other modules fail to do so. In this way, resilience theory suggests that a system with a modular structure has a greater chance of absorbing shocks. In terms of vulnerability and food security this could be understood if we consider a regional seed trading system, where, through protection of regional seed stocks, trading is tightly regulated within cultural boundaries that preserve the diversity of the gene pool and provide physical (distance) and social (custom) boundaries that protect the particular variety when there is disease or pests in another area.
The tightness of feedback relates to how rapidly and strongly the effects of a shock in one component of the system will be reacted to in other components (Walker & Salt 2006). Institutions and social networks play a crucial part in influencing how tight the feedback is. As feedbacks lengthen there is an increased chance of crossing a threshold without detection. When feedbacks occur across scales they are more likely to affect the larger system. In a political context a system can be the region or nation-state. In an economic context this would be the regional market versus the one at the Jumla capital and in the context of Jumla’s economy, it might be as wide as locations in India or China where Jumli products are traded. In ecological terms, soil, diseases that are transported by water moving within the soil profile are an example of expanding and contracting systems that are tightly tied at some times (very strong positive feedback) and during drought, may be weakly connected. Changes that occur within the same scale are more obviously recognizable in causal terms but nonetheless, the potential for emergent properties that are the consequence of some policy or event at a larger scale can have significant impact, and can have far reaching affects. It is the accumulative effect of that emergence perhaps replicated across scales—drought, soil disease, market failures—that increases the positive feedback (positive in the sense that it is tightly connected and accelerating change) throughout the system as previously defined (social, cultural, economic). Food aid may be an example of this when supply networks of desirable or accessible food supplies overrun local production. This occurred in Ethiopia in the late 1980s when there was no land to grow staples because the land was being used to grow wheat for the export market to reduce national debt. As a result, the nation received food aid for basic staples.

A social-ecological systems approach (Berkes & Folke 2000; Gunderson & Holling 2002; Walker et al. 2002) informed by ideas of resilience is useful in this study to understand how society and environment interact to impact on people’s vulnerability to food insecurity. Specific ideas such as diversity, redundancy and modularity, as described by resilience, are used to understand how people with different vulnerabilities experience or anticipate food security in Chapter six and Seven of this thesis.
However, for many scholars, the concept of resilience does not provide the answer to many pivotal questions related to food insecurity within society. So, while the concept of resilience has gained some interest in the social sciences in recent years, with some researchers encouraging its adoption (for example, see Abel, Cumming & Anderies 2006), others are more cautious about its applicability to food security (Adger 2000; Davidson 2010; Heland & Sorlin 2012; Hornborg 2009; Leach 2008). For example, scholars criticise the resilience framework for its over attention to bio-physical systems (Leach 2008). It is criticised for being dominated by ecological thinking with limited capacity to explain human behaviour and social systems. Similarly, Adger (2000) suggests that it has not effectively been defined across the disciplinary divide to examine the meaning of resilience of a community or a society as a whole.

Davidson (2010) cautions that we must first have solid theoretical grounding for the application of the resilience framework to social systems. The author (ibid) highlights two main issues that hinder the applicability of the concepts of resilience in social science: i) its explanation of system complexity itself, and ii) lack of acknowledgment of human agency: power and collective action. Highlighting the importance of increased connectivity, she argues that high connectivity of communication and currency systems contribute to the rapid generation of disaster relief funds (Davidson 2010, p. 1142). She also objects to the presupposed relationship between scale and pace of feedback (ibid). She argues from a humanist perspective, that while the structural complexities of both ecological and social systems are similar, the feedback processes associated with them are incomparable:

…social systems are unique in that the tendencies toward complexity, and the response of individual organisms to those levels of complexity are defined not solely by structural variables, but solely by agency (2010, p. 1142).

Moreover, social systems have the capacity to anticipate the change.

Brock (1997) is another critic of resilience, stating humans are more than just ‘one of the organisms’ of an ecosystem. This is slightly paradoxical as the concept of an ecosystem existing is a human concept. His argument is that humans can both imagine, anticipate and prepare for the future to a much greater degree than ecological systems
can, presumably because a human temporal scale is being imposed on the ecological system so the ‘test’ of self-organisation within the ecological system remains. Humans have the capacity, both cognitively and through the use of instrumentation, to perceive (as in predict and analyse) historical data (as in the archaeological record) but this changes at a larger scale and longer term (Davidson 2010). For example, when a drought occurs in an agriculturally-based social system, a resilient social system will include options such as alternative drought resistant crops, development of reservoirs and irrigation techniques, and these assist in withstanding the shock and maintaining the system function in a new environment. It should be noted that such responses are about maintaining the social and production systems in the same state—so absorbing shocks. In this way, resilience is understood as maintaining the status quo (Beilin, Sysak & Hill 2012) and not so much about acknowledging the uncertainty or dynamism within both social and ecological interactions, i.e. living with change.

Thapa, Marshall and Stagl (2010) argue that the resilience framework itself cannot explain human behaviour. Hornborg (2009, p. 255) argues that ‘the discourse on resilience is oblivious not only to power, conflict and contradiction, but also to culture’. He argues that the ‘rising global anticipation of socio-ecological contradiction’ is being ideologically disarmed by the rhetoric of ‘resilience’ (Hornborg 2009, p. 237). The question of what to do with the changes and what measures are needed to respond to such changes depend on the framings of the problems from different groups of actors, power, politics and institutions (Thapa, Marshall & Stagl 2010). Adger’s (2000, p. 350) earlier writing, cautions against simply taking the concept of resilience from the ecological sciences and applying it to social systems assuming that there are no essential differences in behaviour and structure between socialised institutions and ecological systems. In a Vietnamese case of mangrove conversion into commercial agriculture, Adger (2000) examines social resilience through proxies of institutional change and economic structures, property rights, access to resources, and demographic change. Adger (2000) and Walker and Salt (2006) observe that whilst resilience is related to stability, it is not clear whether this characteristic is always desirable. For example, an oppressive and dictatorial regime may be highly resilient but not desirable in civilised society. As such, the above
critiques have raised the significance of positionality, culture and agency in how resilience is both understood and valued.

While noting these points, it is nonetheless valid to consider how by making the biophysical (as in ecological) more explicit in the decision-making process, because social and ecological systems are entangled in this complexity modeling, there is an opportunity to better explore the interface that connects human actions to landscape practices and cultural ways of interpreting such practices. Therefore, despite these critiques, the concept of social ecological resilience provides an important advancement in furthering the understanding of society-ecology relations. The next section highlights how the theory of resilience can be combined with vulnerability theories to arrive at an integrated framework to be used in this study.

2.4 Integrating approaches: Theoretical framework of the study

As highlighted in the literature review above, socio-economic, cultural, political and environmental processes and their interactions are of crucial importance in vulnerability analyses associated with food security (Ericksen 2008). This demands the application of a framework capable of facilitating analyses and discussions around such processes at a number of spatial and temporal scales. This study employs an integrated social and ecological framework of vulnerability to analyse food insecurity. The purpose of this framework is to identify specific insights relevant to the practice of food security policy, using a case study from Nepal.

This integrated framework locates vulnerability as a condition of a system shaped by the interactions of multiple biophysical and human processes, stresses, and shocks acting on the social-ecological system. I employ key elements of resilience theory through a focus on integrated social-ecological systems to explore vulnerability to food insecurity in the context of a case study from Nepal. Key ideas from social-ecological resilience utilised in this research include diversity, capacity to learn, preparedness including planning for future. I draw upon key ideas from vulnerability in general and political ecology in particular such as power, marginalisation, and political economic system. A summary of key ideas employed in this research from these different bodies of literature is presented in Table 2.3. As such, vulnerability is the focus and is
understood as a condition of the system that influences food insecurity. This thesis brings together food security and vulnerability scholarship and does so by applying a system approach and social-ecological lens.

In this framework I intend to contribute to a conception of social-ecological resilience that accounts for power, justice and marginalisation and captures the dynamic relations within social-ecological systems. The right-based approach to food security, as discussed at the beginning of this chapter, tends to accommodate these ideas. It provides a foreground to incorporate ideas of vulnerability and social-ecological resilience. For example, ideas of food justice and food sovereignty advocate for people’s right to healthy and culturally suitable food that are produced through ecologically sound and sustainable ways (Via Campesina 2007). They also advocate for small holder agriculture, encourage localized control over and access to natural resources and focuses on local people’s capacity to produce and consume socially and ecologically appropriate food. Food justice ideas emphasise the need to pay special attention to the most marginalised and disadvantaged sections of the society.

Current research on vulnerability, ‘through methods and conceptualization of the stresses and processes that lead to threshold changes’ can potentially contribute in applying the concept of social-ecological resilience in social science (Adger 2006, p. 268) and it is this that I have sought to do in this thesis. Folke et al. (2002) believe that integration of ideas of resilience and vulnerability gives analyses an added temporal dimension as this facilitates the combination of strategies and local conditions that make communities more resilient. Political ecology has always emphasised the importance historical dimensions in vulnerability analyses. For this reason, I have located practices in time and space in the case study landscape. My approach is in accord with other scholars who believe that these approaches can complement each other (Miller et al. 2010; Nelson, Adger & Brown 2007), because actor-based vulnerability analyses focus on the ‘processes of negotiation, decision-making and action whereas systems-based resilience approach analyses complement [this] by examining the interaction of social and ecological processes’ (Miller et al. 2010 no pagination). I reflect that this is my experience over most of my 20 years of engagement with policy as an extension agent in many regions of Nepal. Therefore, I
began this study seeking a way of developing and integrating a framework that might overcome the limitations I have experienced in the local, national and global discourse of food security. This thesis is in part a response to this quest, and a test of its assumptions.

2.5 Summary

In reviewing food security theories and practices, I have made particular reference to the key vulnerability paradigms. This review of different schools of thought around food security discourse demonstrates the strengths and weaknesses of each of the five vulnerability paradigms in terms of areas of focus, explanations of causes of food insecurity and key strategies to address food insecurity. The key ideas identified here inform and facilitate discussion in subsequent chapters. These are employed to understand and discuss nuances of vulnerability to food insecurity. A sustainable livelihoods approach helps understand how and why people can or cannot combine resources, and how strategies change in response to opportunities and shocks/stress/seasons. Similarly, methods and tools developed within livelihoods research, such as the seasonal food security calendar, and historical timelines are relevant in this study to understand issues that influence people’s vulnerability to food insecurity.

The entitlement approach highlighted structural inequalities around food security. As Sen (1989) demonstrated, it helped highlight why certain groups of people are unable to obtain food even if food is present in the market. Similarly, a political ecology perspective on food security helps contextualise vulnerability at the local scale with wider scale and local drivers that may have an influence, such as, access to food, land or viable seed. The social-ecological lens from resilience provides an opportunity to examine relationships between society and the ecology with a fresh insight—that change is inevitable, emphasising uncertainty and the need to learn to live with change. Table 2.3 below summarizes key concepts drawn from each of the five different food security traditions based on different philosophical premises within the vulnerability and resilience scholarship discussed above as applied in this research.
Table 2.3: Key concepts drawn from each of the five vulnerability perspectives associated with food security studies

<table>
<thead>
<tr>
<th>Major vulnerability perspectives on food security</th>
<th>Key ideas</th>
<th>Areas of focus</th>
<th>Explanation of major causes of food insecurity</th>
<th>Key strategies to address food insecurity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivist or Bio-physical</td>
<td>Pace of population growth would be higher than the pace of growth in the agricultural production. Biophysical factors are paramount in shaping food security.</td>
<td>Food availability. Vulnerability of biophysical conditions. Predicting the timing, frequency and nature of risks and hazards.</td>
<td>Food security is caused by a decline in food availability and is related to biophysical conditions and changes in population</td>
<td>Increasing agricultural production and productivity by crop improvement, smarter use of water and fertilisers, pesticides, reduction of post-harvest loss, use of biotechnology and nanotechnology. Controlling population growth. Attention to the most vulnerable. Attention to coping and adaptive capacity within a system. Achieving sustainable livelihoods by accessing a range of livelihood resources or capitals. The value of income and livelihood diversification.</td>
</tr>
<tr>
<td>Sustainable livelihoods</td>
<td>Understanding that people need more than just access to resources to be less vulnerable, but also employ active strategies (coping and adaptation) to manage their resources in the face of risk. Understanding how and why people can/cannot combine resources, and how strategies change in response to opportunities and shocks/stress/seasons. Methods and tools such as the seasonal food security calendar, historical timeline.</td>
<td>Identification of vulnerable population. Mobilising resources at local level. Dynamics of social structure. Coping and adaptation to risks and hazards.</td>
<td>Food insecurity is the result of the destruction of people’s livelihoods by risks and hazards and the success (or otherwise) of coping strategies.</td>
<td>Attention to the most vulnerable. Attention to coping and adaptive capacity within a system. Achieving sustainable livelihoods by accessing a range of livelihood resources or capitals. The value of income and livelihood diversification.</td>
</tr>
<tr>
<td>Entitlements</td>
<td>Explanation of why certain people are unable to obtain food even if food is present in the market. Structural inequalities around food system.</td>
<td>Food access. Dynamics of social structure. Role of inequalities and differential political and economic</td>
<td>Food insecurity is result of social inequalities and failing entitlements.</td>
<td>Poverty reduction. Enhancing entitlement.</td>
</tr>
<tr>
<td>Political ecology</td>
<td>Social relations that shape resource management.</td>
<td>Food insecurity is caused by dynamic historical processes, differential entitlements, political economy and power relations.</td>
<td>Adaptive capacity.</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Contextualising vulnerability at the local scale with reference to broader scale processes that may have an influence on, access to food, land or viable seed.</td>
<td>Focus both on local (gender, caste) and global level (corporatisation of food system, north-south divide) structural inequalities and processes that lead to food insecurity.</td>
<td>Food insecurity is caused when environmental risks and hazards are mediated by dynamic historical processes, differential entitlements, political economy and power relations as they together determine people’s adaptive capacity.</td>
<td>Gender empowerment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regard environment as an independent variable – environmental processes are constructed (or influenced) by political economic processes.</td>
<td></td>
<td>Right to seed/food.</td>
<td></td>
</tr>
<tr>
<td>Social-ecological systems</td>
<td>Focus both on social and ecological outcomes (system focus).</td>
<td>Food system vulnerability is a function of environmental change hazard, exposure, and adaptive capacity.</td>
<td>Adaptive management strategies.</td>
<td></td>
</tr>
<tr>
<td>Insights that change is inevitable and that we need to learn to live with change.</td>
<td>Processes and interactions within social-ecological systems.</td>
<td>Global environmental change affects many aspects of food system activities and outcomes with potentially negative consequences for food security.</td>
<td>Learning and flexibility in action.</td>
<td></td>
</tr>
<tr>
<td>Diversity, modularity, redundancy, feedbacks.</td>
<td>Change in community’s relationship with social-ecological systems.</td>
<td></td>
<td>Enhancing adaptive capacity.</td>
<td></td>
</tr>
</tbody>
</table>
These approaches taken individually appear to have been unsuccessful addressing vulnerability to food insecurity as they are not able to accommodate the social-ecological complexity shaping food insecurity. Food security policies based on these approaches (taken individually) have so far failed (for example in Nepal) to comprehend the reality that people are often concurrently responding to multiple stresses; not only one. The compartmentalised nature of such policies is not able to address root causes of food insecurity or understand the interaction of changing social-ecological processes at multiple scales. We require an understanding and recognition that social and environmental systems together shape the context of food insecurity and that in order to be able to capture the complex relations between social and environmental systems an integrated approach to vulnerability analyses (Eakin & Luers 2006; Miller & Bowen 2013; Turner et al. 2003) associated with food insecurity is required. Such analyses, often termed a systems approach, are thus important to provide a nuanced understanding of the processes that influence vulnerability to food insecurity which ultimately assist in effectively anticipating, addressing and resolving the issue.

The focus of the research now turns to exploring how the processes that contribute to vulnerability to food insecurity in Jumla, Nepal were examined from the perspective of the local community. Very little is understood of the local perspective, as to what social-ecological processes influence food security, how changes to food security situations influence such processes and interactions, which are the main factors the community identifies as differentiating their vulnerability and the implications of their relationships with their local social-ecological system. In order to gain this understanding a qualitative, mixed methods approach to research was adopted.
Chapter 3: Research approach and methodological framework: a qualitative case study

3.1 Introduction

This chapter outlines the methodological underpinnings of the research questions. The chapter discusses the approaches and methods that were used in this study to explore the processes influencing vulnerability to food insecurity in Nepal. It outlines the reasons behind the choice of these approaches and methods. These contribute to the case study methodology and explain the multiple methods used including: semi-structured interviews, focus group discussions, observations and historical records. The data collection process is described including my methods and rationale in selecting participants. Following this is a description of the data analysis process.

3.2 A qualitative approach

This study explores processes that contribute to vulnerability to food insecurity from the perspective and experience of local communities in Nepal. This involves understanding the actual society-food relations from the views, practices and experiences of people themselves, including farmers, traders, community leaders, extension officers and other stakeholders. Being an extension officer (1997-2010), I was aware of the statistical metrics available around Nepal’s food and agriculture but they were not enough to unravel what I know from experience are the social-ecological complexities around food security. As highlighted in Chapter Two, food security approaches relying only on objective indicators, while analysing food security, are unable to reveal the complexity around food insecurity. This therefore demands the research problem be explored in a wider context, in a systemic way, to expose the actual conditions. Consequently, a qualitative approach that allows the study of phenomena in their natural settings and with attention to the meanings research participants bring to them (Denzin & Lincoln 2000) was chosen. Using a qualitative approach, researchers ‘confront and come up against the constraints of the everyday social world’ looking at this world in action and embedding their findings in it (Denzin
& Lincoln 2011, p. 9). In this study, the qualitative approach follows a critical social science epistemological framework.

A critical social science approach can be traced back to Marx (1818-1883) and Freud (1856-1939) (Neuman 2003; Neuman 2006). This approach joins constructivism in claiming that the way of knowing social phenomenon needs to be different from the way of knowing other natural objects (Neuman 2003). French sociologist Bourdieu (1930-2002) rejected the objective and quantitative empirical approach that positivists employ in their work and argued that ‘social research must be reflexive’ (Neuman 2006, p. 63). Critical theory is based on the ontology of historical realism that reality is shaped by social, political, cultural, economic, ethnic, and gender values; crystallized over time (Guba & Lincoln 1998). It upholds subjectivist epistemology (ibid) but criticises constructivism for treating people’s ideas as more important than actual conditions (Neuman 2006).

Critical social science is a ‘critical process of inquiry that goes beyond surface illusions to uncover the real structures in the material world in order to help people change conditions and build a better world for themselves’ (Neuman 2006, p. 63). Critical social scientists believe that one of the reasons for social research is to debunk myths and empower people to change their society - not just to understand and describe meaningful social action, as generally believed by constructivists (Neuman 2006). Critical theorists undertake social science that is committed to issues of ‘social justice, equity, nonviolence, peace, and universal human rights’. This is based on a recognition that social science is ‘already embedded in issues of value, ideology, power, desire, sexism, racism, domination, repression, and control’ (Denzin & Lincoln 2005, p. 13). Literature reviewed in Chapter Two highlighted most of these issues and recognises them as important processes influencing food security at multiple scales. For example caste, class, gender and place-based discrimination are regarded as having an important influence on food security as they affect people’s access to resources and their ability to choose livelihood options (Hildyard 2010; Holt-Gimenez & Shattuck 2011; Miller & Bowen 2013; Sen 1981). The chapter also discussed how productivism underpinned by ideology of liberalism could not solve problem of hunger globally.
indicating the importance of ideologies in shaping food security (Holt-Gimenez & Shattuck 2011; McMichael 2005; Sen 1981).

From a critical social science perspective, reality is over time, shaped by social, political, cultural, economic, ethnic, and gender factors and these crystalise into a series of structures that are sometimes inappropriately taken as real (Guba & Lincoln 1998). The emphasis then, can be on ‘combating surface-level distortions, [acknowledging] multiple levels of reality, and on value based activism for human empowerment’ (Neuman 2006, p. 65). In Jumla, persistent historical processes such as caste- and gender-based discrimination have been widely regarded as important factors influencing vulnerability to food insecurity. Unraveling these kinds of cultural and structural prejudices in Jumla requires employing an epistemology that is capable of ‘digging deep’ to unearth a more substantial understanding of what is seen at surface-level, with its distortions. Similarly, there is a reality to the ecological context of living in Jumla as manifest in soils, water, weather and other biophysical conditions. To ignore these structures has proven to exacerbate environmental degradation in many places and cases. People are not just ‘structured’ by social experience in isolation from their biophysical reality. There is, thus, a responding to and a co-creation/construction of landscape that is ‘relational’ in critical systems thinking (Simon 2003). As Capra & Luisi (2014, pp. 81-3) argue soft systems thinking shifts our attention from the study of the ‘particular to the whole’, from ‘objects to relationships’, from ‘measuring to mapping’, from ‘quantities to qualities’, from ‘structures to processes’, from ‘objective to epistemic science’ and from ‘Cartesian certainty to approximate knowledge’.

A constructivist approach is based on a relativist ontology and is premised on the idea that social realities are not absolute but are relative, depending upon one’s perception, understanding and experience of the world. In describing a constructivist approach Guba and Lincoln (1998, p. 85) state that ‘the truth is the most powerful, and sophisticated construction, which is informed, and, therefore constructed out there’. Constructivists believe that research should be open to varying opinions, concepts and understanding of the world being studied. So whilst a critical position is adopted, since this research explores social processes within the social-ecological systems, I accept that interconnectedness within systems thinking means that such processes are
relational; but as some elements from constructivism reflect relativity—the relative viewpoints of different respondents, for example, I am conscious that these are also evident in the data. This acknowledgement of the importance of interconnectedness also highlights the influence of systems thinking on the research methodology, as discussed in Chapter Two. Social-ecological systems thinking originated initially from the work of ecology. It is criticised by social scientists for the assumed arrogance of transferring the ideas of ecological science (e.g., networks, communities) to the social world. In response to these criticisms, and with regard to the use of critical social theory in this research as the way in which ‘the social’ is included, I argue that the social-ecological dimension can be informed by critical systems thinking. A critical system thinking offers a way of sensitising analysis to relational aspects within systems that are not objects or elements of that system but ideas and imaginaries that emerge as a consequence of the system being constituted as described by myself as the researcher, by the literature in its various domains and disciplines, and importantly, by the respondents, themselves—and, importantly—all have ramifications for the conceptualisation and operation of that system.

With this epistemological framing, this research employs a case study method to explore the structural realities of food security and their interconnectedness in Jumla, while acknowledging that the social construction of reality can be multiple. This approach follows others investigating social-ecological dynamics—the interaction between nature and society—and contributes to case study research situated in particular places and cultures (Berkes & Jolly 2001). Due to multiple realities, this study placed a high priority on capturing diverse perspectives.

### 3.3 Case study

Case study research is a commonly used method in critical social research. It is used in a variety of ways: for evaluation, education, policy analysis and action research. The case study is highly useful in providing an in-depth understanding of complex social phenomena because the goal in a case study is to develop a full exploration and understanding of the context being studied. It tries ‘to keep together, as a unit, those characteristics which are relevant to the scientific problem being investigated’ (Goods
& Hatt 1952 cited in Blaikie 2000, p. 215). The qualitative case study approach offers an opportunity to explore a situation in sufficient detail and to unravel its complexity (Denscombe 1998) by describing the process, not only the outcome. Systems thinking also emphasises the importance of making the methods transparent—the difference between other paradigms and systems thinking is the awareness of studying not ‘an object’ but ‘processes’ of interconnectedness and emergence (Berkes & Folke 1998). A case study leads to a detailed understanding; not just a causal explanation of the phenomenon studied (Gummesson 2000, p. 86). The results of case study research cannot always be generalised but the depth of exploration and ‘thick descriptions’ generated with thorough triangulation can allow meanings to be understood at a level not always possible through other methods, and, consequently, improve general understanding of the phenomena (Stake 2000, p. 439; Stake 2005). To Stake (2005, p. 444), a qualitative case study ‘concentrates on experiential knowledge of the case and close attention to the influence of its social, political, and other contexts’. The ‘other’ here reflects the environmental context.

Yin (2003, p. 13) defines a case study as ‘an empirical inquiry’. It investigates a contemporary phenomenon within its real life context, when boundaries between a phenomenon and context are not clearly evident (ibid). Clyde Mitchell (1983) categorises case studies by the level of complexity of the social situation under investigation. The most complex he refers to as an extended case study which ‘deals with a sequence of events sometimes over quite a long period, where the same actors are involved in a series of situations in which their structural positions must be continually re-specified and the flow of actors through different social positions specified….The extended case study enables the analyst to trace how events chain on to one another and how therefore events are necessarily linked to one another through time’ (Clyde Mitchell 1983, p. 194). In the case study, the researcher ‘digs into meanings, working to relate them to contexts and experience and in each instance, the work is reflective’ (Stake 2005, p. 450). This idea was applied in this research by focusing on people’s perception, experience and practices around food security.

In this study, the people, their environment and the issues of food insecurity they are dealing with, in Jumla district of Nepal, constituted the immediate case, but from the
outset I must acknowledge that the conditions and story of Jumla are subject to and affected by events beyond its borders. I will return to this idea later in the thesis, in particular in Chapter Four relating to food insecurity and policy. This study captured, at least in part, a representation of the socio-economic and biophysical diversity and inherent uncertainty through the case study lens. Capturing such diversity and uncertainty and emphasising equity and social justice are some of the important considerations in vulnerability and food studies (Eakin & Luers 2006). Analyses of the views, practices and experiences of people and other stakeholders involved in food security intervention programs provided a rich picture of Jumla’s everyday life. Jumla was selected not just for it being broadly representative of the typical mountainous areas of Nepal but also due to the fact that this area is regarded by the government and other development agencies as one of the most food insecure regions in the country (CBS 2013c; NPC 2010a, 2010c). A detailed description of Jumla is presented in Chapter Four and a detailed description of how Jumla was selected as a research site is provided in the next section.

In this case study, food insecurity is investigated in both semi-subsistence and subsistence settings. Local community members were asked to define their vulnerability associated with food insecurity, power, collective and individual actions and they were also asked to ‘map’ the complexity of the food security chain: who is involved, livelihoods and other activities identified by them as relevant to this discussion. The focus on local understandings of the food chain and vulnerability in the data collection, address some of the human agency related critiques of resilience (and the social-ecological systems approach) as discussed in Chapter Two. Both semi-structured interviews and focus group discussions (formal and opportunistic) were used in this case study to collect primary data during two field study phases.

The flow diagram in Table 3.1 below summarise the connection between theory, research aims, methods and data drawn upon in this research; the theory helps frame the issues, the issues are specified in the questions, the methods show how this research addressed the research questions, and the type of data collected to answer these questions.
Table 3.1: Flow diagram summarising connection among theory, research aim, methods and data needs in this research
**Research aim:** To explore processes that contribute to vulnerability to food insecurity from the perspective and experience of local communities in Jumla, Nepal

**General approach:** Qualitative

**Research paradigm:** Critical Social Science

**Main methodology:** Case study

**Key methods applied:** Semi-structured interviews, Focus groups, Observation, Historical data

**Sampling:** Purposive, Snowball

<table>
<thead>
<tr>
<th>Research questions</th>
<th>Method</th>
<th>Major tools used (in parenthesis how these tools help generate information)</th>
<th>Major interview questions themes</th>
</tr>
</thead>
</table>
| According to local communities, what social and ecological processes influence their vulnerability to food insecurity? | Semi-structured interviews, Focus group discussions, Observation | **Ranking food sources/sources of living** (i. putting sources of food and sources of livelihoods in order of importance and showing the reasons for the order, reasons for any changes over time)  
**Seasonal food security calendar** (i. seasonal variation in the different sources of food supply throughout the year, ii. seasonal farming activities, iii. distribution of days of precipitation, amount of precipitation or soil moisture, crops, women’s, children’s and men’s work including non-agricultural labour, diet, food consumption, sickness, prices, migration, income, expenditure, iii. relationship between different patterns of change—e.g. the relationship among income level, ethnicity and food security, iv. when people may be particularly vulnerable and v. seasonal changes in coping and adaptive strategies)  
**Resource mapping** (i. what resources and services are available to different people, and who uses them e.g. what resources and services are available to women and people from marginalised sections of the society? Can all people use these resources? ii. different people’s views of available resources, iii. understand the reasons why some people have access to resources and services and others do not) | Background and household details  
Experience of food insecurity  
Coping and adaptation strategies  
Changes in sources of livelihoods  
Changes in modes of obtaining food
Market  
Weather and climate  
Government policy  
Modern developments  
Experience of changes in landscapes/demography |
| How do local people describe/understand vulnerability’; ‘food insecurity’?          | Semi-structured interviews, Focus group discussions | **Resource mapping** (i. what resources and services are available to different people, and who uses them e.g. what resources and services are available to women and people from marginalised sections of the society? Can all people use these resources? ii. different people’s views of available resources, iii. understand the reasons why some people have access to resources and services and others do not)  
**Seasonal food security calendar** (i. seasonal variation in the different sources of food supply throughout the year, ii. seasonal farming activities, iii. distribution of days of precipitation, amount of precipitation or soil moisture, crops, women’s, children’s and men’s work including non-agricultural labour, diet, food consumption, sickness, prices, migration, income, expenditure, iii. relationship between different patterns of change—e.g. the relationship among income level, ethnicity and food security) | Background and household details  
Food security perception and current practices  
Meaning and experience of food insecurity  
Food self-sufficiency  
Sources of food and livelihoods and any changes to them (if any) |
In comparison to historical experience, how have changes to food security situations, influenced processes and interactions within the Jumla social-ecological system?

Semi-structured interviews, focus group discussions, historical data

Historical timeline (i. changes over time, trends, past efforts, ii. chronologies of events, listing major events with approximate dates, iii. people’s accounts of the past of how customs, practices have changed, iv. ecological histories, v. changes in land use, cropping pattern, population, migration, fuel use, education, health, credits etc. and causes of such changes and trends, estimation of relative magnitude),

Ranking food sources/sources of living (i. Putting sources of food and sources of livelihoods in order of importance and showing the reasons for the order, for reasons for any changes over time

Seasonal food security calendar (any changes overtime on their food security calendar)

How do people (individuals, households, community leaders) cope with and respond to food insecurity?

Semi-structured interviews, focus group discussions, historical data, observation

Historical timeline (i. changes over time, trends, past efforts, ii. people’s accounts of the past of how customs, practices have changed, iv. ecological histories, iii. changes in land use, cropping pattern, population, migration, fuel use, education, health, credits etc. and causes of such changes and trends, estimation of relative magnitude)

Ranking food sources/sources of living/coping and adaptation strategies (with the reasons for the order, any changes on such orders)

Historical timeline (i. changes over time, trends, past efforts, ii. people’s accounts of the past of how customs, practices have changed, iv. ecological histories, iii. changes in land use, cropping pattern, population, migration, fuel use, education, health, credits etc. and causes of such changes and trends, estimation of relative magnitude)

Seasonal food security calendar (i. relationship between different patterns of change—e.g. relationship among income level, ethnicity and food security, ii. When people may be particularly vulnerable, and iii. Seasonal changes in coping and adaptive strategies)

What are the main factors people identify as differentiating their vulnerability?

Semi-structured interviews, focus group discussions, historical data

Ranking food sources/sources of living (i. putting sources of food and sources of livelihoods in order of importance and showing the reasons for the order,) Historical timeline (ii. people’s accounts of the past of how customs, practices have changed and their effects on access to resources, ii. ecological histories, iii. changes in land use, cropping pattern, population, migration, fuel use, education, health, credits etc. and causes of such changes and trends, estimation of relative magnitude.)

Resource mapping (i. what resources and services are available to different people, and who uses them e.g. what resources and services are available to women and people from marginalized sections of the society? Can all people use these resources? ii. different people’s views of available resources, iii. understand the reasons why some people have access to resources and services and others do not)

Background and household details

Experience of food insecurity

Changes in coping and adaptation strategies

Changes in agriculture

Experience of key changes in landscapes/demography

How do local communities’ relationships with social and ecological systems influence the coping and response strategies that they employ and how have these changed over time?

Semi-structured interviews, focus group discussions, historical data, observation

Historical timeline (i. changes over time, trends, past efforts, ii. chronologies of events, listing major events with approximate dates, iii. people’s account of the past of how customs, practices have changed, iv. ecological histories, Resource mapping (i. What resources and services are available to different people, and who uses them e.g. what resources and services are available to women and people from marginalized section of the society? Can all people use these resources? ii. Different people’s views of available resources, iii. Understand the reasons why some people have access to resources and services and others do not)

Seasonal food security calendar (i. seasonal variation in the different sources of food supply throughout the year, ii. seasonal farming activities, iii. relationship between different patterns of change—e.g. the relationship among income level, ethnicity and food security, iv. when people may be particularly vulnerable and v. seasonal changes in coping and adaptive strategies)

Background and household details

History processes; culture; traditions;

Previous experience with food insecurity

Support networks and connections

Experience of changes in landscape/community

Views on household activities

Changes in agriculture

Changes in sources of income

Support networks and connections

Differential vulnerability

Differential vulnerability
3.4 Fieldwork and data collection

I embarked on my first fieldwork in the spring (May, June and July) of 2012 intending to determine the site of the case study. I had agreed with my PhD confirmation panel that I would choose the site from within the mid-western hills and mountains of Nepal. In order to come up with a research site, I undertook a short scoping visit to seven different districts, namely Surkhet, Salyan, Rukum, Jajarkot, Dailekh, Jumla and Kalikot (Figure 3.1). In these visits I consulted with policy and local level service providers such as forest officers, agriculture extension officers. Considering their advice and most importantly bearing in mind the unstable political situation of Nepal at that time (discussed below), I decided to conduct my fieldwork in Jumla. The reasons for this choice are described in the next paragraphs.

![Figure 3.1: Map showing mid-western hills and mountain districts of Nepal visited during scoping visits (Chandra Jayasuriya, The University of Melbourne 2014)](image)

The scoping study revealed that all of these districts have largely similar social-ecological processes that influence their food security situation; although the coping and adaptation strategies that people employ can appear to be different. My support networks in each of these districts (other extension officers) were equally supportive and kept encouraging me to undertake the study in their respective areas. Through
consultation with local community members and service providers, I was convinced that my research questions were equally relevant in all of these areas.

I then weighed up some practical issues that are important to consider for conducting PhD research fieldwork. As resources were limited, I was conscious of the financial limitations of doing this in a developing country. There was, at the time, only 14 days left for Nepal’s first-ever constitutional assembly to promulgate a new constitution for the nation. This was the time for different groups of people (such as ethnic groups, language groups, regional groups) to be more vocal and pressure the assembly so that their demands and issues were reflected in the upcoming constitution. In the process of making their issues heard, many of these groups were organising ‘Nepal bandha’ (mainly strikes of road transportation). These actions limited my mobility; for example I had to cut short my visit to Dailekh and return back to Surkhet to avoid Nepal bandha called for the following two days. As the date to announce the new constitution was approaching, I believed that different groups would become more vocal and increasingly organise such strikes.

As opposed to other districts, Jumla is a small district with a relatively small road network and thus limited road transportation facilities. Walking was the main mode of transportation and strikes and transportation shut-downs would not affect this mode; I could walk to the villages and conduct my fieldwork without any such disturbances. So the next day I flew to Jumla and reflected on Chambers’s (1981) six biases of rural research that prevent a researcher from capturing the perspectives of the poorest. One important bias is the ‘roadside bias’—researchers only go to places easily accessible by roads near cities and towns. In a bid to avoid the disruption of Nepal bandha, this bias was overcome by choosing a site where I and most of the people had to walk.

While I chose the district, and by doing so, viewed it as a container of people, I was to learn that their environment and their issues of food insecurity, were not boundaried in this geographical way. Both spatial and temporal scales needed to be resolved and this was not an easy task. Since the issues I am investigating in this research are complex in nature, setting boundaries may risk losing some processes and interactions from the purview of the research. With this in mind I used political demarcations in setting an
initial spatial boundary. I also interviewed people and documented stories across the political borders. I had interactions with people technically living in neighbouring districts. For example, I interviewed people living in Nagma—a bordering village of both Jumla and the neighboring district of Kalikot. This village has socio-cultural similarities with Jumla and interacts with Jumla in various activities. Similarly, interviewees in Jumla referenced neighbouring districts as if it was part of Jumla because they had some common property resources located there.

Setting the time boundary was also challenging. Despite the fact that official historical records of Jumla are rare, efforts were made to present some historical accounts as old as 1769 AD, when Jumla was annexed to present Nepal. Similarly, while my last day of fieldwork was June 10, 2013, I have in a few places in this thesis used references from reports after this date. The purpose was to acknowledge and understand the changes in the social-ecological systems and local communities’ relationship with such systems.

The first fieldwork in Nepal in general and Jumla in particular, began with reviewing relevant secondary data on food security (agriculture, forestry, food aid policy and practices) followed by consultations with local and policy level government and non-government officials about secondary data. Local extension staff were also consulted to identify the list and locations of grassroots groups within the district. Before the actual start of interviews, pilot interviews, with community members and with a local government official, were conducted. The pilot interview with the community members exposed the need to simplify some of the words in the interview questions. The pilot interview also reinforced the fact that the interview place should be selected carefully so as to avoid disturbances during the interview. The fieldwork was carried out in March to June 2012 and March to May 2013. The first fieldwork phase lasted for three months while the second was two months long.

During the second stage of fieldwork, more interviews and focus group discussions were conducted. Preliminary findings of the first fieldwork phase were also presented in a two hour seminar at Jumla district headquarters. Research participants and other local community members and representatives of both government and non-
government agencies present at the seminar were requested to provide feedback. Feedback received included the importance of acknowledging local diversity in terms of geography and weather. As will be discussed in Chapter Four, the Jumla landscape is not only diverse in terms of altitude and thus weather and climatic conditions; but also in people (including culture, socio-economic endowment, education etc.), availability of services, market integration, and available livelihood options. Feedback regarding diversity is addressed by acknowledging the nuances of diversity present in Jumla while collecting, analysing and discussing the data in this thesis.

Four data collection methods were employed:

3.4.1 Semi-structured interviews

Semi-structured interviews are one of the most useful methods to collect data in qualitative research where a set of pre-tested questions are used to generate responses from the participants (Alston & Bowles 2003). Individual semi-structured interviews were used as the primary method to gather field data in this research. Interviewing provides a way of generating empirical data about the social world by asking people to talk about their lives (Holstein & Gubrium 2002). An interview situation has the ability to incite the production of meanings that address issues relating to particular research concerns (ibid). The semi-structured interview is one of the most common and powerful ways to understand other people (Fontana & Frey 2005). It provides greater breadth as its analysis allows us to understand the complex behavior of members of society without imposing any a priori categorisation that may limit the field of inquiry (ibid).

During semi-structured interviews, questions are not put in any prescribed order. The selection of questions is instead governed by the actual situation confronting the interviewer and the knowledge and experience of the interviewee; it is a more natural way of carrying out conversation and ultimately may provide a more realistic understanding of a sequence of events in the teller’s narrative. Having a set of questions can be used to generate responses from respondents (Alston & Bowles 2003), but judging how to ask them and when depends on the interview situation.
Bryman (2001) states that the researcher can use an aide memoir as a brief set of prompts to deal with a certain range of topics if specific questions are not useful. Semi-structured interviews can contain open-ended questions allowing the researcher to probe and verify ideas generated in responses; or stimulating further responses through additional questions (ibid). This kind of flexibility is essential to understand and explore issues and phenomena in terms of the meanings that participants bring to them. This is a face-to-face interaction and creates an informal platform for discussion between the researcher and respondents.

In an informal conversation situation, recording nonverbal communication is also important (Fontana & Frey 2000). Gorden (1980, p. 335) outlines four basic modes of nonverbal communication: proxemic, chronemic, kinesic, and paralinguistic. Proxemic communication is the use of interpersonal space to communicate attitudes, chronemic is the pacing of speech and length of silence in conversation, kinesic includes any body movements or postures, and paralinguistic includes all the variations in volume, pitch, and quality of voice. Since interview data are more than verbal records, nonverbal features of interaction can be manually transcribed and noted as much as possible (Fontana & Frey 2005). Use of these different modes of nonverbal communication by participants during interviews was recorded by writing field notes during and after each of the interviews in this study. These nonverbal recordings are important in cultures where there is so much class difference, and where people’s responses to inequities, at times, may be implied from their body language rather than from their voice. One example of this is women sitting at the back of a meeting, away from the centre of discussion.

In this study, interview participants were asked to describe their views, practices (of production and consumption) and experiences of food insecurity (Figure 3.2). They were also requested to explain how they coped and/or are coping with a food insecure situation and if there were any changes over time, in their coping strategies. Participants were encouraged to recall their past experiences of responding to food insecurity as far as they could remember. Most participants were able to recall their experiences for up to 30 years; some participants even went further and also shared their parent’s account of how they coped with food insecure situations up to 80 years.
ago. Attention was given to the responses from the interviewees to document if there was any relation between their socio-economic status (crudely defined by the amount of good quality land people own and the caste group they belonged to), gender or location with the choice, selection and effectiveness of their coping strategies. This is because systems and interconnectedness of elements within systems are relational. These stories were then used as prompts for exploring their current ideas about the effectiveness of their strategies. Due attention was given to ensure diversity of participants in terms of socioeconomic status, ethnicity, gender and remoteness from the headquarters of the district. In addition, during semi-structured interviews some participatory rural appraisal (PRA) tools were applied, such as seasonal food security calendar, resource mapping, rankings and historical time line. These tools are used in this study to strengthen the validity of research by triangulating the data and information collected, through the use of different methods.

Figure 3.2: A dalit respondent in a remote Jumli village of Kanakasundari, Sinja (with permission) (Photo: Kamal Gaire, 2012)
Two interview guides were used for the semi-structured interviews—one for community members and the other for government and non-government officials. These interview guides are presented in Appendix One and Two respectively. All the respondents were able to speak Nepali—the language used in interviews. All the interviews were tape recorded, transcribed and then a synopsis was provided to the respondents for their commentary.

### 3.4.2 Focus group discussion

Focus group discussion involves organised discussion with a selected group of individuals to gather information about their views and experiences on a particular topic. In a broader sense, focus groups are ‘collective conversations or group interviews’ (Kamberelis & Dimitriadis 2005, p. 887). Focus groups can be small or large, directed or non-directed (ibid). For Bryman (2008), the focus group technique is a method of interview that involves at least four interviewees. There is an emphasis in the questioning on a particular topic. The focus group contains elements of two methods: the group interview—several people discuss a number of topics, and a focused interview—in which participants are selected because they ‘are known to have been involved in a particular situation’ (Metron et al. 1956 P.3 cited in Bryman 2008, p. 474). The use of focus groups in social science research can be traced back to the work of Lazarsfeld and Metron in 1941 when they were assessing media effects on attitudes towards America’s involvement in World War II (Kamberelis & Dimitriadis 2005). Since then, it has been used as an instrument of qualitative inquiry within studies employing different epistemological positions.

Researchers use focus groups as a forum for getting participants to explain why they responded in the ways they did. In a normal individual interview the interviewee is asked about his or her reasons for holding a particular view, but the focus group approach offers the opportunity of allowing people to probe each other’s reason for holding a certain view (Bryman 2008). It is a dynamic setting ideally allowing a multiplicity of views. For example, an individual may answer in a certain way during a focus group, but as she/he listens to other’s views, she/he may want to qualify or modify their own view or voice agreement – something that she/he would not have
thought of without the opportunity of hearing the views of others. This means that the focus group approach helps in the elicitation of diverse views in relation to a particular issue (Bryman 2008). It is important, though, to pay utmost attention and exercise caution while conducting focus group discussions as they can be an uneven platform where those with power may dominate the session—disadvantaging those with less power who are then able to openly talk.

Unlike in an individual interview, moderators can challenge interviewees and point out inconsistencies in their responses. Individuals can argue with each other and challenge each other’s views, depending on status and power relations. The discussion also allows the researcher to understand why people feel the way they feel, their similarities and differences. For example, I asked participants in a mixed gender focus group discussion about their views on the main reasons for the decline in cultivation of some of traditional food crops particularly chino and Kaguno in Jumla. Participants listed some ten reasons for this but the most important reasons for male and female participants were different. According to male participants the main reason for decline was that these crops were less profitable than other replacement crops such as beans, whereas according to female participants the main reason was the widespread perception of these crops as inferior food. Male participants later agreed that these crops are regarded in Jumla as ‘women’s food’ and that they feel ashamed to consume them. In the end, participants agreed that change in food habits towards rice is the main reason for them abandoning cultivation of these crops. One women participant said she stopped cultivating these crops because of increased disease and pest infestation at the milking stage. This process of collective construction of the issue under investigation provides the researcher an opportunity for a more realistic account of what people think, because participants are forced to think about and possibly revise their views (Bryman 2008). Since this research involves an historic analysis requiring participants to recall past events, a focus group approach assists to obtain a collective understanding of events. The interview guide for focus group discussions for this research is presented in Appendix Three.

Focus group discussions are also an important tool to triangulate data obtained through individual interviews. Focus group sessions were tape recorded and subsequently
transcribed (Figure 3.3). Apart from discussing their views, experiences and practices related to food insecurity, focus group discussions were also utilised to triangulate cropping calendars, rankings of most important sources of food/sources of income and the seasonal food security calendar developed as part of the fieldwork. A list of key social-ecological changes in Jumla was produced by the focus groups participants and consolidated by me into the calendar presented in figure 3.4.

Figure 3.3: Mixed gender focus group discussion in a remote village of Taliyum, Jumla (with permission) (Photo: Kamal Gaire, 2013)
3.4.3 Observation

I spent a total of five months in the field—three months in 2012 and two months in 2013 for this research. During these times I attended a few workshops, meetings and training programs organised by government agencies, NGOs and by the community themselves. These included a Farmers’ Field School to learn Integrated Pest Management (IPM) on apple orchards being organised by DADO in Urthu village, Talyum Community Seed Bank’s committee meeting in Taliyun village, apple orchard management training organised by a farmers’ group in Tatopani village and a District strategic planning workshop organized by the Jumla District Development Committee at the district headquarters. I also attended a progress review meeting of the Sheep and Goat Research Unit of Nepal Agriculture Research Council stationed at Guthichaur.

Figure 3.4: List of key social-ecological changes (and their English translation is presented in Box 1) produced from a women only focus group discussion (Photo: Kamal Gaire, 2012)

**Box 1: Key changes (English translation)**

1. opening of new road connecting Jumla to the rest of the country
2. increases in piped drinking water supply facilities
3. toilet construction (starting of toilet using culture)
4. relatively improved sanitation system
5. people started eating leafy vegetables
6. increase in knowledge of improved agriculture
7. deforestation
8. declining snowfall
9. construction of community based small irrigation systems
10. women organizing in groups
11. establishment of schools/children (even daughters) are going to schools
12. use of improved cooking stoves
13. start of apple orcharding
14. slight respite in caste based discrimination
15. increased contribution of NTFPs particularly yarchagumba in livelihood
16. decline in discriminating attitudes towards women (specially during mansuration)
village and visited agriculture research stations located in Bijayanagar and in Rajikot villages. Meetings, visits and training programs attended allowed me to be an observer; whereas, in workshops I took part in discussions. Apart from such observations, during formally organised events, informal but direct observations occurred while being in the field. Such observations occurred during walking from one village to other, having tea in a village tea shop, having food with some interview participants, reading the local newspapers—all helped in getting to know the community’s life, the food they eat, the way they prepare food (Figure 3.5) and their experiences of everyday production and consumption.

Figure 3.5: Observations while having tea at a nearby tea shop (Photo: Kamal Gaire, 2013)

(Women milling paddy in a traditional way while men and children do other household chores in a remote Jumli village of Hanku. The job of milling grains is regarded as women’s work.)
3.4.4 Literature review including historic records and the ‘grey literature’ from local government departments

The literature review has been a continual process throughout my time as a PhD student. Journals, books, policy documents, and conference proceedings were searched from a number of databases available through The University of Melbourne’s library services. The main databases used for this research were Web of Science, SCOPUS, Science Direct and Proquest. Google and Google Scholar were also used in searching many Nepalese related policy documents and other grey literature—and here the ‘grey literature’ is that which is not peer reviewed, and mostly comprises government agency and aid agency documentation. A variety of search terms including vulnerability, social-ecological systems, political ecology, food security, food systems, climate change, complexity, livelihoods, resilience were used.

Apart from these searches, teachers and colleagues also recommended interesting and relevant books and papers during regular monthly reading group sessions run by the Landscape Sociology Group at the Department of Resource Management and Geography. Some Nepalese related books, especially those discussing Jumla’s environmental and socio-economic histories, and local line agencies’ (such as District Agriculture Development office, District Livestock Services Office, District Forest Office, District Public Health office) annual publications were collected during fieldwork. Similarly, meteorological data from the Jumla meteorological station located at district headquarters were purchased from the Department of Hydrology and Meteorology, Government of Nepal. These data were used to triangulate related qualitative data obtained from interviews and focus group discussions.

3.5 Selection of research participants

Face to face, semi-structured interviews were conducted with 42 participants – 28 community members and ten government and non-governmental officials working on food security issues. Additionally, four policy level officials working at the central level were also interviewed. Each interview lasted, on average, 45 minutes. A total of three focus group discussions were conducted—two of them involved six to eight community member participants each and one involved both community members and
service providers (six to ten participants). Of the two focus group discussions with community members only, one was conducted exclusively with women while the other one was mixed gendered. The mixed gender discussion was conducted in a remote village whereas the ‘women only’ community member discussion and the one involving both community members and service providers were conducted in a village near district headquarters. Recruitment was purposive and participants were selected from the following categories in order to capture the diversity of citizens present in Jumla.

**Community members:**
- gender
- socio-economic status (by amount of land ownership)
- ethnicity (caste)
- location of their neighborhoods (people living in both relatively accessible and inaccessible areas)
- livelihood (including share cropping farmer, labourer, trader, off-farm business)

**Service providers:**
- government (agricultural extension, livestock, forestry, public health, local development, local school teacher)
- non-government (agriculture, livestock, forestry, food aid, public health)

Lists of farmers’ groups and other community organizations and their contact details were obtained from the publicly available annual reports of District Agriculture Development office and from the District Development Committee (Local Government). Arrangements were made to meet groups particularly relevant to this study, for example women’s groups and vegetable growing groups. Group leaders from relevant groups were contacted and asked to participate in face-to-face individual interviews and/or focus group discussions. Initially some people were contacted by telephone to arrange a time to meet face-to-face to discuss the research, to share the plain language statement required by the University of Melbourne Human Ethics approval for the project, and to request their permission to use the interview data in the thesis and any subsequent papers. In the case of service providers, a consent form was
signed before proceeding with the interviews but in the case of community members the plain language statement, translated into Nepalese, was read out with a verbal consent recorded. Plain language statements in English and its Nepalese translation are presented in Appendices Four and Five respectively. A sample of the consent form is presented in Appendix Six.

Apart from purposive sampling, this study also used snowballing. Local group leaders (for potential participants who are affiliated with groups) and/or village leaders (for potential participants who are not affiliated to groups) were contacted and requested to assist in identifying potential research participants. The breakdown of 42 interview participants is presented in table 3.2 and 3.3. Some community member participants fit into more than one category, for example, a dalits male, living in a remote village,

Figure 3.6: Farmer participant from a remote and higher altitude village of Guthichaur, Jumla; interview conducted on the side of the walking track (with permission) (Photo: Kamal Gaire, 2012)
involved in share cropping and owning a small plot of his own land and is involved in sewing to complement his income. It was apparent during the field work that all the community members had farming as their main source of livelihood; even if some participants did not directly practice farming they nevertheless were found to own farm land and offered their land for share cropping. Similarly, some participants were farmers but had some members of the family doing salaried jobs or working in small businesses. All the *dalits* participants were found to be doing share cropping.

Table 3.2: Breakdown of community members interviewed by gender, caste groups and by location of their neighbourhoods

<table>
<thead>
<tr>
<th>Participants categories</th>
<th>Dalits</th>
<th></th>
<th>Other caste groups</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From remote villages</td>
<td>From around district headquarters</td>
<td>From remote villages</td>
<td>From around district headquarters</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>3</td>
<td>12</td>
<td>9</td>
<td>28</td>
</tr>
</tbody>
</table>

Table 3.3: Breakdown of service providers interviewed

<table>
<thead>
<tr>
<th>Participants categories</th>
<th>Government</th>
<th></th>
<th>NGOs</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agriculture</td>
<td>Forestry</td>
<td>Teacher</td>
<td>Others</td>
<td>Food security</td>
</tr>
<tr>
<td>Local level</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Policy level</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

3.6 Data analysis

Data analysis processes began with the start of data collection. Conceptualisation and an initial reflection on interviews and focus group discussions in the form of field journals were incorporated into the data.

An approach proposed by Seale (2004, p. 299), entitled ‘Qualitative Content Analysis’, was used to guide the analysis of data in this research. It involves reviewing the interview transcripts/field notes and giving names to the words or sentences that seem to have theoretical significance. ‘Open coding’ is the process of ‘breaking down,
examining, comparing, conceptualizing and categorizing data’ (Strauss & Corbin 1998, p. 102).

The qualitative data analysis software package NVivo 10 was used to analyse the data. NVivo helped with organisation of the coding and categorisation process. Some interview and focus group discussion data were presented in a number of coding workshops organised regularly within the social research discussion group at the Department of Resource Management and Geography. Comments and suggestions received during these workshops helped greatly in coding. My codebook became more focused over time. For example categorising of one of the codes—‘coping and adaptation’ changed a number of times. I initially had two sub codes namely i) strategies that undermine their future ability to cope, and ii) strategies that do not undermine their future ability to cope; and additional sub codes of strategies. It was, at times, difficult to differentiate among them as some strategies do not undermine some participants’ future ability to cope but the same strategy was found to have a negative impact on some other participant’s future ability to cope. After a series of discussions in the shared coding workshops, I finally changed them into four sub-codes. My final codes are shown in table 3.4.

During the process of coding interviews and focus group discussion transcripts, texts were analysed line by line to identify concepts. The abstracted concepts were compared with previous interviews. Similar concepts were grouped to develop core categories or core themes. Major themes uncovered during qualitative analysis were denoted by memos. These memos were used to record my thoughts during the process of coding. Use of NVivo 10 allowed the original source in the transcript to be linked to the relevant memo. This was followed by further analysis wherein comparisons were made for similarities and differences, and questioning about the phenomena reflected in various themes emerging from the data. The coding and memo process, in this way, uncovered what turned out to be the main themes around processes influencing food vulnerability. These were later contextualised within existing theory reviewed earlier in this thesis. Aspects of these theories were used in describing experiences and practices among research participants and to facilitate some generalisations beyond Jumla as the research site.
<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-code</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food insecurity</td>
<td>Meaning</td>
<td>Includes definition/understanding of food insecurity</td>
</tr>
<tr>
<td></td>
<td>Experience</td>
<td>Includes stories of food insecurity participants and/or their parents faced</td>
</tr>
<tr>
<td></td>
<td>Sources of food</td>
<td>Account of sources of food</td>
</tr>
<tr>
<td>Coping and adapting</td>
<td>Withdrawing</td>
<td>Account of strategies that participants think undermine their future ability to cope such as eating less, taking children out of schools, selling assets</td>
</tr>
<tr>
<td></td>
<td>Resisting</td>
<td>Account of strategies that demonstrates some degree of agency and potentially access to a more diverse suite of relations and resources, such as increasing farm area, planting new crops and new varieties, changing expectations of activities associated with the cropping calendar</td>
</tr>
<tr>
<td></td>
<td>Maintaining</td>
<td>Account of strategies where people attempt to maintain <em>status quo</em> in their day-to-day activities and interactions such as making claims on friends, families, extended families, neighbours, NGOs government and hoarding food materials</td>
</tr>
<tr>
<td></td>
<td>Adapting</td>
<td>Account of strategies that demonstrate futuristic actions and that demonstrate a move beyond coping to adapt to social-ecological uncertainties such as diversification of sources of food and income, and collective community efforts and embracing innovations</td>
</tr>
<tr>
<td>Social-ecological changes (at regional, landscape and neighbourhood levels)</td>
<td>Armed conflict</td>
<td>Accounts of how armed conflict affected food security situation</td>
</tr>
<tr>
<td></td>
<td>Deforestation</td>
<td>Include changes in forest cover in their surrounding and accounts of any effects it had on food security, soil fertility</td>
</tr>
<tr>
<td></td>
<td>Government policy</td>
<td>Account of influence current and historical policies had on food security such as agriculture, food security, water, forestry, land policies, government support</td>
</tr>
<tr>
<td></td>
<td>Diseases and illness</td>
<td>Account of illness in the family/valued animals influencing food security situation of the households; accounts of changes in sanitation and public health issues</td>
</tr>
<tr>
<td></td>
<td>Modern development</td>
<td>Account of changes in modern development and their influence on food security situation, such as development in education, health, transportation, electricity and information and communication technologies (ICT)</td>
</tr>
<tr>
<td></td>
<td>Population</td>
<td>Account of changes in population, family size, family type and their impact on livelihoods and food security</td>
</tr>
<tr>
<td></td>
<td>Weather and climate</td>
<td>Account of weather and climatic variabilities and changes in social-ecological relationships e.g.</td>
</tr>
</tbody>
</table>

![Table 3.4: Codebook](image-url)
3.7 Research quality considerations

Prior to field data collection, an approval from the Human Research Ethics Committee of the Melbourne School of Land and Environment (MSLE), The University of Melbourne was obtained to conduct this research project in Nepal (Ethics ID: 1136873). The professional and personal morality of the researcher, [his] personal and professional integrity and the implicit social justice towards community and informants participating in the research, are three main aspects pertinent to social research ethics (Minichiello et al. 1995). All social researchers need to address the issues related to trust, privacy, confidentiality, and any risks associated with participation (Punch 1998). The participants were informed of the research process. Strict privacy and confidentiality of the data was maintained so as not to reveal the names of interview participants by keeping tape recordings and field notes secured while in the field. Since the data and information obtained are sensitive in terms of respondents’ way of daily life, livelihoods and their past experiences, efforts were made in this thesis to ensure that the identity of individuals was protected by assigning a number to each participant, such as participant one (P 01).

Apart from these ethical considerations, commonly used key qualities of social research are reliability, replication and validity (Bryman 2008). Reliability is about the stability of research findings over time and ability of arriving at similar outcomes using different researchers and/or methods. There are two types of reliability, internal and external. Internal reliability is about whether the method used is consistent with the theoretical and practical undertaking of the study itself. External reliability is
related to whether or not the study could be repeated with similar results. Therefore the transparency of methods used is a key factor here.

Validity concerns the integrity of the research and four factors together constitute validity: measurement validity, internal validity, external validity and ecological validity (Bryman 2008). Measurement validity is about appropriateness of research methods in measuring concepts and internal validity is related to causality between observations and the conclusion the research arrives at. External validity concerns whether the findings can be generalised beyond the research boundary whereas ecological validity is about whether or not the findings represent the way people live their lives in a natural social setting (ibid p 48: 2012).

Guba and Lincoln (1998), however believe that qualitative research needs a different set of quality criteria and propose credibility, transferability, dependability and confirmability of the research. They believe that credibility of the research can be enhanced by respondent validation and triangulation whereas the question of transferability is maintained through thick descriptions of the phenomenon studied. Similarly, keeping records of all phases of the research process enhance dependability whereas confirmability is about whether or not the researcher has acted in a good faith.

These quality concerns are addressed in this research by triangulation, reflexivity and thick description of the case. In this study my research was guided by reflection with supervisors—both believe in systems thinking and advocate for social justice. Reflexivity is the process where researcher considers their role in the performance or undertaking of a task within the research relationship. In chapter one I reflected on how I developed an interest in studying food security. I have seen people unable to effect their food security and this is so despite government and non-governmental help. As an extension officer I developed my interest in the power structures and social justice in and external to the communities I was working in and how these structures have evolved over time through implicit support within social institutions. As an extension officer I also had reservations on compartmentalised style of working within my organisation—for example, irrigation separate to pomology.
I needed to consider how my actions contributed to the way in which society and food security in Nepal were framed. As Davies (1999:18) argues, “society exists independently of our conceptions of it, in its casual properties, its ability to exert deterministic force on individuals; yet it is dependent on our actions, human activity, for its reproduction”. This was relevant to my research study – historical social structures (caste, class, gender based) are present within Jumla communities whether or not I am there to observe them. These structures may not always ‘visible’ as they are reinforced through religious institutions, policy mechanisms, and people carrying on with ‘business as usual’ approach; they may not look obvious unless discussed; they are however ‘discoverable’.

The reflexive practitioner is conscious that practices have meaning and purpose and that in reflecting on actions (our own, the actions of others) there is a possibility to not only transform these practices but engage with different forms of reasoning (Mattson and Kemmis, 2007:186) and in so doing, encourage a critical awareness among others (196) and for oneself.

Despite a semi-structured interview approach, the basic framework of questions and themes was used for all research participants. The findings were compared to relevant theories to enable viewing of the outcomes in a broader theoretical sense. This was important to address the issue of generalisability of the outcomes across a wider population. Immediate reflections in the form of field notes after each interview and focus group discussions were written to document settings of interactions among others and identify any possible researcher influence on participants’ responses. This was important to check the internal validity of the research process. My experience of working as a government extension officer with rural communities enabled me to understand the issue through the same lens as research participants.

Measurement validity, in this research, was addressed by the use of triangulation. In this research triangulation was achieved by gathering information from a number of sources in a variety of ways. This involved comparing semi-structured interview data (around views, practices and experiences about food vulnerability) with other sources of data, namely focus group discussions (for feedback) and documentary (secondary
source) materials (for validation). Triangulation was also achieved through regular informal discussion with local service providers such as District Agriculture Development Office (DADO) officials, District Livestock Service Office (DSLO) officials, District Forest Office (DFO) officials, National Agriculture Research Council (NARC) scientists stationed locally, Village Development Committee (VDC) secretaries. Official meteorological data for Jumla was purchased from Department of Hydrology and Meteorology (DOHM), Kathmandu and used to verify respondents’ accounts of drought, and changes in temperature. Annual progress reports of local agencies were gathered and used as reference and verification of more generally discussed materials. Historical records such as population, land use, agricultural production were also used in this study. In research, triangulation means using multiple methods and data sources to ensure richness, depth, complexity, rigour and breadth of the study (Denzin & Lincoln 2000, p. 5). It is the ‘display of multiple, refracted realities simultaneously’ (ibid, p. 6). I have been careful to triangulate the field data as described above.

Preliminary findings from the first round of fieldwork were presented locally to some research participants and other stakeholders in a half-day seminar on May 17, 2013 at Jumla district headquarters. Feedback during the seminar aided reliability and the validity of the data analysis.

3.8 Summary

This chapter described the approach and methods used in this study. A qualitative approach and case study methodology was considered appropriate given the exploratory nature of the research questions. The case study methodology was consistent with a critical social science perspective. This perspective is both realist and relational and this aligns with complexity ideas, ideas of political ecology and a social-ecological systems approach informed by resilience thinking. A combination of necessary and appropriate subjective and objective ways was adopted to answer research questions. Mixed methods were used to collect data, including semi-structured interviews, focus group discussions and historical data. This helped in triangulation of information and developing a richer description of social-ecological
processes that influence vulnerability to food insecurity in Jumla. Management and analysis of data was done by using qualitative data analysis software—NVivo and coding spreadsheets. The results of these analyses are discussed in detail in the next three chapters.
Chapter 4: The changing social-ecological context of food in Nepal

The literature reviewed and discussed in Chapter 2 identifies important structural/contextual issues that influence food security. Scholars point to key issues such as ecology, climate, and political economy—operating at multiple scales—as shaping food security. This chapter introduces Nepal in the wider context of this study and the research site (Jumla district) in particular. I focus on its geography, food systems, culture, socio-economic conditions and food and agriculture policies in this chapter.

4.1 Physical geography

Administratively, the country is divided into five development regions and 75 districts. But, ecologically, Nepal has three distinct regions which run through it from east to west, roughly parallel to each other. The three regions are: i) the terai, a low, flat, river plain, ii) the hill region, and iii) the mountain region, which contains Mt. Everest, the world’s highest mountain (Figure 4.1).

Fig 4.1: Map of Nepal showing three ecological zones (Source: Wessel et al. (2014))
As one travels north, the regions increase in elevation, and the climate changes from tropical in the terai to alpine in the mountains. The regions are suited to different kinds of agriculture, depending on elevation. The terai has mostly cereal grains, cash crops and livestock. The hill region also has cereal crops, with horticulture present as cash crops as well as livestock. The agriculture of the mountain region is predominantly livestock based. As altitude rises, agricultural production tends to decrease due to less favorable climatic conditions, shorter growing periods and increasing soil gradients which make cultivation difficult (Agostinucci & Loseby 2008). In hill and mountain areas transport is also complicated due to the lack of adequate infrastructure. As a result, my experience as an extension officer suggests that the higher the altitude in Nepal, the more the food security status of a household is at risk. Yet, as discussed in Chapter Two, it is not environmental factors alone that shape people’s food security.

4.2. Food and agriculture systems in Nepal

Smallholder and marginal farms dominate Nepalese agriculture (see Table 4.1). The latest national agricultural census in 2011 recorded more than two thirds of Nepalese households as essentially farm households, with farm income and agricultural wage income accounting for nearly half of their family income (CBS 2013c). Despite the fact that Nepal’s agriculture is regarded as the backbone of the economy—a third of the GDP (MOF 2010, 2012)—the country nevertheless relies to a large extent on the import of food, especially cereals, in order to meet its food requirements (Agostinucci & Loseby 2008). Nearly a half of all farms have less than 0.5 hectares (ha) of land, while those with less than 1 ha of land constitute nearly three-quarters of all holdings (CBS 2013c).

The land ownership system in Nepal remains highly skewed, with 7.5% of farmers owning nearly a third of the farming area; and nearly half of all holdings (47.7%) are too small to enable the family to meet subsistence requirements (less than 0.5 ha) (Willy, Chapagain & Sharma 2008). At least another 10% of rural households are landless (half a million rural households) (ibid). Together, nearly 60% of rural households are functionally landless. Farms are getting smaller – the average size of holdings has declined by 28 percent in a fifty year period (from 1.11 ha in 1961 to 0.8
ha in 2001 to 0.68 ha in 2011) with the number of holdings nearly doubling over the same period (1.5 to 2.8 to 3.8 million in the same three sample census periods) (CBS 2013c; NPC 2010c). The government’s redistributive land reform efforts in the past are believed to be behind such changes in farm sizes and number of holdings (Willy, Chapagain & Sharma 2008) as successive land reform programs implemented in the past kept decreasing the overall limit of land ownership in the country. While these changes provided increased access to land, increased land fragmentation causing smaller size of parcels also increased the vulnerability of local agricultural systems.

The Nepal Labour Force Survey conducted in 2008 revealed that the agriculture sector alone engaged 74% of people (persons aged 15 years and above) (CBS 2009). However, this agriculture sector is home for a large majority of people living below the poverty line. The National Living Standard survey (CBS 2005) reported that marginal and small farmers with less than one hectare of land constituted 76% of all the poor in Nepal (see Table 4.1). Besides being small in size, this land is often fragmented in scattered parcels and located on slopes or at higher elevations (Willy, Chapagain & Sharma 2008) with low moisture retention capacity and with little or no irrigation facilities (MOAC 2010). As Nepal’s agriculture sector, which is one third of the GDP and provides employment to the majority Nepalese population, is dependent on weather and climatic conditions, the Nepalese economy is sensitive to climate change (Alam & Regmi 2004).

In addition to the limited availability and poor quality of land, some types of marginal farm households – especially sharecroppers and migrant households on recently cleared forest land, and women-headed households – have insecure land tenure on which they depend (Willy, Chapagain & Sharma 2008). This reduces the incentive for them to invest in their land, which in turn limits improvements in agricultural productivity (ibid). As a result, Nepal has a poor average agricultural yield in comparison to neighbouring countries. Crop production in the last few decades has stagnated lagging far behind the growth in population. Since the early 1990s, food production shocks have generally led to a national annual food deficit. At a regional level, the situation is even more worrisome, with the pattern of food security spatially
and socially uneven. The Terai region produces a surplus in food but the hills and mountain regions are consistently in a production deficit.

Subsistence family farms dominate Nepal’s agriculture. The occupational classification of current employment reported in the Nepal Labour Force Survey revealed that 64% of those employed were in subsistence agriculture while only 3.1% were employed in market agriculture (intensive agriculture) (CBS 2009). These subsistence farms are not capable of supporting the farm families. For 60% of farming households the annual farm production was not sufficient to feed their household until the next harvest; 40% of farming households were deficient for up to 6 months, while 20% of farming households were deficient in food production for more than half a year (CBS 2013c). Farmers practice a type of agriculture and have livestock enterprises that suit their geo-climatic conditions. The agriculture production system in Nepal lacks the use of ‘modern’ technologies (Agostinucci & Loseby 2008) and the farming systems largely vary in the three distinct geographic regions. Crop production for the most part is almost exclusively dependent on rainfall, and hence affected also by the global increase in temperatures and erratic nature of precipitation patterns which have increased in the last decades (Shivakumar & Hansen 2007). Agriculture on the little available irrigated land and on the rain-fed low land within a region varies in the selection of crops, cropping intensities and cultivation practices (MOAC 2010).

Agricultural production is mostly dominated by the crop sub-sector which accounts for nearly two-thirds of agricultural gross domestic production (AGDP) (MOF 2010, 2012). Cereal crops account for over 80% of the annual cropped area wherein paddy alone occupies 40% followed by maize (about 20%) and wheat (about 17%) (MOAC 2010), with cropping intensity as low at 1.85% on average (CBS 2013c). Cropping intensity is a ratio between net sown area and gross cropped area. The cropping intensity is 100 if one crop is grown in a year and it is 200 if two crops are raised. Production of staple food grains is commonly the choice of farms, especially production of paddy wherever it is possible to grow (NPC 2010b), and this may be because rice is now the preferred food. In the mid-western hills and mountain (the study area), being able to eat rice at dinner and lunch is regarded as a matter of pride in
the community. This indicates that these statistics are important for government provision of food security and for local expectations of food insecurity.

Animal husbandry is another important source of livelihood in Nepal. Large livestock populations provide sources of meat, milk, draft power and farm yard manure. Livestock are a major enterprise for generating farm income. Farmers mostly practice animal husbandry and crops farming together which often complements each other. Farmers variously raise mainly cows, ox, buffalos, goats, sheep, and pigs. Crop residues are fed to animals and cow dung manure is applied to the farms. But recent statistics show a steady decline in livestock numbers in Nepal (MOAC 2011). As will be discussed in Chapter Five, livestock are important in the Jumli food system as they not only provide food and sources of cash to buy food but also supply much needed manure for farming. Key features of agriculture and food security in Nepal are summarised in Table 4.1.

Table 4.1: Key features of agriculture and food security in Nepal

<table>
<thead>
<tr>
<th>Key features of food and agriculture</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area under cultivation (ha)</td>
<td>2,525,639</td>
</tr>
<tr>
<td>Number of farming households</td>
<td>3,831,093</td>
</tr>
<tr>
<td>Average size of the holdings</td>
<td>0.68 ha</td>
</tr>
<tr>
<td>Number (and percentage) of farming households with less than 0.5 ha area</td>
<td>1,987,009 (51.8%)</td>
</tr>
<tr>
<td>Number (and percentage) of farming households with less than 1 ha area</td>
<td>2,971,031 (77.5%)</td>
</tr>
<tr>
<td>Number of parcels per farming household</td>
<td>3.2</td>
</tr>
<tr>
<td>Average size of parcel</td>
<td>0.21 ha</td>
</tr>
<tr>
<td>Percent of farming households having agriculture as the main source of income</td>
<td>83</td>
</tr>
<tr>
<td>Percentage of farming households producing insufficient food for own consumption</td>
<td>60</td>
</tr>
<tr>
<td>Cropping intensity</td>
<td>185</td>
</tr>
</tbody>
</table>

Source: CBS (2013c)

All these structural indicators suggest that while small holder oriented agricultural development has high potential to have wider impact upon poverty and is the pivotal
element for achieving food security in the country, exploring and supporting livelihood opportunities off the farm is a pathway to follow for small and marginal farming households to achieve longer term food security.

4.3. Socio-economic geography of Nepal

This section provides an overview of key social and economic features of Nepal that are important to understanding food security. These include the nature of poverty in Nepal, key social structures in society including the caste system, historical changes in the economy, and the political system of government. Literature on entitlement and political ecology perspectives reviewed in Chapter Two of this thesis indicates these structural features as critical to shaping the food security context.

The Himalayan country of Nepal is largely a multicultural country. About 80 percent of the Nepalese population is Hindu, 10 percent Buddhist and 4 percent Muslim, with considerable diversity in ethnicity and caste (CBS 2011b). According to recent census Nepal's 26.6 million population comprises over 100 ethnic groups; 92 language groups with three predominant and six other religions (CBS 2011b). Table 4.2 highlights key figures on the conditions of education, health and income in Nepal that are related to the overall food security situation.

Table 4.2: Key statistics on Nepal’s poverty, education, health and income situation

<table>
<thead>
<tr>
<th>Key features</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demography</td>
<td></td>
</tr>
<tr>
<td>Total population</td>
<td>26.6 million</td>
</tr>
<tr>
<td>Population density (persons per sq.km.)</td>
<td>181</td>
</tr>
<tr>
<td>Total Households</td>
<td>5,659,984</td>
</tr>
<tr>
<td>Average household size</td>
<td>4.7</td>
</tr>
<tr>
<td>Human Poverty Index</td>
<td>31.12</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Adult literacy</td>
<td>59.57*</td>
</tr>
<tr>
<td>Adult literacy (female)</td>
<td>48.78*</td>
</tr>
<tr>
<td>Adult literacy (male)</td>
<td>71.66*</td>
</tr>
<tr>
<td>Mean year of schooling</td>
<td>3.9 years*</td>
</tr>
<tr>
<td>Mean year of schooling (female)</td>
<td>3.28 years *</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Mean year of schooling (male)</strong></td>
<td>4.55 years*</td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td></td>
</tr>
<tr>
<td>Life expectancy</td>
<td>68.8*</td>
</tr>
<tr>
<td>Percentage without safe water</td>
<td>17.09*</td>
</tr>
<tr>
<td>Percentage of children under age five who are malnourished</td>
<td>40.5*</td>
</tr>
<tr>
<td>Percentage of people not expected to survive to age 40</td>
<td>7.52*</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
</tr>
<tr>
<td>Per capita income (in US $)</td>
<td>1160*</td>
</tr>
<tr>
<td>Per capita income for female (in US $)</td>
<td>909*</td>
</tr>
<tr>
<td>Per capita income for male (in US $)</td>
<td>1427*</td>
</tr>
</tbody>
</table>

Sources: *(UNDP 2014); (CBS 2013a)

Culturally, there are five main groups: (i) caste-origin Hindu groups, (ii) Newars, (iii) Janajatis or nationality groups, (iv) Muslims, and (v) other groups. While having officially outlawed the caste based practices in 1964 with the introduction of Muluki Ain (civil code), Nepal still follows the Hindu caste system to a significant extent. In this system, there are four primary castes, called Varnas. The four Varnas are the Brahmins, the Kshatriyas, the Vaishyas and the Shudras. These Hindu groups have distinct cultural features including a hierarchical structure, hereditary basis of membership and are largely endogamous. The Dalits, or untouchables, are part of the Hindu caste groups. The Newars include the four Hindu Varna caste categories and are divided into two distinct religious groups: Hindus and Buddhists. The Janajati or ‘nationalities’ are indigenous communities that have their own language and traditional culture, yet do not fall under the conventional Hindu hierarchical castes structure (Gurung 1997).

The Dalits, or untouchables, while technically not a caste, are still part of the caste system. Traditionally, caste determined an individual’s actions, obligations, and expectations. Caste is the principal determinant of one’s position in society and limits the occupation one can pursue. For example, Brahmins are the caste responsible for the religious affairs of society and teaching. Kshatriyas are the warrior caste responsible for protecting and ruling people. Vaishyas make up the working class, including craftsman and traders. The Shudras, which are the lowest caste, are historically the equivalent of serfs. The Shudras or Dalits are allowed only jobs that upper castes...
would not do. As discussed in Chapter Two, these historical structural processes of caste and gender based discriminations prevalent in Nepal are significant in shaping people’s entitlement to resources and appear to be resistant to social change.

Table: 4.3: Comparison of key human development indicators among different caste groups and gender

<table>
<thead>
<tr>
<th>Indicators</th>
<th>All caste groups/ gender</th>
<th>By gender</th>
<th>By major caste groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brahmans/ Chhetri</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dalit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Janajati</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Newar</td>
</tr>
<tr>
<td>Human Development Index</td>
<td>0.541</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.609</td>
<td>0.488</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.546</td>
<td>0.627</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult literacy</td>
<td>59.57</td>
<td>48.78</td>
<td>71.66</td>
</tr>
<tr>
<td>Mean year of schooling</td>
<td>3.9</td>
<td>3.28</td>
<td>4.55</td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life expectancy</td>
<td>68.8</td>
<td>73.99</td>
<td>67.19</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per capita income (in US $)</td>
<td>1160</td>
<td>909</td>
<td>1427</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1115</td>
<td>755</td>
</tr>
<tr>
<td></td>
<td></td>
<td>844</td>
<td>1533</td>
</tr>
</tbody>
</table>

Source: UNDP (2014)

Latest human development statistics presented in Table 4.3 shows that there is a huge inequality in the extent of human development among caste groups. Dalits are below other caste groups in all major socio-economic indicators. Their Human Development Index (HDI), which reflects achievements in health, education and income (UNDP 2014) is below all other caste groups. The poverty level, among the upper social castes (Newars, Brahmans/Chetries) is generally much lower than that of the groups which are lower in the ‘social ladder’ (CBS 2011a). The poverty head count rate among dalits is 43.6 as compared to that of 10.3 among brahmans; while the national average of the same is 25.2. People from higher caste groups, on an average earn more income than those from lower caste groups such as dalits with an exception of newars. However, there does not seem to be a straightforward correlation between rank in the traditional caste system and poverty level; but there are broad linkages. Some isolated studies also suggest a correlation between the caste system and the level of food security in Nepal (Joshi & Maharjan 2007; NPC 2010b). Joshi and Makarjan (2007) found in their quantitative study of food security in Dailekh district (in mid-west hills) higher prevalence of food insecurity among dalits communities than their upper caste
neighbours. Numerous institutional changes over the years and the increased dilution of the caste hierarchy stemming from inter-caste marriages in recent times, however, may have challenged the feudalistic thinking of hierarchy reflected in the caste system. As a result, the assumed correlation between the caste hierarchy and the socioeconomic class hierarchy is slowly fading in Nepalese society; many poor high-caste and rich low-caste households are found in the society. However, recent estimates suggest that most low caste people remain resource poor and far behind the higher caste people in all major human development indicators (UNDP 2009).

*Dalits* account for one in five people in Nepal (CBS 2001, 2013a). The share of *Dalits* with cultivable land is just one percent and about two-thirds of *Dalits* currently live below the poverty line (NPC 2010c). Similarly, indicators such as adult literacy and life expectancy of *dalits* are less than half of the national average (ibid). In Nepal, the condition of women in these communities is worse than that of men. This is because discrimination on the basis of gender is rampant in regards to access to education, the right to family property, workload and even the sharing of food (Gaire 2007; NPC 2010a, 2010d).

*Dalits* make up most of the poor in Nepal. The poor are mostly illiterate, tend to come from large families that are landless or have very small landholdings, and are also concentrated in specific ethnic, caste and minority groups, particularly, those of the lowest caste (*dalits*) (UNDP 2009). The poor are predominantly in rural areas, with the highest concentration in the mid and far-western regions of the country (NPC 2010c) that includes Jumla.

This hierarchical socio-economic and cultural geography was directly reflected in the laws of Nepal until the *Muluki Ain* (civil code) of Nepal was amended in 1964. The *Muliki Ain*—the first written law of the land was introduced in 1854 (Table 4.8) incorporating different laws for different caste groups. It had, based on Hindu caste system, discriminatingly prescribed ‘*do’s*’ and ‘*don’ts*’ for separating different caste groups, men and women and the State would penalize egregious behaviour (Sharma 1978). With the help of this law, rulers nurtured and promoted class, caste and gender based discrimination in Nepalese society (ibid). High caste men had absolute control
over state affairs (Upreti & Sigdel 2011). While most of such discriminatory behaviour has now been removed from the current law books, Nepal’s political economy that is rooted in such discrimination continues to influence government policies (Adhikari 2008). Taken together caste, law, ethnic derivation, religion all combine as a formidable backdrop to any change that would undermine these positions consolidated over centuries. However, as with inter-caste marriage, the new laws provide the rhetoric for changing patterns within society. But, such changes tend to play out at particular scales and are more meaningful in government than in village life.

4.4. Nepalese plans, policies and strategies related to Food security

Food security has long been on the Nepalese development agenda. Nepal’s key policy documents addressing food security issues are presented with reference to their theoretical underpinnings in Table 4.4. Although food security policy in Nepal has been following a consistent goal of increasing production and productivity of agricultural commodities through agricultural intensification for some time (Brown & Kennedy 2005) there is nonetheless some discursive change in policies with some recognition of livelihood and entitlement issues.

A formal development planning process began in Nepal in the 1950s. The importance of agricultural growth as a way forward to enhance food security has been underscored in a sequence of GON policies and plans (such as the Five Year Plan, and Three Year Plans (2010-2012)) that outline the broader policy framework of the government that interact with the issue of food security in Nepal. While overall policy goals of such plans remain largely unchanged, policy measures have undergone several turns since the first five-year plan was implemented in 1956. Ten five year plans and two three years plans have been implemented so far in Nepal. More recently, these policies and plans are attempting to variously accommodate elements of ‘entitlement’ and ideas from a ‘sustainable livelihoods approach’. Some efforts are made tangible through policies that enhance people’s access to resources through the provision of safety nets, land reform programs, employment creation measures and promises to expand and enhance local livelihood bases (such as promoting non-timber forest products, and skills development for income diversification). The trajectories of Nepal’s food and
agriculture policies correspond to some of the changing trends, especially by attempting to include access and livelihoods ideas, of food security thinking and practices globally. As discussed in Chapter Two, changing trend in food security thinking and practices includes: a shift from global and national to the household and individual food security, a shift from ‘food first to livelihood, and a shift from objective indicators to subjective perception (Maxwell 2001). These policies are largely silent on addressing deeply rooted caste, class, and gender based discrimination, lack efforts to understand local people’s perception and understanding about food security, and only provide ‘lip service’ in incorporating ecological concerns. The overall approach remains productivist, as these policies emphasise improving agriculture as the only solution to food insecurity.

Achieving increased production and productivity in agriculture and commercialisation of agricultural commodities is reinforced as the main objectives of government policies. As discussed in section 2.3.1, productivist perspective tends to equate food insecurity with the decline in food availability and food insecurity is regarded as natural phenomena (Beddington 2010; Funk & Brown 2009; Rosegrant et al. 2001; Trostle 2010). The argument in the productivist explanation, as observed by Blaikie et al. (1994, p. 80) in commission reports on causes of Indian famines of late 19th and early 20th centuries, is that natural events such as drought and flooding cause crop failure or a reduction in livestock production reducing the aggregate amount of food availability. The only way to enhance food security, according to this explanation, is through an increase in agricultural production and productivity and controlling population growth.

As discussed in Chapter Two, the productivist perspective is criticised for having such a narrow biophysical focus neglecting crucial social, economic and political factors that play an important role in exposure to and impact from threats and shocks (Blaikie et al. 1994). It neglects access and utilisation aspects of food security and focuses only on food availability. In the food security literature, this explanation has been criticised for its naive assumption that available food is shared equitably among the people and that people have no other income sources than agriculture (Blaikie et al. 1994, p. 83).
Table 4.4: Nepal’s key policies related to food security enhancement

<table>
<thead>
<tr>
<th>Key policy documents</th>
<th>Food security related goal(s)</th>
<th>Theoretical lineage</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muluki Ain (Civil Code), 1964</td>
<td>Criminalising caste based discriminations</td>
<td>Bio-physical perspectives</td>
<td>(Sharma 1978)</td>
</tr>
<tr>
<td>Natural Calamity (Relief) Act 1982</td>
<td>Concerned with the rescue and relief activities</td>
<td>Bio-physical perspectives</td>
<td>(MOHA 2006)</td>
</tr>
<tr>
<td>Agriculture Development plans until 1990</td>
<td>Achieving national food self-sufficiency through increased production and productivity of agriculture; food aid</td>
<td>Productivism</td>
<td>(Brown &amp; Kennedy 2005)</td>
</tr>
<tr>
<td>Liberalisation in 1990</td>
<td>Fertiliser subsidy removed; allowed NGOs in food and agriculture sector; abolished system of minimum support price</td>
<td>Productivism</td>
<td>(Pyakuryal, Roy &amp; Thapa 2010)</td>
</tr>
<tr>
<td>Forest Act 1993</td>
<td>Biodiversity conservation, livelihood enhancement (community forestry)</td>
<td>Productivism; elements of political ecology</td>
<td>(GON 1993)</td>
</tr>
<tr>
<td>Forest Regulation 1995</td>
<td>Biodiversity conservation, livelihood enhancement (community forestry)</td>
<td>Productivism; elements of political ecology</td>
<td>(GON 1995)</td>
</tr>
<tr>
<td>Agriculture Perspective Plan (APP) (1995 to 2014) led by Ministry of Agriculture Development</td>
<td>Diversification and commercialisation of agriculture</td>
<td>Productivism; elements of livelihoods and entitlements perspectives</td>
<td>(APP 1995)</td>
</tr>
<tr>
<td>National Biodiversity Strategy, 2002</td>
<td>Biodiversity conservation</td>
<td>Productivism, livelihoods and political ecology perspectives</td>
<td>(MOFSC 2002)</td>
</tr>
<tr>
<td>Health Sector Strategy, 2004</td>
<td>Focus nutrition supplementation, fortification, education and rehabilitation of children and pregnant and lactating mother</td>
<td>Livelihoods and entitlements perspectives</td>
<td>(MOH 2004)</td>
</tr>
<tr>
<td>National Agriculture Policy (NAP) 2004</td>
<td>Commercialisation of agriculture, envisions special and targetted programs for small holder farmers</td>
<td>Productivism; elements of livelihoods and entitlements perspectives</td>
<td>(MOAD 2004)</td>
</tr>
<tr>
<td>Amendment in the Land Act 1964</td>
<td>Abolish dual ownership of land (in 1997 amendment), reduce upper limits of landholding (in 2002 amendment), efforts to maintain gender equality in parental property (land)</td>
<td>Productivism, entitlements perspectives</td>
<td>(GON 1964; Kshetry 2011; Sharma &amp;</td>
</tr>
<tr>
<td>Plan/Policy</td>
<td>Description</td>
<td>Perspective/Interdisciplinary Framework</td>
<td>Source</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-----------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>National Agricultural Extension Strategy (NAES) 2006</td>
<td>Aimed at shifting focus of agricultural extension services from production to people, from technology to innovation and from farming to livelihoods</td>
<td>Productivism; elements of livelihoods perspectives</td>
<td>Khanal (2010) (NAES 2006)</td>
</tr>
<tr>
<td>Interim constitution of Nepal 2007</td>
<td>Mention of achieving food sovereignty as one of the rights</td>
<td>Political ecology but only at the level of rhetoric</td>
<td>NPC (2010d)</td>
</tr>
<tr>
<td>Fertilizer (control order) Policy 2008</td>
<td>Reintroduced the policy of subsidizing fertilizer (initially only chemical fertilizer)</td>
<td>Productivism</td>
<td>MOAC (2010)</td>
</tr>
<tr>
<td>Three Year Plans</td>
<td>Increasing agricultural production and productivity</td>
<td>Productivism; elements of livelihoods and entitlements perspectives</td>
<td>NPC (2010d)</td>
</tr>
<tr>
<td>Agriculture Development Strategy (ADS) 2014 (yet to be implemented)</td>
<td>Achieving agricultural growth, food security</td>
<td>Productivism; elements of livelihoods and entitlements perspectives</td>
<td>Guleti (2013)</td>
</tr>
</tbody>
</table>

Note: Food and agriculture plans and policies that directly influenced food security in Nepal are presented in grey coloured rows and other related development policies are presented in white rows.
In the 1990s, the subsidy scheme for fertilizer was removed with the deregulation of fertilizer trade as part of the international embrace of neo-liberalism—the economic and political philosophy that puts free markets and competition at the centre of policy making (Pyakuryal, Roy & Thapa 2010). Nepal’s development partners particularly the World Bank and International Monitory Fund spearheaded Nepal’s journey to neoliberalism, as envisioned in the ‘Washington Consensus’. The term ‘Washington Consensus’ is generally used to refer to the ten point policy prescriptions for developing countries to recover from economic crises developed by Washington based institutions such as the World Bank, International Monetary Fund and US Treasury Department (Williamson 2000). In the agriculture sector, a pluralistic extension system was introduced allowing NGOs and private companies to be engaged as extension providers. Although the ‘technology transfer’ discourse continued to underpin the national extension strategies (Gaire 2011).

Apart from these broad economic and fiscal policies, a number of sectoral policies and periodic plans were formulated to guide Nepal’s agriculture and food sector. A Multi-Sectoral Nutrition Plan of Action 1998, adopted in the Ninth Five Year Plan to guide both the government and non-government efforts to tackle the issues of nutrition, envisions the agriculture sector to lay the foundation of a national nutritional architecture (NPC 1998). This document, nonetheless talks about ensuring access by all people to adequate and safe food (ibid). Recently, a newly drafted Agriculture Development Strategy (ADS) designed for the next twenty years to guide agriculture and food security programs of the country, continues to rely on agricultural growth as an answer to food insecurity. This, yet to be implemented policy document, aims to replace the Agriculture Perspective Plan (APP) with an enhanced focus to achieve accelerated agricultural growth through four strategic components: governance, productivity, profitable commercialisation, and competitiveness. While the document emphasises the importance of social and geographic inclusion in development efforts, it is unclear on how the unrelenting focus of it on productivity, commercialisation and competitiveness harmonises with the idea of inclusion to ensure food security of the marginalised sections of society in a hierarchical society like that of Jumla. As such, commercial farmers rather than subsistence ones appear to be the main target of the strategy and are most likely to benefit from measures being proposed in the ADS.
Other sectoral policies such as the Natural Calamity (Relief) Act 1982 is mostly concerned with rescue and relief activities. The National Strategy for Disaster Risk Management (2009) drafted to address the gaps in the Act still emphasise the biophysical conceptualisation of disaster.

After the 1990s’ liberalisation, the 20 year APP (1995 to 2014) is the major policy document to guide agriculture and food security plans and programs throughout the country. During the APP period together with enhancing production and productivity of agriculture there is some emphasis, following ideas from the ‘livelihoods approach’, on increasing people’s income either through paid jobs or through high value agriculture (APP 1995). The APP (1995) envisages increasing diversification and commercialisation of agriculture. In Jumla, the current push to establish apple orchards by the Government, the introduction of improved crop varieties and initiation of semi-commercialisation of vegetable farming by some farmers can be attributed to the APP.

The APP was updated through the National Agriculture Policy (NAP) in 2006. It retained its focus on the commercialisation of agriculture, but it envisions special and targeted programs for small-holder farmers to address their needs. Programs to improve access to resources mainly by providing land to some landless were implemented during the APP period (Kshetry 2011). The Land Act 1964 was amended to abolish dual ownership of land (1997 amendment), to reduce upper limits of landholding one can have (2002 amendment), and to maintain gender equality in parental property (land) inheritance (2006 amendment) (GON 1964; Kshetry 2011; Sharma & Khanal 2010). Efforts were also made to improve transfer entitlements by introducing social security programs in the form, mainly, of direct cash transfer to old aged people and widows. Food aid programs continued in order to improve transfer entitlements. As discussed in Chapter Two, the entitlement perspective views food insecurity as the result of not just a decline in food availability but more importantly, of entitlement failure (Sen 1981). This approach has emphasised the importance of rights to access in achieving food security.

In Nepal, the land reform efforts in the past are behind changes in farm sizes and increases in the number of holdings one owner could have (Willy, Chapagain &
Sharma 2008), as successive land reform programs implemented in the past kept decreasing the limit of landholding in the country. While these changes provided increased access to land, increased land fragmentation causing smaller size land parcels also increased the vulnerability of agricultural systems. Smaller and fragmented land parcels make it difficult and/or costlier for farmers to manage irrigation, planting, harvesting, fencing and taking care of crops. For example, if a household has several scattered parcels, one needs to invest, for example, in many irrigation canals rather than only on a single consolidated plot of land.

The National Agricultural Extension Strategy (NAES) emphasises, for the first time, the importance of maintaining social discourse in extension activities in order to improve or ensure agriculture sustainability. NAES (2006 p. 10) advocates for ‘shifting the focus of agricultural extension services from production to the people, from technology to the innovation system and from farming to livelihoods’. But the Jumla case suggests that this intention of the strategy largely remains at the rhetoric level; agriculture extension in Jumla still focuses on production enhancement and ‘technology transfer’. Despite the fact that the overwhelming majority of farms in Jumla are family owned and ‘small’ in size (average size is less than 1 ha) enhancing productivity has been the ultimate intention of both the Government and farmers (DADO 2012). The same old progress model in relation to transfer of technology is being pursued in Jumla with the model focusing on rewarding early adopters as progressive farmers (Stephenson 2003).

The Poverty Reduction Strategy Paper (NPC 2003) and other periodic plans (NPC 2010d) renew the commitment to implement the APP. By envisioning improving people’s livelihoods bases they attempted to incorporate some ideas from the sustainable livelihoods approach to food security. Unlike the purely productivist perspective, the sustainable livelihoods perspective takes a more holistic approach to food and the role of agriculture in people’s lives and economies. It tries to incorporate social aspects in food security analyses (Chambers & Conway 1992). Following key ideas from this perspective such as giving attention to the most vulnerable, the NAP introduces some targeted programs for resource poor communities. This perspective, however, is also criticised for overlooking important elements associated with the
context behind their vulnerability. This ignores the fact that enhancing the livelihoods of one group may undermine those of another (Scoones 2009). Even programs that seek to improve livelihoods pass through a social-political filter that narrows the focus. As highlighted in Chapter Two, risk of maladaptive responses will always be there if strategies do not pay attention to issues such as inequality of power and a disproportionate burden on the vulnerable (Barnett & O’Neill 2010; Serrat 2008). This approach too has largely failed to bring about change in the lives of people in Nepal as it does not address structural reformation such as caste, gender, class and place based discriminations.

The literature discussed in Chapter Two argues that neither the livelihoods nor entitlement approach have been enough to address key social issues around food security either in theory or in practice. These social issues are related to resolving power issues, providing solutions to notoriously escalating processes of marginalization and supporting local livelihoods while conserving ecology. In order to address these issues, scholars including Bryant (1992), Fairhead & Leach (1997), Forsyth (2007), Mearns (2004), Scoones (2009)—all worked extensively on livelihoods and entitlements issues—developed an approach known as ‘political ecology’. These scholars refined the ‘sustainable livelihoods’ and ‘entitlement’ approaches to develop and use political ecology approach in the field of livelihood and food security by including ecological outcomes as well as social concerns (including social justice). As discussed in Chapter Two, political ecology attempts to combine basic premises of human ecology with fundamentals of political economy. At the root, political ecology is designed to focus on the intersections of structural, political forces and ecological dynamics, although there are many different strands and variations (Scoones 2009). Many natural resource conservation attempts around the developing world have ideas borrowed from political ecology in their attempts to balance ecology and social justice issues. Nepal’s community forestry program and recent endeavours in buffer zone programs have elements that draw upon ideas from this body of literature.

With landmark political changes in 2007, the Interim Constitution of Nepal 2007 mentions food sovereignty as an approach to address Nepal’s food and agriculture
sector (Article 18.3). It recognises right to food as a fundamental human right. However, in order to realise rights to food, specific implementing legislation is required but unfortunately such laws have not yet been made so this goal remains at a
The centuries old monarchy was ousted and a new interim constitution of Federal Republic of Nepal was adopted, including the previously warring Maoists. This was in 2007 in Nepal (this is discussed in Section 4.6.2).

As discussed in Chapter Two, food security is a multifaceted phenomenon and is influenced by policies and processes from various areas. In Nepal, various agencies are assigned to implement all of these plans and policies, with implementation largely fragmented and compartmentalised. Although the Ministry of Agriculture Development has been assigned as a nodal ministry to lead food security related activities, other agencies implement parts of the policies that fall under their jurisdiction. The Ministry of Agriculture Development’s work is limited to agricultural extension and supply of key agricultural inputs. Related areas of non-timber forest products (NTFPs), bio-diversity and community forest related matters are handled by the Ministry of Forest and Soil Conservation. Irrigation is under the Ministry of Irrigation but drinking water related works comes under the Ministry of Physical Works and Planning. The Ministry of Health handles most nutrition programs except that the Ministry of Education conducts school nutrition programs. Food for Work is the responsibility of the Ministry of Local Development, whereas the Ministry of Supplies does subsidised food distribution. The Ministry of Local Development manages local roads. Disaster related activities are the mandate of the Ministry of Home Affairs but flood control works are mandated to the Ministry of Irrigation. There is a visible lack of coordination among these policies in the field despite some ad hoc institutional arrangements in the form of coordination committees. Deep-rooted disciplinary and departmental biases generally obstruct any functional and meaningful coordination at the implementation level. This situation affirms the long made appeal from the livelihoods perspective for a coordinated effort to improve integration and ‘not try and impose artificial categories and divides on complex realities’(Scoones 2009, p. 172). In the absence of such coordination, the single focus on productivity as a panacea for food insecurity and poverty alleviation continues to prevail in policy and planning.
Nepal’s experience of putting elements of political ecology into practice is not very encouraging. While it has helped to create awareness in principle among stakeholders about the important correlation between conserving ecology and enhancing the livelihoods of natural resource dependent communities, the field implementation of this approach has not been of much help in achieving long-term food security and conserving ecology. The community forestry programs’ practical ability to achieve these equally important objectives of natural resource conservation and livelihoods enhancement has started to be questioned. Until recently the forest governance system has been lauded globally as one of the most participatory, but the developing critique asserts that many of these programs are controlled by elites within the regions (Ojha et al. 2014). Some experts in Nepal’s community forestry programs have expressed their frustration that conventional power structures and authority endure in Nepal’s community forestry (ibid) signaling the need for a fresh effort on both fronts: conservation and social justice. Ideas of food justice discussed in Chapter Two provide a holistic framework to understand and address political economic issues, historical and cultural contexts including issues of power and ecological concerns that are proven as shaping food security.

Overall, Nepal’s food security policies have not been able to deliver on their objectives. There have been gains in food production over the past 60 years (MOAC 2011; MOF 2012) but food insecurity still persists in many parts of the country and in certain sections of the society (NPC 2010b, 2010c; UNDP 2014; UNICEF 2012). This situation highlights the lack of direct correlation between higher production and productivity, and food security. While there are some promising noises in regards to livelihoods and entitlements, these policies are aligned with broader development thinking associated with liberalism and consequently are overly productivist in nature. Their emphasis on increasing agricultural production and cash cropping provides a solution to just one aspect food security. The incentive in response to such an agricultural policy is, for those who can, to divert from subsistence-oriented polyculture towards market oriented monocultures. Given the discussion here in the previous sections, it is not clear how such a simplification of production will assist the bulk of the most vulnerable in the regions; this is antithetical to the insight from
livelihood studies that diversity is of key importance in spreading risks households face. And it seems a foregone conclusion that the government will not be able to deliver enhanced food security in Nepal in general and remote areas in particular. To argue such a case, it is important to be able to locate ‘both the signal and the noise’: to understand agricultural subsistence and its interaction with village life close-up in an area listed as ‘most food insecure’. The next section discusses the social-ecological systems of mid-west mountains of Nepal with particular emphasis on Jumla—the case study site for this research to background this context. This case study reveals many of the contradictions, tensions and limitations associated with current national efforts to address food security.

4.5. Mid-west mountains: the research site

As discussed in section 4.3, Nepal’s overall society has deeply structural caste and gender based inequalities, and these are exacerbated by the reality of a physically demanding environment—as reflected in its geographical dimensions. Despite close to six decades of planned development efforts, with many periodic plans aiming to reduce regional disparities, Nepal’s remote areas still lack the most basic services and facilities that other parts of the country had long ago. Nepal’s mid-west mountain region is one of the least developed regions. As shown in Table 4.5, this region is far behind the national average in most socio-economic indicators such as the human development index, poverty index, literacy, and life expectancy (CBS 2011b, 2013c; UNDP 2009, 2014).

Table 4.5: Comparison of Mid-west mountain region’s key socio-economic indicators with national averages

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Mid-western mountains</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Development Index</td>
<td>0.445</td>
<td>0.541</td>
</tr>
<tr>
<td>Human Poverty index</td>
<td>44.6</td>
<td>31.12</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>66.8</td>
<td>68.8</td>
</tr>
<tr>
<td>Adult literacy</td>
<td>42.99</td>
<td>59.57</td>
</tr>
<tr>
<td>Mean years of schooling</td>
<td>2.51</td>
<td>3.90</td>
</tr>
<tr>
<td>Per capita income (PPPS)</td>
<td>811</td>
<td>1160</td>
</tr>
</tbody>
</table>
The research site for this study, Jumla, is situated in this region (Figure 3.1). Geographically this region covers five mountain and seven hill districts. Out of the 75 districts in the country, the seven districts (Mugu, Humla, Kalikot, Dolpa, Dolpa, Dailekh, Jajarkot), within the region are among the ten poorest (UNDP 2009). The average human poverty index in the Mid-western mountain region in 2001 was 59.3 (UNDP 2004), in 2006 it was 48.1 and 44.6 in 2011 (UNDP 2014). This shows continuous prevalence of high levels of poverty in this region and it has only marginally declined despite efforts from the government and non-government sectors. High levels of poverty in this region also reflect deprivation of health, education and sanitation (ibid). Demographically, while the proportion of Dalits and Janajatis differs by district, they represent an average 25% of the population in the project area (calculated from CBS 2013a).

4.6 Social-ecological contexts of Jumla

This thesis locates food security as part of a social-ecological dynamic within a remote mountainous landscape of Jumla. As will be discussed in subsequent sections, this region experiences many of the challenges of mountainous regions in terms of remoteness, ecology and climate change, and, in modern times, the transition from semi-subsistence to market oriented production (Beniston 2003). Mountainous regions are some of the most sensitive regions to climate change in the world (Diaz, Grosjean & Graumlich 2003; Neu 2009), and the Nepalese Himalayan region is already quite vulnerable to extreme weather events (Shrestha & Aryal 2011). This reality was, until recently, tightly coupled with a need for self-sufficiency. Even though the aim of self-sufficiency continues to dominate, and despite remoteness, isolation for Jumli people has not meant a lack of trade and out-migration. Indeed, trade and migration have complemented their farming enterprises and sustained their livelihoods over centuries and in complex ways. As Shields (1991) notes, places on the margin manifest characteristics that speak both to their particular circumstances but are also shared by others in diverse locations. Indeed in the context of this case study, I argue that responses to coping and adaptation in Jumla reflect cycles common elsewhere in similarly remote and mountainous regions, including phases of transition from
subsistence to a cash based economy. In such cases, the quest for food security realigns borders and structural responses and therefore, while not the core of this thesis, conceptualising nation-state boundaries in remote terrains can contribute to rethinking food security policy and practices beyond the borders of Nepal.

4.6.1 Physical geography

Remoteness and a rugged terrain define Jumla’s social-ecological system. The altitude and slopes have a great effect on the agro-climatic condition of Jumla. High altitude areas are permanently covered by snow. Even leks (land situated at high altitude parts of the hills; often used as pastures for livestock) are covered by snow for six months. Commonly used terminologies in Jumla such as leks and their English translations are presented in Appendix Seven. South facing slopes receive more sunlight as compared to north facing slopes. Generally, south facing slopes are considered better for settlement and crop production in Jumla (Adhikari 2008). Rainfall occurs in two seasons in Jumla and is comparatively low as it is in a ‘partial rain shadow area’ and therefore get less rainfall compared to eastern mountainous areas of Nepal (Adhikari 2008). The main rainy season is the monsoon and about 80% of annual rain falls in only two months: July and August. The monsoon starts from the Bay of Bengal and reaches Jumla in late June/July and does not carry much rain. Similarly, winter rain comes (in December/January) from the westerly wind that originates from the Mediterranean Sea. If there is a high pressure system around Jumla due to westerly disturbances such as snowfall in Kashmir region, the winter rain may not reach Jumla at all (Adhikari 2008).

The district of Jumla is one of the higher altitude mountainous districts in Nepal. With a total area of 2531 square kilometers, it is situated from 28° 58’ to 29° 30’ north latitude and from 81° 18’ to 82° 18’ east longitude with altitude ranging from 2102 meters (7,000 feet) at Nagma village to 6,339 meters (21,077 feet) at Patarasi Mountain peak (DADO 2012). As can be seen in Figure 4.2, the district has 30 Village Development Committees (VDCs)—the lowest administrative unit of the Government in Nepal. In the past, the lowest administrative units used to be daras consisting of many villages. Before annexation into current Nepal in 1769 AD, the area consisting
of the current Jumla was under the *Khas* Kingdom and the kingdom had 18 *daras* as administrative units (Devkota 1990). Four of those 18 *daras* remain in Jumla today. People still fondly identify themselves as belonging to a *dara*.

Figure 4.2: Map of Jumla showing 30 villages in four *daras* (Source: Kamal Gaire & Bipin Gaire (Digital source map obtained from Ministry of Agriculture Development, Government of Nepal))

The district capital, Khalanga Bazar, is situated at 2,282 meters above sea level (DADO 2012). Geographically Jumla can be divided into two ecological zones: i) *lek*, and ii) river basins (valleys). In some high altitude areas of Jumla, plateau-like areas are present between high mountains (Figure 4.3). These areas are called *patans* and are used for grazing animals, especially in summer months. Valleys are fertile. In Jumla, the major river basins are *Tila* and *Hima*. These river basins have alluvial soil created by floods, and alluvial fans formed by tributaries and these areas host the major settlements in the district (Adhikari 2008), such as the district capital.
4.6.2 Socio-economic geography

The remoteness of the region from the nation’s capital and associated national services partly explains the prevalence of poverty (the poorest region of mid-western Nepal) and miserable human development conditions (UNDP 2004) in Jumla. Remoteness and lack of integration with the national economy are the main contributing factors to poverty in Jumla (CBS 2011a, 2013d).

Poverty in Jumla

However, poverty in Jumla is more than the relationship of people to cash income. It begins with caste systems, which determines access to land, access to land that is suitable for multiple crops, access to livestock, access to and ability to attend school—the list goes on. Caste relations persist in practice in Jumla historically despite changes in the legal provisions banning caste based discrimination.
Jumla has poor infrastructure such as roads, hospitals, electricity and limited access to markets. The literacy rate is 44% and it is ranked 70th out of 75 districts in the country according to the Human Development Index (UNDP 2009). Recent poverty rate estimates by the Central Bureau of Statistics also ranked Jumla as the 70th (out of 75) poor district with over 48% of its population living below the poverty line (CBS 2013d). People earning less than NRs 53 (Aus $ 0.6; official exchange rate on 5th March 2014) per day are regarded as poor (ibid). Jumla was only connected to the national road network in 2007 but that road is frequently closed because of floods or mudslides and is usually not accessible during the rainy season of the year. As shown in Table 4.6, Jumla is far behind the national average in most human development indicators.

Table 4.6: Key human development indicators of Jumla in comparison to national figures

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2004 figures**</th>
<th>2011 figures***</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jumla</td>
<td>Nepal</td>
</tr>
<tr>
<td>Human development index</td>
<td>0.348</td>
<td>0.471</td>
</tr>
<tr>
<td>Human poverty index</td>
<td>57</td>
<td>40</td>
</tr>
<tr>
<td>Adult literacy (%)</td>
<td>27</td>
<td>49</td>
</tr>
<tr>
<td>Adult literacy (Female)</td>
<td>9</td>
<td>35</td>
</tr>
<tr>
<td>Adult literacy (male)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life expectancy at birth</td>
<td>51</td>
<td>61</td>
</tr>
<tr>
<td>Infant mortality rate</td>
<td>125</td>
<td>69</td>
</tr>
<tr>
<td>Stunting (below 5 years)</td>
<td>0.676</td>
<td>0.504</td>
</tr>
<tr>
<td>Severe stunting (below 5 years)</td>
<td>0.356</td>
<td>0.206</td>
</tr>
<tr>
<td>Underweight (below 5 years)</td>
<td>0.495</td>
<td>0.452</td>
</tr>
<tr>
<td>Severe underweight (below 5 years)</td>
<td>0.166</td>
<td>0.146</td>
</tr>
<tr>
<td>Wasting (below 5 years)</td>
<td>0.063</td>
<td>0.096</td>
</tr>
<tr>
<td>Severe wasting (below 5 years)</td>
<td>0.005</td>
<td>0.009</td>
</tr>
<tr>
<td>Percentage of children under age five who are malnourished</td>
<td>74</td>
<td>50</td>
</tr>
<tr>
<td>Percentage of people not expected to survive to age 40</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Percent female household heads</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Poverty incidence</td>
<td>0.344</td>
<td>0.335</td>
</tr>
<tr>
<td>Poverty gap</td>
<td>0.086</td>
<td>0.097</td>
</tr>
<tr>
<td>Poverty severity</td>
<td>0.031</td>
<td>0.039</td>
</tr>
</tbody>
</table>

Sources: *** (CBS 2013a); ** (UNDP 2004); * (UNDP 2014)
These statistics indicate that Jumla reflects the uneven nature of development in Nepal.

**Politics of poverty**

As will be elaborated in subsequent chapters, some scholars describe Kathmandu’s systemic neglect towards Jumla’s development after the annexation, as one of the main reasons for such debilitating conditions in terms of maintaining the livelihood of the majority of people in Jumla (Adhikari 2008; Regmi 1995; Shah 2001). As I describe in Jumla’s historical time line of major events (Table 4.8), reflecting on the interviews and from reading the historical records relevant to the food security situation, there are strong historical and political overtones to poverty. It began when the sovereign state of Jumla was annexed by Nepal in 1769. Many historians believe that Jumla was a prosperous kingdom before annexation (such as Regmi 1995). Such historians believe that discrimination, neglect and an exploitative taxation system (such as the thek-theki system of tax) implemented after the annexation marks the start of the misery of the people of Jumla (ibid). Rulers in Kathmandu strategically appointed people called jimmawals and mukhiyas as agents of the central government in all daras (see daras in Figure 4.2) and villages to collect tax and perform other administrative tasks such as maintaining law and order. These agents enjoyed government power in return for generating revenues for the central government. With government authority in their hands and being able to keep a portion of the revenue, these agents accumulated wealth and power and emerged as a new elite class in the region (Adhikari 2008). The oligarchic Rana regime and subsequent Panchayat political system continued to employ these agents and/or their male children for a long time and often rewarded them for their loyal services with government land in the form of jagir or birta (Regmi 1995). Almost all of those agents were from the high caste group and at the behest of their supervisor, bada hakim, exploited local natural resources and lower caste people. Historically rooted caste and gender based discrimination flourished during jimmawals and mukhiya system of governance (Regmi 1995; Adhikari 2008). As discussed in Chapter Two, political ecologists argue that historical processes are important in understanding food security as they influence people’s vulnerability.

Neglect and discrimination continued even during the brief period of democracy (9 years) Nepal experienced in the 1950s. The then King Mahendra introduced a one
party ‘Panchayat’ political system in 1961 sacking the democratically elected government (Pigg 1992). Adhikari (2008 p. 72) argues that the planned development efforts initiated since 1956 ‘devalued the traditional life style of people… development was imposed from outside’ and that this enhanced the dependency on the part of local people and made it easier for Kathmandu to continue to rule. If this is the case then providing subsidised food grains, mostly rice, as has been a key welfare support program of the government until recently in Jumla, reinforces this relationship.

**Social stratification**

Historically, existing caste and gender-based discrimination within the Jumli society exacerbated the negative effects of the government’s exploitation, neglect and discrimination. For example, Adhikari (2008) demonstrates how a *dalit* woman living in Jumla suffers a triple exclusion, based on gender, caste and peripheral/spatial discrimination—meaning she is permanently located on the sidelines of decision-making within the household, village and district. While there is a historical persistence of these caste and gender-based discrimination and that they could potentially reinforce their hegemony, these processes of discrimination, nevertheless, are largely cultural and political in construction; they can and have, thus, changed over time.

Jumla society is stratified according to caste, livelihood, gender and place. Although officially outlawed, in practice, Nepal still follows the Hindu caste system to a significant extent. The Jumli population of 108,734 (CBS 2011b) is made up of three of the four primary caste: *Kshatrias, Brahmins* and *Shudras or dalits*. Within these main caste groups, there are 27 different sub-groups living in Jumla (CBS 2011b). The population of the main castes is presented in Table 4.7. Detailed population statistics of Jumla is presented in Appendix Eight. *Dalits* comprise of over 18% of the population in Jumla; the national average of *dalit* population is 13% (ibid). The population of *Vaishyas* and *Janajatis* is small in Jumla as compared to the data on the national composition of caste. The detailed list of castes and sub-groups under each caste group living in Jumla is presented in Appendix Nine. As noted earlier, traditionally caste has greatly determined an individual’s actions, obligations, and expectations; and caste and gender arguably contribute unique insights to expectations.
for adaptation or coping strategies. Discrimination between ‘high’ castes and ‘lower’ castes is higher in Jumla than most other parts of the country (Adhikari 2008). Caste was, and largely continues to be, the principal determinant of one’s position in the society and limited the occupation one could pursue. Therefore caste does contribute to expectations around options for adaptation or coping strategies within livelihoods. The caste system in Jumla also affects one’s entitlements; it opens and closes people’s choices. One dalit participant describes the prevalence of the caste system that dictates the jobs he can and cannot pursue.

As being a damai [a sub-group within dalit community], jobs traditionally assigned to me are to sew clothes and play traditional instruments during wedding and other ceremonies…my grandfather did this job, dad did it and I am also doing this. In Jumla, just relying on these kinds of jobs was just not enough to live a life. So we also worked on wages as seasonal farm labourers. Kamis [another sub-group within dalit community] traditionally perform the job of blacksmithing. We cannot start businesses like grocery shops or tea shops. People will not directly stop us doing this but upper caste people would not come to buy food items as we are still untouchable to them. (P 31)

Table 4.7: Population by caste groups in Jumla

<table>
<thead>
<tr>
<th>Caste</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brahmin</td>
<td>11,925</td>
</tr>
<tr>
<td>Kshetria</td>
<td>73,672</td>
</tr>
<tr>
<td>Dalits</td>
<td>19,540</td>
</tr>
<tr>
<td>Others</td>
<td>3,728</td>
</tr>
<tr>
<td>Total</td>
<td>108,921</td>
</tr>
</tbody>
</table>

Source: CBS (2013a)

Gender based discrimination, similarly, is more pronounced in Jumla than many other areas of the country. The Gender-related Development Index (GDI), that measures the gender disparity in opportunities, published recently shows a higher degree of gender inequality in Jumla (UNDP 2014). The Gender Empowerment Measure of Jumla and other mid-west mountain areas, similarly indicates that women are much less empowered than men in the political, economic and professional domain (ibid). Women are still treated as second-class citizens. Historically daughters are barred from
inheritance of their parents’ property; only sons were allowed to inherit such properties. Even today women do not have ownership of fixed assets in 93% of the Jumli households (CBS 2013a). Importantly for this study, women are the ones who eat last in the family. This reality indicates how culture mediates change in this research study. As in most of parts of the country, ‘low status of women, system of patri-lineal descent, patri-local residence and rules of inheritance interact’ to isolate and subordinate women in Jumla (UNDP 2014, p. 13). These political economic realities have a bearing on Nepal’s food and agriculture policies discussed in section 4.7. These historical processes are discussed in more detail in Chapter Five.
Table 4.8: Time line of key historical events that have potential implications in Jumla’s food security situation

<table>
<thead>
<tr>
<th>Year</th>
<th>Key local events</th>
<th>Key national events</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1769</td>
<td>Jumla annexed into Nepal</td>
<td>Jumla annexed into Nepal</td>
<td>(Adhikari 2008, p. 57)</td>
</tr>
<tr>
<td>1846</td>
<td>Start of family based <em>Rana</em> regime in Nepal</td>
<td></td>
<td>(Regmi 1995)</td>
</tr>
<tr>
<td>1854</td>
<td>War with Tibet (Nepal won but it had to forfeit many trade facilities with Tibet)</td>
<td></td>
<td>(Regmi 1995)</td>
</tr>
<tr>
<td>1854</td>
<td>First <em>Muluki Ain</em> (civil code) enacted with different rules for different castes</td>
<td></td>
<td>(Sharma 1978)</td>
</tr>
<tr>
<td>1894</td>
<td>Cholera epidemic in Jumla killing large number of people</td>
<td></td>
<td>(Devkota 1970 cited in Adhikari 2008, p. 69; Devkota 1990)</td>
</tr>
<tr>
<td>1923</td>
<td>Establishment of Dharma Bhakari-a cooperative institution to stock grains to be used in cases of emergency</td>
<td></td>
<td>(Adhikari 2008; Bishop 1990)</td>
</tr>
<tr>
<td>1925</td>
<td>Foot and Mouth' disease epidemic</td>
<td></td>
<td>(Devkota 1970 cited in Adhikari 2008, p. 69; Devkota 1990)</td>
</tr>
<tr>
<td>1950</td>
<td>Democracy in Nepal</td>
<td></td>
<td>(Regmi 1995)</td>
</tr>
<tr>
<td>1955</td>
<td>First ever food aid to Nepal in the form of USA emergency aid</td>
<td></td>
<td>National Planning Commission archive</td>
</tr>
<tr>
<td>1956</td>
<td>Start of planned development in Nepal; first five year plan launched</td>
<td></td>
<td>National Planning Commission archive</td>
</tr>
<tr>
<td>1957</td>
<td>Nationalization of forests</td>
<td></td>
<td>(Gautam, Shivakoti &amp; Webb 2004)</td>
</tr>
<tr>
<td>1959</td>
<td>Tibet annexed in China causing increased restrictions on inter-regional trade and pasturing movements between Nepal and Tibet</td>
<td></td>
<td>(Bishop 1990; Regmi 1995)</td>
</tr>
<tr>
<td>1960</td>
<td>Severe drought in Jumla</td>
<td></td>
<td>(Bishop 1990; interview participants)</td>
</tr>
<tr>
<td>1961</td>
<td>Introduction of Panchayet political system in Nepal by the then King Mahendra after a brief period of democracy</td>
<td></td>
<td>(Pigg 1992)</td>
</tr>
<tr>
<td>Year</td>
<td>Event</td>
<td>Source(s)</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>1962</td>
<td>Current Jumla district formed when the Government replaced then 36 districts into 75 districts</td>
<td>National Planning Commission archive</td>
<td></td>
</tr>
<tr>
<td>1964</td>
<td>Introduction of Land Act abolishing system of compulsory unpaid labour donation</td>
<td>(Awasthi et al. 2002)</td>
<td></td>
</tr>
<tr>
<td>1964</td>
<td>Major amendment of <em>Muluki Ain</em> (Civil code) abolishing caste based discrimination</td>
<td>(Gurung 1997; Regmi 1995)</td>
<td></td>
</tr>
<tr>
<td>1965</td>
<td>Severe food shortage in parts of Jumla due to prolonged drought and Government air dropped food items</td>
<td>(Bishop 1990; interview participants)</td>
<td></td>
</tr>
<tr>
<td>1966</td>
<td>Establishment of Agriculture Input Corporation (only government body to import and distributor of chemical fertilizer)</td>
<td>(Brown &amp; Kennedy 2005)</td>
<td></td>
</tr>
<tr>
<td>1967</td>
<td>Government's official statistics first showing Jumla a food deficit district</td>
<td>(Adhikari 2008)</td>
<td></td>
</tr>
<tr>
<td>1968</td>
<td>Introduction of apple in Jumla by farmers on an individual basis</td>
<td>(Bhandari et al. 2010)</td>
<td></td>
</tr>
<tr>
<td>1971</td>
<td>Subsidised apple saplings introduced in Jumla by the Government during 'Year of Agriculture'</td>
<td>(Adhikari 2008; Bhandari et al. 2010)</td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>Severe food shortage due to prolonged drought in Jumla</td>
<td>(Bishop 1990; interview participants)</td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>Government Food aid started in Jumla (in the form of providing subsidised food materials)</td>
<td>(Adhikari 2008; interview participants)</td>
<td></td>
</tr>
<tr>
<td>1973</td>
<td>Introduction of subsidy (both in price and transportation) in chemical fertiliser in Nepal</td>
<td>(Pyakuryal, Roy &amp; Thapa 2010)</td>
<td></td>
</tr>
<tr>
<td>1974</td>
<td>World Food program (WFP) started food aid in Jumla</td>
<td>(Adhikari 2008)</td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>Economic liberalisation process begin in Nepal</td>
<td>(Pyakuryal, Roy &amp; Thapa 2010)</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>20 year long Agriculture Perspective Plan launched</td>
<td>(NPC 2010d)</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>Start of community forestry</td>
<td>Community forestry regulation implemented in Nepal (Gautam, Shivakoti &amp; Webb 2004)</td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>Deregulation of fertilizer trade, termination of price subsidy in chemical fertilizer in Nepal; transportation subsidy remains for some</td>
<td>Deregulation of fertiliser trade, termination of price subsidy in chemical fertilizer in Nepal; transportation subsidy remains for some (Brown &amp; Kennedy 2005; NPC 2010b)</td>
<td></td>
</tr>
</tbody>
</table>
Livelihood options

Amidst such a divided social situation that largely defines who gets preferential access to resources, quality agricultural land is still scarce in Jumla (DADO 2012). Following the national trend Jumli farms are also small in size, and farm land is highly fragmented (CBS 2013c). These farms are located on slopes mostly with low moisture retention capacity compounded by little or no irrigation facilities (MOAC 2011). Agriculture in Jumla, as in much of Nepal is overwhelmingly subsistence-oriented family farms. In Jumla, out of a total area of 254,365 ha, and an arable area of 39,486 ha, only 26,896 ha of land is under cultivation and 106,430 ha is forest (DADO 2012). The definition of forest, according to the Forest Act 1993, includes ‘waste or uncultivated lands or unregistered lands surrounded by the Forest or situated near the
adjoining forest as well as paths, ponds, lakes, rivers or streams and riverine lands within the forest’ (GON 1993, p. 3). According to the latest estimate of the local District Agriculture Development Office, only 3,173 ha of cultivated land is irrigated and capable of growing paddy, with the remaining 23,619 ha un-irrigated and dependent on precipitation for moisture (ibid). Reliable rainfall and snowfall is critical for Jumla, as Jumli people’s livelihood is largely based on rainfed agriculture and the collection of non-timber forest products.

Cereal crops (barley, buckwheat, wheat, paddy, maize) dominate the predominantly subsistence family farms followed by beans and fruits. In recent years, apple cultivation as a cash crop is gaining momentum. Within the cereal crops, paddy is the most preferred cereal crop for the farms, as farmers grow paddy wherever it is possible to grow (NPC 2010b). As discussed in Chapter Two, being able to access culturally preferred food is an important indicator of food security. However land capable of producing paddy is limited as paddy cultivation requires flat land with irrigation facilities. There is also an issue related to low productivity due to temperature and sunlight hours in the high altitude mountainous landscape of Jumla. This reveals how cultural norms about what food is appropriate and desired locally is out of step with what is ecologically most suitable to grow in Jumla.

Despite limited availability of locally produced rice, diets in Jumla have changed with an increasing preference for rice. Rice requires lower preparation time as compared to other heritage grains in Jumla. This is important because ‘food utilisation’ is an equally important component—together with availability and access - in food security frameworks as discussed in Chapter Two. As a result a significant amount of rice is imported from outside Jumla every year. Production of major cereal crops in Jumla has largely been stagnant as shown in Government statistics (Figure 4.4). This is so despite the introduction of ‘open pollinated’ high yielding varieties (MOAC 2011). Studies blame loss of soil fertility, drought, erratic rainfall, and wind erosion as some of the major causes of poor yield in Jumla (for example see Sapkota et al. 2010). Livestock provide meat, milk, draft power, farmyard manure and income to Jumli households. But the number has declined owing to limited and declining availability of pasture and fodder. This decline in livestock numbers in Jumla is partly/wholly a consequence of
community forests throughout the district having banned grazing inside forest areas and imposing restrictions on collecting fodder from the forest (MOF 2012).

Figure 4.4: Production of major cereal crops (in ton) in Jumla

Forests, including community forests, and pasture land, constitute an important part of the Jumli farming system. By 2010, a total of 26213 ha of forest were handed over to 115 community forest users’ groups and 1575 ha of forest land is leased out to community groups under the community forestry and leasehold forestry schemes respectively of the government (DDC 2010). Forests have been a major resource for people to source firewood, wood, composting materials, and fodder. Over 98% of Jumli households use firewood for cooking their food (CBS 2011b). People also rely on forests for wild food and for precious medicinal herbs. Overall, the agriculture and food system of Jumla is a mixed resource system similar to other mountainous regions throughout the Himalayan range. This reveals that there are diverse relations of people with the agro-ecological system and that this helps to spread risks.

However, Jumla has limited livelihood options available. Apart from farming and livestock, some Jumli people have been historically reliant upon collection and selling of NTFPs for income and livelihood support. Many people choose seasonal out-migration and others are involved in small trades, home industry (such as alcohol
making, apple drying, carpet making) to supplement income from farming and/or livestock. Some people work as seasonal farm labourers and others are involved in occasional skilled jobs such as stonemasons and carpentry. The people of Jumla have always combined different resources from their limited livelihood strategies, according to their circumstances in their quest to sustain their families, although it is becoming increasingly difficult for some to keep up with the pace of change.

**Integration with the outside world**

With the recent construction of a road connecting Jumla to the rest of the country, there is an increasing trend towards integration of local, regional and international economies of food and agriculture and social relations. Jumla is embedded within a global climate system, as expressed in rising concerns about local and regional impacts of climate change on declining water availability, erratic and largely declining rainfall and snow. Jumla imports food materials, garments, agricultural inputs and construction materials from the regional Nepalese townships of Surkhet and Nepalgunj. It exports apples, beans and NTFPs to Nepalgunj and Surkhet. Most of the raw NTFPs are exported to India. Some Jumli NTFPs, particularly *yarchagunba*, are exported as far as China. Jumla also exports some cereals to its neighbouring districts including Kalikot, Dolpa and Mugu. Jumli people migrate out for jobs in the regional Nepalese towns of Surkhet, and Nepalgunj and also to adjoining Indian states. Some Jumli people have permanently migrated to Kathmandu and other districts in the southern plains. Relatively wealthy households have been sending their children to Surkhet, Nepalgunj, Kathmandu and even to Indian cities for better quality schooling opportunities. The inter-district relationship map (Figure 4.5), prepared from the interviews and focus group responses, highlights the way Jumla’s food economy is connected to other parts of the country as well as to India.
The sustainable livelihoods approach to food security as discussed in Chapter Two focuses on enhancing and preserving people’s livelihood bases and options. People actively weigh up, choose and combine those available livelihood resources and options to sustain their livelihoods. This context provides a rationale to study how people are interacting with their social-ecological systems as they consider the changing food security situations in Jumla.

4.6. Summary

This chapter provides an overview of the historical, geographical, policy and social-ecological context for this research study. I have shown how geography, political ecology, political economy including livelihoods and entitlement, local food systems and food and agricultural policies of Nepal interact with life in Jumla at an official level. Subsequent chapters will explore these relationships of interdependency from the on-ground perspective of the interviewees. The literature review in Chapter Two

---

Figure 4.5: Jumla’s relationship with the rest of the ‘world’
has identified that the issues and policies detailed in this chapter influence food security across their social and ecological systems.

Mountainous terrain and limited arable land provides limited options for agriculture. The location also makes delivery, transportation and other infrastructure and services costly. Most people in Jumla depend on climate sensitive livelihoods options such as rainfed agriculture and the collection or selling of NTFPs from wild harvest areas, in a large part because the hierarchal society discriminates based on class, caste and gender; and this has severely limited access of marginalized sections of Jumla society to productive resources such as land and put restrictions on livelihoods options open to individuals and families.

These historical processes have also influenced government policies that interact with the food security situation. While Nepal’s food and agriculture policies still follow a productivist approach to food security, the policy trajectory tends to correspond to the changing trends in global food security thinking. National government policies during its planned development era focused on boosting production. However food aid rather than improving local smallholder agriculture continues to be a focus of development endeavors at the local level in Jumla. Despite 50 years of policy focus, agricultural production in Jumla remains largely stagnant forcing many households to look for the more tenuous alternative livelihood options.

Against this social-ecological backdrop, in Chapter Five I will discuss the nature of risks and hazards for Jumla people and the way they negotiate their vulnerability. I argue that people of Jumla are not passive, but active, to the limits of their capacity in organising their responses to vulnerability.
Chapter 5: Key social-ecological risks and hazards in Jumla

5.1 Introduction

Change, as resilience theory highlights, is a constant feature of social-ecological systems. It is the nature of this change and the extent to which people are able to anticipate, prepare, cope and adapt to the change that largely determines the extent of vulnerability experienced. In this chapter I describe the key social-ecological processes that locals think influence their vulnerability to food insecurity and I analyse how these identified processes are changing over time. The chapter attempts to draw out links and interconnections among these risks and hazards. These social-ecological risks and hazards are categorised, following the research of Chambers and Conway (1992), as trend, seasonal change or shocks; and, these are discussed in relation to how people’s vulnerability to food insecurity is affected. I argue that the risk landscape in Jumla is changing as a result of wider climatic changes as well as more local social changes. Persistent social structures have produced huge inequalities in the Jumli society and such multidimensional inequalities, in turn, contribute to the creation of uneven condition of vulnerability in Jumla.

5.2 Categorising risks and hazards

In their seminal discussion paper, Chambers and Conway (1992) classify the nature of risks and hazards that people are vulnerable to and identify them as being a trend, a seasonal change or a shock. They emphasise that people need to have a capability to avoid, withstand and/or recover from risks for their livelihood to be sustainable (ibid). Usually risks are pervasive and hazards are of a more infrequent nature; but both have social, political, economic and environmental consequences that interact together to generate vulnerability and affect the ability of individuals and households to employ coping and adaptation strategies (Adger 2006; Reid & Vogel 2006) either individually or collectively. Table 5.1 summarises the nature of risks and hazards that people of Jumla identified. I have categorised them as trends, seasonal change and shocks. It is apparent that wider scale climatic changes and social changes, as well as food insecurity, emerge as the most important risks and hazards facing Jumla and that these multiple shocks together act to cause major changes.
Table 5.1: Nature of risks/hazards in their order of importance according to Jumli respondents that interact with their food security (risks and hazards indicated in bold letters are reported by most respondents as the most severe ones)

<table>
<thead>
<tr>
<th>Trends</th>
<th>Seasonal changes</th>
<th>Shocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rise in surface temperature</td>
<td>Food shortage (hungry months)</td>
<td>Drought and erratic rainfall</td>
</tr>
<tr>
<td>Drought and erratic rainfall</td>
<td>Strong wind</td>
<td>Strong wind</td>
</tr>
<tr>
<td>Population growth</td>
<td>Frost</td>
<td>Frost</td>
</tr>
<tr>
<td>Decline in snow</td>
<td>Road blocks by landslide</td>
<td>Road blocks by landslide</td>
</tr>
<tr>
<td>Increased animal and crop</td>
<td>Cold winter</td>
<td>Hail storm</td>
</tr>
<tr>
<td>diseases and insects</td>
<td></td>
<td>Bandha or road blockades for political reasons</td>
</tr>
<tr>
<td>Declining soil fertility</td>
<td></td>
<td>Serious illness in the family</td>
</tr>
<tr>
<td>Declining forest area and other</td>
<td></td>
<td>Death in the family</td>
</tr>
<tr>
<td>common property resources</td>
<td></td>
<td>Armed conflict</td>
</tr>
<tr>
<td>Declining soil fertility</td>
<td></td>
<td>Death of valued animal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wild animals destroying crops</td>
</tr>
</tbody>
</table>

(Note: Decline in availability and size of land is not explicitly mentioned but comes under population growth)

In this framework of categorising risks and hazards, key social-ecological trends in Jumla include the rise in temperature, declining and erratic rainfall, and the increase in population pressure on resources. Declining and erratic rainfall is recognised as one stress that is cumulative, over time it weakens adaptive capacity of individuals, households and communities (Quinn et al. 2011). Shocks that people perceive as increasing in frequency include extreme events such as drought, hail, flood, and landslides. Other shocks are death and/or illness in the family or to valued animals, epidemics of crop pest or animal diseases, armed conflict, bandhas (general strikes) etc. Chambers and Conway (1992 p. 15) define seasonal changes as ‘regularly occurring stresses [that] arise from cycles which are either diurnal or seasonal’. They emphasise that seasonal changes rather than diurnal timeframes are more significant.
for sustainability of livelihoods as they have ‘physical, biological and socio-economic
dimensions which often interlock’ at already stressful times of the year (Chambers &
Conway 1992, p. 15). People experience particular stresses at different times of the
year. In Jumla, these include the ‘hungry months’ (April to June), road blockades by
landslides (July and August), cold winters or weather conditions (November to
January). The following sections characterise the nature of major risks and hazards in
Jumla according to respondents’ experiences.

5.3 Key trends

5.3.1 Drought and erratic rainfall

Research participants in Jumla have the perception that the predictability of rainfall has
worsened in the last 40 years. Jumla has experienced, in the recent past, drought
2008). Participants confirm these dates and remember these times as a loss in crop
production. Almost all of the research participants perceive that over time Jumla is
receiving less and experiencing more erratic rainfall, coupled with less snowfall. By
erratic rainfall, they mean variable precipitation patterns and heavier downpours.
Research participants were unanimous in citing a decrease in the volume and a change
in the timing of snowfall. Analysis of Jumla rainfall data (1977 to 2010) from the
Government Department of Hydrology and Meteorology corroborates this perception.
Gentle and Maraseni (2012) also observed similar patterns of precipitation in Jumla.
Total mean annual, winter, pre-monsoon and post monsoon rainfall records for Jumla
indicate that the rainfall pattern is erratic and rain is gradually declining in the last 30
years. Rainfall has increased during the monsoon (June to September) period. All
participants mentioned that the occurrence of a long drought is their worst fear; with
families having the least or no access to irrigation that is sourced from rivers
(permanent sources) not from seasonal tributaries (seasonal sources), being the ones
who are most affected by drought in Jumla.
5.3.2 Rise in temperature

Respondents also perceive a rise in temperature. Their evidence is that crops including maize and pumpkins can now be grown successfully in high altitude areas such as Guthichaur, Dillichaur, Chhumchaur, and Patarasi (see Figure 4.3 and 4.4)—areas where this was not possible in the past. As one respondent said:
...maize, beans, pumpkins are new crops to our village...just 20 years ago these crops could not ripen in high altitude areas like ours...we used to have ice on our backyards until April. These days we are able to produce enough maize and beans and in our family, maize is the number one source of food...in some good years we even sell some. (P 04; also similar stories from P 12 and P 20)

Other cited indicators of rising temperature are drying spring water sources, increased crop disease and pest infestations, crops’ early maturation, early flowering and budburst. People link a rise in temperature with drought and erratic rainfall. These observations and experiences of Jumla participants corroborate the empirical findings of Baidya et al. (2008) that temperature is rising and that such a rise is more pronounced at the higher altitudes than lower altitude areas of Nepal.

Fig 5.3: Cabbage butterfly infestation in Jumla (Photo: Kamal Gaire, 2012)

The recent IPCC report states with a high degree of confidence that rise in temperature has allowed many species to shift their geographic ranges and abundance (IPCC 2014). Jumla participants believe that increased infestations of fungal diseases of blast (pathogen: *Pyricularia oryzae*) in paddy and papery bark or sappy bark (pathogen: *Trametes vercolor*) in apple trees are the result of temperature rise. In the eastern high altitude villages of Jumla, participants said paddy crops are attacked by *Gundhi* bug.
They said adults and nymphs of these bugs suck the juice from the developing grains in the early stage of grain formation in paddy. Young and succulent paddy leaves and stems are also attacked before the grain formation stage. Explaining these bug infestations as a new phenomenon in Jumla, a farmer participant who is also working as a helper at the office of the Village Development Committee in an eastern village of Jumla said:

I don’t remember my father [a farmer] talking about this kind of bug in paddy before. This is a totally new bug…if I am not wrong we saw this bug for the first time in our village just nine to ten years ago. We have had our crops damaged by some other threats…but this is a different thing ... what we are seeing these days is something totally new. (P 23)

Again, the local people’s perception is consistent with the empirical evidence. Gentle and Maraseni (2012), in their analysis of 30 years of temperature data, report a gradual increase in both mean maximum and mean minimum temperature in Jumla (Figure 5.4 and 5.5).

Figure 5.4: Variation of mean annual maximum temperature of Jumla (1975-2010)
Sourced from Gentle & Maraseni (2012)
5.3.3 Changes in population dynamics

Research participants noted unequivocally that there has been an increase in the population, which was observed, by an increase in the number of houses. This increase in housing corresponds with the decline in the size of family in Jumla. As will be discussed in subsequent chapters, participants unanimously note a gradual change in Jumli ‘family’ structure. More people are now living in nuclear families than in the 1970s—a change from the predominantly extended family culture of Jumla.

Participants also mentioned that new couples now want to have less children than their parents. Analysis of recent census confirms this situation (increase in population of Jumla and decline in size of the family) and shows that younger mothers are having fewer children in Jumla (CBS 2013b). Table 5.2 lists the changes in population.

Migrating out for jobs, mainly for short-term benefit, has traditionally been an important process in Jumla. Participants note that Jumli people go to neighbouring Indian states and Nepalese regional towns such as Surkhet and Nepalgunj in search of jobs. Relatively financially well-off families send their children to Kathmandu and other towns for better educational opportunities. Some local development workers, however, questioned the reliability of this aspect of the population data. In interviews, they argued that the census has partly failed to produce disaggregated data to reflect the number of people migrating out. Some respondents stated that people want to have their official address in Jumla despite the fact that they live most of the year out of Jumla. This is mainly because Jumla is on the Government list of ‘highly remote’
districts providing some advantages. For example, there is a quota legislated in the Civil Services Employees Act (1993) for people from these ‘highly remote’ areas in the recruitment and promotion of government employees. Government universities and colleges also have some spaces reserved for students coming from highly remote areas. Immediate implications of these demographic shifts are that more food is required in Jumla and that in the absence of adequate alternative livelihood options there will be more pressure on Jumla’s natural resources. Despite these apprehensions by development workers interviewed, both empirical and anecdotal evidences show that population in Jumla is increasing and this has been a trend (not a shock or a seasonal change) over the last 40 years.

Table 5.2: Change in population of Jumla

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1868</td>
<td>22,800</td>
</tr>
<tr>
<td>1971</td>
<td>52,253</td>
</tr>
<tr>
<td>1981</td>
<td>68,797</td>
</tr>
<tr>
<td>1991</td>
<td>75,964</td>
</tr>
<tr>
<td>2001</td>
<td>89,427</td>
</tr>
<tr>
<td>2011</td>
<td>108,734</td>
</tr>
</tbody>
</table>


5.3.4 Soil fertility decline

Almost all participants perceive that soil fertility has gradually declined. Agriculturalists at the District Agriculture Development office believe this to be anecdotally true but there is a lack of official soil fertility data available to them. Their inability to verify this situation by collecting necessary data shows, other than misplaced priorities and the inherent problem of limited resources in developing countries, the disconnect between practice and expert knowledge. The decline in livestock numbers (main source of manure), low chemical fertiliser use in the past, the recent ban on chemical fertiliser use (as Jumla is an organic district), and deforestation are considered the main causes of fertility loss, as participants recounted during interviews.
A farmer respondent in his 60s attributes deforestation to declining soil fertility. He said:

...when there is no forest around where can we get leaf litter and bedding materials from? We need these to make compost. ‘When you do not give food to earth (soil), how can earth give food to you?’ We are in total loss...we are losing these forest products, spring water sources, and clean air...’ (P17)

Also many people cannot spare labour from their farm to collect leaf litter and other bedding materials from the forest for their livestock. Even traditional practice of sending animals, particularly sheep and goats for grazing to patans (highland pasture, usually small plain area in highland) for extended periods during summer is declining. As one participant said:

I had to sell many of my livestock...because I have no one in the family to look after them. My father who used to look after them died, children need to go to school, my wife and I are busy farming....I sold all of my 30 goats and five cows last year...I now have only one horse. (P 22)

Farmers used to use these materials as bedding in the animals sheds, and leave them in the shed for a couple of days before finally composting them along with animal dung and urine to be used in the farm as manure later in the season.

Other participants linked declining organic fertiliser to the smaller size of families; as a result they no longer can afford to keep livestock in sufficient numbers to adequately manure their farm.
Changes to population, labour availability and soil fertility are interlinked and clearly have implications for agricultural productivity, and in the longer term for food security. This will be elaborated in details in Chapter Six and Seven.

5.4 Key seasonal changes

5.4.1 Food shortage

Based on interviews and focus group discussions a representative food security calendar for Jumla was devised (Table 5.3). This calendar shows that Jumla residents face three months of food shortage in April, May and June. These are the three months when households run out of their previous food stocks and await the next harvest. This is largely the trend over the last 30 years. Most of the research participants reflected on the issue of food shortages and independently suggested this pattern.
Table 5.3: Seasonal food security calendar for Jumla (Prepared based on interviews and focus group discussions)

Locals know that this kind of situation occurs every year; so they are managing such risk with a variety of strategies (discussed in the next chapter). However, in the case that one lot of crop fails and the next one does not look good, due to unexpected drought, heavy rain or other social-ecological risks and hazards, the hungry months extend and risks are transformed into a shock requiring a different set of strategies to manage it. Yield of most crops in Jumla, as verified both anecdotally and from government statistics, are well below the national average.

Apart from three regular hungry months, other key risks that come with changing seasons are strong winds and frost damaging buds and flowers of fruit trees, road blockades by landslides during rainy season and excessive snowfall during the winter. In addition, winter in Jumla is notoriously cold restricting the mobility of people, livestock and food supplies for weeks.

130
5.5 Key shocks

5.5.1 Climate related shocks

Key climate related shocks that people in Jumla face are winter drought, a late monsoon season, hailstorms, unexpected frost in late April and May. Hailstorms physically damage crops and frost can seriously affect the flowers of apples and other fruit crops. As one dalit farmer who has mostly been doing sharecropping recalled:

...during the dasain festival in 2009 we had paddy almost ready to harvest...but since dasain was approaching we decided to harvest the paddy only after the dasain celebration...it was just matter of days. It was in the evening of dasain tika day, all of a sudden we had a heavy hail storm. Almost all paddies in our area got damaged. (P 02)

5.5.2 Wild animals damaging crops

Risks of crops being damaged by wild animals was a major concern for farmers just a decade ago. Farmers complained about wild animals such as bears damaging their crops. The farmers there had to choose crops that least attracted such wild animals. For example wild bears like maize the most. One participant described the risk of wild animals destroying the crops, saying:

...earlier we had bears, monkeys, wild pigs and porcupines destroying our crops....in some years we had all the crops in some paddocks get either eaten or destroyed by wild animals—we couldn’t harvest even a single grain. In 1977 one of our neighbours was killed by a bear. Nowadays, however, we rarely see these animals around our village...where can they live? (P 06)

This type of risk is now confined mainly to remote parts of Jumla where farms adjoin the remaining forest area. Respondents blame deforestation and the claiming of forest land for cultivation for destroying the habitat of these wild animals. This shows the loss of forest and it is an indicator of land use change in Jumla.
5.5.3 Deaths, illness in the family and among value-producing animals

Shocks arising from the death of a working age family member and/or value-producing animals, or illness of a serious nature require deployment of the most serious coping strategies. These coping strategies however, are the ones most likely to have negative longer term consequences such as selling productive assets. This further limits the family’s ability to cope in the future. One participant who had both of his legs amputated describes below how his life changed after the amputation of both of his legs.

“...when I was ill I had to undergo two major surgeries and eventually lost my legs in 1998...after that all the problems started in our family. We could not continue our farming practice at least for two seasons, had to sell all of our goats, sheep, horses, mules, both of our oxen and the buffalo we had...because we needed money to pay my medical bills and also my wife with small children could not take care of those animals. As a result we lost our source of income from animals and also much needed manure for our farms” (P 19)

There is no health insurance system in Nepal; most participants said that illness is the single most common reason for families to sell their most productive assets. A government secretary of a village agreed that illness in the family results in very hard times. And that this often leads to the selling of land and other productive assets. The village secretary said:

The most distraught situation is when someone in the family is seriously sick. Air transportation of patient and carers to the hospitals in the city, treatment, food and accommodation is very expensive. We would not have any other option other than to sell land to cover such a huge cost. A good hospital in the vicinity is such an important issue for us. (P 16)

5.5.4 Armed conflicts and political violence

Politically related shocks that people have experienced recently include a 10 year armed conflict between the government and Maoist rebels which ended in 2006; and numerous politically motivated bandhas (strikes) and road blockades afterwards. Road blockades disrupt incoming essential supplies and export of beans, apples, herbs and
other mostly perishable Jumli products. As such they limit livelihood options for the locality.

Despite some political gains at the end of the armed conflict—both at the national and local level, the conflict negatively affected people’s livelihood in Jumla. During the conflict period, agricultural production and marketing activities got disrupted, much development infrastructure such as school buildings, bridges, and government offices got destroyed and consequently delivery of vital development programs was disrupted. This highlights an earlier point noted by political ecologists: how wider political economic processes constrain food security.

5.6 Change in seasons themselves

All the research participants believe that they are experiencing longer warm periods and shorter cold periods; and argue that crops are maturing earlier than before, resulting in a changed cropping calendar (Table 5.4). Within the temperate climatic zone of Jumla, the pattern of this change in high and low altitude areas is different. In high altitude areas harvesting time of major crops remain the same. Farmers in high altitude areas are not able to plant early. Previously, August/September used to be very cold in these areas; cold enough that even if seeds were sown, they remained dormant until the end of winter. But nowadays, if seeds are sown in August/September they start germinating within a month and saplings get burnt during the following cold winter. So planting has been rescheduled to the start of the winter, that is, October/November, since last 15 years. Participants report a trend of the early onset of summer and an early bud burst and flowering in apple and other temperate fruit trees, particularly in higher altitude areas. Flowering behaviour of such temperate fruits in lower parts of Jumla is different from season to season, it is generally delayed and/or sporadic if the preceding winter was not cold enough. Research participants were asked to describe any changes in the last 15 years in their cropping calendar. Table 5.4 shows these changes in cropping seasons in Jumla.
Table 5.4: Change in cropping seasons in Jumla showing planting and harvesting time of major crops in different altitudes

<table>
<thead>
<tr>
<th>Crops</th>
<th>Planting time</th>
<th>Harvesting time</th>
<th>Planting time</th>
<th>Harvesting time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High altitude</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>August/September</td>
<td>June/July</td>
<td>October/November</td>
<td>June</td>
</tr>
<tr>
<td><strong>Low altitude</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>Oct/Nov</td>
<td>June</td>
<td>November</td>
<td>May/June</td>
</tr>
<tr>
<td><strong>High altitude</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>August/September</td>
<td>July/August</td>
<td>September/October</td>
<td>July</td>
</tr>
<tr>
<td><strong>Low altitude</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>Sept/Oct</td>
<td>July/August</td>
<td>October</td>
<td>June/July</td>
</tr>
<tr>
<td><strong>Low altitude</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paddy</td>
<td>June</td>
<td>Oct/Nov</td>
<td>June</td>
<td>Sept/Oct</td>
</tr>
<tr>
<td><strong>Low altitude</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>March/April</td>
<td>Sept/Oct</td>
<td>April/May</td>
<td>August/Sept</td>
</tr>
</tbody>
</table>

5.7 Historical marginalisation

Whilst it is not a shock or trend, the wider process of historical marginalisation is a key issue that exacerbates the condition of vulnerability in Jumla.

Blaikie et al. (1994, p. 23/4) classify causes of vulnerability as proximate causes and underlying causes. In this classification, underlying causes of vulnerability are the ‘function of economic structure, legal definition of rights, gender relations and other elements of ideological order’ (ibid p 24). These are about how power is distributed in a society. In the case of Jumla, as participants indicate, continuous neglect and isolation from the state, prevalent caste based discrimination, and patriarchy and its system of patrilineal property inheritance are the three main underlying causes of food vulnerability. They are exacerbating the already detrimental effect of past and current social-ecological risks and hazards.
5.7.1 Kathmandu-Jumla relations

Prominent Nepalese historian Regmi (1995) believes that the exploitation of Jumla began with its annexation into current Nepal in 1769. Exploitative government policies pertaining to land, labour and taxation continued in Jumla throughout 19th and 20th century (Adhikari 2008). Even today, participants believe that the government’s policies towards Jumla are condescending and discriminating; they cite the incredibly long time it took for the government to initiate road construction to Jumla. Similarly, some participants expressed frustrations over the government’s apathy towards the plight of people living in remote areas in maintaining their livelihoods. A local village secretary during interviews expressed his frustrations:

...government can spare billions of rupees every year to subsidise petrol and diesel for rich urban people but it does not have money to build roads and bridges in Jumla that would make our lives easier...this is so unfair (P 16)

Official figures of per capita expenditure from the government in Jumla in recent years, however, is acceptable compared to other districts but large portions of this expenditure is spent on food aid (Adhikari 2008; NPC 2010d). As a result Jumla is far below all human development indicators according to the national averages (NPC 2010b; UNDP 2004, 2014).

Since 2007, Jumla is on the government list of nine ‘most backward’ districts of Nepal (NPC 2007). Apart from Jumla other districts in such list are Achham, Jajarkot, Mugu, Humla, Kalikot and Dolpa (ibid). The ‘most backward’ status is given to these districts by the government based on socio-economic and other human development indicators so that it is easier legally for the government agencies to provide reservation (on government jobs, education institutions, parliament etc. for people hailing from these areas), allocate resources and implement special development programs there. Despite this, the overall socio-economic condition and the way government functions in these areas have not improved. Human Development Index (HDI) scores of these areas continue to be lower as compared to other parts of the country (UNDP 2013, 2014).
5.7.2 Centre: Periphery discrimination

Regional discrimination by central authorities in Kathmandu is not the only concern that participants expressed in this research. Participants from remote villages experience discrimination within Jumla, itself. They said the attitude of people living in and around the district headquarters towards people from remoter parts is very condescending. People use a derogatory word ‘paawai’ for people from remote areas. Some participants aired their frustrations about how hard it is for there to be any ‘trickle down’ (or ‘trickle out’ in this case) of government and NGO support and services to the remote areas from the powerful elites living in and around district headquarters. Schools, colleges, health centres, government offices all are concentrated around the district headquarters.

5.7.3 Caste-based discrimination

Despite landmark political changes in Nepal in 1950 (the end of 104 year old family rule of Rana prime ministers), in 1990 (end of absolute monarchy), and in 2008 (ousting of the monarchy) – caste-based discrimination is still pervasive in rural areas of Jumla where dalits say they are still living life as second-class citizens. Dalits constitute nearly 16% of the Jumli population (CBS 2011b) and are expected to do the jobs higher-class neighbours do not want to do. These jobs are regarded as inferior jobs and are traditionally assigned to certain castes.

While the intensity of caste-based discrimination is less, untouchability still persists. Many upper caste people still do not allow dalits to enter their homes and do not eat cooked food that dalits have touched in some way. A dalit participant recalled an event of caste-based discrimination that he experienced a few years ago:

...among humans we didn’t have value and dignity in our society before. We were much like slaves. I will tell you a story…when I was travelling with Thakuries (one of the upper caste groups) to Surkhet, we had to have a sleepover in a hotel. The hotel owner allowed only Thakuries in our group to have a sleep in his hotel. We were not allowed to go in… this is not an isolated case…it was like this everywhere before. We had to sleep in nearby
caves while Thakuries in our group would enjoy their night in hotel beds. (P 02)

All of the dalit participants mentioned that they are the ones in their villages who do not own irrigated land or that they have far smaller pieces of land than their upper caste neighbours. Interviews and focus group discussions affirm that most of dalits own less land, less productive land, less rice land than their upper caste neighbours all over Jumla. But it is not that all dalits never had such land; some dalit participants recalled their life stories about how they lost their productive assets (land) to cunning and feudal upper caste village leaders. One dalit participant who apart from his own upland is sharecropping on his neighbour’s irrigated land described his case:

…my father told me that we used to have some land capable of producing rice. But my grandfather was compelled to sell that land... he could not repay the loan he borrowed earlier from a local landlord. My grandfather had borrowed grains on a much higher interest rate and the interest got compounded every year. At that time if you failed to repay such loans, you had to work as kamara, kamari or slave. My grandfather did not like to be a slave so he gave his prime land in order to get rid of the earlier loan. The landlord himself decided the price and bought the land. (P 02)

This describes how historical process of caste-based discrimination influence people’s access to productive resources; systematically denying such access to weaker sections of the society. Writing about the prevailing caste system in India, Mannathukkaren (2014) describes the caste system as one of the most abhorrent mechanisms devised by human beings to oppress other human beings. However, the current trend of out-migration, change in population dynamics—especially the size of a family and tendency to look for other forms of livelihood options by upper caste people, is providing farm land access to dalits for share cropping in Jumla. Many dalits also feel that there are some improvements in the way upper caste people practice untouchability today.

5.7.4 Gender based discriminations

Discrimination on the basis of gender is obvious in the areas of education, the right to family property, workload and even the share of food in Jumla. A popular saying in
Jumla æv}gL d'lvgL, afv|f a 6fnf]Æ means ‘women leading a society and a goat showing the way is similar; we would not reach the destination in both cases’. It indicates the lack of importance and lack of dignity women command in Jumli society. In many caste groups, women cannot touch men and food items including water during menstruation periods. These socio-cultural regulations based on gender discriminatory ideology about women’s reproductive roles often impede women’s real participation in societal affairs.

In many Nepali ethnic groups, women, culturally, are supposed to perform tasks related to cooking, cleaning, and child caring. Men, generally, do not assist women in performing these activities. It is regarded as a matter of shame for a husband to cook or clean utensils and carry farm products on their back. As one male participant said:

It has now become a cultural norm that men do not carry loads, especially the household goods, on their back. Transporting vegetables or apples to the town is done by women. Bringing crop harvests home, taking cow dung manure to the field and all other household transportation work are done exclusively by women on their backs in Jumla. (P 19)

Government and NGO officials working in Jumla agree that the life of women in Jumla is much harder than that of men. Pictures below provide glimpses of some of the jobs only women do in Jumla.
Figure 5.7: Women at work in Jumla (Photo: 5.5 a, c, e Kamal Gaire; 5.5 b, d Krishna Rokaya, DADO Jumla)
Many parents only provide educational opportunities to their sons and in most cases girls get married at a younger age than boys. There is clearly a preference for sons over daughters in Jumli society. Participants concede that there is a huge disparity in providing educational opportunities and thus educational attainment between their daughters and sons. Sending daughters to look after grazing animals, to collect firewood in the forest, to work on farms and asking daughters not sons to do household chores was common in many families in Jumla.

Culturally women cannot plough. They need men to plough their land. In Jumla, where there is no farm mechanisation at all, all the preparation of land is done manually or with the help of oxen. Women, if there is no working men in their household, irrespective of their caste, need to wait for their male neighbours who would first complete their own farming activities, to get their land ploughed. This could delay farming in a women only household.

Lack of access to, and control over productive resources is one of the major factors that hamper women’s empowerment. Men are migrating out to the cities for employment leaving women and children solely responsible for their ‘little’ agriculture back in the villages. This has created opportunities for women to exit ‘the wall of their houses’, take further responsibilities and manage their families, farms and social relations and exercise independence. But their access and control over most productive resources is not transferred to them. For example, land and other fixed assets continue to be in the man’s name. Even if the men are out of the village for a long time, women cannot make decisions that involve property rights. This systematically excludes women from institutional credit as institutional credit providers need collateral—mostly land—before lending money. It is thus obvious that an increased number of female-headed households are more vulnerable to external shocks. Situations of this kind also reinforce the need to probe the surface illusions when it comes to understanding women’s issues.

As discussed in Chapter Four, the National Civil Code of Nepal (Muluki Ain) that governs marriage, divorce, property rights, inheritance, etc., reinforces patriarchy and puts severe limits on women’s control over economic resources. Despite amendments,
there is still a legal barrier to women’s entitlement to ancestral land and other properties in Nepal. Parental properties are divided equally among sons not daughters. This is so despite the fact that Nepal is a party to many international conventions on women’s rights. Nepal has signed the Convention of Elimination of All forms of Discrimination Against Women (CEDAW) and other human rights conventions that bind Nepal to respect women as equal. Women’s status in the society, their roles and behaviour are largely guided by religious beliefs. Cultural Hinduism mainly favours patriarchal society and generally places women as subordinate to men. Nepal’s family laws governing marriage and inheritance are largely based on Hindu ideologies. These persistent social structures have produced huge inequalities in the society. And Jumla’s case affirms IPCC’s (2014) assertion that existing multidimensional inequalities, will contribute to the creation of uneven conditions of vulnerability.

5.7 Summary

The risk landscape in Jumla is changing as a result of wider climatic changes as well as local social structural stagnation in the face of new social changes. The data suggests changes in weather and climatic conditions, market penetration, population growth, and historical marginalisation based on caste and gender are the key social-ecological processes that background people’s vulnerability to food insecurity in Jumla. Persistent historical processes including caste, gender and place-based discrimination have contributed to the prolonged presence of uneven conditions of vulnerability. The evidence here is that Jumla has been experiencing incremental and significant changes in its social-ecological systems due to local, regional and wider scale changes. These changes are not uniform and they influence people’s food security in different ways. Overall we can ascertain a continuous transition process affecting both the biophysical realities of Jumla—less forest, less wild harvesting, more farming, changing timing and availability of precipitation, warmer temperatures—and the social realities that both respond to and are the impetus for physical change. From the above it is apparent that the risk landscape in Jumla is changing.

The next two chapters discuss the interaction between these multi-scale changes and people’s varying experiences of food insecurity.
Chapter 6: Narratives of food security from Jumla: withdrawing and resisting

6.1: Introduction

This introduction is a preamble to Chapter Six and Seven. Both of these chapters outline how people respond to risks and hazards as they cope with or adapt to food crises. Chapter Six begins by revisiting key ideas from theories on vulnerability and coping and adaptation to food insecurity that frame both this chapter and the next one. Section 6.3 is particularly crucial as it sets the context for the four narratives that emerge from the data and that I will argue constitute the core strategies within household and village decision-making to counter or cope with vulnerability and food insecurity. I aim to demystify how local communities’ relationships with social-ecological systems influence coping and response strategies, and how changes to food security situations have influenced processes and interactions within the local social-ecological systems. In this research, I identify four main strategies people of Jumla employ to respond to food crises.

This chapter goes on, from section 6.3 to focus on two of the strategies namely ‘withdrawing’ and ‘resisting’ and the next chapter discusses the remaining two strategies of ‘maintaining’ and ‘adapting’. I describe the nuances of withdrawing and resisting and how these strategies have changed with the change in local social-ecological systems. By discussing issues such as who employs such strategies and why certain groups of people are able to successfully overcome risks and hazards and others are not, I unravel some of the complexities within this social-ecological system.

6.2 Understanding vulnerability to food insecurity

As discussed in Chapter Two vulnerability has been used differently within various theoretical traditions (McLaughlin & Dietz 2008) especially in the food security literature (Vogel et al. 2007). As discussed in Chapter Two, key theoretical perspectives and approaches used in food insecurity and vulnerability studies include: productivism (Malthus 1798), sustainable livelihoods (Chambers & Conway 1992),
entitlements (Sen 1981) and political ecology (Blaikie & Brookfield 1987; Bohle, Downing & Watts 1994; Watts & Bohle 1993). These approaches to the concept of vulnerability have contributed to an enriched understanding of complex issues associated with food security (Miller et al. 2010; Vogel et al. 2007). In recent times, there have been attempts to utilise ideas from a social-ecological resilience in describing vulnerability to food insecurity (for example see Ericksen 2008). As articulated in Chapter Two vulnerability analyses largely focus on actors within systems and associated ‘processes of negotiation, decision-making and action’ and social-ecological systems approaches can potentially complement this by investigating interactions among social and ecological processes as apparent in the systems approach within resilience analyses (Miller et al. 2010 no pagination).

In order to integrate these issues, this research examines the lived experience of people within the context of a multi-scale social-ecological system. This thesis considers coping, adaptation, and vulnerability as defined by farmers, residents, government and NGO officials and extension workers. Their responses have effectively framed what it means to be resilient in the face of social and ecological shocks. These shocks necessarily trigger change in everyday practices. Understanding and appreciating such response strategies is important in providing a rich understanding of food insecurity (Barrett & Carter 2000; Chambers & Conway 1992; de Waal 1991; Ericksen 2008; Lambert 1994; Maxwell 1996; Maxwell 2001; Sen 1981). One way of understanding coping and adaptation strategies has been to disaggregate problems and focus only on a single hazard, such as drought or an increase in input costs, but this tends to produce a partial understanding of the situation (Quinn et al. 2011). This approach to risks and hazards is overly and artificially simplifying and can hide or neglect the reality of multiple and interacting risks and hazards that people face in their daily lives. As such, important contextual factors (discussed in Chapter Four) that reveal the interconnected nature of social-ecological systems may be neglected. Therefore this thesis considers multiple risks and hazards in the context of people’s lived experiences of food security.

Risks and hazards of a social, political, economic and environmental nature interact to generate vulnerability and affect people’s coping and adaptation options (Adger 2006; Quinn et al. 2011; Reid & Vogel 2006). Depending upon whether risk emerges from
sudden or gradual change, as manifest in seasonal changes, trends, or shocks (Chambers and Conway, 1992), people pursue different coping and adaptation strategies before, during and after the occurrence of risks and hazards. This time dimension of vulnerability is crucial in distinguishing the different strategies people undertake, and are able to pursue as well as the interaction between these different strategies. Vulnerability shifts and changes over time, with people pursuing different strategies before, during and after the occurrence of risks in order to reduce their impact. Assessment of the sustainability of such actions needs to thus be understood not only in the context of the social-ecological system itself but also over the longer term.

As discussed in Chapter Two, coping is generally understood to refer to short-term responses such as selling assets, borrowing food or money, or reducing the number of meals to ensure survival in the ‘near future’. It involves active strategies to manage access to and use of resources to reduce vulnerability (Barrett & Carter 2000). Generally, coping strategies cannot be pursued over a longer period of time as they tend to erode well-being, relationships or the resource base upon which people depend. Adaptation means longer term changes in behaviour and livelihood strategies (over months or years) for the maintenance of food security in the future (Berkes & Jolly 2001). Coping is commonly conceptualised in relation to managing current stresses or shocks and is often reactive, whereas adaptation is a more anticipatory and proactive concept associated with the potential to adapt to future uncertain changes by minimising known vulnerability (Ericksen 2008). However, that distinction between coping and adaptation is not always clear.

Individuals and households may have considerable experience coping with multiple risks and there is a substantial literature documenting strategies for coping with stress and shocks. Chambers and Conway (1992) categorise coping into seven strategies (Table 6.1): stint, deplete, move, hoard, claim, protect and diversify. The strategies people pursue depend on their assets and relationships and their perception of the nature of risks and hazards such as whether it was unanticipated or understood to be a transitory risk. Blaikie et al. (1994, p. 53) refine this framing of coping by categorising such strategies in light of their potential to undermine future ability to cope. The sale
of productive assets such as land, farm tools (depleting resources) or eating less (stinting on food) as a strategy are regarded as actions that undermine a future ability to cope. In the case of disasters, Blaikie et al. (1994) categorise eight different coping strategies (Table 6.1). This portrayal largely assumes people’s ability to cope depends on their socio-economic and political conditions. As such, insufficient attention is given to dynamic ecological considerations—a concern later pursued by Turner et al. (2003). However, Blaikie et al. (2004) emphasise that disasters are part of a continuum rather than a discrete event and vulnerability is shaped by longer-term environmental trends.

Table 6.1: Classification of coping and adaptation strategies

<table>
<thead>
<tr>
<th>Blaikie et al.’s categories</th>
<th>Chambers and Conway’s categories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unsustainable strategies</strong></td>
<td></td>
</tr>
<tr>
<td><em>Post-event coping strategies:</em> eating less, wild food, inferior food</td>
<td><em>Stint:</em> reduce current consumption; shift to lower quality foods; draw on energy stored in the body</td>
</tr>
<tr>
<td></td>
<td><em>Deplete:</em> draw upon household stores of food; pledge or sell assets</td>
</tr>
<tr>
<td><em>Impact minimising strategy:</em> prefer to improve access to food over access to income</td>
<td><em>Move:</em> disperse family members, livestock, and assets; and/or migrate</td>
</tr>
<tr>
<td><em>Building up stores of food and saleable assets:</em> stocking up</td>
<td><em>Hoard:</em> accumulate and store food and other assets</td>
</tr>
<tr>
<td><em>Development of social support networks:</em> marry into wealthy family</td>
<td><em>Claim:</em> make claims on relatives, neighbours, patrons, the community, NGOs, the government, the international community, variously by calling in debts, appealing to reciprocity and good will, begging, and political action</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sustainable strategies</strong></td>
<td></td>
</tr>
<tr>
<td><em>Preventative strategies:</em> evade seasonal and/or altitudinal concentration of disease vectors; choose locations for housing with less exposure to wind, flood</td>
<td><em>Protect:</em> preserve and protect the asset base for recovery and reestablishment of livelihood</td>
</tr>
<tr>
<td><em>Diversification of production strategies:</em> planting greater varieties of crops, inter-cropping, mix-cropping</td>
<td><em>Diversify:</em> seek new sources of food—wild foods, gleanings, wild animals, food stored by rats and other animals; diversify work activities and sources of income, especially in off-</td>
</tr>
</tbody>
</table>
Diversification of income sources:
craft and extractive enterprises,
brewing beer

Source: Adapted from Blaikie et al. (1994, p. 53) and Chambers & Conway (1992, p. 15)
(Note: strategies that undermine the future ability to cope are grouped as ‘unsustainable’ and visa-versa)

These classifications fail to appreciate both the time dimension and the social-ecological nature of risk and vulnerability. A more nuanced appreciation through an integrated analysis of different strategies people pursue is important to refining responses to food insecurity in ways that address its causes within the context of their social-ecological systems.

6.3: Four narratives of Jumli responses to food insecurity

Historically, Jumli people combine different livelihood pursuits—agriculture, animal husbandry, home industry, exploitation of wild products, trade, and out-migration for work (Bishop 1990, p. 157)—and in doing so have devised various coping and adaptation strategies that suit their particular conditions. People’s strategies distinguish between what is a trend, a seasonal change or a shock. Strategies, combined variously, differ in the extent they are accessed or employed by respondents, even though they may be responding to the same trend, seasonal change and/or shock. It depends on opportunities and individual circumstances including wider historical structural processes. People’s response strategies to these diverse pressures are mainly undertaken as individual pursuits although collective initiatives are also apparent. While people of Jumla provide historical evidence of responding to multiple risks associated with food insecurity, their response strategies are not static, reflecting changes in their local social-ecological systems and the success or otherwise of particular strategies. In effect these strategies underpin their social-ecological resilience. Figure 3 revisits the earlier work of Chambers & Conway and Blaikie et al. (Table 5.1 and 6.1) but importantly, reframes it within the context of changing social-ecological systems. This reframing of people’s coping and adaptation strategies takes
better account of social-ecological interactions and differential nature of vulnerabilities compared with earlier categorisations.

Figure 6.1: Framework for understanding coping and adaptation to food insecurity within Jumla’s social-ecological system

Out of the diverse risks and social-ecological conditions, four narratives that expose the complexity of coping and adaptation to food insecurity emerge; each with different implications for individual and collective long-term well-being and sustainability. People are not necessarily in sequential order, withdrawing, resisting, maintaining, and/or adapting to food insecure situations. Their responses are complex and highly context specific. These stories show a lack of simplicity in the lived experience of managing food insecure situations and highlight the importance of both individual and household level responses, as well as collective actions in the overall Jumla experience of food insecurity. It is through understanding the diverse narratives of ‘coping with’ and ‘adaptation to’ food insecurity that opportunities which resonate more strongly within local social-ecological relations can emerge. This discussion also reveals the
local manifestation and negotiation of global, regional and national trends, notably in terms of climate change and market integration.

6.4 Withdrawing

‘Withdrawing’ reflects an inability to consider future. People withdraw when all their positive options to manage their food security are exhausted and they are compelled to employ strategies that undermine their ability to cope with similar situations in the future. Examples of withdrawing strategies are those where Jumla respondents have had to spend their life savings, sell productive assets, start consumption rationing, eat seeds intended for subsequent plantings, skip medicine, take their children out of schools and send children away to work elsewhere. Finally the ‘choice’ to migrate out of the district can be considered as the ultimate ‘withdrawal’ from the Jumla social domain. These responses do not necessarily follow a sequence—e.g., eat seeds last. Rather the apparent ‘options’ are weighed up according to the current context at the time of the crisis or catalyst for evaluating their situation and are dependent on the relationships and resources each household is situated within. Relatively well-off participants employ strategies only during extreme events such as serious illness in the family. Even in normal seasons, many dalits and other land poor participants reported that they needed to either sell their productive animals or get loans to be able to afford festival celebrations.

Participants, during interviews and focus group discussions, indicate where they spend their income the most. Table 6.2 below explains where a typical Jumli household spends its income in the order of importance. For land poor participants, most of their income is spent on food. When faced with multiple shocks, participants agree that they look for any opportunity to cut these costs. They weigh up their circumstances and decide where to cut expenditure. But however they choose to cut costs, withdrawing from these activities will have serious repercussions in their future ability to cope. For example defaulting on debt repayments may eventually lead to loss of productive assets such as land and animals.
Table 6.2 Areas of spending by an average Jumli household (based on interviews and focus group discussions)

<table>
<thead>
<tr>
<th>Order of importance</th>
<th>Areas of spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>food (including meat, cooking oil, spices)</td>
</tr>
<tr>
<td>2</td>
<td>health care</td>
</tr>
<tr>
<td>3</td>
<td>education</td>
</tr>
<tr>
<td>4</td>
<td>clothing and utensils</td>
</tr>
<tr>
<td>5</td>
<td>energy e.g. kerosene, electricity</td>
</tr>
<tr>
<td>6</td>
<td>house repair</td>
</tr>
<tr>
<td>7</td>
<td>debt repayment</td>
</tr>
<tr>
<td>8</td>
<td>festival celebrations</td>
</tr>
<tr>
<td>9</td>
<td>farm labour hire</td>
</tr>
</tbody>
</table>

6.4.1 Withdrawing from health and sanitation needs

During interviews, one male participant who belongs to the dalit community with no formal education and living in a remote village far away from the district headquarters, said he was skipping his asthma medication so that he can save some of his income from sewing clothes for food (P2). He was aware that by doing so he was jeopardising his health in the long run. While the case of skipping asthma medication was an isolated but extreme case of withdrawing by one research participant, many of the participants during interviews said that they themselves or members of their family, have, in the past, deferred their important hospital visits because of economic circumstances, distance to hospital and/or the ability of family at home to accomplish all the things that were needed without the hospital-goer.

Government hospitals with doctors are located only in district headquarters meaning many patients have up to 12 hours of walking to reach them, depending on how far their villages are located from the district headquarters. Local health posts in Jumla are in poor condition and do not have basic equipment, medicine or trained staff to enable
better medical services. The poor cannot afford, as one participant from the *dalit* community mentioned, medical and travel costs as treatment with even government hospitals is costly and respondents said that in many instances, they tend to prioritise food over medical attention. Patients with serious medical conditions are required to be air lifted to Nepalgunj and other regional townships as even the district hospitals lack advanced medical facilities (road transportation, as at the time of fieldwork, took up to 24 hours to reach the closest hospital with reasonably advanced facilities). A woman interview participant (opportunistic) who is a junior health worker in a remote Jumla village said that she knows many women living with a prolapsed uterus. It is a serious reproductive health issue in rural parts of Nepal. A research study conducted in eastern Nepal found patriarchy, gender discrimination, and cultural traditions such as early marriage and pregnancy are social and cultural reasons variously causing this medical condition (Radl, Rajwar & Aro 2012). She mentioned that many women do not even know that this is a medical condition, some regard it as a curse bestowed upon them by god, and others do not have the means to go to hospitals and pay for the surgery. Further highlighting the intra-family power relations existing in the society, she said:

…given the rampant gender discrimination in Jumla society, women’s health issues do not get priority in the family affairs. If his wife is seriously ill, husbands find it easier to marry other woman than to provide treatment for her. (P 29)

In Jumla people from the low-income group are suffering the most as there is a lack of affordable medical services, not to mention a total absence of a medical insurance system. Historically prevalent cultural prejudices, the gender related prejudices in the case of prolapsed uterus, further exacerbate the misery.

The situation of the preventative health care system is worrisome in Jumla. Research indicates that public health issues associated with sanitation, water quality and disease prevention and control are important for food security (Spears 2013). For example, medical research documents note that chronic childhood environmental exposure to faecal germs can be a major cause of malnutrition (Humphrey 2009). Many households in the remote villages of Jumla do not have toilets. Even with toilets in their homes, some members of their family continue or prefer to defecate in the open.
During fieldwork I saw children defecating along roadsides, human faecal matter all along the roads, particularly before entering various neighbourhoods. As in many other developing countries (for example see Barnett 2011), gastrointestinal disorders and typhoid fever are common health problems reported by participants in Jumla. Lack of proper sanitation and clean drinking water is considered as a main cause of this problem and when infected, this disease reduces the body’s ability to utilise the food one eats (Barnett 2011; Spears 2013). In many villages of Jumla people’s health is declining, not just because they lack sufficient and nutritious food, but also because of recurring bouts of diarrhoea, dysentery and an infection from a variety of parasites. People are affected not only if they defecate in the open but also if their neighbours do. A longitudinal health and sanitation study conducted in India shows that the poor quality of drinking water and lack of available sanitation is the major cause of child malnutrition (measured in terms of stunted growth) in India, and is more significant than the lack of availability of food in terms of general well-being (Spears 2013).

In the aftermath of seasonal downpours, the sources of drinking water in Jumla get contaminated and households have to individually boil or chemically treat drinking water in order to make it drinkable. Not all households can afford to do so and nor can they keep continuous vigilance over their small children. As a result a lot of the Jumli population, mostly children, suffer from water borne diseases every year. As I found during my fieldwork, despite observing the utmost caution, I also suffered from diarrhoea. The problem of contaminated drinking water is not just limited to Jumla and the pervasiveness of the issue masks the seriousness of its consequences. A study commenced by United Nations International Children’s emergency Fund (UNICEF) in 2007 in Nepal found that over 80% of water from gravity fed supply schemes in some hill districts were micro-biologically contaminated (UNOCHA 2008).

Efforts to provide gravity fed piped water are underway but there is no mechanism, apart from individually treating water in Jumla, to check and improve the quality of such piped water. A toilet campaign is also being run in some villages but large numbers of people are reluctant to construct and use toilets, while others cannot afford toilet construction. I witnessed a household-use toilet room, constructed with the
financial support from an NGO, being used to store firewood and the family continued to practice open space defecation. The sanitation situation partly explains why Jumla has the highest incidences of malnutrition (as discussed in Chapter Four) in the country (UNDP 2014) and also highlights the complexity around food security that food production (availability) is just one of the many aspects of food security.

Sanitation issues like these undermine their future ability to cope with food insecure situations. While I am describing withdrawal in this section, this issue brings up several issues for further consideration. There may be a withdrawal from responsibility on the part of government or NGO providers such that reasons for ill health or malnutrition are not associated with poor sanitation. But there is also an inability on the part of some of the respondents to prioritise such matters over more obvious cause and effect situations: like no food and subsequent hunger. This indicates that less direct consequences of vulnerability do not trigger an alert within the household, and so the opportunity to act is lost. In such circumstances vulnerability is exacerbated despite going unnoticed at the time, and the idea of removing or withdrawing family members from circulation (to avoid infectious disease, for example) is inconsequential too, as the source is likely to be systemic. I will return to this point later in the thesis in Chapter Seven.

6.4.2 Withdrawing children from schools

Most participants similarly said that they have withdrawn their children from schools for various durations for different reasons. Many of them gave instances of children missing school to help mind their younger siblings. Others leave school for a range of activities such as working on their own farms, working as wage labourers on others’ farms (mainly during planting and harvesting seasons), working in food for work programs, helping adults in collection of NTFPs and to taking care of livestock. There are instances in many households where children permanently leave school, usually after grade five. Recent government statistics show the school dropout rate is higher in Jumla than the national average (CBS 2011a). One interview participant in a remote village could not afford to send his 14 year old eldest daughter to school; she is taking care of her differently abled younger sister and also grazes livestock (P 20). He said he
needed her help to work to earn the family’s livelihood. While Nepal’s education policy (law) does encourage parents to have their children enrolled in schools, it does not directly penalise parents for not sending their children to schools. Most participants were nevertheless aware that withdrawing children from schools will affect the children’s ability to compete with their peers in future. Such strategies perpetuate and exacerbate vulnerability to food insecurity.

This particular coping strategy has a gender as well as a socio-economic dimension. All respondents who had withdrawn their children from schools either for the short-term or permanently, had withdrawn their female children first. Similarly, it was a common practice in Jumla to send their sons to relatively better ranked private schools (recently a few private schools have opened in Jumla district headquarters area) and daughters to public government schools. Relatively well-off and educated parents, as indicated during the interviews, tend not to withdraw their children from schools if possible and they also tend to be less discriminating against daughters. Again, structural issues of society undermine any gains for the poorest and the discriminated against.

6.4.3 Consumption rationing

The Jumla case confirms the findings of studies undertaken elsewhere that consumption rationing is one measure that people in a food crisis routinely adopt (see Chambers & Conway 1992; Ford & Beaumier 2011; Grobler 2014; Osbahr et al. 2008). As mentioned earlier, people may be aware of, but unable to, avoid the long-term negative consequences of particular strategies. Coping strategies during food crises are known to be preoccupied with avoiding depletion of assets rather than maintaining consumption levels (de Waal 1991). Participants in Jumla reported that eating less, eating inferior food, even not eating for days were some of the strategies they use during a food crisis. As one participant said:

...what we used to do is collect some edible plant leaves from the forest (bethe, sisno), add some cereal flour and boil them to make slurry and drink for dinner or lunch (P 02)

Another participant said:
...in hard times, we would just count how many of us in the family would be having dinner or lunch and cook a handful of grains per person....when cooked we would just divide that equally and eat (P 04)

When families in Jumla employ the strategy of consumption rationing, many participants indicate that they start it mostly with women, children and aged people first. Working-aged men get priority in intra-house food allotments. Female members are the last ones to eat in the family. In an extended family situation, the female in-laws come after the female members of the immediate family. One obvious disadvantage of eating last is that they often get less and sometimes nothing. As one female participant said:

Sometimes we run out of food prepared for dinner while serving to other family members...we are too tired to cook again late at night. So I eat whatever’s left and go to bed. (P 15)

Consumption of milk and meat is still a luxury in Jumli households. As a result, cutting milk and milk products consumption is a households’ first choice during crises, compelling small children to eat the same as the adult family members. During crises, a family’s focus is to properly feed hard working male members of the family so that they continue to work hard and earn more. Hard work in this instance refers to ploughing and digging; work such as transplanting paddy, cooking, childcare, and studying are not regarded as hard work. Participants agree that working age males are given the best food and women, children and aged people have to live on second grade food. As one women participant explains:

It’s normal that we have two types of food prepared in our home...rice and roti or chino or kaguno. Rice, milk and yoghurt is given to dad and my brother whereas inferior food such as roti or chino for my mum, me and my sister-in-law. This is because my mum thinks dad and my brother have to work hard so they require more energy food...we still have this system of food discrimination based on gender in our families. This is why a 25 year old woman looks like a 50 year old in Jumla. (P 09)

Many other participants agree that this kind of situation is common in Jumli families even in the absence of food crises or shortages. For many female household members
including mothers or sisters-in-law, having an abundant or sufficient store of food may not necessarily constitute a food secure condition. The culture of women eating last, the culture of assigning kitchen jobs exclusively to women and the heavy workload of women compound intra-household food insecurity problems in Jumla.

This shows that food insecurity is more complex than simply not having enough food. This corroborates earlier findings that access to food by individuals in a family is linked to the control one has over household resources and his/her access to household income (Kabeer 1995). Increased availability of food in the household does not necessarily mean enhanced food security for women in the family in Jumla. The situation of gender bias thus indicates the need of a holistic approach to a food security enhancement program. Simply making food available and accessible to the households may not work unless women’s ‘position’ in the family and society as a whole is improved; and issues of intra-household power and inequalities are tackled.

Tracing the root causes of the subordinate position of women in Nepalese society in general and Jumli society in particular, as discussed in Chapter Five, takes us to the Hindu traditions and mythological text of ‘Manusmriti’. It is widely acknowledged that the ‘Manusmriti’ also known as Manab Dharma Shastra—the earliest metrical work on Brahminical Dharma in Hinduism is the source of caste and gender based discrimination in Hindu society. According to Hindu mythology, the Manusmriti is the word of Brahma (the creator), and it is regarded as the most authentic statement on Dharma (Patwari 2011). The scripture consists of 2690 verses, divided into 12 chapters (ibid). Although there are some verses present in Manusmriti that outline a women friendly code of conduct, such as “where women are provided place of honour, gods are pleased and reside there in that household” (chapter 3/verse 56), many others are quite discriminating and patronising. One such patronising verse is:

Since women are not capable of living independently, she is to be kept under the custody of her father as child, under her husband as a woman and under her son as widow (chapter 9/verse 3).
6.4.4 Withdrawing rights for people with disabilities

Having a family member with a disability compounds stress as there is a total absence of a formal social security system for disability in Nepal. There are no education facilities for the blind and other physically disabled children. The latest census reports that three percent of the Jumli population is living with some form of disability (disability by number of persons is shown in Table 6.3) (CBS 2013a). Cultural and traditional systems of supporting these people by neighbours and extended family members do exist in Jumla but during the time of crises they easily come asunder. One participant recalls how one of his hearing impaired neighbours suffered during the 1996/97 drought. Human dignity and family values were shattered during that particular crisis; he was not given any food for three consecutive days. Participants agree that these people with disabilities, particularly those who have extreme disabilities such as being blind, get the least attention in the family.

Table 6.3: Number of people living with disability by types of disability and gender in Jumla

<table>
<thead>
<tr>
<th>Type of disability</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical disability</td>
<td>1043</td>
<td>618</td>
<td>425</td>
</tr>
<tr>
<td>Blindness/low vision</td>
<td>593</td>
<td>314</td>
<td>279</td>
</tr>
<tr>
<td>Deaf/Hard to hearing</td>
<td>867</td>
<td>494</td>
<td>373</td>
</tr>
<tr>
<td>Deaf-Blind</td>
<td>51</td>
<td>32</td>
<td>19</td>
</tr>
<tr>
<td>Speech problem</td>
<td>375</td>
<td>222</td>
<td>153</td>
</tr>
<tr>
<td>Mental disability</td>
<td>111</td>
<td>54</td>
<td>57</td>
</tr>
<tr>
<td>Intellectual disability</td>
<td>44</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>Multiple disability</td>
<td>164</td>
<td>88</td>
<td>76</td>
</tr>
<tr>
<td>Total</td>
<td>3248</td>
<td>1850</td>
<td>1398</td>
</tr>
</tbody>
</table>

Source: CBS 2013a
6.4.5 **Depleting assets**

When stinting does not work, people start depleting their assets. Spending savings, selling goats, chickens and/or sheep and even selling cows, bullocks and/or buffaloes is the next step of coping with a food crisis. People acknowledge that these responses make them more vulnerable to any future hazards. As discussed in Chapter Five, some participants even had to sell some of their productive land to manage severe food crises resulting from drought or serious health problems. It is apparent from the interviews and focus group discussions that employing these kinds of strategies is common generally among land poor households and households that have limited sources of livelihood. Relatively well-off participants had to resort to these strategies only during extreme events such as serious illness in the family.

Even in normal seasons, many *dalits* and other land poor participants reported that they needed to either sell their productive animals or get loans to be able to afford festival celebrations. *Dashain* and *Tihar* are the main festivals people in Jumla celebrate. People eat meat, *sel roti* (bread made out of rice flour) and wear new clothes during these festivities. These festivals are an important part of Nepalese culture and everyone irrespective of their economic status celebrate them.

6.4.6 **Migration**

Another common way of withdrawing in Jumla is to migrate out—in both the short and long term. Migration has been a part of Jumli people’s lifestyle for generations. While all of the interview participants, across all castes, mentioned that at least one member of their family (mostly male members) had migrated for work in the past, the land poor tend to employ this strategy the most. Participants mentioned two equally important benefits of this kind of short-term migration: i) it saves food which can be used for a longer time by remaining family members, and ii) remittances that migrating members send back home can be used to buy food and other necessary items.

Participants mentioned three different times for short-term migration. The most common short-term migration normally starts in July when the planting of the summer crop is complete and short-term migrants return after the winter. The second migration starts in December and people return in April/May to harvest winter crops. The third
one starts in July/August and ends in September/October. People following the latter two types of migration patterns normally come from nuclear families so they need to be home to perform planting and harvesting jobs. Another reason for engaging in these two types of short-term migration is that the high value yarchagumba and other NTFPs collection season falls in May/June and July. Participants agree that it is financially much more profitable to come back home and venture up in the Himalayas for yarchgumba collection than to continue working in India or in Nepalese regional towns.

The third important reason for migration is the lack of education and health care facilities in Jumla. As one female participant, whose husband is a teacher in a government primary school, said:

I love my village and wanted to stay there and do farming but because I had to prioritise the future of my children over other interests, I had to migrate to the town. We do not have good schools and teachers there. (P 21) Participants understand the importance of having good health and education for overall food security and that Jumli villages do not have proper sanitation, health care and education facilities. In this way they are more aware than the government of the interconnectedness of these issues. But not all can afford to migrate out for better health and education for themselves and for their children. Participants indicate that only those who have alternative livelihoods options can. Many of these relatively well-off families have been moving to district headquarters and other Nepalese townships for better education and health care facilities for their children.

Withdrawing in Jumla consisted largely of unsustainable response strategies that reflect an almost total inability to consider the future. These strategies are deployed to avoid the situation of food insecurity in the short term. Withdrawing for short-term migration is essentially an end point for the migrant’s hunger during the difficult months, but here it can be understood to lead to an improved food security situation. This shows that normative judgements about certain response strategies as being good or bad in terms of their effect on people’s future ability to cope, needs to be contextualised within each social-ecological and cultural setting. Overall,
‘withdrawing’ strategies exhibit least power/agency (because people are frequently locked-in); so in term of resilience, this is the most vulnerable time to risks and does not contribute to a resilient social-ecological system. The next section discusses how people in Jumla, in their fight to ensure food security, resist social-ecological risks and hazards.

6.5 Resisting

Whereas most of above strategies of withdrawing in Jumla result in an erosion of long-term capacity to cope with change, the strategy of resisting demonstrates a greater degree of agency and potentially access to a more diverse suite of relations and resources. ‘Resistance’ involves subtle responses, depending on socio-economic conditions and emphasising agency by households and individuals. Yet these strategies do not consider longer term social-ecological implications. In their struggle to respond to a changing risk landscape, people pursue several resistance strategies in Jumla: i) increasing farm area, ii) planting new crops and new varieties, and iii) changing expectations of activities associated with the cropping calendar. Each of these reflects responsiveness to changing social-ecological relations. But Fankhauser and others’s (1999) assertion that the way people select a particular strategy or combination of strategies depends on their socio-economic, cultural and ecological circumstances appears to be true in the case of the Jumla landscape. In the next sections I describe the way people of Jumla resist through their struggle to secure food for themselves and their families emphasising the differing vulnerabilities among them.

6.5.1 Increasing farm land

Land is the most important natural resource in small family farm-based subsistence agrarian Jumli society (discussed in Chapter Four). Apart from caste and gender, the amount of land one owns determines one’s status in Jumli society. Participants were unanimous that those who own more farm land (especially irrigation land) enjoy higher status in society and that the amount and the quality of land one owns is a measure of relative poverty.
Farming in forest land

With population pressure resulting in increased demand for food, households in Jumla, where the overwhelming majority of people earn their livelihood from agriculture (CBS 2013c), are seeking to increase their farm size beyond what they inherit. This is predominantly through forestland clearance. As one farmer participant from a remote village, said:

...farmland that my grandfather used to own and cultivate was enough to feed his family at that time. But now that land is just not enough... we have become 17 people from my two grandparents and the inherited land I now have is not enough for my family... I had to increase my farmland ... I started cultivating the adjoining forestland. In 1997, the Government kindly legalised it by registering it in the book of land registration. (P 06)

Many in Jumla share this story, where the total cultivated area has increased almost eight times in the last 40 years. Bishop (1990) recorded a total of 2990 ha of land under cultivation in 1969/70. Official total cultivated land in 2011 has increased to 26,896 ha in Jumla (DADO 2012). Similarly, an increase in irrigated land (jyulo or khet in local language) is significant. In 1868, Jumla had only 584.1 ha of khet land (Bishop 1990). In 1968 it reached 846.5 ha (ibid) and in 2011 it was 3,173 ha (DADO 2012). Despite population growth (Table 5.2 in Chapter Five), per capita land holding in Jumla has increased from 0.06 ha to 0.2 ha over the last 40 years. The is compared to the national average per capita land holding of 0.1 ha (CBS 2011b, 2013c). Despite this increase in the supply of land in Jumla, albeit at the cost of forest, the food security situation of many households has not improved. Clearing forestland for farming can be seen as an example of how the social and ecological can be in conflict. Cumming (2011) notes that overexploiting ecological resources in unsustainable ways can still create economic benefits and increase short-term social resilience—defined as ‘ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change’ (Adger 2000, p. 347). In this case those who clear forestland get access to more land resources to do their farming and also get access to forest products such as timber and wood. Although in the case of Jumla the social benefits from land clearing are contested (discussed in next paragraphs). In the longer term, as participants have already experienced, the local population will not have other ecological services such as bio-diversity, water retention
capacity and regular supply of fodder and fire wood. As discussed previously, local level evidence of this is that people unanimously feel that the soil fertility is declining in Jumla and associate it with, in part, forest clearing.

Clearing forests for farming is one of the main reasons for the loss of wild biodiversity globally. Mountainous landscapes such as that of Jumla encompass diverse and rich ecosystems and are regarded as ‘key elements of global geosphere-biosphere system’ (Diaz, Grosjean & Graumlich 2003, p. 2). There is thus an agreement among the scientific community on the importance of conserving the earth’s biodiversity in general and mountain biodiversity in particular. The importance of such conservation is succinctly summarized in this excerpt below by Godfray et al. (2010, p. 817):

…we must avoid the temptation to further sacrifice Earth’s already hugely depleted biodiversity for easy gains in food production, not only because biodiversity provides many of the public goods on which mankind relies but also because we do not have the right to deprive future generations of its economic and cultural benefits.

Fig 6.2: Cultivation on encroached forestland in Kudigaun village of Jumla (Photo: Kamal Gaire, 2012)
Politics of land encroachment

On the whole, clearing forests for farming, as can be seen in Figure 6.2, has been an important and largely consistent coping strategy in Jumla. Studies have shown that this strategy is being employed in almost all other areas of the mid-western hills and mountains and is not just limited to Jumla (Adhikari 2008). But who gets to pursue this strategy is largely determined by the prevalent caste system. As a result, despite an all-round increase in farm area ownership in Jumla, inter-caste differences have persisted. As discussed in Chapter Five, dalits generally have less landholding than their upper caste neighbours. Brahmis and Thakuries—both upper caste groups, control most of the irrigated land or khet in Jumla. Dalit participants identified three main reasons as to why they have less land despite everyone in the past encroaching on forests. Dalits had to do forest clearing for upper caste people so they had less time for their own clearing works. Second, they received less fertile, marginal land to clear that was left by others, eventually abandoning it after one or two cropping seasons due to insufficient yields. Thirdly, after clearing and cultivating the forestland at the time of official registration, elites fraudulently got the dalit land registered in their name, legally depriving many dalits families of land ownership. Upper caste participants refuted these claims and blamed dalits for being lazy in the past and not willing to face the risk associated with farming the forestland, such as wild animals destroying their crops. It is, however, hard to believe these claims of laziness as dalits are the ones who still perform the most physically demanding farm jobs in Jumla. The other claim that dalits did not want to face the risks associated with farming in forestland is beyond comprehension as most of them live in the margins of villages and own mostly marginal land.

With decline in the overall forestland in Jumla in recent years and with changed forest governance regimes in many areas, people are changing the way they encroach on forest land. Participants say that it is rare, these days, that one can clear the deep forest patches and start farming in most parts of Jumla. Although participants did tell me accounts of isolated cases where people still burned the top of forested hills in remote villages to grow buckwheat, in most parts of Jumla, the style of encroachment appears to be more subtle these days. Farmers who have their farmland adjoining forest land keep expanding their farms’ boundary slowly but every season as they till their farm. Again, this new style favours those who already have more land—the more land they
have the more the opportunity to encroach. Dalits and other land poor are the ones who are the most disadvantaged again in this new and more subtle form of encroachment.

In addition to caste-based prejudices, there are also gender biases apparent in Jumla’s land ownership system. Cutting across the caste boundary, as participants agree, most of Jumli farmland is registered in men’s names. Only 6.4% households reported during the population census conducted in 2011 that they have some female ownership over fixed assets (either land or house) in Jumla (CBS 2013a). Average figure of female ownership over fixed assets for rural Nepal is 18%; much higher than that of Jumla (ibid). As I have argued, these examples reveal how social-ecological relations are shaped by cultural prejudices and structural inequalities.

The situation today, as indicated by participants, is that those who work on the farm own less land; and those who do not work on the farm and depend on others to do their farming own most of the irrigated land in Jumla. People, such as full-time businessmen or government workers who do not spend time farming, nonetheless own farmland. Some families who migrated to other districts continue to hold land ownership in Jumla. Participants, especially around district headquarters believe that owning land is a secure investment for their future and liken it to investments in security bonds or shares. As a result of all these factors absentee landlordism is on the rise in Jumla. In the short term, this absentee landlordism seems to favour dalits and other traditionally marginalised land-poor communities. They now have more chance to access land for sharecropping. Many dalit and other land poor participants noted this fact during interviews and focus groups discussions. But lack of ownership deters the performance of their farming activities. Informal and often short-term agreements for sharecropping discourage tenants from long-term investments and deny the stability associated with farm planning over time. Formal financial institutions in Jumla require a land ownership certificate before they can process any farm loan applications. This too, would be an important first step in women gaining confidence and make way for more decision-making opportunities within the households as well as in society.

Situations like this necessitate a holistic and historical look at what Sen (1981) maintains as the determinants of production, reproduction and distributions relations,
as I apply it to Jumla. This would not only help identify root causes of this problem in Jumla but also help address them effectively. The starting point to address existing land ownership systems, which is skewed towards powerful upper caste elites in Jumla, may well be an implementation of a land reform policy. A policy that focuses on a fair and just land ownership system may be important to enhance food security of many land poor Jumli farming families. A reform that encourages the working farmers to own the land and discourages absentee landlordism could be pivotal in solving the structural inequalities of the current land distribution system and could be a starting point for a longer term solution. There was evidence during my fieldwork that a fair and just land ownership system would also discourage deforestation to a larger extent. There would be no or lesser need for poor people to clear forests for their survival and an inverse incentive for landlords to do so.

Giminez and Shattuck (2011) in their food regime and food movement framework, suggest implementation of land reform programs as one way of ensuring rights to food for marginalised sections of society. They believe that the challenge is to ‘address the immediate problems of hunger, malnutrition, food insecurity and environmental degradation, while working steadily towards the structural changes needed for sustainable, equitable and democratic food systems’ (Giminez and Shattuck 2011 p. 132). McMichael (2014, p. 357) writes ‘without land management policies, food sovereignty is a non-starter’. Real causes of hunger, as Sen (1981) wrote, are inequities in the access to resources and this is still the case in Jumla, Nepal. As discussed in Chapter Four, historical processes such as caste, class, gender and place have cemented inequality in Jumli society providing inequitable access to land and other resources. Inequality of food access, at its core, reflects inequitable societies. But given the fact that both empirical and anecdotal data confirm the likely and unprecedented impacts of climate change particularly on resource poor communities (IPCC 2014), and ignoring this big picture would be like what Scoones (2009 p. 182) called ‘fiddling while Rome burned’.
6.5.2 Planting new crops and their varieties

Resisting does not stop at increasing farmland. Many farmers are constantly making use of opportunities to try new crops and their varieties. Selection of new crops and their varieties, as participants said, is influenced by a combination of biophysical crop characteristics and social preferences in Jumla: i) climatic suitability of new crops, ii) availability of high yielding crops and varieties, iii) ease of crops to grow, iv) crops and varieties that have higher market demand, v) consumption and production preferences to avoid crops that are socially regarded as inferior food, and vi) sometimes people are compelled to grow certain crops because some climatic shocks, such as a delayed monsoon, prevent them from growing their preferred crops.

**Fighting the odds with new crops**

As such, farmers do not rely on a single criterion to decide on crops. For example, despite millet being an easier crop to grow, farmers in Jumla show a general reluctance to cultivate millet. Overall area coverage of millet is declining (DADO 2012) as it is now regarded as an inferior food by locals. Similarly, despite buckwheat being the easiest crop to grow, wheat, potatoes, and bean crops are replacing it. Buckwheat, too, is regarded as an inferior food in Jumla. Some participants blame the lower production potential of these two crops as their reason for abandoning them. Local government agriculture extension officers agree that these traditional crops also get less attention in government research and extension systems.

Almost all participants said that the main reason for farmers’ preference to expand growing of Jumli beans is the higher price they fetch in regional markets. Jumli local beans are in high demand in Surkhet, Kathmandu and other regional markets. Participants reported during interviews that despite increasing risk of pod damage as a result of heavy rainfall in the month of July/August (month of Shrawan in Nepali calendar), many farmers tend to accept the risk as this cash crop is more profitable compared to other crops. Relatively well-off farmers report this risk-taking behavior more than others in the interviews. These are farmers who have other reliable sources of income and/or have relatively more land ownership and farmers located around district headquarters. However, of those *dalits* interviewed, those from remote parts of
Jumla and participants who own marginal land said they still grow the traditional crops of millet and buckwheat and are less enthusiastic about growing beans at the cost of other crops because of the risk.

Similarly, the historically local (but introduced) white and round variety of potato has been completely replaced by red potato varieties. Participants noted that despite the perceived better taste and longer storing qualities of the white variety, people preferred to grow red varieties because of their higher production potential. Farmers have to sell the red potato varieties right away as they cannot be stored longer for later use. In higher altitude areas of Jumla, farmers have started cultivating maize and pumpkins. As discussed earlier, participants believe their ability to grow these newer crops is an important indicator of temperature rise in Jumla (discussed in Chapter Five).

According to research participants, those crops were not feasible in these areas just 15 years ago. One participant during interviews recalled how his late father brought maize seed from the neighbouring district of Jajarkot and tried to grow them in his backyard in Guthichaur village 20 years ago (in 1990). Maize did germinate and grow but could never reach the ripening state owing to the onset of cold winters. Growing period is becoming shorter. Growing periods for cereal crops in these high altitude areas is longer as compared to lower areas and only one crop per year is feasible.

Sometimes, changing weather conditions force farmers to abandon sowing of planned crops and instead they plant a different crop or leave the land fallow. For example a delayed monsoon prevents timely paddy transplantation. Delayed planting pushes harvesting time out and makes it uncertain if farmers will be able to harvest it in time. In the event of an early snowfall during harvesting time, paddy cannot ripen; and it remains green in the field. In such cases of late monsoon some farmers try to compensate for the loss by growing beans in place of paddy and others leave the land fallow. This has been the experience of many participants who have paddy land that depends on irrigation water from tributaries, which get activated only after good rainfall, for paddy transplantation. This type of land is locally known as *chyute jyula*. Those who own *jawadi jyula*—paddy land with irrigation coming from a permanent source such as rivers, may not have to face such a situation. In Jumla most of this ‘A’ grade land is owned by upper caste elites.
Farmer participants from eastern villages of Jumla have largely abandoned paddy cultivation for a multitude of reasons. One of the main reasons is increasing disease and pest infestations such as blast disease and gundhi bug insect, as discussed in Chapter Five. Paddy in these areas is largely replaced by potato and maize. Participants said even if they wanted to they cannot replace paddy, with millet there. Their replacement choice must also be resistant to the Gundhi bug – millet is not.

In another example of resisting, participants believe that farmers of Jumla are resisting a constant push from government extension agencies to grow wheat in place of barley. Government agencies cite the higher production potential of wheat over barley for their promotion of wheat. Despite all efforts of the government, farmers are reluctant to cultivate wheat crops on their irrigated land. Wheat varieties being promoted in Jumla have a longer maturation period than their traditionally preferred crop of barley. Delay in harvesting of one crop has bearing on the ability of farmers to cultivate the next crop on the same land in a timely manner. The next crop after wheat in most cases (wherever irrigation is available) in Jumla, is paddy. In a cold region like Jumla, delayed transplanting of paddy may result in total failure of the crop in case of an early onset winter; then paddy will not ripen. Barley is also preferred over wheat as food by the Jumli community as they consider barley roti as tastier, more nutritious and easier to make. The case of extension agencies in Jumla pushing for high yielding wheat varieties is an example of how the production imperative relies excessively on expert knowledge and technological solutions; and that such reliance may actually increase the vulnerability of the people. As discussed in Chapter Two, scholars have warned that excessive reliance on expert knowledge and technology and neglecting the social dimension may increase vulnerability (Liverman 1990; Pelling 2001).

Many Jumli farmers, exhibiting their utmost agency, have largely resisted the extension agencies and their wheat cultivation push to replace their traditional barley crop. Such resistance was visible to me during fieldwork conducted for this thesis in the months of May, June and July, as almost all of the irrigated land, where paddy would be the next crop to grow, was covered by barley. June and July is the harvesting season of barley in most parts of Jumla. This resistance to wheat shows that there is still a high degree of agency among farmers in Jumla. Participants blamed extension
agencies for ignoring the connection to the second crop in their promotion of a wheat crop.

**Tensions in the policies**

Government agricultural extension agencies operating in Jumla are the District Agriculture Development Office (DADO) and District Livestock Services Office (DLSO). Research participants from these offices admit that they are operating in a conflicted policy environment. As discussed in Chapter Four (Section 4.4), the National Agriculture Extension Strategy (NAES) developed by the Ministry of Agriculture Development (then Ministry of Agriculture and Cooperatives) does advocate for ‘shifting the focus of agricultural extension services from production to the people, from technology to the innovation systems and from farming to livelihoods’ (2006 p 10). Similarly, a program implementation guideline from the Department of Agriculture (DOA 2008) emphasises that agricultural extension programs need to 1) be based on people’s needs, and 2) create a feeling of ownership by farmers for effective implementation of the government programs.

While these policies are in place, they compete with other broader policies that emphasise higher economic growth and increased productivity targets. The twenty-year Agricultural Perspective Plan (APP) focuses on commercialisation of agriculture by the intensified production of high value and high yielding crops and livestock (APP 1995). A recently concluded periodic plan—a national policy document—allocated investments in agriculture and livestock extension programs with two main aims: 1) to expand agricultural production and productivity, and 2) to generate employment (NPC 2010d). Employment is defined in the plan as having a paid job or generating a cash income.

Efforts to introduce social and human capital discourse to these overwhelmingly productivist and economic rationalist Nepalese extension programs have been largely misinterpreted at the implementation level mainly because of tensions with other broader policy frameworks. The district level agricultural and livestock extension agencies in Jumla have the stated aim to improve agricultural production and productivity for economic growth (DADO 2012; DLSO 2012). These national plans
are significantly poor in prescribing and guiding policy measures for overcoming socio-institutional barriers: maintaining quality measures in agricultural extension practices, ensuring compatibility with the small-holding agrarian system of the country, and recognizing the socio-cultural value system in the community and its implication for women farmers’ wellbeing (GIDA 2005).

However, the Jumla experience of resistance relating to the new crop of apples, described below, is different from the resistance people demonstrated in the case of wheat. In this case most farmers are following government’s advice and encouragement to establish apple orchards as a cash crop.

**Apple dilemmas in Jumla**

Apple growing highlights people’s struggle to negotiate their options and earn cash income to sustain their livelihoods in the wake of changing social-ecological circumstances. Participants from interviews and focus group discussions agree that apple orcharding in Jumla has recently become one of the most popular strategies to resist food insecurity. Jumli families are increasingly establishing apple orchards. Examination of the history of apples in Jumla reveals that the government promoted apples as a cash crop from as early as 1970. In the ‘Year of Agriculture’, 1972/73, the Government distributed subsidised apple saplings imported from Himanchal state in India and from some European countries. To support apple and other temperate fruit cultivation, the Government established a Horticultural Research station in Jumla in 1971/72. Despite suitable agro-climatic conditions and the Government’s continuous encouragement, expansion of apple cultivation was very slow until 2001. In 2000/2001, the Government again distributed some 73,500 subsidised apple nursery stocks imported from Kashmir and Himanchal states of India (DADO 2012). The government also encouraged and supported local farmers to establish apple nurseries so that future demand of nursery stock can be met locally. A total of 106 nurseries produced 490,000 stock in 2011 alone, in Jumla (DADO 2012). Jumla, nowadays, is not only self-sufficient in apple nursery stock but also exports them to neighbouring districts. This nursery experience shows Jumla farmers are not passive victims and it exemplifies their capacity to embrace an opportunity when they can do so.
The Government originally promoted apple cultivation in Jumla as a cash crop to help raise the income of people in Jumla as an alternative to the traditional salt trade with Tibet. Inter-regional trade and pasturing movement between Nepal and Tibet was severely restricted after Tibet was annexed to China in 1959 (Adhikari 2008; Bishop 1990). But the recent opening of a motorable road (Karnali Highway) in 2007 connecting Jumla to the rest of Nepal, appears to be the main motivation for the farmers responses to the Government’s encouragement to grow apples. The rush to establish new orchards and the expansion of apple cultivation in Jumla coincided with the start of the construction of the Karnali highway. As of 2011, 2472 hectare of land is covered by apple trees in Jumla—a significant increase from 397 ha in 2004 and 548 ha in 2008.

Farmers believe that this road could provide easy and cost effective access to the developing national apple market with some 92% of apples being imported; 65% of which come from China, 22% from India and 5% from other countries including New Zealand and Australia (Bhandari et al. 2010). Apart from the market access provided by the new road, there are other motivations for farmers to start or upscale apple cultivation in Jumla. Jumla’s dry to semi-humid agro-climatic condition is regarded as suitable for apple growing and people give the agro-climatic condition the credit for the taste of Jumli apples—considered to be the best tasting in Nepal. Apple trees can be grown on Jumli land that is not suitable for paddy so there is no conflict over land use with paddy.

In a recent effort to expand apple cultivation in Jumla, the Government has launched a ‘one household, one apple orchard’ program. The Government intends that at least 80% of the total households establish an apple orchard of at least 25 trees. The program is meant to pay special attention to the poor, land poor, dalits and other disadvantaged households so they do not lag behind in establishing apple orchards (DADO 2012). The government is providing technical and financial help to farmers for the initial four years. Highly subsidised apple nursery stocks are being provided to farmers. Training is being provided on a range of issues including land preparation, transplanting, pruning, irrigation and manuring techniques. To oversee stock distribution and to support training programs a critical mass of ‘Agriculture Resource
Persons’ (ARP) have been trained in all 30 villages. District Agriculture Development Office reports that a total of 234 ARPs have been trained and were working in villages by 2011 (DADO 2012). In addition to this, some farmers are being provided with small farm tools at a subsidised rate.

At the completion of the initial phase of orchard establishment, the Government plans to shift its focus from orchard establishment to apple marketing and has already started some work on the marketing front. The Government subsidises packaging materials and shares the cost of transporting apples from Jumla to the nearest regional market centre—Surkhet. In addition, local entrepreneurs are increasingly optimistic about establishing apple drying, cider and brandy making processing plants and farmers are building low cost, zero-energy cold storage (Cellar store) facilities—individually or in groups, which can store apples for another three to six months after the harvest.

Many of the interview participants noted that apple orchards are helping them to raise their income. For them, the apple is a cash crop and is helping them to obtain more cash income than from cereal crops they otherwise would have cultivated in their field. Apples have been a good way of diversifying sources of income for the Jumli community. With gradually improving road access to the markets and perceived better taste of Jumli apples, the exports have notably increased in the last few years. In 2011, Jumla exported 2,300 tons of fresh apples to the rest of Nepal as compared to 1,100 tons in 2010 (DADO 2012). Jumla is an organic district where chemical fertilisers and pesticides are banned, so the organic Jumli apples are in a better position to fetch higher prices in Kathmandu and other regional market centres. Realising the fact that ‘diversification is recourse for poor price’ (Lundy 2012, p. 44), local entrepreneurs have recently started small scale processing to make dried apple rings and apple brandy from third grade apples, mostly for export.

The Jumla apple case confirms that even in such a short time span, apples are becoming synonymous with Jumla’s farming identity. ‘Brand Jumla’ (Fig 6.3) is now used to sell apples. Despite its short history, apples have become an important part in religious and cultural ceremonies in Jumla. Apples are being used to make garlands to offer to gods and also to welcome guests in the community (Fig 6.4). Apples have
become an important fruit to be used in worshipping god as *prasada* (offerings to the god at the end of worships).

Figure 6.3: Brand Jumla Apples (Photo source: District Agriculture Development Office, Jumla)

Figure 6.4: Visiting guest welcomed with apple garland in Jumla (Photo source: Yog Prasad Kharel, 2013)

Apple trees, along with other trees, are also being used by people as a ‘weather vane’ in Jumla, alerting the community to the seasons in their surroundings. People can tell
the temperature and season of the area from the flowering behaviour of apple trees. When there is minimum flowering or delayed flowering in their apple trees, people realise that winter was not very cold. The start of flowering signifies the arrival of spring and the apple flowering has become noticeable as a signal of changing seasons.

While the apple is becoming a major source of income for many households, some negative consequences are starting to appear that could potentially threaten future food security of many Jumli families (Christensen & Gaire 2015). Despite economic, cultural and nutritional benefits from apples for many households, some research participants expressed their skepticism about the sustainability of their livelihoods through apples. Many land poor farmers, who established apple orchards earlier, noted in retrospect that it was not a good decision to establish an apple orchard. All the apple orchards in Jumla are family owned and ‘small’ in size from both national and global standards. Enhancing productivity of and profit from such orchards has been the ultimate intention of both the Government and growers. The progress model of agriculture extension is being pursued. This model focuses on rewarding early adopters as progressive farmers (Stephenson 2003). This kind of move from subsistence farming to a commercialised one, poses a direct threat to biodiversity (Chappell & LaValle 2011). In Jumla, expansion of apple cultivation is already affecting local biodiversity in three major ways. There is: i) a shrinking diversity of apple cultivars, ii) competition with traditional food crops for land, and iii) exacerbated deforestation.

As mentioned above in the environmental history of apples in Jumla, apple cultivation in Jumla was initiated and encouraged by the Government. The Government imported apple saplings mostly from India and distributed them at a subsidised rate. Interview participants believe that barring few consultations with some lead farmers, the majority of farmers did not have much influence on the choice of varieties they planted. Experts at the Department of Agriculture made decisions on varieties to be imported based on their expert knowledge and sapling availability in India. There are 15 different apple cultivars grown on 2472 ha of land in Jumla (DADO 2012), but the main ones in terms of area covered and market demand are Red and Royal Delicious, Golden Delicious, Jonathan and Macintosh. Cox Orange Pippins are strains of the English sour apple requiring a medium length of chilling hours but they are not popular in Jumla and in
Nepali apple markets because of their taste. All of these imported varieties physiologically require more than 1000 chilling hours to start flowering with current rising temperature trends future viability of these farms is threatened.

Since the introduction of apples in Jumla, the number and area coverage of traditional crops and their varieties are in the decline. As discussed earlier, major traditional crops grown in Jumla are barley, buckwheat, millet, chino, and kaguno. Political economists suggest that introduction of new crops and their varieties, create cultural change among farmers and/or economic changes and these are responsible for a decline in agricultural biodiversity (for example see Steinberg 2001). In Jumla, apples compete with traditional crops for land—mainly upland locally known as bhuwa. Jyula is the local name of irrigated land and used for paddy cultivation. Jawadi jyula is a type of irrigated land where two crops per year—paddy and barley or wheat—can be grown whereas only one good crop of paddy is grown in chyute jyula because mountain shade prevents growing other crops (Shrestha 1993). Although introduction of apples is not the only reason, out of the crops grown in the uplands, buckwheat, millet, chino and kaguno have experienced a dramatic decline in terms of area cultivated to the extent that some environmental and biodiversity conservation NGOs (for example LiBIRD) are advocating for and implementing intervention programs for both in-situ and ex-situ agro-biodiversity conservation of chino and kaguno. This is so despite the fact that the total cultivated land in Jumla has increased almost seven times in the last 40 years.

Similarly, the Government’s promotion of apples is also contributing to the already high rate of deforestation in Jumla threatening the wild biodiversity of the region. Given the low level of law enforcement in a remote place like Jumla and limited availability of arable land, farmers are encroaching on forest areas in response to the increased demand for food supply to feed the family (discussed in section 6.4.1) and more recently to respond to the government’s encouragement to establish apple orchards. Apart from the issue of law enforcement, there is a visible lack of coordination among forest, biodiversity and forest policy implementing agencies. During interviews, forest officers openly blame the ‘one household one apple orchard’ program for ignoring forest and biodiversity concerns. The Forest Act 1993, Forest Regulation 1995 and National Biodiversity Strategy 2002 are the key policy
documents responsible for biodiversity conservation in Nepal. Importantly, despite the
fact that agricultural biodiversity too comes under the purview of the National
Biodiversity Strategy, the District Forest Office is the sole government agency at the
district level responsible for the implementation of these policies. The apples program
is being conducted largely independently by the District Agriculture Development
Office with no onground coordination whatsoever with the Forest Office in Jumla.
Situations of this kind reflect the long-standing critique by livelihoods perspective
scholars (discussed in Chapter Two) that employing single-sector approaches in
solving complex problems will not work. This perspective has long suggested that we
ought ‘not try and impose artificial categories and divides on complex
realities’ (Scoones 2009, p. 172). Irrespective of their legal land holding size, many
farmers (predominantly from relatively well-off upper caste groups) are clearing forest
to establish apple orchards. Participants said during interviews and focus group
discussions that they have witnessed many of the apple orchards being established on
such cleared land. Local forest officials interviewed for this research said most of the
recent apple orchards are established illegally on forestland. Agriculture officers agree
but said it was not part of their responsibility nor was it in their control.

Again, apple cultivation as a cash crop in Jumla is a fairly recent phenomenon and it
therefore places pressures on other previously existing land uses. Scholars have
demonstrated that having a diversity of crops is an important precondition for a
resilient food system (Barnett 2011; Campbell 1990). In his case study of food security
in Pacific Island nations Barnett (2011) found that attempts to develop monoculture
cash crops together with the increased penetration of the cash based economy,
weakens agricultural diversity and increases dependence on markets. Overall this
decreases resilience within the local food system.

Even within the short experience of growing apples, some Jumla participants are
already noting that apple orcharding may not be helpful for small holders, and already
marginalised sections of the community. A similar situation demonstrating the
differential experiences of coping with risks and hazards by members of the same
communities dependent on climate sensitive resources is noted by Adger (2010) in his
social-ecological case study of South East Asian coastal systems. He writes that
societies that are dependent on climate-sensitive resources are themselves heterogeneous and will have variable experiences and successes’ in responding to social-ecological risks and hazards (ibid, p. 401). The following section discusses how this ‘resistance’ strategy of apple growing disadvantages the weaker sections of the Jumli society.

As discussed in Chapter Five, both empirical and anecdotal evidence suggests that rises in surface temperature in the last few decades has emerged as a threat to apple cropping in Jumla. Apart from meteorological data showing a rise in temperature in Jumla (Gentle & Maraseni 2012), almost all participants noted that the temperature in Jumla has risen to the extent that they physically notice it. For example, early maturity of crops, new sub-tropical crops starting to do well in Jumla, decline in snowfall, infestation of new kinds of diseases and pests that were previously seen only in lower altitude areas (detailed descriptions in Chapter Five). It is, however, a physiological need of most apple cultivars grown in Jumla (high chilling) that they need many hours of winter chill to break dormancy in spring and then flower. On average they need 800 to 1500 chill hours and not having such a chill factor retards flowering or stymies flowering at all (Campbell 1995; Legarreta et al. 2011). In the case of an inadequate number of chill hours, the flowering period may be increased to 4 to 6 weeks rather than the optimum 1 to 2 weeks, with very irregular bud break all over the tree. This may result in a lack of pollination as cross-pollinating cultivars’ flowers are over or not yet in bloom as different cultivars have different physiological requirements. Given the apple cultivars requiring higher chilling hours on Jumli farms, the current trend in surface temperature rise, poses a constant threat to the viability of these farms in future. This indicates insufficient attention and acknowledgement of such ecological aspects in Nepal in agricultural development policies and practices.

Another critical factor for the future of the apple in Jumla is the availability of water. As discussed in Chapter Five, both total rainfall and winter rainfall records for Jumla show that the rainfall pattern is largely erratic and is gradually declining. Since rainfall is the only source of irrigation for almost all apple orchards in Jumla (apples are grown in the upland areas), drought or less rainfall will directly affect apple production.
The other factor that does not support small apple growers in Jumla is the remoteness and lack of transportation facilities within Jumla. Jumla is a mountainous landscape and road networks are just in the making. Being a bulky commodity, apples produced in remote areas are difficult and expensive to get transported to the road junctions for selling. The only means of transportation in those cases are either by porters or animals. With apples being a perishable commodity, farmers have to endure a higher transportation loss (post-harvest loss) if transporting them in baskets on the back of animals. The few zero-energy cold storages that exist in Jumla, according to the farmers, cannot hold apples for more than two to three months. Other issues are that despite such storage technology, farmers have not been able to work out why the stored apples quickly get wrinkled in transport to market, making them less appealing to the consumers. Clearly, apple growers in the remote areas benefit less, compared to those closer to road junctions. The ‘one household one apple orchard’ mission in its orchard establishment drive does not discriminate by location (nor can it really, given equity issues) based on the remoteness of villages in Jumla. But this does mean that the extension and support services within the region need to be supplemented for more remote areas or other crop strategies derived with the local growers.

Another key point is that arable land is generally scarce in Jumla. Having access to a limited amount of land and establishing an apple orchard there disadvantages land-poor farmers. As mentioned in previous sections, apples compete with other staple food crops such as barley, buckwheat, and millet for land. For land-poor farmers, apple orchards can only be established at the cost of staple food crops, potentially threatening their longer-term food security prospects.

In addition to this, most apple cultivars grown in the region require six to eight years to be mature and start fruiting which is longer than in Australia and other developed countries where dwarfing rootstocks allow full production after just two to three years of transplantation. Farmers are growing the current ‘heritage’ varieties as these were recommended and provided by the government extension agencies. Most small growers do not keep themselves up-to-date with the recent improvement in apple varieties. Initial years are financially difficult for resource poor farmers as there is no return from the orchard. Farmers could do some intercropping of cereals and beans in
the initial years but when trees grow bigger there is little space available for this intercropping.

Establishing apple orchards on their little land-holdings poses increased risk as a result of the diminished diversity of crops small farmers can grow. For example, in the event that the apple crop is destroyed by an insect pest infestation or hailstorm, or by frost during flowering, small farmers will not have the luxury of relying on other crops on some other part of their land - their land is covered by apple trees only. In the case of Jumla, hailstorms, unexpected frost spells and increased disease and pest infestations are a frequent phenomenon, in recent years, and these damage the apple crop.

Another factor that poses a threat to the livelihoods of resource poor farmers establishing apple orchards in Jumla is the socio-economic status of the farmers themselves. Taking care of apple trees requires a lot of investment in terms of time and money. From land preparation to weeding, training and pruning, irrigation, manuring and disease and pest control—all need to be done without having any return for up to the first eight years. With the rise in temperature, apple farmers noted an increase in insect pest infestations in recent years in Jumla and this assertion is supported by studies conducted both in Nepal and elsewhere (for example see Legarreta et al. 2011; Manandhar et al. 2011) requiring investment of more time, effort and resources to control. Not all farmers have the ability to afford such investment. As a result of this, economically poorer farmers will end up with less productive apple trees as they could not properly take care of their trees in the early stage of disease or they may cut down the trees and go back to cereal farming. Moreover, the apple being a relatively new crop for most of the growers in Jumla, they lack any traditional knowledge on apple cultivation.

Taking care of apple trees requires different knowledge and skills than that of other traditional crops. Apple experts note that not performing agronomic operations (such as pruning, manuring, weeding) properly means there is a severe decline in production. Moreover, as an imported crop (not native), farmers are facing new kinds of insects and pests in their apple trees that came with the imported rootstocks - some requiring
expert solutions. Farmers have to rely on the few available experts to respond to this new threat.

During the interviews, participants—irrespective of their gender—acknowledged that generally women are the ones who are taking care of apples in their family. Apart from initial pit digging, women mostly perform watering (done manually as there is no availability of piped or canal irrigation to apple orchards on hills), weeding, manuring and other agronomic operations (Figure 6.5). Transporting apples from farms to the road or market centre is the sole responsibility of women. Male interview participants could not recall if they had ever carried apples on their backs to the market centres. It would be unlikely, as manual transportation of apples and other agricultural products by men is still a cultural taboo in Jumla. In this sense, apples contribute an increased workload to the already over-burdened women of Jumla.

Figure 6.5: Women performing agronomic operation in apple orchard (with permission) (Photo: Kamal Gaire, 2012)

Similarly, it appears during the interviews that apple marketing requires different sets of skills which many farmers lack as they were traditionally doing subsistence
farming. Jumli apple growers may thus need to understand how current marketing systems work and visualise future apple marketing when new orchards start production. Establishment of an inclusive apple producers’ cooperative to look after production and marketing could be an option as many respondents talked about how middle men are benefitting the most from apple sales.

**Semi-commercialisation of agriculture**

Another resistance strategy people are employing is pursuing semi-commercial vegetable farming and vegetable seed production. Some households around district headquarters have started to sell vegetables that are in excess to home consumption, in local markets for cash earnings. With plastic tunnel technology made available by the government extension agency and local NGOs, some farmers are now able to grow seasonal vegetables like cauliflower, broccoli, cabbage, leafy vegetables such as broad leaf mustard, and spinach, carrots, radish, and peas to sell in the local market (Figure 6.6). Exploiting the advantages provided by the altitude of Jumla, farmers are producing carrot, broad leaf mustard and radish seed with the technical help of District Agriculture Development Office and other NGOs. Horticulturalists at the local Agricultural Development Office said vegetable seeds produced at an altitude higher than 2000 meters will have less or no virus infestation on them. As such, some farmers have recently ventured into small-scale vegetable seed production to sell in the regional townships of Surkhet and Nepalgunj as well as locally.
Again, not all can pursue these semi-commercial enterprises. Fresh vegetable marketing is limited to district headquarters in Jumla and because of the lack of transportation facilities it will not be cost effective to transport vegetables from remote areas. Apart from this spatial limitation to semi-commercial fresh vegetable cultivation, both of these enterprises require substantial financial investments, particularly in purchasing vegetable seeds as compared to traditional crops. Jumla being a temperate region, farmers need extra investment in constructing plastic tunnels that are required to protect seedlings from regular frost. They have additional risks associated with changing climatic conditions (such as increased disease and pest infestation, shrinking water supply), limiting poor sections of the society pursuing these strategies. These new enterprises are labour intensive and require a high level of care and attention as compared to traditional cereal crops. This is why participants living in a nuclear family structure express hesitation in employing these strategies. As these technologies, especially the seed production, are new, Jumli farmers lack traditional knowledge so those who do not have access to expert knowledge are left out. Above all, these enterprises compete for scarce land with cereal and other traditional food crops with possible long-term repercussions for food security in land.
poor households with already limited livelihood options at their disposal. Dalit participants, even from around district headquarters, do not expect their future possibilities to include pursuing these businesses. Extension officers do not bother to ‘dig deep’ to find out what is behind the reluctance shown by this community. Different forms of deeply rooted social prejudices need to be confronted if extension agencies really want to serve the community in a meaningful way, because as described here, just providing their services to all does not work in an unequal socio-economic and cultural situation.

These stories of resistance by the people of Jumla reinforce earlier findings that how people get affected and respond to risks and hazards depend not only on the intensity of such risks and hazards but also on their own social, economic, ecological and cultural conditions (Adger & Kelly 1999; Mendelsohn, Dinar & Williams 2006). These stories highlight a need for more interconnection and coordination from government and non-government agencies, rather than the current compartmentalised situation of delivery concerning policies that interact with food security. Complexities presented here also highlight the need for government policies to engage with social-ecological systems as an integrated whole so that there is a check and balance system within agencies when considering new policies to support food security directly and to check on indirect consequences should a policy be introduced—like ‘one household, one apple orchard’.

6.5.3 Changing cropping calendar

Farmers’ resistance is not just limited to changing to new crops and varieties. They have also tried to resist the odds by employing the strategy of changing the timing of agronomic activities of traditionally grown crops. Research participants were asked if they have changed their cropping calendar in the last 15 years and if so to describe such changes. Participants noted an overall decrease in crop maturation time (see Table 5.4 in section 5.6 of Chapter Five). Farmers are delaying sowing time except for paddy and despite this they are harvesting earlier. Yet there is a variation between high and low altitude areas, with the change in harvesting time of major crops in high altitude areas small or similar to historic expectations. In high altitude areas farmers
can grow only one crop per year whereas in low altitude areas they have been doing two crops a year. Even in low altitude areas the cropping calendar for irrigated land is different from unirrigated land. Farmers tend to prefer paddy, in most parts of Jumla, wherever it is feasible to grow paddy, so paddy gets top priority while deciding the cropping calendar for irrigated land. A representative cropping calendar for irrigated land in low altitude areas in Jumla, as constructed with the research participants, is presented below in Table 6.4. Paddy seeding dates have not changed in Jumal for centuries.

Table 6.4: A representative cropping calendar for irrigated land in low altitude areas of Jumla

<table>
<thead>
<tr>
<th>Date</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chaitra 12 (March 14)</td>
<td>Soaking paddy seed on water</td>
</tr>
<tr>
<td>Chaitra 16 (March 18)</td>
<td>Draining water off the seed</td>
</tr>
<tr>
<td>Chaitra 20/21 (April 22/23)</td>
<td>Sowing paddy seeds on seed bed</td>
</tr>
<tr>
<td>Jeshtha (June)</td>
<td>Transplanting paddy seedlings</td>
</tr>
<tr>
<td>Asoj/Kartik (October)</td>
<td>Harvesting paddy</td>
</tr>
<tr>
<td>Kartik/Mangsir (November)</td>
<td>Sowing barley seed</td>
</tr>
<tr>
<td>Jeshtha (June)</td>
<td>Harvesting barley</td>
</tr>
</tbody>
</table>

In unirrigated land in low altitude areas farmers still grow two crops a year. They grow various combinations of crops depending on a variety of conditions and preferences described in section 6.4.2 above. Common combinations of crops, according to the research participants are wheat and beans, barley and beans, maize and barley, maize and wheat.

Historically, August/September used to be very cold in high altitude areas; cold enough that seed sown then remained dormant and did not germinate until the end of winter. Nowadays, if seeds are sown in August/September they start germinating...
within a month and seedlings get burnt during the following cold winter. So planting has been rescheduled to the start of the winter—that is October/November. In the case of paddy, however, local’s responses are different. It has become a cultural practice that farmers sow paddy seed on 12th of Chaitra of the official Nepali calendar (March 14th) and this has not changed for centuries in Jumla. Resistance in the case of paddy includes maintaining cultural practices as Jumla has limited land suitable for paddy cultivation and production is mainly for home consumption.

Therefore a historical continuity is apparent in the strategies of trying new livelihood strategies. However, the resistance strategies described above, reflect considerable changes in prevailing social-ecological conditions requiring major adjustments. Once again, however, it is noteworthy that the people of Jumla are mostly active in responding to these changing conditions.

6.6 Summary

In this chapter I discussed the way the people of Jumla withdraw from the mainstream Jumli system and highlighted their stories of resistance while confronting multiple social-ecological risks and hazards. The findings of this research indicate that in largely subsistence systems of Jumla, people cannot ever be certain about their future and express a sigh of relief or relax about weather, crops and other sources of livelihoods. The people of Jumla must constantly be on guard and provisioning for the next uncertainty.

Respondents reported constantly employing a number of strategies in their fight to secure food for their families. With changes in social-ecological realities, people are adjusting and changing the way they deal with their situations. Such adjustments and changes are different in different families. They weigh up the circumstances they confront and employ complex permutations and combinations of response strategies from those available, at that time. While deciding on which strategies to employ, people consider a range of factors such as weather and climatic conditions, availability of natural resources to access, family circumstances, government policies, market conditions, local cultural and social norms. Despite the fact that people are largely
aware that some of the strategies they employ are negative in nature and that they will have negative repercussions on their future ability to cope and adapt to food insecure situations, people are still compelled to employ such strategies in Jumla. Historically rooted cultural prejudices such as caste and gender bias clearly exacerbated such compulsions.

It is apparent in this research study that longer term solutions to food security are not necessarily just pertaining to agriculture and land. Addressing the inequitable land base, education and health systems are important issues to enhancing food security in Jumla. Many government policies that interact with food security and that are designed to help solve complex issues of food insecurity are found to be implemented in isolation. It is important to have interconnections among them at the implementation level so that policies strengthen each other. Urgent attention is required to harmonise and make these interconnections among food security, climate change, agriculture, biodiversity, gender, health, education policies. To do this, a rights-based lens as enunciated in the food justice/sovereignty ideas (Chapter Two) may be essential for Jumla’s longer-term solutions to food insecurity.

Chapter Seven will focus on the ideas of ‘maintaining’ and ‘adapting’ as strategies to complement ‘withdrawing’ or ‘resisting’ and combined with these concepts help us understand what it takes to negotiate food security in Jumla.
Chapter 7: Narratives of food security from Jumla: maintaining and adapting to food insecure situations

7.1 Introduction

In this chapter I discuss the remaining two of the four narratives that have emerged from my fieldwork, namely, ‘maintaining’ and ‘adapting’ to food insecurity. Taken alone or together, these coping and adaptation strategies highlight the complexities around and within the Jumli food system and locate the food system within the wider Jumli landscape of the forest and district. The chapter attempts to elaborate on people’s endeavours to fight food crises both in individual and collective ways and how their strategies have changed concurrently with the change in local social-ecological realities. By discussing issues such as why certain strategies are helpful to certain groups of people but not sufficient and sometimes even disadvantageous to others, I unravel some of the complexities of this social-ecological system.

7.2 Maintaining

‘Maintaining’ is another response strategy where people make claims on friends, families, extended families, neighbours, NGOs and on the government in Jumla. These strategies are employed with an aim to ‘maintain’ their food security status quo. With increasing market penetration in Jumli society and changes in demographic structures, many of the traditional ways of making claims for food have disappeared, some have changed and some other new ways have emerged. As discussed in subsequent sections and unsurprisingly given the previous chapters, not all members of society have the same leverage to make such claims. Gender, caste, place, government policies and other social-ecological circumstances influence the way people make claims on food. Hoarding food stock to pre-empt imminent future risks and hazards such as those of the seasonal hungry months or road blocks is one strategy many people in Jumla deploy. Both the ability of people and the need for them to hoard food materials is also influenced by individual circumstances and social-ecological conditions. Jumla, in recent history, has been a food importer. Food security needs of individual households differ where many households experience temporary food insecurity but not
necessarily at the same time. By engaging premeditated strategies of hoarding and spontaneous opportunism as in accepting food aid and other ways of making claims, people (those who are able) attempt to maintain their status quo in their day-to-day activities and interactions.

7.2.1 Claiming

With the increased proximity to market and the increasing influence of the cash-based economy, facilitated by improving transport links and migration, the way people make claims on food items has changed in recent times.

Borrowing food grains

Popular practices of making claims in the past included borrowing food grains from landlord neighbours or local grain merchants, but this is rapidly declining in Jumla. Instead, people prefer to get cash loans or purchase food on credit. Participants said that the traditional practice of lending grains as a loan from grain merchants, a practice that required borrowers to return the grains back with interest the next season, is almost non-existent. Explaining the exploitative system of borrowing grains in Jumla, one male participant from a remote village of Jumla said:

...if one borrows one dun (16 pathi; approximately 32 kilograms) of grain from the grain merchant, he will have to repay 1.5 dun (24 pathi; approximately 48 kilograms) of same quality grain next year; 8 pathi (approximately 16 kilograms) as interest (P 06)

Traditional system of weighing and measurement used in Jumla and their equivalent of standard measurement are presented in Appendix Ten.

Nowadays, there are only a few grain merchants in Jumla who sell their grain for cash. A dalit participant, living in a remote village said he and his neighbours who work as seasonal farm labourers preferred taking cash for their wages rather than the traditional system of grains. With food available in the market in recent years, participants said that having cash in hand gives people the power to choose food of their preference. Participants unanimously agreed that the operation of the Karnali Highway has significantly increased the availability of food in the market. This has replaced the need for air lifting or transporting on animals and helped to substantially reduce the
cost of transporting food materials to Jumla district headquarters from southern districts of Nepal. This situation of easier availability of food materials, to some participants, has also changed the definition of ‘rich’ in Jumla. Describing the changes in his perception of who is rich, a district headquarter based participant who farms and also works as legal counsel at the local court said:

…earlier those who produced maximum food grain and could store it in their homes were considered rich people. Even if one had cash and other assets such as gold, buying food grains was not an easy task; shopkeepers in Jumla would not have much grain to sell. But nowadays, if you have cash in your hands you can buy whatever the amount of food grain you want. So whether or not you are rich is determined, nowadays, by how much cash you earn; not by how much grain you produce and have in your storage. (P 11)

Another mode of making claims on food is by borrowing grain with the commitment that repayment will be in the form of farm work for the lenders. Lenders are usually the landlord neighbours. This system of work relationships, to many participants, is disappearing in most parts of Jumla. However, land poor participants from remote villages said they still practiced this system. Research participants who, at some time in the past had borrowed grain in this way accept that it was helpful for them in responding to food shortages. At the same time this system has some serious disadvantages. As the monsoon starts, borrowers need to prioritise paddy transplantation for their merchant landlord and come back to their own cultivation after the landlord’s transplanting is complete. As a result a borrower’s own paddy transplantation gets delayed, seriously increasing the risk of less production and in the case of early onset of winter, non-maturity. This indicates how a key social relation influences risk.

**Changing traditional labour relations**

Similarly, one of the popular coping strategies of the past—working as *lagitya*—is almost extinct. In Jumla, *lagi-lagityas* is the system of ‘long term hereditary contractual labour relations’ (Gurung 2003, p. 13) where low caste land poor *dalits* work as *lagitya* for their higher caste landlords, *lagies*, to supplement their own agricultural produce. Traditional rituals and Hindu culture prevented higher caste groups such as *brahmans*, *thakuris* and *chhetris* ploughing agricultural land. They had to rely on low caste people for ploughing. Land poor *lagityas* used to get a certain
amount of grain, depending on the quality of land they ploughed, for their service. This system is regarded by many as feudal and discriminatory so they do not want to practice it. Today, farm workers get paid either in cash (mostly) or in-kind for their labour by the landowners. Many resource poor higher caste landowners have recently started doing traditionally forbidden jobs such as ploughing their own land. Female-headed households have to rely on hired labour for ploughing as it is still socially forbidden for women to plough; and this is so irrespective of their caste and financial status.

**Disappearing barter systems**

There is another popular mode of claiming on the decline - the barter system. Farmers from high altitude areas used to exchange their potatoes, barley, and buckwheat for paddy. Others bartered ghee and/or honey (harvested from wild bees) for paddy. During the interviews many participants recalled bartering their product for paddy. This system has now, however, faced a sharp decline in Jumla. Participants from around district headquarters said the easy availability of rice in the market is the main reason for this change. People find it much easier to perform such transactions with cash as bartering involved carrying a heavy load both ways. Similarly, people consider it a bit fairer as they do not need to endure the monopoly of rice merchants, in many instances, fixing bartering rates.

Although bartering is still in practice in remote areas to a limited extent, participants from remote areas said they still barter potato for beans, barley for maize or millet for wheat among neighbours. This system is based around principles of trust, obligation and reciprocity and helps them by providing them surety in cases of disaster; neighbours look out for each other.

Although participants expressed concerns that the practice of borrowing grains on interest, bartering and working as *lagityas* had some inherent element of caste and class based discrimination and feudalistic thinking (exploitative work relations and trade relations in the case of bartering), they nevertheless served Jumli community in their hard times in the past. These strategies of making claims on food have now become largely redundant in Jumla in favour of other so called ‘more efficient’ cash-
based strategies - buying and working for cash. As discussed in Chapter Two, the concept of redundancy in social-ecological resilience is about the function of different elements of a system; different elements performing the same function makes the system more structurally resilient. It is a useful concept to apply in systems experiencing rapid change as redundancy may only become truly useful when circumstances change. In this sense, having more coping options that serve a similar function strengthens the system’s resilience. So by not practicing these two traditional coping strategies, the Jumli community may have become less resilient in terms of securing their food security as they now have fewer options for making claims on food. Although a cash-based system is useful in many ways, it breaks the bonds that tied barter to community and ideas of mutual reciprocity come asunder. The loss of community ties makes the individual more vulnerable and even more cash dependent. On the other hand, resilience theory also suggests that a series of injustices like these can be catalysts for system change. Many scholars in Nepal argue that existing caste, class and gender-based discrimination as well as biased centre-periphery relations were the main causes of the ten year long civil war in Nepal that ended in 2006. The war started and gained momentum in remote areas of Nepal where these injustices are most rampant. The system has already undergone social shocks such as the end of monarchy. However, while this war is widely credited for the end of the kingship in Nepal, ironically much of those social and cultural prejudices (even if the intensity has subsided) that fuelled the rebellion during the war are still present in Jumli society.

**More Share-cropping opportunities**

Participants said that sharecropping is becoming a popular coping strategy in Jumla. Land-poor farmers cultivate either their landlord neighbours’ land or the land belonging to neighbours who have family circumstances restricting them from doing their own cultivation. A retired village secretary from an upper caste group who has offered his land for sharecropping to his *dalit* neighbours explained:

In western Jumla (Sinja area), *dalits* are doing well as many upper caste people do not work on their land; they depend on *dalits* to do their farming work. They feel ashamed to work on their own land. As a result, they end up either offering their land for sharecropping or start selling whatever land and other properties they have to cover the cost of their living. Some of them have migrated out. *Dalits*, on the other hand, are hardworking and industrious; they do not feel
ashamed to do agricultural work. More and more agricultural land is available for sharecropping and even for buying. *Dalits* in our area are making full use of this opportunity. (P 14)

A *dalit* participant from the same area interviewed for this research agrees with this explanation about the changing dynamics of sharecropping (P2). He agrees that there is an increased availability of land for sharecropping these days and that *dalits* and other resource poor households are able to undertake sharecropping. However, absence of formal contracts and legal protection discourage sharecroppers from considering long-term investment or to pursue farm planning over time. As discussed in Chapter Six (Section 6.4.1), lack of ownership deters the performance of farming activities. In the situation of insecure verbal sharecropping contracts, the most common in Jumla, there is constant apprehension on the part of tenants that the landlords can terminate contracts at anytime. Apprehension like this makes tenants think twice even about basic agronomic requirements such as applying manure on sharecropped land. Urgent implementation of a land reform policy that focuses on a fair and just land ownership system is important to settle outstanding issues of land relations in order to enhance long-term food security of many land poor Jumli farming families.

**Food aid**

Food aid both from the Government and NGOs is another option for making claims on food in Jumla. The Government’s food aid program started in 1972 when Jumla faced a drought induced famine-like situation (Adhikari 2008). Since then, Jumla receives food aid every year in different forms, including: government provision of grain at a subsidised rate; the World Food Program (WFP) providing food/cash for work programs in selected villages; and some bilateral donors including the USA, Japan, and European Union (EU) are also involved in delivering food aid in the form of food-for-work to Jumli people. But the dominant form of food aid in Jumla, in terms of volume, until recently, has been the direct subsidisation of food grains. As per its policy to provide subsidised food grains to the districts that are not touched by the road network, the government has been spending sizable portions of its development budget on food aid. The government had to airlift food grains to Jumla as there was no road network until 2007. The Nepal Food Corporation (NFC) provided subsidised food material (mainly rice) to Jumla until 2007 (Table 7.1). Although the amount of food grain
transported was not enough to feed all the people in Jumla, it nevertheless was enough to affect the change in food habits towards rice, among the people (Adhikari 2008) and effectively masked the social-ecological feedback in Jumla.

Table 7.1: Amount of subsidised food grains provided to Jumla through NFC

<table>
<thead>
<tr>
<th>Year</th>
<th>Food materials (in ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1885/86</td>
<td>102</td>
</tr>
<tr>
<td>1986/87</td>
<td>602</td>
</tr>
<tr>
<td>1987/88</td>
<td>610</td>
</tr>
<tr>
<td>1988/89</td>
<td>650</td>
</tr>
<tr>
<td>1989/90</td>
<td>710</td>
</tr>
<tr>
<td>1990/91</td>
<td>454</td>
</tr>
<tr>
<td>1991/92</td>
<td>362</td>
</tr>
<tr>
<td>1992/93</td>
<td>387</td>
</tr>
<tr>
<td>1993/94</td>
<td>437</td>
</tr>
<tr>
<td>1994/95</td>
<td>634</td>
</tr>
<tr>
<td>1995/96</td>
<td>896</td>
</tr>
<tr>
<td>1996/97</td>
<td>854</td>
</tr>
<tr>
<td>1997/98</td>
<td>1043</td>
</tr>
<tr>
<td>1998/99</td>
<td>1353</td>
</tr>
<tr>
<td>2001/02</td>
<td>1153</td>
</tr>
<tr>
<td>2002/03</td>
<td>1111</td>
</tr>
<tr>
<td>2003/04</td>
<td>1145</td>
</tr>
<tr>
<td>2004/05</td>
<td>1176</td>
</tr>
<tr>
<td>2005/06</td>
<td>1010</td>
</tr>
</tbody>
</table>

Source: Sourced from Adhikari (2008 p. 178)

Questioning the usefulness of food aid, Giminez and Shattuck (2011) note that the reformist politics associated with the corporate food regime actually exacerbates food insecurity in the long run. Programs like food aid have nothing to do with addressing the causes of food insecurity (Winne 2008). Walker and Salt (2006) suggest that subsidies mask the feedback system jeopardising SES’s ability to self-organise, but this is taking a neo-liberal stance in interpreting that self-organisation is only about the economy, and its meaning distorted. Clearly people will take food aid if it is an entitlement. The Government’s food aid oriented approach, when offered as a political necessity, can distort local reckoning, acting as a ‘bandaid’ to food security in Jumla and not part of a transitional arrangement that addresses the causes of poor access to
food. This approach to food security in Jumla has a lot of bearing on the state of affairs in terms of the difficulties faced by many people in Jumla in maintaining their livelihoods. For some participants, food aid is a neoliberal measure that has actually worsened the food security situation for Jumla. Many interview participants partly blame food aid for the change in food habits and promoting a rice culture in Jumla. Participants from the eastern part of Jumla, are of the view that ‘food for work’ programs are responsible for a tendency among local people to put less attention on their own farming activities and rely largely on food aid for rice. Local government considers relatively remote eastern parts of Jumla as severely food deficient as compared to other parts of the district and it has been implementing a number of food-for-work programs there (DDC 2010). Anecdotal evidence also suggests that more people from the eastern parts of Jumla are involved in the collecting and selling of non-NTFPs such as yarchgumba (discussed in detail on section 7.3). Money spent on food aid programs including the direct subsidy of food grains could have instead been utilised for improving small holder agriculture infrastructures such as irrigation, local seed and grain storage, farm roads and for capacity building within the local community. This would have resulted in a more resilient food system or at least one that values local resources and traditional food in Jumla. Therefore the promotion of a small holder oriented agriculture that draws on social-ecological perspectives may be the way forward for enhancing food security in Jumla.

7.2.3 Hoarding

During the farming season, people work extra hours in the fear that they may not get work in coming seasons. They save money to be used in the months when there is less work available, such as winter. In addition to this, people stockpile food as roads used for supplying food may be obstructed due to excessive snow during winter or rainfall in spring. There is also possibility of the weather triggering landslides along the roads during the rainy season. Even though the road is relatively new, it has already become a significant factor in relation to food security in Jumla. I asked a participant who farms and works as a shepherd in a nearby livestock research farm why he needed to stockpile food grain. He replied:
I stockpile these four sacks of rice in fear that the rainy season is approaching and rain may trigger landslides and block the only road and cause a short supply of food. (P 25)

Again, not everyone can stockpile sufficient amounts of food grain. Even if people think this is an important coping strategy, low-income earners cannot afford to stockpile grain because it reduces their immediate income and their physical assets may not be sufficient to safely store grains. Some participants recall resorting to selling their assets or borrowing money to be able to stockpile grains before the start of the rainy season.

Overall, by employing a response strategy of making claims on friends, families, extended families, neighbours, NGOs and government (food aid) and of stockpiling food, people attempt to maintain the status quo in their food security condition. Increased proximity to the markets has increasingly eroded some of the important traditional labour relations in Jumla. Moreover, these claiming strategies are devoid of longer-term thinking and focus on short-term fixes and thus are inadequate to address the long-term effects of wider climatic, social and historical processes.

In resilience terms, ‘maintaining’ strategies are about maintaining the status quo and keeping within system boundaries so little thought is given to the future and/or multiple risk. These strategies do not aid the improvement of food security of Jumla in a sustainable way. Data in this research indicates that these strategies of making claims on available food aid may rather have cultivated a dependency among the locals jeopardising their long-term food security prospects.

7.3 Adapting

Individual diversification of sources of food and income, and collective community efforts are major strategies people in Jumla have engaged in to move beyond coping to adapt to social-ecological uncertainties threatening their food security. Entitlement relations are also changing as a result of the increased integration of Jumla into the market economy. ‘Adaptation’ is a long-term response people employ. It is focused on planning for change through diversification of livelihoods and anticipations of benefits
in the future. These strategies are more likely to produce resilient outcomes because of their focus on diverse, innovative, and adaptive solutions but these too are subject to wider structural impediments. The following sub-sections summarise key adaptation responses Jumla residents employ to enhance their food security prospects.

### 7.3.1 Diversification of food sources

Sen (1981, p. 2) writes that people get food through five different types of ‘entitlement relationships’ in private-ownership market economies. These are production-based entitlement (growing food), trade-based entitlement (buying food), labour entitlement (working for food), inheritance and transfer entitlement (being given food by others) and intra-family allocation of food as extended entitlements (ibid). People in Jumla employ a variety of entitlements to obtain food items, which differ among social groups. Home farm production, food aid, purchasing food grains from the market, labour wages in the form of food grains and wild food (food not cultivated but found in the forest) are important components of contemporary Jumli food systems. The way these entitlement relations have been changing in Jumla is discussed in subsequent sections below.

**Changes in food entitlement relations**

Increased road and communication opportunities provide greater quantity and possibly quality of connections in Jumla. Despite concern of occasional road blockages and making people dependent on these fragile connections (especially the road), improvements seen in their conditions every year, allows each household to function more independently of the district/community and the confines of local natural systems - therefore each household can ‘act’ like a module creating a highly modulated structure within the social-ecological system. Each household makes choices about when and how to engage with these connections (mobile phones, road infrastructure) that integrate families into wider social networks that provide greater flexibility and a wider range of choices i.e. diversity in livelihood choices. As discussed in Chapter Two, modularity is one of the qualities of resilient social-ecological systems. Modularity means that a system comprises individual functional parts or modules that can evolve independently (Berkes 2007). In resilient SESs, the modules are loosely
linked, but not completely dependent. In this way, disturbances are not rapidly transmitted through the entire system.

While almost all participants noted that the numbers of sources of income have increased in recent times (in amount and diversity, discussed in the next section), the contribution of these entitlements to their food basket has changed and also the contribution of each varies through the year and by community, household, and individual. For example, people believe that the overall contribution of production-based entitlements in their food is declining. This is because participants’ perception of overall performance of their agriculture is ‘stagnating’ not just declining. As many people in Jumla prefer to eat rice, and since their own paddy production is low, people rely on purchased rice. One female farmer from a remote village explains this complexity:

> What should I do other than buy rice [sir]? ... my children do not want barley or maize bread. They want to eat rice at least once a day. Since we do not have enough paddy production I have to buy them. So what I do is sell maize, barley and other grains and potatoes… whatever I have and buy rice to supplement my own paddy production. (P 23)

The contribution of trade-based entitlements, labour and transfer entitlements to people’s food basket has increased in recent years. However, *dalit* participants believe that with the availability of more opportunities for sharecropping, the production entitlement for Jumla’s land poor *dalit* community has recently improved.

**Changes in sources of food**

The main food sources and the way people obtain access to these food sources in Jumla have also changed over time. I asked research participants their three most important sources of food and any changes in these sources in the last 15 years. Rice, barley and maize were identified as the current three most important sources of food. Rice and maize have largely replaced millet, buckwheat and other traditional food sources such as *chino* (proso millet) and *kaguno* (foxtail/italian millet) resulting in a visible change in food habits. Given Jumla’s agro-climatic condition, rice can only be grown on limited land; the crop is not sufficient to meet a family’s requirement. Therefore people mostly rely on food aid and markets for rice. It is clear from
interviews that, rice is preferred, followed by wheat and beans, when food items need to be bought. Readymade food such as noodles and biscuits are also replacing traditional snacks, irrespective of remoteness. Table 7.2 shows the main sources of food in Jumla and the way people obtain these food items.

Table 7.2: Major sources of food, food items and mode of obtaining these sources in Jumla

<table>
<thead>
<tr>
<th>Food sources</th>
<th>Food items</th>
<th>Mode of obtaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>rice</td>
<td>rice, bread (sel roti)</td>
<td>purchasing, own production, exchange, food aid, wages in kind</td>
</tr>
<tr>
<td>barley</td>
<td>bread (roti)</td>
<td>own production, wages in kind, purchasing</td>
</tr>
<tr>
<td>wheat</td>
<td>bread (roti)</td>
<td>own production, wages in kind, purchasing, food aid</td>
</tr>
<tr>
<td>maize</td>
<td>roti, dhindo, maize rice (aato)</td>
<td>own production, wages in kind, purchasing, food aid</td>
</tr>
<tr>
<td>millet</td>
<td>roti</td>
<td>own production, wages in kind, purchasing</td>
</tr>
<tr>
<td>buck wheat</td>
<td>roti, dhindo</td>
<td>own production, wages in kind</td>
</tr>
<tr>
<td>chino</td>
<td>chino rice</td>
<td>own production</td>
</tr>
<tr>
<td>Beans</td>
<td>dal, curry, boiled beans, roasted beans</td>
<td>own production, purchasing, exchange</td>
</tr>
<tr>
<td>Potato</td>
<td>boiled potato, curry, roasted potato</td>
<td>own production, purchasing, exchange</td>
</tr>
<tr>
<td>Leafy vegetables</td>
<td>fried, curry</td>
<td>own production, exchange, gifts, purchase</td>
</tr>
<tr>
<td>Meat</td>
<td>meat curry, meat fry</td>
<td>purchasing, own production</td>
</tr>
</tbody>
</table>

People in Jumla overwhelmingly regard rice as an ‘elite’ food. It is easier to cook in comparison to making roti (chapatti) out of barley, millet, buckwheat and/or wheat flour—the more popular food items in the past. Women participants have welcomed this change to rice as it reduces some of the drudgery in their workload. Cooking rice takes less time than cooking roti. The milling process for maize, millet, wheat and barley in traditional water powered mills is labour intensive and is considered to be a women’s job. Buying milled rice means less milling work than for making maize, millet, wheat or barley flour. Generally four kilograms of maize, barley or wheat are exchanged for one kilogram of rice in Jumla. Apart from food aid, the recent market availability and the positive gender dimensions that enhanced the popularity of rice eating, there is also a historic dimension to it. As discussed in Chapter Four, when Jumla—a sovereign nation, was annexed to current Nepal in 1769, Kathmandu sent its
representatives to rule Jumla. These political representatives, security personnel, and bureaucrats brought rice with them to eat at lunch and dinner. Historians believe this situation made locals see rice as something eaten by ‘important’ people and started viewing it as an ‘elite’ food (Adhikari 2008). Slowly, consuming rice became a status symbol in the village and those who could afford it started to grow wherever possible and/or purchase rice to show their superiority (ibid). Still today, rice is proudly offered as a main dish in Jumla on special occasions such as weeding parties and other feasts. A women participant from a remote village expressed how she felt when she had to eat bread or dhindo:

It’s human nature…I felt bad in the situation when my neighbours ate rice but I couldn’t. I felt like we were too poor and weak in the village. When my children saw their friends eating rice they came home and right away demanding rice. I felt bad and sometimes used to even cry. I then used to sell whatever I had and buy or barter for rice. We still had enough of our own production of grains but not paddy. (P 23)

**Changes in diversity of Jumli farms**

Participants agreed that agro-diversity in Jumli farms has declined in the last 30 years. People today are cultivating fewer crops overall and less varieties. They attribute this decline in agricultural biodiversity to an ever increasing market influence in Jumla, and to government’s policy push towards increasing farm productivity. Jumla is following the global trend where the caloric intake of most people is based on fewer crops. The FAO Director General has recently warned that food monotony has negative effects on ecosystems and food security (da Silva 2012). Even though crops like chino, kaguno and millet grow well in adverse conditions, participants said they have largely abandoned growing these crops. Official government records of cultivation of these traditionally important crops confirm this and show a sharp decline both in terms of area coverage and production (DADO 2012; MOAC 2011).

Participants noted that local varieties of potato, barley and paddy are disappearing in favour of high yielding varieties promoted by government extension agencies. The significance of local crops and varieties has been reduced mainly for two reasons: i) the government extension system does not promote these crops and only focuses on dominant crops such as paddy, wheat and maize, and focuses on productivity not on diversity and, ii) locals regard many of these crops as inferior food. The government
follows a progress model of agriculture extension that has largely failed to acknowledge and address the inevitable vagaries of the social-ecological system. Homogenous extension policies from the government and the market mechanisms have clearly failed to serve longer-term interests of marginalised sections of this community. A clear result of this is a visible change in food habits ignoring nutritious locally available food sources and leading to Jumla being dependent on imported white rice for food.

**Change in food habits**

In order to more clearly understand the nuances of these changes in food habits, participants in the focus group discussions were asked to rank what they think the main reasons are for their lack of interest in some crops particularly *chino* and *kaguno*. These crops were, in the past, regarded as poor man’s rice as they look like rice when cooked. During interviews and focus group discussions, I asked participants their reasons for largely abandoning the cultivation of these two crops. Table 7.3 shows reasons for this. It highlights that the market and unresponsive government policies or lack of policies are responsible for the decline of these two important crops.

Table 7.3 Reasons for abandoning cultivation of *chino* and *kaguno* with their order of importance

<table>
<thead>
<tr>
<th>Reasons for abandoning <em>chino</em> and <em>kaguno</em></th>
<th>Order of importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of rice in the market (in earlier time households would have exhausted paddy by August/September so harvesting time of <em>Chinu</em> and <em>Kaguno</em> used to fill that gap)</td>
<td>1</td>
</tr>
<tr>
<td>Given current market demand, cultivating beans in place of <em>chino</em> and <em>kaguno</em> is more profitable</td>
<td>2</td>
</tr>
<tr>
<td>Inferior food</td>
<td>3</td>
</tr>
<tr>
<td>Increased disease infestation during milking stage</td>
<td>4</td>
</tr>
<tr>
<td>No market to sell</td>
<td>5</td>
</tr>
<tr>
<td>Not easily digestible</td>
<td>6</td>
</tr>
<tr>
<td>Women’s food</td>
<td>7</td>
</tr>
<tr>
<td>Younger generation do not understand the nutritional/medicinal values of <em>chino</em> and <em>kaguno</em></td>
<td>8</td>
</tr>
</tbody>
</table>

**Declining wild food**

Wild foods have been precious sources of food to fall back on when other crops failed. Participants recalled times when they relied on fruit, vegetables and root crops found
in the wild. Most respondents believe that the contribution of these sources to their everyday food items is declining but land poor respondents living in the remote parts of Jumla said they still source considerable parts of their diet from the wild. They consider harvesting of wild food as a buffer when other ways to access food fail. In the past everyone collected these products, but now it is only the land-poor respondents living in the remote parts of Jumla that still source considerable food from the wild. A list of wild food Jumla participants said they consumed in various quantities at some point in their lives are presented in table 7.4 below.

Table 7.4: List major wild food people in Jumla consumed at some points in their lives

<table>
<thead>
<tr>
<th>Wild fruits</th>
<th>Wild root crops (locally known as kandamul)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild walnut</td>
<td>Bhataura</td>
</tr>
<tr>
<td>Wild pears</td>
<td>Bhaduri</td>
</tr>
<tr>
<td>Wild pomegranate</td>
<td>Padyara</td>
</tr>
<tr>
<td>Arya</td>
<td>Tamanna</td>
</tr>
<tr>
<td>Pauro</td>
<td>Kanjara</td>
</tr>
<tr>
<td>Ringo</td>
<td>Chyamri</td>
</tr>
<tr>
<td>Guyala</td>
<td>Dhyadhari</td>
</tr>
<tr>
<td>Dakh</td>
<td>Buki jara</td>
</tr>
<tr>
<td>Kafal</td>
<td>Sakarkhanda</td>
</tr>
<tr>
<td>Aiselu</td>
<td>Pahadi gunji</td>
</tr>
<tr>
<td>Maleo</td>
<td></td>
</tr>
<tr>
<td>Tarechuk</td>
<td></td>
</tr>
<tr>
<td>Mayal</td>
<td></td>
</tr>
<tr>
<td>Bansudo</td>
<td></td>
</tr>
</tbody>
</table>

With increasing deforestation, the availability of wild food is generally limited to the remaining wild forests located mostly in remote areas. Bishop (1990) estimates that 50 percent of the forest was destroyed between 1950 to 1970 and this trend still continues. Similarly, the change in the forest governance system also affected the way people can access wild food. As discussed in Chapter Six, community forest users’ groups have variously put restrictions on wild harvesting.
7.3.2 Diversification of Income Sources

Describing important qualities of resilient social-ecological systems, Adger et al. (2005, p. 1036) write ‘resilient social-ecological systems incorporate diverse mechanisms for living with, and learning from, changes and unexpected shocks’. One important strategy the people of Jumla employ to try to live with and learn from such uncertainties is to diversify their sources of income. It is universally recognised that diversification increases the options for coping with risks and hazards (Berkes 2007).

Changes in sources of income

I asked participants to list and rank their sources of income in order of importance in terms of contribution to their livelihoods. Ranking order was different across the district. Table 7.5 lists the sources of income for people of Jumla that research participants recounted. Participants rank farming, collections and selling of NTFPs and livestock husbandry as their most important sources of household income. Income from unskilled and skilled labourers, remittances and small businesses follow. These three important sources are all dependent on natural resources and thus are sensitive to the global process of climate change. Land holding size, caste, size of family and remoteness were the most influential factors in ranking decisions indicating that not all people can pursue similar kinds of diversification. For example, people with a large family living in eastern Jumla ranked collection and selling of NTFPs, especially *yarchagumba* (*Cordyceps sinensis*), as their number one source of income. In contrast, families with educated working age children ranked skilled work as the number one source of income.
Table 7.5: Major sources of income and participants’ perception of their overall performance in Jumla

<table>
<thead>
<tr>
<th>SN</th>
<th>Major sources of income</th>
<th>Overall performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>farming</td>
<td>Stagnated</td>
</tr>
<tr>
<td>2</td>
<td>NTFPs</td>
<td>Increased</td>
</tr>
<tr>
<td>3</td>
<td>livestock</td>
<td>Declined</td>
</tr>
<tr>
<td>4</td>
<td>unskilled labour (both farm and non-farm)</td>
<td>Increased</td>
</tr>
<tr>
<td>5</td>
<td>remittances</td>
<td>Stagnated or declined</td>
</tr>
<tr>
<td>6</td>
<td>skilled work (government and NGO jobs, stone masonry, carpentry)</td>
<td>Increased</td>
</tr>
<tr>
<td>7</td>
<td>skilled work (blacksmithing, sewing)</td>
<td>Declined</td>
</tr>
<tr>
<td>7</td>
<td>petty trade/business</td>
<td>Increased</td>
</tr>
<tr>
<td>8</td>
<td>Handicrafts (baskets, mats, carpets)</td>
<td>Declined</td>
</tr>
<tr>
<td>9</td>
<td>alcohol making</td>
<td>Declined</td>
</tr>
<tr>
<td>10</td>
<td>food aid/government aids</td>
<td>Increased or static</td>
</tr>
<tr>
<td>11</td>
<td>portering</td>
<td>Declined</td>
</tr>
</tbody>
</table>

Apart from these differences within the families, changes in the overall SES, has influenced the way these different sources of income perform in Jumla. Almost all participants agreed that income from livestock has significantly decreased in recent times. A decline in livestock numbers and hence income is positive feedback within the SES - households cannot keep large herds because of declining family size, deforestation and community forestry programs banning livestock entry in the forest areas. Income from handicrafts, especially carpet making has declined. Income from the traditional jobs of blacksmithing and sewing (Figure 7.1) has also declined. The availability of cheap, Chinese garments and tools jeopardises these traditional jobs. As sewing and blacksmithing are jobs traditionally performed by *dalits*; their decline affects one group more than others. With the construction of new roads, portering as a source of supplemental income is also declining. But with the increase in development projects, jobs for stonemasons and carpenters have increased. Similarly, participants agree during interviews and focus group discussions that NTFPs have become one of the important sources of income for Jumli communities.
Figure 7.1: Dalit man performing his traditional job of sewing cloth in a remote village of Kanakasundari, Jumla (Photo: Kamal Gaire, 2012)

**Emerging source of income—NTFPS**

Most of the participants note that they had engaged in collection and selling of NTFPs in the past. But with rise in the price of some NTFPs, particularly yarchagunban there is a major boost in their income NTFPs. Many NTFPs are continually harvested. For example, yarchagumba collection season ends in July and wild garlic collection season starts in August. Then in September and October people start collecting satuwa and jatamashi. Table 7.6 shows major NTFPs participants said people in Jumla collect from the wild and sell.
The price of most of these NTFPs has increased in Jumla. Participants noted that the price of *yarchagunma*, *guchchichyau* and wild garlic, especially, has skyrocketed (Rupees 2 ten years ago to Rupees 5 five years ago and in 2012 Rupees 400 per piece of sun dried *yarchagunma*) in last 10 years. Participants attribute the role of the new road connecting Jumla to the rest of the country for the increased demand of these NTFPs in China and thus the dramatic price rise.

**New avenues—new problems**

While NTFPs continue to be the number one income source for many households in recent years, participants reported a marked decline in the availability of most of these species, particularly the ones that fetch higher market prices such as *yarchagunma* (Figure 7.3), *guchchichyau* (Figure 7.2) and wild garlic. The time it takes to collect the same amount has almost doubled in the last 15 years. People have to climb to the high Himalayas and travel far afield in search of *yarchagunma* often risking their lives. In the 2014 season, local newspapers reported that four people (two from Jumla) died of altitude sickness in a week in the highlands of the neighbouring district of Mugu while collecting *yarchagunma* (Malla 2014). People blame deforestation, over-harvesting, illegal harvesting and the rise in temperature for the decline in the availability of these
NTFPs. Local government forest officials note that NTFPs such as *panchaunle* and *kutki* are on the verge of extinction—they defended the government’s decision to ban collecting and selling of these two NTFPs.

The other concern participants expressed was the main destination markets of most of the high value NTFPs – China for *yarchagumba*, wild garlic and *guchchichyau* and most other bulky and voluminous NTFPs are for India. Therefore any changes in Nepal-China and/or Nepal-India trade relations could have detrimental repercussions on this income stream. Historically Nepal-Tibet trade relations have been unstable. Nepal-India trade relations have largely remained stable except in some instances when India has raised questions on sanitary and phyto-sanitary issues. As India and Nepal share open borders, people do not require visas for travel.

Many participants also expressed their scepticism on the current functioning of the NTFP market in Nepal, and Jumla in particular. They believe that middlemen are making more money than those who actually collect the products. These middlemen are the ones who have contacts with the Chinese traders and traders operating from Kathmandu. Participants believe that making, maintaining and enhancing good networks and connections with regional and Kathmandu based traders are the best strategies to minimise possible exploitation by local NTFP middlemen. This would increase their awareness of the current price structure at the regional and national markets and enhance their bargaining power. Recent provision of mobile phone services in Jumla has helped tackle this problem to some extent but a large number of illiterate and individual small-scale NTFPs pickers still get cheated by middlemen. There have also been issues of taxes imposed by community forest groups on collectors. Some people blame these forest groups for imposing higher taxes at the point of collection of NTFPs. The Government also charges a levy (nominal compared to the community groups’ levy) on such products but it charges at the point of export. Most participants in this research expressed their displeasure as they had to pay an increased amount of tax. Most of the alpine regions where *yarchagumba* are found are technically not in the Jumla district but in neighbouring Dolpa and Mugu. Others sympathise with these community forest groups as they think these groups should have a fair share of the resources they nurture. As a higher number of people, most of whom
are not members of such community groups, throng through these areas during the collection season, and in recent years leave their footprint by increasing deforestation, disrupting the local way of life and by overburdening health and sanitation systems of the locality, which otherwise is a quite clean and relatively isolated place during the rest of the year. Thus there are a lot of people who support higher taxes, as they have to endure whatever social-ecological damage occurs during the collection season.

Figure 7.2: Guchchichyau in natural habitat (Photo source: Asia Network for Sustainable Agriculture and Bio-resources (ANSAB) 2013)
Despite this scepticism about the long-term sustainability of their income from these NTFPs, participants reflect that people, especially from eastern parts of Jumla, are increasingly engaging in NTFPs collection and selling. All participants from that area of Jumla were getting ready to embark on their journeys to the harvesting areas just after the interview period in May. The temptation to make more money is encouraging parents to take their children out of school so the whole family can participate in harvesting the *yarchagumba* in the high Himalayas. I found, during fieldwork, that almost all grade five and above students in Guthichaur, Chhumchaur, Dillichaur and Patarasi villages of eastern Jumla had either left or planned to leave their schools for nearly three months of *yarchagumba* collecting season. Participants say that children have a good eye for spotting the ‘half fungus-half caterpillar’ looking *yarchagumba*, in the mountains.

Moreover, the season of collecting *yarchagumba* (May, June and July) coincides with one of the main harvesting and planting seasons in Jumla. This is the time to harvest barley and wheat, and also the time to transplant paddy. Since people are making more money from *yarchagumba*, farming is getting less attention and priority in the family. Some families have even abandoned growing the most treasured crop of paddy in
eastern Jumla. The eastern part of Jumla has less arable land and other livelihood options as compared to other parts of the district (DADO 2012). Location wise, it is closer to the high mountains where yarchgumba are available and combined with complaints about increased insect and pest infestation on paddy crops in recent years, the wild harvesting, while it lasts, looks more attractive and more likely to sustain the family in the months ahead.

Participants see yarchagumba as one of the main reasons why people are also increasingly abandoning livestock rearing; or reducing the number of livestock they keep. The responsibility for livestock rearing and the labour demanding farming activities in that particular season are left mainly to women and elderly people. Some participants believe that because of yarchgumba, people’s destination for short-term migration during this season has also changed from India (mainly) to the rugged high mountains in neighbouring Mugu and Dolpa districts.

This suggests that there is a significant relationship to ecological resources off the farm, such as in the forest and wild areas. It also indicates the importance of considering food security from a social-ecological systems perspective rather than a farming system perspective alone.

Changes in agriculture
Apart from income from NTFPs, people have started diversifying their agriculture in a bid to adapt to changing risks and hazards and because of opportunities presented by higher connectivity to the markets and the attention of the extension services to some crops (e.g. apples). Diversity, as conceptualised in a social-ecological system perspective provides the impetus for new opportunities; it increases the options for coping with shocks and stresses (Berkes 2007). Farmers are increasingly establishing apple orchards, initiating semi-commercial vegetable farming and vegetable seed production schemes. Interview participants, however, noted that despite having a good chance of making money out of these three kinds of commercial enterprises, not all could start these businesses. Variously, they listed declining family size, land holding size, transportation difficulties, and health of family members, as important determining factors to start such ventures. For example households with sick members
cannot afford to start vegetable seed production businesses because these require a higher level of maintenance and management. Households with a nuclear structure cannot spare the labour required for commercial vegetable farming. Some participants cited their nuclear family structure as the main reason to abandon or downsize the number of livestock they keep as they had to prioritise child caring and other more important and immediate needs over livestock rearing. Further, there is the reality of declining livestock numbers even in many joint family situations owing to declining availability and access to pasture land. Participants from remote villages blame the lack of a motorable road for their reluctance to commence apple orcharding. For many farmers considering initiating vegetable seed production enterprises, requirements to have relatively advanced technical knowledge and mandatory expert supervision by the government was a hindrance. This reinforces earlier findings that how people get affected and respond to risks and hazards depends not only on the severity of such risks and hazards but also on their own social, economic, ecological and cultural conditions (Adger & Kelly 1999; Mendelsohn, Dinar & Williams 2006). Commercialisation also may make them more vulnerable—changing social conditions combine to limit who can participate in these opportunities.

**Changes in traditional income diversification activities**

Jumla has seen an important change in one of its popular income diversification activities, that of carpet/blanket making. Jumli homemade woolen carpets and blankets used to be popular Jumli exports. But participants argue that the sharp decline in livestock numbers (especially sheep and goats) and availability of cheaper Chinese carpets and blankets, have severely impacted this industry for export and sale within Jumla has almost ceased. Older people in some families can be seen making these carpets and blankets still, but just for their own use (Figure 7.4). A male participant from a remote village of Jumla recounted how this business used to substantially contribute to his family’s livelihood:

‘...just until 15 years ago, all of my family members together used to make carpets and blankets. We used to prepare wool and make yarn and women in the family used to weave them. My father and I used to take them to Surkhet and Nepalgunj for selling. While returning home we used to get rice, salt, clothes and other daily items with the money that we made from carpet selling. ’ (P 07)
More job opportunities off the farm

With recent development works initiated by both the government and NGOs, new school buildings and roads are being built in Jumla. Several government offices damaged during the decade long war are being rebuilt. Apart from these, several private homes are being built mostly around district headquarters. These infrastructure projects have helped create some new job opportunities. Skilled opportunities include stone masonry and carpentry (Figure 7.5) complemented with unskilled labour such as carrying sand, stones, timber and other earth works.
7.3.3 Collective action

In his study of vulnerability to climate change in coastal Vietnam, Adger (1999, p. 252) disaggregates social vulnerability into individual and collective vulnerability. These are two different but interlinked aspects of vulnerability. According to Adger (1999) collective vulnerability is determined by institutional and market structure and is exacerbated by ‘exogenous’ environmental changes whereas individual vulnerability is determined by access to resources, diversity of income sources and individual’s status in the community. Dealing with collective vulnerability (and also individual) requires collective actions. Collective action is generally conceptualised as coordinated efforts among groups of individuals to achieve common goals. It is usually when individuals’ capacity is inadequate to achieve the desired outcome (Tompkins & Adger 2003). Societies’ ability to perform actions collectively is critical in adapting to changing social-ecological circumstances, and the ‘ability of societies to adapt is determined, in
part, by the ability to act collectively’ (Adger 2010, p. 387). In this research I asked participants to describe if they are part of any collective community action in their bid to adapt to changing social-ecological circumstances as discussed in Chapter Five, and how these might impact their overall food security. The participants’ responses pointed to four types of collective community action in Jumla: building community infrastructure, organising community groups, establishing community seed banks, and initiating community farming.

**Building community infrastructure**

Rather than being passive victims of risks and hazards, large numbers of people have organised themselves in some form of community groups to construct new infrastructure including community irrigation canals, or to maintain existing infrastructure such as old canals, small bridges, roads and drinking water schemes.

It was apparent during fieldwork that people are increasingly constructing small irrigation canals to tap sources of available water in Jumla. Declining water availability due to erratic and uncertain rainfall and deforestation is the local reality. Participants mentioned they have collectively made either new irrigation facilities or repaired old ones. One participant described how he anticipates further declining water availability and why collective action of constructing the irrigation canal was important:

> I think that was the last resort...increasing drought is a reality here as we have in the past caused a lot of deforestation. The only way to save our farming is by bringing water from nearby tributaries to our farms. And you know it cannot be done individually; it is costly. So we, in our village, jointly dug a canal two years ago. The District Agriculture Development Office gave us Rupees one lakh (NRs100 thousand), which we used to by some cement and pipe. (P 06)

For him, this has increased the certainty of cropping now and in the future; he can plan his crops in advance. But for a *dalit* participant from another remote village who owns sloping land this type of community action has little or no value. It would be extremely difficult and costly to cover his sloping land by a canal irrigation system. He thinks a gravity fed sprinkle irrigation system could be an alternative but this has not
yet received community consensus. He suggested he would be involved in the community collective action if it benefitted him.

Other infrastructure projects see some communities engaging in the construction of local roads and small bridges over seasonal creeks so that movement of people and supplies are not restricted during the rainy seasons. The local community built the wooden bridge shown in Figure 7.6. These physical connections improve the stability of food networks and marketing opportunities important for enhancing food security. Another example is where many communities have been able to bring piped drinking water into their community with little external financial support.

Figure 7.6: Wooden bridge built by the community in a remote village of Urthu, Jumla (Photo: Kamal Gaire, 2012)

Community institutions—community groups

Jumli communities have organised themselves in different types of community groups such as community forestry users’ groups, farmers groups, mothers’ groups, and
women’s groups. The formation of these groups was largely initiated by external agencies like Government Departments or NGOs, but local people run them all. Participants believe that they need such community groups to help solve problems arising from different risks and hazards. In the absence of external support, community groups are often the only avenue for local people to get help (Gaire 2007). Group members help each other with problems ranging from medical emergencies to making seed available for the next lot of crops. Some groups make cash and grains available on credit for ‘in need’ members, using their savings and credit schemes. Members also share new farming technologies with each other (Figure 7.7). Some participants mentioned that they go for NTFPs collection trips in a group; this saves time in logistical preparations and also gives a sense of security in the remote mountains and forests. Participants all mentioned that while helping neighbours and other community members (both individually and in groups) has always been part of Jumla culture, forming semi-formal and formal groups to help each other in solving current and eminent future problems is a recent phenomenon.

Figure 7.7: Members of women farmer’s groups on an apple orchard management training program (Photo: Kamal Gaire, 2012)
Official statistics at the district level line agencies offices show a steady increase in the number of these community groups (DADO 2012; DDC 2010; DLSO 2012). However, because of persistent cultural prejudices in Nepal, the meaningful participation of women in mix-gendered groups (such as farmers’ groups and community forest users’ groups) and members from the *dalit* community are limited to tokenism, in many instances, just to fulfill the requirements set by government in order to be eligible to receive some kind of grant. Very few of these groups have women or *dalits* as their chairpersons or secretaries. Analysis of farmers’ groups operating in Jumla reveals the existence of a limited number of women only groups. Out of a total of 280 farmers’ groups in Jumla that liaise with the District Agriculture Development Office, only 19 of them are women only; the rest are mixed-gender groups (DADO 2012). Notably, out of 31 staff members at the District Agriculture Development Office, only one staff member is a woman.

It is the experience of extension officers in Jumla, and in Nepal, that women in mixed gender groups generally remain as ordinary members and men will quickly take over the management posts. The situation also applies to *dalit* community in Jumla. Although participants said the caste divide is declining in Jumla’s community oriented development activities, there are still some group members from upper caste groups who feel uncomfortable working with *dalits*; especially eating together and sharing seats in meetings. This subtly discourages *dalits* and women from actively participating in the functioning of the groups. Similarly, as some participants indicated, resource poor members of the community cannot afford to spare time to take part in group activities such as meetings and other group discussions. This is an example of how inequality present in the society exacerbates marginalisation and as Adger (1999) hypothesises, links to increased vulnerability. These cultural prejudices and socio-economic biases exclude these individuals and groups from the communities’ decision-making processes and further marginalise the already marginalised sections of society. It affects the communities’ collective efforts to anticipate and prepare for future uncertainties within their social-ecological systems. This indicates that, while food security is shown in this research to be very context specific the lack of equity in the social structure undermines collective endeavours that do require the next scale up—
where neighbours must work together equally to benefit as in bridge building and in irrigation systems.

Among these different community groups, the community forest users’ groups are the most formal in terms of the way they are formed as well as in their function. Acts passed by Parliament provide the legal authority for these groups to manage the forests. This participatory forest governance system is lauded globally as one of the most participatory forest governance structures. Yet, most participants expressed concerns with the way their community forest users’ groups are functioning in recent times. The most common concerns are about failing to conserve forest resources on the one hand and reluctance to provide traditional access to minor forest resources to resource poor members of the community on the other. Many community forests in Jumla have restrictions on grazing traditional pasture land (still regarded as forestland in forest laws), firewood and NTFP collection. It appears from the interviews and focus group discussions that many participants believe that they were left out of the decision-making processes of community forestry programs. They blame their community forest users’ groups for having knowingly failed both to conserve natural resources and address the needs of poor sections of their society. Executive committees of many such groups are now controlled by local elites who are more concerned with making money by selling timber and by increasing charges for NTFP collection than addressing poor and marginalised sections’ ‘trivial’ needs. One dalit participant expressed his frustrations:

They have put restrictions on fodder collection for us; if they see us bringing even a small branch of leaves for our goats they penalise us. But there is no one to stop those who cut trees. They [upper caste neighbor who was the local leader of a political party] cut trees last time when they were building their home, everyone just kept quiet. It seems rules are only for us. I tried to raise the issue but no one listened. (P 02)

This reinforces Adger’s (Adger 2010) findings that homogeneity of decision-making groups and the distribution of benefits of management are important factors in collective action for adaptation. To participants of this research, community forestry programs have largely failed in Jumla in their equally important two objectives of natural resource conservation and livelihood enhancement.
Scholars list a number of reasons for the inability of Nepal’s forest governance to deliver equitable outcomes for the community through the concept of community forestry—despite being informed largely by the ideas from political ecology. Key reasons are Nepal’s lingering political instability and corrupt governance, especially the nexus among local elites, corrupt bureaucrats and greedy businessmen, which is becoming systemic, according to interviewees. These are not just Nepal-specific problems but common to many resource poor developing countries. In addition to these genuine and mainly governance related problems, evidence emerging from all over the country is that there has been a gap in theories underpinning natural resource management through the concept of community forestry (Acharya 2002; Ojha et al. 2014; Thoms 2008; Varughese & Ostrom 2001). It shows how interwoven the management of the community forest program is with all aspects of life in the region. This, therefore, can be an indicator of the well-being of the SES, so it is important to consider it. Again, the issue of food security is a landscape or regional issue not one confined to the political borders of a village or the administrative borders of a region.

**Community seed bank**

The community seed bank is another collective endeavour, for at least two different village communities. The chairperson of Taliyum Community Seed Bank noted that the community felt a need to preserve traditional crops and their varieties. People may need these seeds in the event of a commercial crop failure. With market forces beginning to impact Jumla, farmers are tempted towards growing commercial crops. This, according to the chairperson of the bank, is a threat to the future availability of minor crops seeds. Farmers borrow seeds from the bank, plant them and return double the amount of seed the next season to be stored in the bank. These adaptation strategies tend to anticipate risks that the social-ecological systems may face in future.

**Collective community farming**

Some farmers in Jumla have more recently pursued collective farming practices. According to the District Agriculture Office’s record, at least six community apple orchards have been established in the district either on community owned or government owned land. Generally it is the land poor involved in this new initiative. In all the six cases the District Agriculture Development Office provided subsidised apple and walnut nursery stocks. Local NGOs together with the District Agriculture
Development Office supported land preparation and other technical matters. Farmers involved in these collective farming initiatives are yet to benefit from the orchards as they have not started fruiting, but responses from interviews show that farmers have largely liked the community spirit evoked at the time of planting and during the interim maintenance of them. Although these community farms are at their early stages of development and it is too early to be able to draw any conclusions on their efficacy to help the community in relation to food security, it can certainly be said that promotion of such practices can be an important strategy to help improve land poor’s access to the land resources and avail them an opportunity to have a new source of income and food.

7.3.4 Embracing innovations

In their efforts to adapt to changing social-ecological circumstances, people in Jumla are adopting different innovation technologies. Adaptation literature associates adaptation with innovation. Participants recalled three types of innovations that Jumla has embraced in recent years relating both directly and indirectly to their food security. Although some of these innovations have been long adopted in many other parts of the country, these nevertheless, are new to Jumla and will enhance food security efforts in this region.

Improved cooking stoves

One innovation embraced by almost all households in Jumla is the installation of improved cooking stoves (Figure 7.8). It was good to witness, during fieldwork, these stoves being used even in dalits’ homes. Participants believe that this has helped Jumla’s women, who perform the cooking in almost all households, improve their health condition. This stove, through an exhaust pipe, takes the firewood smoke out of the kitchen while making the kitchen warm. Houses in cold regions like Jumla are traditionally designed so that cold wind is blocked out– this design also means that smoke is blocked in. District level government agencies claim that improved cooking stoves have reached all Jumli households. While firewood consumption efficiency of these stoves as compared to traditional stoves is debated, participants report that family respiratory problems and recurrent ‘itchy’ eyes symptoms have declined after adoption
of these improved cooking stoves. This simple idea of an exhaust pipe has changed Jumli kitchens and thereby helped to protect the health of women.

Figure 7.8: Improved cooking stove in a Jumli house (Photo: Kamal Gaire, 2012)

Toilets and sanitation campaign
Another improvement on the health front, according to participants, is the establishment of toilets. As discussed in Chapter Six, water borne gastro intestinal diseases have been an important cause of illness in Jumla that affect patients’ ability to utilise the food they eat. Defecating in the open is a major source of water contamination. Participants report an increasing number of households are constructing toilets every year. Half the participants interviewed for this research had a toilet in their home; most of them said these were built in the last ten years. The interviews reveal that those who have toilets in their homes tend to have multiple sources of
income such as members of the family in a salaried job, or those operating businesses. Also participants around district headquarters have a tendency to build toilets more than those who are living in remote villages. As indicated in previous chapters, the relative wealth and access to information (knowledge) of the people living around district headquarters means that they have more toilets per person than in remote areas.

**Organic farming**

The third innovative action, according to research participants, is the declaration of Jumla as an organic district. Although the decision was prompted, it seems, by financial and rational needs, the subtle and indirect benefits may surpass the tangible financial ones. The decision was made by the local government—the District Development Committee (DDC), in consultation with and concurrence of political parties, civil society groups and farmers’ groups (Bhandari et al. 2010). According to a local agriculture development officer who lobbied for this declaration and was involved in the decision-making process, people were convinced that for Jumla to financially progress it needed to be innovative. One way was through finding a niche market – and one niche identified was through organic agricultural products. The local government fully supported this innovation. The local government has been enforcing a ban on chemical fertiliser and pesticide import to Jumla, supporting (financially) the organic certification process and helping in advertising Jumla’s organic initiatives.

Given the low level of agricultural export from Jumla, many households are yet to see the financial benefits of these organic initiatives. But some apple and bean farmers have already started to fetch higher prices in Kathmandu and other regional townships. Government officers in Jumla agree that there is a need to support resource poor communities so that they can come up with some kind of organic enterprises and directly benefit from this initiative.

**7.4 Summary**

In this chapter I discussed key ways the people of Jumla employ strategies of maintaining and adapting to ensure their food security. ‘Maintaining’ the current activities and daily interactions results in attempts to keep the status quo in their food security situation but to do so requires engaging in premeditated (as in hoarding) and
spontaneous opportunism (as in food aid). Like ‘withdrawing’ and ‘resistance’ (discussed in Chapter Six), ‘maintaining’ strategies are also focused on short-term ways of coping with current risks and hazards and have little or no anticipation of potential future scenarios. ‘Adaptation’, however, is the only longer-term response, that Jumla participants employ, as identified in this research study. Adaptation strategies are more focused on planning for change through diversification of livelihoods, collective community actions and anticipation of benefits in the future. This chapter not only discussed how people of Jumla are maintaining and/or adapting to food insecure situations but also highlighted the way these strategies have changed over time as a result of change in local social-ecological processes. I have explained why certain strategies are helpful to certain groups of people but not always sufficient; and sometimes even disadvantageous to others, in order to unravel the complexity around food security in Jumla.

Historically, the people of Jumla are employing strategies to maintain their food security situation. They have been making claims on food with neighbours, friends and governments. However, with changes in social-ecological systems, the way they make claims has changed in recent times. Some traditional ways such as working as lagityas are disappearing and new ways of claiming such as making claims on food aid and buying grains with cash are increasing. Increased proximity to market, increasing influence of a cash-based economy and migration are found to be key processes behind these changes. The recent opening of a road connecting Jumla to the rest of the country has had a significant role in the increased availability of food in the market. Similarly, changes in various demographics have led to an increased availability of land for sharecropping by ‘in need’ resource poor communities in Jumla.

Apart from short-term strategies for maintaining their food security situation, people also employ adaptation strategies that are beyond coping, including anticipation of future risks and hazards and planning. Their innovative actions demonstrate how the Jumli community is preparing for future uncertainties. But even though these innovations, such as improved cooking stoves and toilet installation, begin to address the underlying problems and take a more holistic perspective, these are still not enough in terms of the pace and scale of change. People have always attempted to integrate
their responses to changing risks and hazards circumstances through re-organising not only what is available to them at the time of the crisis but also with an eye to the consequences of their actions within their social-ecological systems. People are variously diversifying their sources of income and adopting innovative technologies in their day-to-day lives. Given the fact that people are reliant on ecological resources off the farm for their livelihoods and that availability of these off-farm resources are declining as a result of changes in regional social-ecological processes and multi scalar interactions, considering food security from a social-ecological systems perspective is important in Jumla.

Using these narratives, this chapter demonstrates that the food insecurity in Jumla is not a problem of too little production alone. If there is not enough rice, for example, then food aid provides rice in Jumla and this has been the case since 1972. However, people in Jumla produce other grains. In this case, policy mistakenly associates food security with food preferences. This chapter reiterates the findings of Chapter Six that in subsistence systems, people cannot ever be certain about their future; they must constantly be on guard and provisioning for the next uncertainty. It is also with these narratives, this chapter builds on this understanding to highlight the implications given the changes in entitlement relations in Jumla. It appears that people in Jumla believe that change is inevitable and are prepared in their own ways to face it. One thing that has not changed in years is the people’s ability and conviction to try to self-organise. Despite years of isolation, marginalisation, neglect and recent misinformed government policies, people have fought the odds with dignity. Government support that acknowledges social-ecological realities would make a difference in people’s lives in terms of their food security.

As was the case with withdrawing and resisting, people, have to adjust to current and potential future changes in their social-ecological realities. These adjustments and changes were different for different households. They weigh their circumstances and employ complex permutations and combinations of response strategies that suit them the most, at that time. While deciding on which strategies to employ, people consider a range of factors such as weather and climatic conditions, availability of natural
resources around to access, family circumstances, government policies, market conditions, local cultural and social norms.

It is apparent in this chapter that people cannot individually solve many of the recent problems posed by changes in different social-ecological processes operating at different scales. In their efforts to adapt to these changes people have started to address them collectively. But as with the situation in previous chapters, a closer analysis indicates cultural prejudices and continuing social structures implicate collective efforts. These continue to be barriers to effectively addressing food insecurity in Jumla.
Chapter 8: A paradigm shift required in current food security thinking and practices for improving food security in Jumla

This study set out to understand social-ecological processes influencing vulnerability to food security in Jumla, Nepal. To achieve this aim, this research explored six questions.

1. According to local communities, what social and ecological processes influence their vulnerability to food insecurity?
2. How do local people describe/understand ‘vulnerability’; ‘food insecurity’?
3. In comparison to historical experience, how have changes to food security situations, influenced processes and interactions within the Jumla social-ecological system?
4. How do people (individuals, households, community leaders) cope with and respond to food insecurity?
5. What are the main factors people identify as differentiating their vulnerability?
6. How do local communities’ relationships with social and ecological systems influence the coping and response strategies that they employ and how have these changed over time?

In this concluding chapter I summarise the main research findings and identify key elements of the study. I also draw out the wider implications of the study, both in terms of what this study means for theory (how food insecurity, vulnerability and social-ecological systems are viewed) and what this particular case study of food security means for other regions confronting food security challenges. I revisit the earlier work of Chambers and Conway (1992) and Blaikie et al. (1994) on coping with risks and hazards and reframe it within the context of a changing social-ecological system. From interviews and discussions with Jumla locals, four narratives representing Jumli responses to food insecurity, emerge. Each has different implications for individual and collective long-term well-being and sustainability. These narratives show people are (not necessarily in sequential order) withdrawing, resisting, maintaining, and/or adapting to food insecure situations.
This research points towards the need for a paradigm shift in current food security thinking and practice if food security, as part of a national integrated rural development program, is to be improved. This includes context-based implementation practices in local settings like Jumla. The study reframes vulnerability to food insecurity towards a critical social-ecological systems approach. The chapter concludes by looking at future research needs and identifying policy and practice implications of the study.

8.1 Local reflections of wider scale changes in social-ecological systems over time

This detailed social-ecological analysis of Jumla began from the perspective that within Nepal Jumla is understood to be a food insecure place. This study has indeed confirmed that Jumla is food insecure but only for some people, in certain places and at certain times. The case study demonstrates that food insecurity in Jumla is seasonal, demographically uneven and reflects both historical and cultural realities of caste, gender and land tenure, as well as biophysical change. Scholars distinguish temporal dimension of food insecurity as transitory and chronic food insecurity. People’s inability to meet food needs in certain seasons is termed as transitory food insecurity (Barnett 2011; Maxwell & Frankenberger 1992). The intersections of environmental, social, historical and political processes contribute to uneven patterns of food insecurity. The implication here is that food security needs to be understood in context.

The research evidence presented in this thesis is that Jumla has been experiencing incremental and significant changes in its social-ecological system due to wider scale changes in climate as well as national and local level social (including demographic and policy) processes. Local people identify key social-ecological processes of weather and climatic variability, historical structural processes such as caste, gender and periphery based discriminations, government policies and population growth as affecting their vulnerability to food insecurity. These processes are connected with wider development changes associated with modernisation in Jumla and Nepal more generally. Erratic and declining precipitation, temperature rise, frost spells in spring, hail storms, gusty winds, land slides and flooding are the main wider scale climate related risks and hazards that local people consider interact with their food security
prospects. These risks and hazards have always been present in Jumla but their severity is perceived to be changing. People, households and communities have differing capacities to respond to such changes -some are able to successfully respond to these risks and hazards while others cannot. With almost total consensus among scientists that there is an increased likelihood of these risks in future (IPCC 2014), the need for a robust focus on contextual factors around people’s vulnerability to such risks and hazards, more than just identifying, locating, and measuring them, is important in order to help enhance adaptive capacity. This thesis agrees with scholars such as Miller & Bowen (2013), Holt-Giminez & Shattuck (2011), Hildyard (2010), Milestone (2010), McMichael (2009), Vogel et al. (2007), McLaughlin & Dietz (2006), Turner et al. (2003), Brown (1998), Blaikie et al. (1994), Bohle et al. (1994), and Bryant (1992) on the need for vulnerability assessments to engage with marginalised perspectives that highlight contextual factors for adaptation actions to be successful.

8.2 Significance of these social-ecological changes on Jumla’s food security

Changes in social-ecological systems have impacted people’s vulnerability to food insecurity in a variety of ways. As discussed in Chapter Four, rainfed agriculture, NTFPs and livestock rearing are the main sources of livelihood in Jumla. They have long been the main focus of livelihoods but the contribution of these to people’s livelihood has changed. Since the performance of agriculture, livestock and availability of NTFPs largely depends on climatic conditions, Jumli society is already sensitive to climatic variability. Socially, there is population growth and a move towards a nuclear family structure. These demographic and environmental changes have impacted on households’ relationships with social-ecological systems. Overall it has been demonstrated in this thesis that there is an ongoing transition occurring that is affecting both the biophysical realities of Jumla—resulting in less forest, less wild products for harvesting, more intensive farming, changing in the timing and availability of precipitation, warmer temperatures—and the social realities that both respond to and are the impetus for physical change. Population pressures and the increasing integration of Jumla into the national economy have provided both opportunities and threats to the people. One direct effect is seen in the way people pursue their livelihood
strategies. For example, an increase in population has forced households, in the absence of other livelihood opportunities, to clear forest for farming in order to respond to increased food demand. Deforestation and demographic changes together with institutional changes in forest governance systems such as introduction of community forestry, forced households to reduce the number of livestock they rear. This decrease in livestock numbers and reduced access to leaf litter, in turn, has affected crop yields as households have less manure available for their crops. This web of relations in Jumla highlights the value of looking at SES interconnections and flows while dealing with complex issues such as food security.

Similarly, with the recent road connection to Jumla and increased market penetration can be seen as influencing the everyday life of Jumli society. The Karnali Highway, although still under construction and subject to blockades by recurrent landslides, has largely replaced the need for expensive air transport and/or the arduous transport of food by animal, thereby significantly improving the ‘availability’ of food in local markets. Food availability in Jumla has improved, not through increased local agricultural production but by improvement in the means of access by food transportation. However, ‘food availability’ is only one of the four important determinants of food security: availability, access, utilisation and stability and that just because food is available in the market does not necessarily guarantee all people can access and utilise it in a stable manner (Barnett 2011; Blaikie et al. 1994; Maxwell 2001). Many people and households are still food insecure in Jumla despite improvements in the ‘availability’ dimension of food security as they cannot access food available in the market. The Jumla case confirms the observation made by McMichael and Schneider (2011, p. 120) that ‘subordinating food security to market mechanisms threatens to deepen food insecurity’ especially in developing regions.

Jumla is moving towards a cash-based economy. Such a transition is a global phenomenon and is always uneven and difficult for some (Beniston 2003; Vanhaute 2011). In Jumla, transition to a cash-based economy has influenced the way of life. Many traditional labour relations (such as lagi-lagitya system) have disappeared and other new relations have emerged. Similarly, many traditional job opportunities are disappearing with different ones emerging. The opening of roads has affected the
traditional job of portering usually done mainly by dalit men. The easy availability of readymade Chinese garments is impacting the livelihood option of sewing, traditionally done by a section of the dalit community in Jumla. This process of market integration in conjunction with other social-ecological processes has also changed many of the traditional food entitlement relations in Jumla that have been based around principles of trust, obligation and reciprocity. The market together with other government policies is increasingly having a greater influence over the way people source their food and choose which crops to grow. Some traditional crops such as chino and kaguno are disappearing as they are replaced by crops that are in higher demand in the market such as beans and apples.

Overall, with changes in social-ecological processes brought about by wider environmental and economic processes there have been changes in the way people interact with their social-ecological systems in Jumla. Jumla’s subsistence and small family farm based economy is transitioning towards a semi-commercialised and cash-based economy. This transition has brought some opportunities in Jumla but also necessitated some adjustments. Findings from this research indicate that those who have historically been discriminated against (based on caste, gender and by being located on the periphery of government or supply) have limited capacity to deal with the need to adjust and are most negatively affected. There is a continuity of historically rooted discrimination in Jumla despite overall changes within their social-ecological system. Vulnerability and resilience theories align with critical social science to suggest that certain structural factors, such as historically rooted sources of discrimination are persistent and are in themselves, resilient. The marginalized may persist but are less equipped to successfully negotiate such transitions and in effect repeated shocks (flood, landslide, unseasonal temperatures, illness, births and death) erode the capacity to make longer-term decisions. Changes in local communities’ relationships within the SES influence their coping and response strategies with marginalised sections of the society compelled to employ strategies that may negatively affect their future ability to cope.
8.3 Four narratives of response strategies in a changing social-ecological setting

In understanding people’s coping and response to food insecurity in a rapidly changing social-ecological situation, this thesis extends Blaikie et al. (1994) and Chambers and Conway’s (1992) early categorisations of coping to examine food insecurity as an outcome of interlinked, multiple risks manifest in Jumla’s social-ecological setting. This extends the literature on vulnerability and food security by demonstrating the complex series of responses and interactions within communities to social-ecological shocks. Coping with the present and adapting to the future in potentially food insecure situations in Jumla is inherently dependent on being able to respond to multiple risks together or separately as part of their social-ecological conditions. Response strategies to these diverse pressures are not homogenous and are undertaken as individual, household and/or community initiatives. People’s response strategies differ depending on trends, seasonal changes and shocks. And people employ various combinations of strategies differently, even though they may be responding to the same trend, a seasonal change or a shock. They reflect both local and wider community structures and changing social, ecological and social-ecological relations.

Understanding the coping and adaptation strategies that people employ to respond to risks and hazards is a critical part of providing a richer understanding of food insecurity (Barrett & Carter 2000; Chambers & Conway 1992; de Waal 1991; Ericksen 2008; Lambert 1994; Maxwell 1996; Maxwell 2001; Sen 1981). Chambers and Conway (1992) categorise coping into seven strategies: stint, deplete, move, hoard, claim, protect and diversify. Blaikie et al. (1994, p. 53) refine this framing of coping by categorising such strategies in light of their potential to undermine future ability to cope. In the case of disasters, they (1994) classify coping strategies into eight different categories. However, these classifications fail to appreciate both the time dimension and the social-ecological nature of risk and vulnerability. In this thesis, I demonstrate the need for a more nuanced approach to these issues through an integrated analysis of different strategies people pursue to refining responses to food insecurity in ways that address its causes within the context of their SES. In distinguishing between the variations in response to food security I argue in this thesis that there are four
strategies that distinguish local coping mechanisms in the face of vulnerability. This thesis disaggregates the meaning of food insecurity through ‘thick description’ of these four mechanisms: withdrawing, resisting, maintaining, and/or adapting.

‘Withdrawing’ reflects an almost total inability to consider the future, resulting in the selling of assets, disposal of seeds and out-migration. People withdraw when all their positive options to manage their food security are exhausted; they are compelled to employ these unsustainable strategies that result in an erosion of long-term capacity to cope with change. This depletion of resources is likely to accelerate vulnerability to even the slightest shift in conditions or future stresses. In Jumla, resource poor dalits, female-headed households and people living in remote villages are the ones who regularly employ this kind of response strategy; others will only employ it in most extreme cases. ‘Resisting’ is a more subtle response, expressing the agency of individuals and households, depending on socio-economic conditions. A ‘resisting’ strategy demonstrates a greater degree of action and access to a more diverse suite of relations and resources. Through ‘resisting’ strategies those that can try novel approaches to deal with changing social-ecological circumstances, extend land frontiers and modify their cropping, extending their personal commitment to change and seek innovation (the constant trying and experimenting with new ways while responding to risks and hazards) as a way forward. ‘Maintaining’ the current activities and daily interactions result in attempts to keep the status quo but to do so requires engaging in premeditated actions (as in hoarding) and spontaneous opportunism (as in food aid). Strategies of maintaining involve making claims on friends, families, governments and stockpiling food material pre-empting eminent future risks and hazards.

Withdrawing, resisting and maintaining strategies are all short-term ways of coping and generally performed on an individual basis. ‘Adaptation’ is the only long-term response identified in this research study. This response strategy moves beyond coping to adapt to social-ecological uncertainties threatening food security and is more focused towards enhancing adaptive capacity. Adaptation strategies are focused on planning for change through diversification of livelihoods and anticipation of benefits in the future. Utilising and benefitting from cash income and engaging in collective
community actions plays a larger part in this response, which in the case of Jumla, appears to further depend on the transition from subsistence to cash economies. Findings from this research, however, indicate that persistent caste, gender, class and periphery based discrimination have made it difficult for the disadvantaged sections of Jumli society to meaningfully engage many adaptation strategies that are focused on developing both individual and collective adaptive capacities.

This re-framing of people’s coping and adaptation strategies, by drawing together elements of an SES perspective with elements from a livelihoods and political ecology perspective, takes better account of social-ecological interactions compared with earlier categorisations. It is through understanding the diverse narratives of coping with and adaptation to food insecurity that opportunities that resonate more strongly within local social-ecological relations can emerge. Using these narratives of withdrawing, resisting, maintaining and/or adapting, this thesis demonstrates, that food insecurity in Jumla is not a problem of too little production alone.

8.4 Persistent inequalities in Jumla exacerbate vulnerability

This thesis highlights how changes in SES are not uniform in time or space and affect vulnerability to food insecurity of different people in different ways. Persistent inequalities present in Jumli society have affected the way individuals and households cope with and respond to these changes. Historically rooted caste, class and gender based discrimination and marginalisation, as well as other forms of discrimination, affect individuals and households’ power relations in society and eventually affect the capacity to cope with and adapt to risks and hazards in changed social-ecological settings. An explicit understanding of inequalities present within households and communities is important in vulnerability and social-ecological resilience analyses as they are proven to be key in exacerbating vulnerability (Adger 2000; Adger & Kelly 1999; Boyd et al. 2008; Brown 2011; Cannon & Müller-Mahn 2010). It is crucial that vulnerability assessments engage with marginalised perspectives in order for vulnerability reduction interventions to be successful (Miller & Bowen 2013). In the particular case of vulnerability to food insecurity, Hildyard (2010) notes that power imbalances lie at the root of food insecurity. There is strong evidence presented in this thesis that reveals these social and cultural prejudices to be systemic in Jumli society.
and that these prejudices have been instrumental in denying and/or restricting fair access to resources to certain sections of society. Dalits and women face such discrimination the most in Jumla. Dalits, female-headed households, land poor households and, generally, people living in remote areas are more directly dependent on ecological resources of declining quality and diversity but own little land, of marginal quality in most of the cases, and in some cases, no land. There is little prospect for change as education, health and other government support and services have largely failed to serve the needs of these marginalised sections of Jumli society. As long as social inequalities persist, so too does food insecurity. These structural factors need to be addressed and to-date, remain unresolved.

Persistent social structures, including caste, gender and periphery based discrimination contribute to the creation of uneven conditions of vulnerability. It is evident in this study that these processes have historically influenced people’s entitlements, the way resources are distributed and the way people cope with and adapt to risks and hazards in Jumla. Hierarchical caste and gender based social relations in Jumla influence the risks that people face. As a result, these marginalised sections of society lack adaptive capacity and are found to mostly employ short-term coping strategies while responding to rapidly changing risk and hazard conditions. Many of these strategies exacerbate vulnerability by negatively affecting the future ability to cope and adapt. Historically rooted biases systematically deny the abilities and resources to diversify livelihood options and discriminatory social norms make it difficult for these people to actively participate in collective efforts that are aimed at collectively adapting to changes in risk and hazards.

These social issues are related to resolving power issues, providing solutions to notoriously escalating processes of marginalisation and supporting local’s livelihoods while conserving ecology. In order to understand these issues, scholars refined ‘sustainable livelihoods’ and ‘entitlement’ approaches to accommodate ecological as well as social concerns (including social justice) to develop an approach known as ‘political ecology’ (Blaikie et al. 1994; Bohle, Downing & Watts 1994; Robbins 2012; Scoons 2009; Watts & Bohle 1993). Political ecology focuses on the intersection of structural, political forces and ecological dynamics. This thesis extends the political
ecology perspective by combining it with a social-ecological systems perspective by examining the relationship between social and ecological systems. This helped in analysing processes, relations and interactions rather than just events, within the system.

It is apparent in this thesis that food security is compounded by national government commitment to other policies that affect land access and land tenure. For example, community forestry programs deny supplementary and traditional access to forests. Where forest access is available the land pressure for farming is significant and consequently there are less wild non-timber products available for harvesting in nearby areas, extending the need to forage further out and up the mountains. This leads to new areas of exploitation and degradation, is more physically exhausting and only the most marginal households continue to hunt for these products, increasing the burden on the most vulnerable families. These examples are self-evident when studying these communities through a SES lens. The SES lens complemented this analysis of vulnerability to food insecurity by facilitating, as noted by Miller et al. (2010), the examination of interaction of social and ecological processes. Integration of an SES approach, underpinned by a critical social science perspective offers a way of linking vulnerability and food security in a useful framework, as demonstrated in this research. Integrated rural development has historically aimed to be inclusive but in my experience and through the examination of the Jumla case, I suggest that it suffers from and is subject to relativist implementation. This necessarily leads to prioritizing policies and/or actions based on pressures that may emanate from different levels of government and lead to very local and short term decisions. The distribution of food aid in its various forms reflects such a situation. However, arguably, the point of a systems perspective is that it locates the issues within a relational framework so that those imagining and implementing the programs are compelled to think of the connectedness of what they are doing to the whole and with both short and longer term variables in mind. In this way, I argue that there is a chance for local people to make longer term decisions because they have some surety that there are multiple pathways and opportunities being reinforced through government services and local community networks. The reality of climate change seems to already be there for the inhabitants of Jumla, indicating that even this very geographically remote (from the centre of Nepal)
location is no longer just Jumla but Jumla-as-part-of-a-region and the region-as-part-of-Nepal and the world.

These complex stories of managing food insecure situations highlight the need for more nuanced and context sensitive policy responses that acknowledge and address such complexity. A rights-based approach to food security as envisaged in food justice and food sovereignty frameworks, as proposed by Giminez and Shattuck (2011), are the most likely ways forward to sustainably solving Jumla’s food insecurity and more generally contribute to greater resilience and equitable outcomes. As discussed in Chapter Two, these rights based approaches to food security tend to accommodate ecological as well as livelihoods needs of the people. These approaches are sensitive to historical inequalities present in the society. To take forward a rights and justice approach to food, a paradigm shift is required in current thinking and practices as a part of national integrated rural development program—with context based implementation practices in local settings like Jumla. More generally, issues that usually fall outside the food security policy arena, such as power, marginalisation, land tenure, caste, need to be brought into it.

8.5 Government policy impacts on Jumla’s food security

This thesis has discussed how a range of government policies in food and other policy domains has affected Jumla’s food security. Nepal’s food security rhetoric aligns with the global change in the thinking and practices of food security. While almost all the policies are overtly productivist, some elements are, nonetheless, drawn from ideas of entitlement and sustainable livelihoods perspectives. However, on-ground implementation indicates that these policies are clearly inadequate in addressing the complexity of daily life; and, many of them have encouraged misguided response strategies among agencies and communities in Jumla. Broad policy directions such as bilateral trade relations with China and India as well as liberalisation and other mid-level socio-economic and sectoral policies and periodic plans adopted by the government have had interactions with Jumla’s food security situation. This research finds two major flaws in government policies related to Jumla’s food security. One is
about inadequate theoretical underpinning on policies and the other is about issues of practice.

There is ample evidence presented in this thesis that food security enhancement efforts in Jumla lack a nuanced and context-sensitive understanding and awareness of Jumla’s SES. On ground, these policies fail to engage with persistent socio-economic inequalities as well as cultural prejudices; and these combined, are creating uneven conditions of vulnerability and shaping social-ecological relations. Further, there is a lack of and/or only bare acknowledgment of environmental concerns in these policies, which has significant repercussions in considering where and how food is to be grown (for example Jumla is a locally declared organic district). But most significantly, the policies overwhelmingly consider food security as being only a problem of too little production. This compartmentalised approach to policy further exacerbates the interpretation of on-ground responses to government initiatives—focusing on food preferences as incentives to increase production. There is negligible attention to alignment of policies that for example, bring food aid into the district, even in productive years and consequently undermine household decisions regarding crop selection, labour and market surpluses. In this scenario, policy mistakenly associates food insecurity with food preferences. In effect, Jumla can grow sufficient grains but not sufficient paddy. A concerted effort to promote locally available food rather than imported rice, is urgently needed in Jumla.

Agricultural development plans and programs are mistakenly regarded as food security enhancement plans and programs. Most agricultural development plans have been overtly productivist with increasing production and productivity as the overarching goal to the neglect of important issues of access and resilience. The case study of Jumla presented in this thesis highlights a lack of comprehension and theoretical rigour as to how such plans help enhance food security conditions of particularly the marginalised and resource poor sections of the society. Such policies do not acknowledge hierarchical social structures that underpin existing conditions where women and *dalits* in Jumla own less land.
Further, many parents indicated that they would still withdraw, and do withdraw, female children first, when they have to take their children out of schools as a part of their household coping strategy. In a similar way, the well-being of the most vulnerable—which tends to be the well-being of women, children and people from the dalit community—requires policies that support an integrated approach to changing cultural values. The cultural expectation that women will eat last in the family and only if there is enough food, does not support the reality that they are the principle field workers, farmers, and the carers of those who are too young and or old to contribute to primary labour. This expectation is despite the high number of absent male head of households and their sons, in out-migration to other areas and countries. Importantly, these cultural issues are long-reported issues in development studies (Bishop 1990; Chambers 1981; Peter & Kahn 1999). The implications for overall household well-being and household food security is that these current policies continue to be designed, at best, to address only proximate causes not the root causes of food insecurity. Government policies are silent on tackling the uneven conditions of vulnerability created by persistent cultural and social prejudices.

Several recent efforts to include social aspects in some policies and programs, while promising, were inadequate in capturing social-ecological realities. Some of these efforts such as gender mainstreaming programs in agriculture either did not reach their intended targets or were misunderstood at the implementation level. Redistributive land reform programs implemented did not, despite their stated goals, help improve people’s access to land resources but instead increased the vulnerability of the agricultural system as it resulted in an unprecedented increase in land fragmentation. It also failed to provide land access to women, dalits and other land poor sections of the society who historically work on farms but are denied access to land resources. In Jumla, these land reform programs have, ironically, strengthened the status quo within land administration systems as they failed to discourage absentee landlordism, as a large number of people who are not farmers continue to own farmland in Jumla. This further entrenches the existing social structure where the land ownership pattern is skewed towards upper caste males; and most irrigated land capable of cultivating a high value crop like paddy, is still owned by upper caste elites in Jumla. Land reform
programs in Jumla were also misused by elites to legalise their encroachment of forest land.

Reflecting the focus on economic development, ecological concerns are limited to lip service in most plans and program documents. Policies conspicuously lack an explicit environmental focus to help people develop their capacities to adapt to changes in weather and climatic variability such as Jumla is experiencing. An example of local recognition of environmental change is rising surface temperatures associated with the drive to establish apple orchards by the agricultural extension service. All apple varieties distributed by the government in Jumla require high chilling hours to be able to initiate flowering. However, even in the short time since this apple cultivation drive began in 1970, flowering time has noticeably shifted. Nonetheless the same varieties are distributed and the same advice given.

Nepal has made some deliberate efforts to engage people with natural resources in policies and their subsequent programs that focus on environmental change and conservation. Policies such as community forestry and biodiversity have helped to create awareness, in principle, among stakeholders about the important correlation between conserving ecology and enhancing livelihood of natural resource dependent communities. But these programs are not connected with other policies on increasing food production and the tension between the two hampers livelihood improvement efforts. Community forestry programs’ ability to achieve their equally important twin objectives of natural resource conservation and livelihoods enhancement, have been questioned by Jumla participants. And the national biodiversity policy, it appears, has been overridden at the implementation level, by other productivist policies.

As a result, the 60 years of policy focused on agricultural production enhancement, has not changed the situation and food insecurity still persists in Jumla. As well, the production drive has caused an unprecedented level of deforestation (Bishop 1990), with people clearing forests for farming. Policy that focuses on enhancing agricultural production on marginal land is ‘doomed to fail’ (Fresco 2009, p. 383). Similarly, both anecdotal and empirical evidence suggests a loss of agricultural biodiversity in Jumla as farmers are being encouraged to adopt ‘high yielding’ crops and varieties in place of
traditional ones. Important traditional Jumli food grain crops such as chino and kaguno are on the verge of extinction. Participants stated that overall agro-diversity on their farms has declined in the last 30 years and that crop and farms in Jumla are increasingly homogenous.

Data presented in this research indicates the significance of people’s relations with ecological resources off the farm, such as forests and wild areas. With changing social-ecological circumstances, people are equally dependent on ecological resources in the wider landscape. This indicates the importance of considering food security from a SES perspective rather than a farming systems perspective alone. A social-ecological lens on food security extends the farming system lens and needs to do so. There is a disproportionate reliance of poorer/marginalised sections of society on these resources and the threat that enclosure of such resources by elites and government agencies, poses to the most marginalised.

The program implementation approach so far in Jumla has been compartmentalised into different government departments and their respective district offices. Key government policies and programs that interact with food security have largely failed in Jumla to acknowledge the diversity present both in physical and social landscapes of Jumla. A ‘one size fits all’ philosophy continues to be evident in government programs; one example being the ‘one village one apple orchard’ program being implemented in Jumla which encourages all households to establish apple orchards without knowing their individual circumstances and the long term effects it may have on their livelihood sustainability. Evidence from this research indicates that this flagship program lacks important ecological considerations such as the weather and climatic variability that Jumla currently experiences.

Overall, while there is a clear need to reorient the government’s agricultural development policies to suit the need of small-holder farmers, looking beyond agriculture is equally necessary for a long-term and sustainable solution to food insecurity in Jumla to be developed in ways sensitive to both the environment and needs of the weaker sections of the society. Small-holder oriented agricultural development has high potential to have wider impact upon poverty and is the pivotal
element for achieving food security in Jumla and elsewhere (Carolan 2013; Holt-Gimenez & Shattuck 2011; McMichael & Schneider 2011). A social-ecological lens to food security looks at food security in an holistic way that goes beyond agriculture to help strengthen existing opportunities and also to open up new livelihood strategies available off the farm.

8.6 Reframing vulnerability to food insecurity

The question then becomes one about how vulnerability associated with food insecurity is being framed. The evidence presented in this thesis is that local people have always attempted to integrate their responses to adversity through reorganising what is available to them at the time of the crisis but with an eye to the consequences of their actions within their SES. Their strategies for coping and adaptation are buffers against food insecurity and vulnerability to risks and hazards within the SES. This includes their expectations of how to manage across the seasons and over time and within their circumstances. They are employing different ways of coping and inventing adaptation strategies reflecting the variations in weather and climatic conditions.

However, with increasing population and the reality of stagnant agricultural growth despite 40 years of aid and technical assistance through extension programs, it would seem that the time has come to look for more integrated and holistic policy responses that address food security within the context of the local people embedded within dynamic SES.

Globally, the case of Jumla speaks to the level of socially differentiated and integrated support and services that governments and aid agencies need to consider when responding to topical (and traumatic) issues. The four response strategies described in this thesis, taken together, present an opportunity to mediate more complex policy and practice outcomes. Noting that focus in many developing countries, as in Nepal, is often on improving agriculture as ‘the sole solution’ to food insecurity, I argue for policies and resources that support negotiated, differentiated and diverse coping and adaptation strategies. The importance of moving beyond a simple interpretation of food insecurity is that real food security reflects a whole of system—integrated systems approach. Specifically, Jumla requires differentiated extension support for
small farmers. This could encourage diversity in farms, support improving livelihood options off the farm and the implementation of a land reform program for fair and just access to land resources. Further institutional changes in this vein could ensure certainty of access to resources. This would contribute to a more sustainable use of ecological resources. Government policy could integrate divergent programs to make explicit possible interconnections among food security, climate change, agriculture, biodiversity, gender, health and education outcomes. A beginning may well be policy support for integrated rural development services that do not conceive of improving agriculture as ‘the sole solution’ to food insecurity, instead policy and resources that support the successful and diverse coping and adaptation strategies outlined above offer promising ways forward. The evidence presented in this research is that just providing adaptation support, increasing food entitlement and availability may not be an answer to longer-term solutions to Jumla’s food insecurity. These interventions have helped to reinforce existing inequalities and weaken the ability of people, households and communities to self-organise. Jumla requires important policy support for off-farm strategies and, in a hierarchical society like Jumla, gender, caste, class and place sensitive support strategies for equality. Jumla requires resisting food aid but re-invigorating agriculture by promoting small-holder oriented agriculture that draws on social-ecological perspectives. Similarly, implementation of necessary land reforms and other institutional changes are required to ensure certainty/security of access to resources to contribute to sustainable use and care of ecological resources. To do this, a rights-based lens as enunciated in the food justice ideas may be essential for Jumla’s longer-term solution to food insecurity.

8.7 Relevance of this research outside Jumla

Jumla experiences many of the challenges mountainous regions confront in terms of remoteness, ecological and climate change, and the transition from semi-subsistence to market oriented production (Beniston 2003). Due to its remoteness Jumla has also had time to anticipate and potentially negotiate the opportunities as well as the risks associated with market integration. As Shields (1991) notes, places on the margin manifest characteristics that speak both to their particular circumstances, but can be understood as shared by others in diverse locations. Indeed in the context of this case
study, this thesis argues that responses to coping and adaptation in Jumla reflect cycles common elsewhere in other farming communities, in similarly remote and mountainous regions undergoing transition, and therefore, contributes to rethinking food security policy and practices beyond the borders of Nepal.

8.9 Future research needs and possible implications of the study

This thesis presents an analytical framework based on a Jumla based case study to understand food security. It is important that this framework be tested in other areas to see whether or not it provides the same output. The four narratives of responses to food insecurity in Jumla could be explored in practice. Action research could be undertaken to apply these ideas in food security interventions. Such action research would be important in tracing the negative and positive consequences of the emergent narratives and their social-ecological relations. Significantly, this framework could then be anticipated and addressed in future policy and programs.
References cited


Alam, M & Regmi, BR 2004, Adverse impacts of climate change on development of Nepal: Integrating adaptation into policies and activities, Bangladesh Centre for Advanced Studies (BCAS), Dhaka.


242


Bhandari, D, Gurung, I, Rayamajhi, D, Raut, P & Regmi, C 2010, Organic apple certification (With special focus on Jumla), DADO Jumla, SNV Nepal and World Vision International Nepal, Jumla.


Blaikie, N 2000, Designing social research, Blackwell, Cambridge, UK.


Brock, WA 1997, 'Asset price behavior in complex environments', in SN Durlauf & DA Lane (eds), The economy as an evolving complex system, Addison-Wesley, Reading, pp. 385-423.


Carolan, MS 2013, Reclaiming food security, Taylor & Francis, New York.


DADO 2012, *District agriculture development programs and statistics*, by DADO, District Agriculture Development Office (DADO), Jumla.


Devereux, S, Baulch, B, Hussein, K, Shoham, J, Sida, H & Wilcock, D 2004, Improving the analysis of food insecurity: Food insecurity measurement, livelihoods approach and policies: Applications in food insecurity and vulnerability information and mapping systems (FIVIMS), UK Department of International Development (DFID), Sussex.

Devkota, R 1990, Karnali ko Artha Itihas (An economic history of Karnali), Sajha Prakashan, Kathmandu.


DLSO 2012, Yearly book with district profile, by DLSO, District Livestock Services Office, Jumla.

Downing, TE 1992, Climate change and vulnerable places: Global food security and country studies in Zimbabwe, Kenya, Senegal and Chile, Research Reoprt No 1, Environmental Change Unit, University of Oxford, Oxford.


FAO 2011, The state of food and agriculture 2010-11, Food and Agriculture Organization of the United Nations, Rome.


FAO 2013, The state of food insecurity in the world, Food and Agriculture Organization of the United Nations, Rome.


Holstein, JA & Gubrium, JF 2002, 'Active interviewing', in D Weinberg (ed.), *Qualitative research methods*, Blackwell Publishers, Malden, Massachusetts.


254


Neu, U 2009, 'Climate change in mountains', in T Kohler & D Maselli (eds), Mountains and climate change: From understanding to action, Geographica Bernensia, Bern.

Neuman, LW 2003, Social research methods: qualitative and quantitative approaches, 5th edn, Allyn & Backon, Boston, MA.

Neuman, WL 2006, Social research methods : qualitative and quantitative approaches / W. Lawrence Neuman, 6th edn, Allyn and Bacon, Boston.


Sharma, K & Khanal, S 2010, 'A review and analysis of existing legal and policy issues related to land tenure and agriculture in Nepal', *Kathmandu University Journal of Science, Engineering and Technology*, vol. 6, no. 2, pp. 133-41.

Sharma, PR 1978, 'Nepal: Hindu-tribal interface', *Contributions to Nepalese Studies*, vol. 6, no. 1, pp. 1-14. doi:


Tompkins, EL & Adger, WN 2003, *Building resilience to climate change through adaptive management of natural resources*, Tindall Centre for Climate Change Research, Norwich.

Trostle, R 2010, *Global agricultural supply and demand: Factors contributing to the recent increase in food commodity prices (rev. ed.)*, DIANE Publishing, Derby, PA.


Via Campesina 2007, 'Nyéléni 2007', in *Forum for Food Sovereignty, Sélingué, Mali*.


Widgren, M 2012, 'Resilience thinking versus political ecology: Understanding the dynamics of small-scale, labour-intensive farming landscape', in T Plieninger & C


Willy, LA, Chapagain, D & Sharma, S 2008, Land reform in Nepal: Where is it coming from and where is it going?, DFID, Kathmandu.

Winne, M 2008, Closing the food gap, Beacon Press, Boston.


Appendix 1: Interview sample questions around views, practices and experiences on food security for community members

Background and household details
- How long have you and your family lived in this area/region?
- Where were you living before? Why did you move here?
- What do you do for living? (such as farming on own land, farming on someone else’s land, farm labour, off farm labour, businesses, government job, (seasonal) migration for job etc)
- What others in your family do?

Views on household activities
- What do you think is your main source of living? Why?
- Has your main source of living changed overtime?
- How has it changed? Why has it changed?
- Have your other sources of living changed overtime? Has the contribution of different sources to your living changed overtime? How?

Main sources of food
- What are your main food sources?
- How do you obtain these?
- What are your three most important sources of food?
- What main food you normally eat during religious ceremonies/festivals?

Food security perception
- What does food security mean to you? (limited food, food shortage, reduced meat intake etc)
- When did you last have your staple food (eg rice, dal, curry, pickle and meat or milk products or any other food that WFP or FAO or local custom suggest is a staple)?

Practices and experiences
- Do you do your farming for your own consumption or for selling or for both?
• Has your own agricultural production been enough for you and your family’s own consumption? Who else is there in your family? (Who else in your family had dinner in your home last night?)

• Have you had experiences in the past that your own production was not enough to meet your food need? Or have you had experiences in the past that you and your family could not meet your food need? (either production or purchasing)

• When was that you experienced food insecurity (limited food, food shortage, reduced meat intake) last time? What was the length of time? Is it about not having enough every day for a week or more? How regular does this happen?

Previous experience with food insecurity

• In the past what have been the major issues at a household level that have affected your food security? (such as family illness, death in the family, declining land productivity, fire, insect pest infestation etc)

• In the past what have been the major issues at a local/regional level that have affected your food security? (drought, landslide, flooding, lack of or over snowfall, land degradation, forest degradation, shrinking water sources etc)

• In the last 10 years what have been the major issues at a national/global level that have affected your food security? (such as subsidies, food aid, market price, global warming etc)

Coping strategies that undermine/do not undermine future capacity to cope

• What changes have you made to your agricultural practices over time to cope with uncertainties (such as drought, flooding etc)? (like planting earlier or later, changing crops, changing fertilizer application or acquisition etc)

• What changes have you made to your household functioning over time to cope with food insecure situations? (like children’s labour, having only one cooked meal a day, eating wild food, etc)

• How did you manage that situation overall? (selling assets, asking help from friends and family, migration, extending farming in forest areas, increasing cropping intensity, government food aid etc)
• What do you think you will do if similar situation occur in next season? (or any other events like flood or holidays that have come up during the interviews also take in mind that different events and different times can elicit different responses)

Support network
• Did anyone (government, NGOs, friends, relatives, extended family etc) help you in that time or after? Did you except such help?
• Have you always taken help from these people about these kinds of issues? (Are they normally the same people who offer to help you in these kinds of issues?)
• What did they do to help you?
• How do you find such help extended to you? Were they useful for you? Why? Why not?
• Who did you used to get help from about these issues but don’t anymore?
• Why did you stop taking help from them about these issues?
• What changes have your village/neighborhood have made overtime to cope with food insecure situation? (collective response over an individual one such as building a new irrigation canal, planting trees, establishing a community seed bank etc)

Experience of changes in landscape/community
• What changes have you noticed in the community since you have been here? e.g. changes in population, farming practices, opening and closing of businesses/services etc. (ascertain how long they have been there or had control as a head of HH or in other capacities)
• What do you see as the most significant changes (as in the way things get done, or people respond) in the time you have been here?
• What changes can you see in the local/regional landscape? e.g. changes in vegetation, waterways, farms, road and other infrastructures
Appendix 2: Interview sample questions around views, practices and experiences on food security for service providers

Background
Name:
Organization/s working and or worked with:
Working experience around food security:

Views on household activities
- What do you think is main source of living of people living in this region? Why?
- In comparison to you previous experience, has main source of living of people in this region changed overtime?
- How has it changed? Why do you think has it changed?
- Have other sources of living of people changed overtime? Has the contribution of different sources to living changed overtime? How?

Main sources of food
- What are main food sources in this region?
- How do people obtain these?
- What are three most important sources of food in this region?
- What main food people normally eat during religious ceremonies/festivals?

Food security perception
- What does food security mean to you and your organization? (limited food, food shortage, reduced meat intake etc)

Practices and experiences
- When was that you experienced food insecurity in this region (limited food, food shortage, reduced meat intake) last time? What was the length of time? Is it about not having enough every day for a week or more? How regular does this happen?
- How have you help people in such situation?
- Has the way you help people changed? How has it changed?

Previous experience with food insecurity
- In the past what have been the major issues at a household level that have affected food security of the people? (such as family illness, death in the family, declining land productivity, fire, insect pest infestation etc)
In the past what do you think have been the major issues at a local/regional level that have affected food security? (drought, landslide, flooding, lack of or over snowfall, land degradation, forest degradation, shrinking water sources etc)

In the last 10 years what have been the major issues at a national/global level that have affected food security in this region? (such as subsidies, food aid, market price, global warming etc)

**Coping strategies that undermine/do not undermine future capacity to cope**

What changes do you think people in this region made to agricultural practices over time to cope with uncertainties (such as drought, flooding etc)? (like planting earlier or later, changing crops, changing fertilizer application or acquisition etc)

What changes, do you think people in this region made to household functioning over time to cope with food insecure situations? (like children’s labour, having only one cooked meal a day, eating wild food, etc)

How do they manage that situation overall? (selling assets, asking help from friends and family, migration, extending farming in forest areas, increasing cropping intensity, government food aid etc)

What do you think you will do if similar situation occur in next season? (or any other events like flood or holidays that have come up during the interviews also take in mind that different events and different times can elicit different responses)

Did you help them in that time or after? Did they except such help?

Have they always taken help from you about these kinds of issues? Do they also take help from other organizations?

What did you do to help them?

Who did you used to help to about these issues but don’t anymore?

Why did you stop helping them about these issues?

**Experience of changes in landscape/community**

What changes have you noticed in the community in this region since you have been here? e.g. changes in population, farming practices, opening and closing of businesses/services etc. (ascertain how long they have been there)
• What do you see as the most significant changes (as in the way things get done, or people respond) in the time you have been here?

• What changes can you see in the local / regional landscape? e.g. changes in vegetation, waterways, farms, road and other infrastructures
Appendix 3: Sample questions for Focus group discussions

Background and household details
- How long have you and your family lived in this area/region?
- Where were you living before? Why did you move here?
- What do you do for living? (such as farming on own land, farming on someone else’s land, farm labour, off farm labour, businesses, government job, (seasonal) migration for job etc)
- What others in your family do?

Views on household activities
- What do you think is your main source of living? Why?
- Has your main source of living changed overtime?
- How has it changed? Why has it changed?
- Have your other sources of living changed overtime? Has the contribution of different sources to your living changed overtime? How?

Main sources of food
- What are your main food sources?
- How do you obtain these?
- What are your three most important sources of food?
- What main food you normally eat during religious ceremonies/festivals?

Food security perception
- What does food security mean to you? (limited food, food shortage, reduced meat intake etc)
- When did you last have your staple food (eg rice, dal, curry, pickle and meat or milk products or any other food that WFP or FAO or local custom suggest is a staple)?

Practices and experiences
- Do you do your farming for your own consumption or for selling or for both?
- Has your own agricultural production been enough for you and your family’s own consumption? Who else is there in your family? (Who else in your family had dinner in your home last night?)
• Have you had experiences in the past that your own production was not enough to meet your food need? Or have you had experiences in the past that you and your family could not meet your food need? (either production or purchasing)
• When was that you experienced food insecurity (limited food, food shortage, reduced meat intake) last time? What was the length of time? Is it about not having enough every day for a week or more? How regular does this happen?

**Previous experience with food insecurity**
• In the past what have been the major issues at a household level that have affected your food security? (such as family illness, death in the family, declining land productivity, fire, insect pest infestation etc)
• In the past what have been the major issues at a local/regional level that have affected your food security? (drought, landslide, flooding, lack of or over snowfall, land degradation, forest degradation, shrinking water sources etc)
• In the last 10 years what have been the major issues at a national/global level that have affected your food security? (such as subsidies, food aid, market price, global warming etc)

**Coping strategies that undermine/do not undermine future capacity to cope**
• What changes have you made to your agricultural practices over time to cope with uncertainties (such as drought, flooding etc)? (like planting earlier or later, changing crops, changing fertilizer application or acquisition etc)
• What changes have you made to your household functioning over time to cope with food insecure situations? (like children’s labour, having only one cooked meal a day, eating wild food, etc)
• How did you manage that situation overall? (selling assets, asking help from friends and family, migration, extending farming in forest areas, increasing cropping intensity, government food aid etc)
• What do you think you will do if similar situation occur in next season? (or any other events like flood or holidays that have come up during the interviews also take in mind that different events and different times can elicit different responses)

**Support network**
• Did anyone (government, NGOs, friends, relatives, extended family etc) help you in that time or after? Did you except such help?
• Have you always taken help from these people about these kinds of issues? (Are they normally the same people who offer to help you in these kinds of issues?)
• What did they do to help you?
• How do you find such help extended to you? Were they useful for you? Why? Why not?
• Who did you used to get help from about these issues but don’t anymore?
• Why did you stop taking help from them about these issues?
• What changes have your village/neighborhood have made overtime to cope with food insecure situation? (collective response over an individual one such as building a new irrigation canal, planting trees, establishing a community seed bank etc)

**Experience of changes in landscape/community**
• What changes have you noticed in the community since you have been here? e.g. changes in population, farming practices, opening and closing of businesses/services etc. (ascertain how long they have been there or had control as a head of HH or in other capacities)
• What do you see as the most significant changes (as in the way things get done, or people respond) in the time you have been here?
• What changes can you see in the local / regional landscape? e.g. changes in vegetation, waterways, farms, road and other infrastructures
Appendix 4: Plain Language Statement

Who is conducting this study?
This study is being conducted by Kamal Gaire, PhD candidate of the Melbourne School of Land and Environment of the University of Melbourne. Kamal is supervised by Associate Professor Ruth Beilin and Dr. Fiona Miller of the University of Melbourne. This project will form the basis of Kamal’s PhD thesis and has been approved by the University of Melbourne Human Research Ethics Committee. The purpose of this statement is to advise people about the project and to provide contact details if you would like further information. Kamal is currently on a study leave from his position as a Senior Agricultural Extension Officer at the Ministry of Agriculture and Cooperatives, Nepal.

Purpose of research
The aim of this research is to explore and understand processes that contribute to vulnerability to food insecurity from the perspective and experience of local communities in Nepal.

When
The interviews and focus group discussions will be conducted in April/May/June 2012 and, if you are willing, it would require you to participate at a time and place that is convenient to you.

What will I be asked to do?
Should you agree to participate, you will be asked to participate in either face to face semi-structured interviews or focus group discussion or in both.

Interview
The interview will take approximately one hour. In the interview you will be asked to describe your views, practices and experiences pertaining to food security. You will also be requested to explain how you coped and/or are coping with the food insecure situation and if there were any changes over time in your coping strategies.
Focus group discussion

Focus group discussion will take approximately three hours. In the focus group discussion you will be asked to discuss around practices and experiences pertaining to food security. You will also be asked about changes in the landscape and region over time.

Your contact address was obtained from public documents (eg. the annual publication of District Agriculture Development Office, District Development Committee) or through recommendation of other research participants. With your permission, the interview/discussions will be tape recorded to ensure an accurate record of what you said.

Contacts

Kamal Gaire       +977 9841610655
                kgaire@student.unimelb.edu.au
Ruth Beilin       +61 3 83445009
                rbeilin@unimelb.edu.au
Fiona Miller      +61 2 98508425
                fiona.miller@mq.edu.au

Involvement in this project is voluntary and participants are free to withdraw consent at any time, and to withdraw any unprocessed data previously supplied. Involvement or non involvement in this research and withdrawing consent will not affect professional relationships that you have or may have with the student researcher. We will do our best to ensure the confidentiality of data but as the size of the sample is small, it may be impossible to guarantee anonymity/confidentiality of participant identity.

Data collected for this project will be destroyed five years after completion of the project. This project has received clearance by the Human Research Ethics Council (HREC) and should you have any concerns about the conduct of the project, you are welcome to contact the Executive Officer, HREC, The University of Melbourne, on ph: +61-3-8344 2073, or fax: +61-3-9347 6739.
Appendix 5: Plain Language Statement in Nepali language

:yfgLo ;d"bfosf] vfB c;"/lffdf of]ubfg ug]{
k[s[ofx? Aff/]sf a'enefO{, cg'ej / cEof; M Ps

cWoog ;+rfng

ljBfjfl/wLsf ljBfyL{ >L sdn u|x[]n] ;Grfng ub}{ x'g'x'G5 . d]njg{ ljZjlfBfnosf ;x–
k[fWofks 8f= ?y aLnLg / 8f= lkmof][f dLn/sf] ;'kl/j][f0fdf of] cWoog ;Grfng e]/x]sf
5 . of] cWoogsfl cfwf/df sdn u|x]|n] ljBfjfl/wL zfj]wkq tof/ ug' { x'g]5 / o;sf nfuL
cfjZos ;jLs[tL ljZjlfBfnosf] x\o"dg l;r PLYS; sld6Laf6 k[iKt e];s]sf] 5 . of] kqsfl
på]Zo o; cWoogsfl af/]df oxf+nfo{ ;+lIkT hfgsf/L u/fpg' / yk hfgsf/L rfxg'ePsf]
v08df ;Dks{ ug{ cg';Gwfgsf[t/xsf] ;Dks{ 7]ufgf pknAw u/fpg' /x]sf] 5 . ljBfjfl/wL
cWoogsfl nflu xfn cWoog ljbfdf /xg'ePsf sdn u|x[]] s[lif tfy ;xsf/L dGqfnosf al/i7 s[lif
k];f/ clws[t x'g'x'G5 .

cg';Gwfgsf] nlo

g]kfndf vfBc:"/lf a9fpg of]ubfg lbg] k[s[ofx?nfO{ :yfgLo ;d"bfosf] k{kJ6Leaf6
aem\g' / tLgnfO{ phfu/ ug'{g} o; cg';Gwfgsf] nlo /x]sf]5 .

slxn]

oxL @)^{ }jIfv, h]7 / c;f/df cgtjftf{x? / ;dx 5nkmmn sfo{x? ;+rfng x'b}5g, obL tkfO{ o;
cWoogdf ;xefuLx'g rfxg'x'G5 eg] o;df tkfO{nfO{ pko'OQm x'g] ;do / :yfgdf ;xefuL x'g
;Sg' xg]5 .

s;[L ;xefuL x'g]

olb oxfF o; cWoogdf ;xefuL x'g tof/ x'g'x'G5 eg] oxxFnfO{ of t k[Tolf cGt/jftf[df of
;d"x 5nkmmdf of b'a]df ;xefuL x'g cg'/f]w ul/g] 5 .

cGt/jftf

cGt/jftf{ nueu Ps 306sf] nfdfl x'g]5 . o;df oxxFnfO{ vfB;/lfsf af/]df oxxFsf
jLrf/, Aojxf/ / cg'ejx? AoQm ug{ cg'/f]w ul/g]5 . o;}u/L vfB c:"/lfsf]
cj:yfnfO{ s;/L ;DxfNg' ePsf] lyof] jf ;DxfNb} x'g'x'G5 / tlfO{sf] vFB c"/Ifnfo{ ;DxfNg] /OfgLltdf ;do ;+u} ePsf] x'g'Sg] kl/jt{gx?sf af/]df kgL AofVof ug{ cg'/f]w ul/g] 5 .

d"x 5nkmn
;d"x 5nkmn nue u tLg 306f nfdf} x'g]5 . o;df vFB ;"/lfsf af/]df oxfFsf cg' e|j / Aojsx/x? sf af/]df atfpg cg'/f]w ul/g] 5 . o;sf ;fy} oxfFsf] If]q / j]k/Lsf e"b[idf ePsf kl/jt{gx?sf af/]df kgL 5nkmn ug{ cg'/f]w ul/g] 5 .


;Dks{

kmf]g Od]n
sdt u}x] ±(&(%(*$!^&$)!^)%&kgaire@student.unimelb.edu.au

?y aLnLg ±^! #@*($%$%)))(rbeilin@unimelb.edu.au

lkmo]gf] dLn/ ±^! @(*(%$!^$)%&fiona.miller@mq.edu.au

o; cWoogdfs xoxFsfsf] ;xefutfsf lGtTtfGt P][R5s xf] / oxFn} ;xefutfsfsf nflu lb'gf ePsfsf]
;LS[tL s'g} kgL ;dodf lkmtf{ nLg / klxNs] ;DxGg e};]s]sf] cGt/jftf{;d"x 5nkmsnsf ck]zf]lw] ctfj:yf] tkmtf{ nLg ;d]t oxfFsfi jQ]x g'x'G5 . oxfFn} o; cg';Gwfgd; ;xefu x'g'g'x'G5 . oxfFs} lGtTtfGt{ lBfyL{+uf} oxFsfsf] ;DaGwdf] s'g} c/ kg]5]g . o; cWoogsf] tYoIsf] uf]klogt] f]lglZrt] uH'EjU/j]kTg ul/g] 5 t] cGtU/jftf{ / ;d"x 5nkmsnsf ;xefu[xsf]} ;+Vo; f]g] x'g[ ePsfn}] ;xe]xu[xsf]} kl/ro ;t k|lt;?kdf uF]Kog x/g ;Sb5 .

o; cWoogsf nflu ;+sng ul/Psf] tYoIsf cWoog ;dflKt ePsfsf] kffR jif{ kl5 w'NofOg] 5 . defg cWoog OyLS; kl/fbfn} o; cWoog g;GrfgnfsO{ cg'df] bg u}j]s]f] 5 ; o; cWoogfsf af/]df sg] u'gf]f] ePsf dso{sf/L clws[t, defg cWwog OyLS; kl/fb}, d}njg{ lZjIlBfno;f} ;Dks{ ug{ Sg' x'g]5 . kmf]? ±^! #@*%$%&@& cyjfk km\oFs; ±^! # (#$^&^&
Appendix 6: Consent form for persons participating in a research project

Project title: Exploring Vulnerability: a case study of community experiences of food insecurity in the mid-west Hills and Mountains of Nepal

Name of participant: 

Name of investigator: Kamal Raj Gaire

1. I consent to participate in this project, the details of which have been explained to me, and I have been provided with a written plain language statement to keep.

2. I understand that my participation will involve an interview/a focus group discussion and I agree that the researcher may use the results as described in the plain language statement.

3. I acknowledge that:

   (a) I have been informed that I am free to withdraw from the project at any time without explanation or prejudice and to withdraw any unprocessed data I have provided;

   (b) The project is for the purpose of research;

   (c) I have been informed that the confidentiality of the information I provide will be safeguarded subject to any legal requirements;
(d) I have been informed that due to the limited sample size, anonymity cannot be ensured however all steps will be taken to minimize this risk;

(e) I have been informed that with my consent the interview will be audio-taped and I understand that taped data will be stored at University of Melbourne and will be destroyed after five years;

(f) My name will be referred to by a pseudonym in any publications arising from the research;

(g) I have been informed that a copy of the research findings summary report will be forwarded to me.

I consent to this interview being audio-taped  □ yes  □ no  
(please tick)

Signature  

Date  

( Participant)
### Appendix 7: Glossary of selected words commonly used in Jumla

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aabal</td>
<td>A grade of land quality; best quality land</td>
</tr>
<tr>
<td>Adhiya</td>
<td>A system of land tenure under which rents or taxes on land are collected at half of the produce; share cropping</td>
</tr>
<tr>
<td>Aalu</td>
<td>Potato</td>
</tr>
<tr>
<td>Aul</td>
<td>Malaria prone, hot area</td>
</tr>
<tr>
<td>Bada</td>
<td>A village or settlement, often defined along caste borders</td>
</tr>
<tr>
<td>Bandha</td>
<td>Literally: “closed” or “shut-down”; term refers to strikes, road blockages and the ban on all kinds of traffic; a measure (sometimes violently) applied to push for political aims and can last several days or even weeks</td>
</tr>
<tr>
<td>Ballo</td>
<td>Oxen</td>
</tr>
<tr>
<td>Baure kaam</td>
<td>Working for other people, e.g. agricultural work, weeding, ploughing, or portering</td>
</tr>
<tr>
<td>Besaya</td>
<td>Practice of purchasing food in other villages or regions. Can also include the exchange of goods for food</td>
</tr>
<tr>
<td>Bhabiyo</td>
<td>Kind of long grass</td>
</tr>
<tr>
<td>Bhakari</td>
<td>Grain-store</td>
</tr>
<tr>
<td>Bhatti</td>
<td>A shop where alcohol is served along with other food items</td>
</tr>
<tr>
<td>Bhoj-patra</td>
<td>The bark of a Bhojpatra tree, which was used for writing as a paper and also as one of the roof making materials</td>
</tr>
<tr>
<td>Bhuwa</td>
<td>Unirrigated land</td>
</tr>
<tr>
<td>Birta</td>
<td>Land grants made by the state to individuals, usually on a tax-free and inheritable basis</td>
</tr>
<tr>
<td>Buki</td>
<td>Grassland or alpine pasture</td>
</tr>
<tr>
<td>Chahar</td>
<td>Land quality grade; fourth (last) best quality</td>
</tr>
<tr>
<td>Chino</td>
<td>Common millet (<em>Panicum miliaceum</em>)</td>
</tr>
<tr>
<td>Dalit</td>
<td>Term refers to those castes who are economically, socially,</td>
</tr>
</tbody>
</table>

283
religiously, and politically suppressed; Dalits comprise various castes at the lowest level of the Hindu caste hierarchy

Daha

Lake

Dashain

Main Hindu festival; usually the occasion when whole family meets

Dara

Sub-district or a collection of villages in Jumla

Dhami

Oracle (shaman); he is consulted for various problems by a village’s community

Dharma Bhakari

Religious grain-store, where people donate food grains, which is distributed to people adversely affected by various crises

Doko

Bamboo basket; usually carried on the bag

Dori

Rope

Doyam

Land quality grade; second best quality

Dumsi

Porcupine

Gad

Stream, river

Ghatta

Water mill

Gorkhali

Term represents the office-workers who came from Kathmandu and carried out the administration for the previous Gorkha-rulers in Karnali

Goth

Animal shed

Hakim

Chef, boss

Hali

A ploughman

Himal

Mountains, the Himalaya, comprising the northern ridge of Nepal bordering the Tibetan Autonomous Region

Hing

Dried sap extracted from the stem and roots of a plant *Ferula asafoetida*. It is used as spice and to cure digestive problems

Ista

Spiritual friend

Jagir

Land assigned to government employees as emoluments
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Janai</td>
<td>Sacred thread that <em>tagadharis</em> wear</td>
</tr>
<tr>
<td>Janajati</td>
<td>Term refers to indigenous groups, often with an own mother-tongue</td>
</tr>
<tr>
<td>Jhakri</td>
<td>Witchdoctor or shaman</td>
</tr>
<tr>
<td>Jhara</td>
<td>System of forced labour</td>
</tr>
<tr>
<td>Jiban jal</td>
<td>Anti-dehydration powder</td>
</tr>
<tr>
<td>Jyula</td>
<td>Irrigated paddy land</td>
</tr>
<tr>
<td>Kaddu</td>
<td>Pumpkin</td>
</tr>
<tr>
<td>Kaguno</td>
<td>Italian millet (<em>Setaria italic</em>)</td>
</tr>
<tr>
<td>Kasturi</td>
<td>Musk deer</td>
</tr>
<tr>
<td>Khas</td>
<td>Local people of Karnali region, who were <em>Atagadharis</em> and <em>matwalis</em>; later converted to <em>Chhetri</em> (Adhikari 2008)</td>
</tr>
<tr>
<td>Khet</td>
<td>Irrigated field</td>
</tr>
<tr>
<td>Kipat</td>
<td>Land owned by the community; state has no right in this land</td>
</tr>
<tr>
<td>Khola</td>
<td>A small river</td>
</tr>
<tr>
<td>Kodo</td>
<td>Finger millet</td>
</tr>
<tr>
<td>Kucho</td>
<td>Broom</td>
</tr>
<tr>
<td>Kut</td>
<td>Taxes or the rent</td>
</tr>
<tr>
<td>Lagi, lagi-lagitya</td>
<td>Traditional patron-client system; lagi refers to the patron</td>
</tr>
<tr>
<td>Lek</td>
<td>Land situated at high altitude parts of the hills; often used as pastures for livestock</td>
</tr>
<tr>
<td>Maiti</td>
<td>The wife’s parents’ house</td>
</tr>
<tr>
<td>Masta</td>
<td>Religion in large parts of the Karnali zone. The Masta god is not physically represented, but seen through the possession of human body (→Dhami)</td>
</tr>
<tr>
<td>Matwali</td>
<td>People who were allowed to drink alcohol</td>
</tr>
<tr>
<td>Mit</td>
<td>Spiritual friendship</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mohi</td>
<td>Tenants cultivating other’s land</td>
</tr>
<tr>
<td>Nambari</td>
<td>Taxable land listed in the assessment register</td>
</tr>
<tr>
<td>Pahad</td>
<td>Foothills of the Himalaya, reaching up to 3000m</td>
</tr>
<tr>
<td>Pakho</td>
<td>Dry land field</td>
</tr>
<tr>
<td>Patan</td>
<td>Highland pasture, usually small plain area in highland</td>
</tr>
<tr>
<td>Panchayat</td>
<td>Previous, party-less government system in Nepal (till 1989)</td>
</tr>
<tr>
<td>Phatke</td>
<td>Small wooden bridge</td>
</tr>
<tr>
<td>Puja</td>
<td>Hindu ceremony to praise god</td>
</tr>
<tr>
<td>Sanghu</td>
<td>Wooden bridge</td>
</tr>
<tr>
<td>Sim</td>
<td>Land quality grade; third best quality</td>
</tr>
<tr>
<td>Simi</td>
<td>Beans</td>
</tr>
<tr>
<td>Silajit</td>
<td>Tar-like hydrocarbon extracted from rocks</td>
</tr>
<tr>
<td>Sisno</td>
<td>Stinging nettle (<em>Utrica dioica</em>); its leave is consumed by people as vegetable</td>
</tr>
<tr>
<td>Tarai</td>
<td>Flat area at the southern ridge of Nepal, bordering India; belongs to the Gangetic plain</td>
</tr>
<tr>
<td>Thar</td>
<td>Clan, sub-group within the caste</td>
</tr>
<tr>
<td>Tihar</td>
<td>Important Hindu festival, also referred to as “brother-sister” festival</td>
</tr>
<tr>
<td>Yarchagumba</td>
<td>Yarsha Gumba (tibet., literally: “winter-worm, summer-gras”)</td>
</tr>
</tbody>
</table>
Appendix 8: Population other basic statistics of Jumla (Based on 2011 Census)

1. Households, population and population density

<table>
<thead>
<tr>
<th>Total population</th>
<th>108921</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Male population</td>
<td>54896</td>
</tr>
<tr>
<td>Total Female population</td>
<td>54023</td>
</tr>
<tr>
<td>Total households</td>
<td>19291</td>
</tr>
<tr>
<td>Average household size</td>
<td>5.64</td>
</tr>
<tr>
<td>Sex ratio</td>
<td>101.6</td>
</tr>
<tr>
<td>Population density</td>
<td>43</td>
</tr>
</tbody>
</table>

2. Population by 5 years age group

<table>
<thead>
<tr>
<th>Age group</th>
<th>Total Number</th>
<th>Male Number</th>
<th>Female Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>00-4 yrs</td>
<td>14961</td>
<td>7528</td>
<td>7433</td>
</tr>
<tr>
<td>05-9 yrs</td>
<td>15703</td>
<td>7812</td>
<td>7891</td>
</tr>
<tr>
<td>10-14 yrs</td>
<td>14425</td>
<td>7299</td>
<td>7126</td>
</tr>
<tr>
<td>15-19 yrs</td>
<td>11423</td>
<td>5521</td>
<td>5902</td>
</tr>
<tr>
<td>20-24 yrs</td>
<td>10024</td>
<td>4847</td>
<td>5177</td>
</tr>
<tr>
<td>25-29 yrs</td>
<td>8292</td>
<td>4258</td>
<td>4034</td>
</tr>
<tr>
<td>30-34 yrs</td>
<td>6413</td>
<td>3199</td>
<td>3214</td>
</tr>
<tr>
<td>35-39 yrs</td>
<td>6130</td>
<td>3139</td>
<td>2991</td>
</tr>
<tr>
<td>40-44 yrs</td>
<td>4927</td>
<td>2521</td>
<td>2506</td>
</tr>
<tr>
<td>45-49 yrs</td>
<td>4347</td>
<td>2314</td>
<td>2033</td>
</tr>
<tr>
<td>50-54 yrs</td>
<td>3383</td>
<td>1793</td>
<td>1590</td>
</tr>
<tr>
<td>55-59 yrs</td>
<td>2875</td>
<td>1592</td>
<td>1283</td>
</tr>
<tr>
<td>60-64 yrs</td>
<td>3176</td>
<td>1498</td>
<td>1678</td>
</tr>
<tr>
<td>65-69 yrs</td>
<td>1513</td>
<td>781</td>
<td>732</td>
</tr>
<tr>
<td>70-74 yrs</td>
<td>712</td>
<td>438</td>
<td>274</td>
</tr>
<tr>
<td>75-79 yrs</td>
<td>336</td>
<td>198</td>
<td>138</td>
</tr>
<tr>
<td>80-84 yrs</td>
<td>188</td>
<td>111</td>
<td>77</td>
</tr>
<tr>
<td>85-89 yrs</td>
<td>57</td>
<td>32</td>
<td>25</td>
</tr>
<tr>
<td>90-94 yrs</td>
<td>19</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>95+ yrs</td>
<td>17</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

3. Household head by sex and age group

<table>
<thead>
<tr>
<th>Sex of household head</th>
<th>Total</th>
<th>10-14</th>
<th>15-19</th>
<th>20-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
<th>60-69</th>
<th>70+ years and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>19303</td>
<td>20</td>
<td>211</td>
<td>3180</td>
<td>4961</td>
<td>4659</td>
<td>3421</td>
<td>2287</td>
<td>564</td>
</tr>
<tr>
<td>Male</td>
<td>16637</td>
<td>17</td>
<td>151</td>
<td>2679</td>
<td>4409</td>
<td>4103</td>
<td>2999</td>
<td>1832</td>
<td>483</td>
</tr>
<tr>
<td>Female</td>
<td>2630</td>
<td>3</td>
<td>60</td>
<td>501</td>
<td>552</td>
<td>556</td>
<td>422</td>
<td>455</td>
<td>81</td>
</tr>
</tbody>
</table>
### 4. Population aged 10 years and over by marital status and sex

<table>
<thead>
<tr>
<th>Sex</th>
<th>Total</th>
<th>Never Married</th>
<th>Single Married</th>
<th>Multiple Married</th>
<th>Re-married</th>
<th>Widow/ Widower</th>
<th>Divorced</th>
<th>Separated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>78257</td>
<td>25467</td>
<td>42837</td>
<td>1000</td>
<td>5433</td>
<td>3272</td>
<td>155</td>
<td>94</td>
</tr>
<tr>
<td>Male</td>
<td>39558</td>
<td>14077</td>
<td>20643</td>
<td>742</td>
<td>2921</td>
<td>1046</td>
<td>98</td>
<td>31</td>
</tr>
<tr>
<td>Female</td>
<td>38699</td>
<td>11390</td>
<td>22193</td>
<td>258</td>
<td>2512</td>
<td>2226</td>
<td>57</td>
<td>63</td>
</tr>
</tbody>
</table>

### 5. Population ages 5 years and above by literacy status

<table>
<thead>
<tr>
<th>Sex</th>
<th>Population aged 5 years and above</th>
<th>Can read and write</th>
<th>Population who can read only</th>
<th>Can’s read and write</th>
<th>Not stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>93960</td>
<td>51355</td>
<td>3184</td>
<td>39379</td>
<td>42</td>
</tr>
<tr>
<td>Male</td>
<td>47370</td>
<td>32326</td>
<td>1417</td>
<td>13508</td>
<td>19</td>
</tr>
<tr>
<td>Female</td>
<td>46590</td>
<td>19029</td>
<td>1667</td>
<td>25871</td>
<td>23</td>
</tr>
</tbody>
</table>

### 6. Households by usual type of fuel used for cooking

<table>
<thead>
<tr>
<th>Type of fuel used for cooking</th>
<th>Number of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood/Firewood</td>
<td>19018</td>
</tr>
<tr>
<td>Kerosene</td>
<td>4</td>
</tr>
<tr>
<td>LP Gas</td>
<td>113</td>
</tr>
<tr>
<td>Cow dung</td>
<td>1</td>
</tr>
<tr>
<td>Bio-gas</td>
<td>9</td>
</tr>
<tr>
<td>Electricity</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>18</td>
</tr>
<tr>
<td>Not stated</td>
<td>126</td>
</tr>
</tbody>
</table>

### 7. Households by usual source of lighting

<table>
<thead>
<tr>
<th>Sources of lighting</th>
<th>Number of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>5656</td>
</tr>
<tr>
<td>Kerosene</td>
<td>62</td>
</tr>
<tr>
<td>Bio-gas</td>
<td>4</td>
</tr>
<tr>
<td>Solar</td>
<td>8548</td>
</tr>
<tr>
<td>Others</td>
<td>4899</td>
</tr>
<tr>
<td>Not stated</td>
<td>122</td>
</tr>
</tbody>
</table>
## 8. Households by sources of drinking water

<table>
<thead>
<tr>
<th>Source of drinking water</th>
<th>Number of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap/piped</td>
<td>15441</td>
</tr>
<tr>
<td>Covered well/kuwa</td>
<td>27</td>
</tr>
<tr>
<td>Uncovered well/kuwa</td>
<td>80</td>
</tr>
<tr>
<td>Spout water</td>
<td>2856</td>
</tr>
<tr>
<td>River/Stream</td>
<td>693</td>
</tr>
<tr>
<td>Others</td>
<td>74</td>
</tr>
<tr>
<td>Not stated</td>
<td>120</td>
</tr>
</tbody>
</table>

## 9. Households by type of toilet

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total households</td>
<td>19291</td>
</tr>
<tr>
<td>Without toilet</td>
<td>5917</td>
</tr>
<tr>
<td>Flush toilet (public sewerage)</td>
<td>4</td>
</tr>
<tr>
<td>Flush toilet (Septic tank)</td>
<td>6453</td>
</tr>
<tr>
<td>Ordinary toilet</td>
<td>6792</td>
</tr>
<tr>
<td>Not stated</td>
<td>125</td>
</tr>
</tbody>
</table>

## 10. Households by female ownership of fixed assets

<table>
<thead>
<tr>
<th>Ownership Type</th>
<th>Number of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total households</td>
<td>19291</td>
</tr>
<tr>
<td>Female ownership in both land and house</td>
<td>552</td>
</tr>
<tr>
<td>Female ownership in land only</td>
<td>540</td>
</tr>
<tr>
<td>Female ownership in neither house nor land</td>
<td>18070</td>
</tr>
<tr>
<td>Not stated</td>
<td>129</td>
</tr>
</tbody>
</table>

## 11. Households by size of persons in the household

<table>
<thead>
<tr>
<th>Number of persons</th>
<th>Number of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 person</td>
<td>582</td>
</tr>
<tr>
<td>2 persons</td>
<td>1090</td>
</tr>
<tr>
<td>3 persons</td>
<td>1753</td>
</tr>
<tr>
<td>4 persons</td>
<td>3084</td>
</tr>
<tr>
<td>5 persons</td>
<td>3777</td>
</tr>
<tr>
<td>6 persons</td>
<td>3370</td>
</tr>
<tr>
<td>7 persons</td>
<td>2154</td>
</tr>
<tr>
<td>8 persons</td>
<td>1479</td>
</tr>
<tr>
<td>9 and more persons</td>
<td>2014</td>
</tr>
</tbody>
</table>
Appendix 9: Castes and the title (surname) people use in Jumla

A. Brahmin
   a. Acharya
   b. Adhikari
   c. Baral
   d. Baskota
   e. Bhandari
   f. Bhatta
   g. Bhattarai
   h. Bista
   i. Chaulagain
   j. Devkota
   k. Dhital
   l. Katel
   m. Khanal
   n. Kharel
   o. Koirala
   p. Lamsal
   q. Neupane
   r. Pande
   s. Pandit
   t. Panta
   u. Pokharel
   v. Regmi
   w. Samal
   x. Sanjel
   y. Upadhyaya

B. Sanyasi
   a. Bharati
   b. Giri
   c. Nath
   d. Puri
   e. Yogi

C. Thakuri
   a. Bam
   b. Chand
   c. Chhantyal
   d. Hamal
   e. Hitan
   f. Kalyal
   g. Khati
h. Malla
i. Rakal
j. Shaha
k. Shahi
l. Singh

D. Chhetri
a. Adhikari
b. Aidi
c. Baduwal
d. Baniya
e. Basnet
f. Bhandari
g. Bista
h. Bogati
i. Bohora
j. Budha
k. Budha Thapa
l. Budhathoki
m. Dhami
n. Dharala
o. KC
p. Karki
q. Kathayat
r. Kunwar
s. Khadka
t. Khatri
u. Mahat
v. Rawal
w. Rawat
x. Rokaya
y. Sejuwal
z. Swar
aa. Thapa

E. Magar
a. Thapa

F. Newar
a. Nagarkoti
b. Shrestha

G. Tamang
H. Thakali
a. Bhattachan
b. Sherchan

I. Bhotia
a. Amdu
b. Khampa

J. Dalits
a. Kami
   i. Bishwakarma
   ii. BK
b. Sunar
c. Sarki
   i. Kulal
   ii. Bhul
d. Damai
   i. Pariyar
   ii. Nepali
Appendix 10: Traditional weighing and measurement system used in Jumla

Area

1 hal = 0.08 hectare (refers to an area that can be ploughed by two oxen in one day)
1 khet muri = 100 mato muri
4 mato muri = 1 ropani
1 khet muri = 1.2718 hectare
1 mato muri = 0.0127 hectare
1 ropani = 0.0509 hectare
1 hectare = 0.7863 khet muri
1 hectare = 78.6257 mato muri
1 hectare = 19.6564 ropani

Length

1 hat = approximately 45 centimeters (this unit of length is determined by the distance between a person’s elbow and fingertips and is most commonly used in measuring cloth)
1 kos = 3.658 kilometers

Weight

1 tola = 11.664 grams (this unit is used to measure items of high value such as gold, silver, musk, and hashish)
1 maund = 15.595 dharni
1 dharni = 3 sher
1 sher = 4 pau
1 maund = 37.325 kilograms
1 dharni = 2.393 kilograms
1 sher = 0.798 kilograms (in Terai areas of Nepal 1 sher = 0.933 kilograms)
1 pau = 0.200 kilograms (in Terai areas of Nepal 1 pau = 0.250 kilograms)
1 kilogram = 0.027 maund
1 kilogram = 0.418 dharni
1 kilogram = 1.253 sher
1 kilogram = 5 pau

Volume

1 muri = 20 pathi
1 dun = 16 pathi
1 supo = 8 pathi (approximately 32 kilograms)
1 pathi = 8 mana
1 muri = 90.909 liters
1 pathi = 4.545 liters
1 mana = 0.568 liters
1 liter = 0.011 muri
1 liter = 0.220 pathi
1 liter = 1.760 mana

(The 8-mana pathi is the standard throughout Nepal. However, in Jumla a 4-mana pathi (i.e., ½ standard values) is commonly used)
Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:
Gaire, Kamal Raj

Title:
Withdrawing, resisting, maintaining and adapting: food security and vulnerability in Jumla, Nepal

Date:
2015

Persistent Link:
http://hdl.handle.net/11343/55442