Markets and livelihoods

Bringing a livelihood perspective to the apple value chain in Jumla, Nepal

Utrecht University
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EXECUTIVE SUMMARY

The remote districts in the mountains of western Nepal belong to one of the poorest and least developed regions in the world. For this reason, the International Fund for Agricultural Development (IFAD) and SNV Nepal implemented a poverty alleviation project. This project focuses on strengthening a value chain of apples from Jumla district, which is a place where the conditions are very suitable for cultivating apples due to the district's low rainfall, high altitude and favourable temperatures. One of the objectives of the project is giving market access to poor people in order to improve their livelihoods, by including them into the value chain.

There is thus a clear need to comprehend the potential for including poor farmers into the value chain and to understand how people's livelihoods can and should be improved. For this, however, it is necessary to first understand their livelihood strategies, their assets, and the context they live in. Therefore, in this thesis it is argued that a multidisciplinary approach is necessary to examine this context, their livelihoods, and how they relate to the value chain. This research uses the livelihood approach to complement the value chain analysis, because it provides a complete picture of the dynamics that are affecting people's lives, and which are directly or indirectly influencing the cultivation of apples. The main research question of this thesis was thus formulated as follows:

> *What new insights does the livelihood approach provide to the involvement of smallholder farmers in the apple value chain in Jumla?*

Research setting

This research took place from February to June 2011 in the district of Jumla, which is located in the Mid-Western Development Region of Nepal. For the combination of a value chain analysis and a livelihood approach, 68 respondents were interviewed in semi-structured household surveys. In addition, several key informants were interviewed and existing studies on the district were reviewed.

While the geography of the region is favourable for the cultivation of apples, at the same time it provides enormous difficulties for the trade of apples (and other products). As one of the most remote districts in Nepal, Jumla is only connected to the national road system by the Karnali Highway, a dangerous and oftentimes impassable road. It takes approximately two full days by bus to travel its length of 232 km to Jumla. Therefore, while the marketable production of apples in Jumla district amounts to approximately 1,900 mt per year, only 200 mt can be exported. A large part of this export happens by airplane, which is heavily subsidised by the local authorities.

Besides the geography and the lack of proper infrastructure, other important contextual factors were identified which influence people's livelihoods and the cultivation of apples. The main factors which were found related to the social ostracising by caste or gender, and an abundance of external factors which included natural disasters, civil unrest, and the monsoon season.

Main findings

In several cases, the livelihood approach did indeed provide new and useful insights. In other cases, the conclusions that were reached with a value chain analysis were confirmed by the livelihood approach. This is also a valuable result from combining these approaches, because data triangulation is provides better and more solid conclusions. The conclusions from this combined approach are presented below.

The value chain arrangement

In the Jumla apple value chain, the District Federation of Cooperatives (DFC) in Jumla acts as a middle-man between the anchor firm in Kathmandu and the farmers in Jumla. The contract is signed between the anchor firm and the DFC, while there is merely an informal arrangement between the DFC and the farmers. It was found that this particular value chain arrangement results in the DFC enjoying most of the benefits of assured demand and fixed prices. In contrast, the farmers bear most of the production risks. These production risks are numerous and very diverse, and include pests and diseases or natural disasters like hailstorms or droughts. It is recommended that the contract arrangement should be changed, so that the market certainty is extended to those farmers. In addition, the production risks should be mitigated by an insurance scheme provided by the other stakeholders in the Jumla apple value chain.

Airfare subsidy

The main stakeholders in the value chain argue that the transportation subsidy by the local authorities for the export of apples by air is necessary to improve the competitiveness of the Jumla apple. However, this subsidy could be counterproductive if it drives those farmers out of the market who are not supported by the subsidies. Hence, the subsidy would be retaining the inefficient farming practices and be decreasing the overall quality of the exported apples, while putting other entrepreneurs out of business. Furthermore, the subsidies do not yet address the lack of flights leaving Jumla. As said above, still only 200 mt of the 1,900 mt of high-quality apples can be exported. This leads to the conclusion that at least part of the subsidies should be used to increase the availability of flights leaving the district, because if a higher proportion of the Jumla apples can be exported, a higher proportion of the people could benefit.

Investments

During the monsoon season, the road which connects Jumla to the rest of Nepal becomes impassable and the transportation by plane becomes very difficult. This is also the time of harvesting apples, so the high supply of apples results in plummeting prices in Jumla. As a result, large amounts of apples decayed while waiting for the transportation to resume. Apples which are not exported within a short time after the harvest will degrade quickly, which makes them unsuitable for sales outside Jumla. Furthermore, in the months after most of the export has taken place, the prices of apples in

the *Terai* and Kathmandu rise quickly. Hence, as long as the apples are kept fresh there are opportunities for profitable exports of apples. Therefore, proper storage facilities are necessary to expand the Jumla apple value chain and to let more poor farmers benefit from the export of apples, which is thus a complementary solution to increasing the amount of flights.

Inputs and credit

Besides these problems of transportation there is also the issue of quality. As said before, a total of 1,900 mt of apples was found suitable for export. However, the total amount of apples produced is approximately 5,000 mt per year. Hence, the majority of apples produced is of low quality. Some of the causes were identified as the low quality and availability of inputs for apple farming. In addition, there is a lack of access to credit facilities which prevents farmers from investing in their orchards. Both the inputs and credit could in theory be provided by the anchor firm or by the DFC by arranging it in the contract arrangement.

However, the poorer households are reluctant to use credit, because they do not have any alternative income sources with which they are able to repay the loan. Moreover, most of the loans are not used productively but only as short term relief from natural disasters or personal tragedies. This has led to serious indebtedness in several cases. Therefore, while it is recognised that the use of credit can bring benefits to the cultivation of apples and thereby to the farmer's livelihood, the findings from this thesis lead to the recommendation to be careful with the provision of credit.

Livelihood patterns

The research identified seven livelihood patterns amongst the respondents. Each pattern contains people who have to some extent similar backgrounds and make similar choices in their livelihood strategies. These patterns give a good idea of their main income sources and livelihood activities.

First, subsistence farmers have minimal participation in markets and are consuming most of their own agricultural production instead of selling it. The basis of their livelihoods lies in natural capital (their land and livestock). Second, day labourers are employed and paid per day, so they have little income certainty. In addition, they are often nearly landless and mostly of the *Dalit* caste. Day labourers are very dependent on human capital (their skills and health). Third, job holders are employed for a longer term, mostly at one of the many local government offices and NGOs in the district capital. They have a relatively high degree of income certainty. Fourth, business owners can own a variety of businesses and have generally average income levels. Fifth, livestock keepers hold mainly goats, sheep or horses. Their reliance on natural capital makes them rather vulnerable to specific external factors like diseases among their livestock. Sixth, households with diversified livelihoods draw their income sources from different sectors amongst the five livelihood capitals. As no single activity dominates their household income, it implies they are quite resilient to the vulnerability context. Finally, welfare dependent households mainly have incomes from social welfare and pensions, for which they do not have to put in any effort or time. They are very

dependent on the continuation of governmental social security payments, without which they will have hardly any alternative income sources.

Income from apples

It was found that people in some livelihood patterns benefit only marginally from the apple trade, while people from other patterns seem to do relatively well. The amount of landholdings and the experience in apple cultivation and trading were identified as important determinants for the amount of income the farmers can get from apples. However, it was recognised that these indicators are not the only decisive factors and that the situation is infinitely more complex.

Two other important aspects with regards to the income from apples which have come to light are that a) *Dalit* are benefitting less from the cultivation of apples, and b) the women in the household have to carry out most of the work in cultivating apples, while most of the profits are gained by their husbands. *Dalit* have fewer opportunities for cultivating apples than the higher castes, because they have lower landholdings, a relative lack of experience, and a lack of income from other sources which can be invested. Finally, the *Dalit* continue to be discriminated against in the communities because of their caste. Women have likewise a lower social status, which results amongst others in the fact that they have to bear the majority of the workload from cultivating apples, besides already doing almost all the household chores and most of the work on the farm. Hence, this shows the need for the Jumla apple value chain to become inclusive of the poorest and most deprived people, which include the *Dalit* and women.

Food security

The food security of the apple farmers in Jumla was examined because it is a major part of their livelihoods and a recurrent problem in the district. On a district-level it was found that there is a lack of food availability because of insufficient food production in the district on the one hand, and dysfunctional markets (caused by the lack of infrastructure) which prohibit the import of sufficient food, on the other hand. It was found that the food security on a household-level is influenced by both the household's food production and the household's income. A related finding is that all the 'coping strategies' in reaction to shocks, stresses and seasonality, are ultimately aimed at either increasing the income or increasing the availability of food. With regards to the Jumla apple value chain it was concluded that the cultivation of apples is not crowding out the production of food crops by means of competition for land, because 'intercropping' allows for simultaneous production of food crops and apples on the same plot. However, the seasonality aspects of the farming-related workload, of the labour prices and of migration do suggest that farmers might be forced to choose between harvesting food crops and harvesting the cash crops (the apples) because of a lack of labour, which is worrisome.

Closing remarks

Combining the value chain analysis and the livelihoods approach, as in this thesis, should give a more comprehensive and realistic understanding of the structure of certain markets and their potential to improve the livelihoods of poor people (Kanji et al., 2005). This thesis has given guidance on how to cautiously attempt to improve the Jumla apple value chain by investing in storage facilities, and providing inputs and credit. Furthermore, it was reported that the income benefits of the Jumla apple value chain are not shared equally among different livelihood patterns, castes and gender. The thesis provided insights into the risks that the farmers have to deal with while cultivating apples, and indeed in their other livelihood activities as well. In conclusion, the added value of using these complementary approaches when researching market-based livelihoods has become obvious from this thesis. It is therefore argued that the use of multidisciplinary and complementary approaches should become common practice in development research, in order to arrive at comprehensive interpretations and recommendations which are policy-oriented.

TABLE OF CONTENTS

ABBREVIATIONS

4S	Surya Social Service Society
ADB	Asian Development Bank
AEC	Agro Enterprise Center
B.C.E.	Before the Common Era
CBS	Central Bureau of Statistics
C.E.	Common Era
CFUG	Community Forest User Group
CPA	Comprehensive Peace Accord
CPN-Maoist	Unified Communist Party of Nepal - Maoist
DADO	District Agricultural Development Office
DCCI	District Chamber of Commerce and Industry
DDC	District Development Committee
DFC	District Federation of Cooperatives (Jumla)
DFID	Department for International Development
GCC	global commodity chain
GDP	gross domestic product
GVC	global value chain
ha	hectares
HDI	Human Development Index
HVA-IB	High Value Agriculture – Inclusive Business (pilot project)
HVA	High Value Agriculture (project)
IB	Inclusive Business
ICG	International Crisis Group
ICIMOD	International Centre for Integrated Mountain Development
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
JAPC	Jumla Apple Processing Centre
JHRS	Jumla Horticulture Research Station
kg	kilogram
km	kilometre
KIRDARC	Karnali Integrated Rural Development & Research Center
LARF	Local Agricultural Resource Farmers
MAPs	Medicinal and aromatic plants
m.a.s.l.	meters above sea level
MoAC	Ministry of Agriculture and Cooperatives
MoFSC	Ministry of Forests and Soil Conservation
mt	Metric ton
NARC	Nepal Agricultural Research Council
NFC	Nepal Food Corporation

NGO	Non-Governmental Organisation
NRP	Nepalese Rupee
NTFPs	Non-Timber Forest Products
Rs	Rupees (Nepalese rupees, unless stated otherwise)
SLF	Sustainable Livelihoods Framework
SNV	Netherlands Development Organisation
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USD	USA Dollars
VDC	Village Development Committee
WFP	World Food programme

CONVERSIONS

Currency

The currency unit used throughout this thesis is the Nepalese Rupee (NPR): [1]

Euro 1.00 = NPR 100.92

NPR 1.00 = Euro 0.0099

Weights

The international metric system is used throughout the thesis, with the possible exception of:

1 dhoko = 50 kilograms of apples (i.e. a 'wicker basket' full) – see plate 4 (appendix D)

Surface

The thesis uses the Nepali unit for measurement of surface areas, the *ropani*. This unit is used in the highlands, although the exact size can differ per region.

1 ropani = 0.05 hectares = 500 square meters

1 hectare = 20 ropani

1 hall[2] = 2 ropani

[1] Rates are taken from April 3, 2011. Source: www.xe.com

[2] A hall is defined as a piece of land with a size that can be ploughed by a man and a pair of oxen in one single day, and therefore a very imprecise unit of measurement.

LIST OF TABLES AND FIGURES

BOXES

TABLES

FIGURES

INTRODUCTION

Nepal is among the poorest and least developed countries in the world, and is (after Afghanistan) the second least developed country in Asia (UNDP, 2011). Almost two-thirds of the population earns less than USD 2 per day (SNV, 2011). Approximately three-quarters of Nepali live in rural areas, and agriculture provides for nearly 80 percent of the employment in the country. However, most of the agricultural work consists of subsistence farming on small plots, with low soil quality, limited access to credit, insufficient infrastructure, and a lack of markets (Rastra Bank, 2008, p.1).

In this context, cash crop production is one of the few activities which can generate income and provide employment. For this reason, many non-governmental organisations (NGOs) in Nepal choose to focus on this sector as a means for poverty alleviation. For one particular project funded by the International Fund for Agricultural Development (IFAD), SNV Nepal is conducting a pilot by strengthening the apple value chain in Jumla district. The production of deciduous fruits like apples is quite limited in Nepal. As a result, large quantities are imported from India and China to meet the growing domestic demand (SNV Nepal, 2011, p.10). Therefore, there is enormous potential to expand this sector and substitute the imports by boosting the domestic production.

The Jumla apple value chain has already been studied to some extent. However, the tendency was to look at the value chain from a national perspective and with an economic outlook. Nevertheless, one of the objectives of the project is to improve people's livelihoods by providing them with market access. But how can one understand the potential for improving people's livelihoods without understanding their livelihood strategies, their assets, and the context they have to operate in? Therefore, in this thesis it is argued that a multidisciplinary approach is necessary.

With the value chain as a starting point, it is argued in this thesis that the livelihood approach can be complementary to the value chain by providing a complete picture of the dynamics that are affecting people's lives and directly or indirectly the cultivation of apples. Hence, the value chain analysis will be combined with an analysis from a livelihood approach, which entails not just a choice in perspective but also in methodology. With regards to the contents, this study will assess the dimensions of the livelihoods in Jumla district and explore Jumla's apple value chain as a means to increase the income of the poorest people in Jumla, thereby reducing their vulnerability and food insecurity.

The main objective of this research is to gain insight into the livelihoods of Jumla's apple farmers, and to examine how these livelihoods influence their participation in the value chain, as well as vice versa. Furthermore, the aim is to provide some recommendations on how to improve both the livelihoods and the value chain. The main research question which will guide the thesis to these outcomes was formulated as follows:

> *What new insights does the livelihood approach provide to the involvement of smallholder farmers in the apple value chain in Jumla?*

In chapter 1, the theoretical backgrounds of the value chain analysis and the livelihoods approach are provided, as well as the reasoning behind combining these approaches for this thesis. In chapter 2, the regional context provides a detailed background to the geographical, historical, and political circumstances that have shaped the current situation in Nepal in general and in Jumla in specific. In chapter 3, the different production stages in the value chain as well as the challenges that have been identified will be discussed. In chapter 4, the five 'livelihood capitals' for the people in Jumla will be examined, with a focus on the implications for the value chain. In chapter 5, it will be shown which external factors affect people's livelihoods and chapter 6 will examine how people respond to these external factors. Finally, chapter 7 will be the conclusion of the thesis in which it will be attempted to answer the main research question and to provide policy recommendations to improve both the livelihoods and the value chain in Jumla.

CHAPTER 1 – THEORETICAL FRAMEWORK

This chapter will provide the rationale behind the main objective of this research as well as the methods employed to obtain the answers to the research questions. Before the research questions for this thesis can be clarified, two strands of theory need to be explained. First, the value chain analyses will be reviewed. Second, a close look at the livelihood approach as a tool for development research will be taken. As a combination of these approaches could give more insight into the potential to improve the livelihoods of poor people, this study will attempt to extend the knowledge of the value chain with an extensive livelihood research. The theory at the basis of these approaches will be explained in section 1.1 (livelihoods) and 1.2 (value chain), respectively.

The research questions of this thesis will be formulated in section 1.3. Subsequently, in section 1.4 the 'conceptual model', which is a simplified illustration of the main concepts described in this thesis and the way they influence each other, will be explained. The model functions as the structure of this thesis, as these concepts are used to arrange the empirical chapters. The methodology used and the limitations encountered are discussed in section 1.5.

1.1 Value chains & contract farming

Since its inception in the 1970s, the interest for value chain analysis as a tool for examining the organisation of the global economy has grown incessantly. It has been widely adopted in economic sectors ranging from fruit, to garments, to automobiles. Value chain analysis has proven to be a useful tool for firms, government policy makers and development workers alike (Gibbon et al., 2008; Bair, 2005; Kaplinsky & Morris, 2001).

The essence of a value chain is that there are producers who supply their goods to 'anchor firms', which are the top of the chain. In between these two, several other activities and actors can be found. See for example figure 1.1, which represents a value chain as several linked production processes. Kanji and others succinctly define a value chain as "a set of value-adding activities through which a product passes from the initial production (...) stage to final delivery to the consumer" (Kanji et al., 2005, p.9). Nevertheless, there are plenty of varying definitions and explanations regarding the workings of value chains. In the subsection below, first the evolution of value chain theories will be examined. Subsequently, various aspects of the coordination of value chains will be under discussion. In particular, the concept of contract farming will be extensively examined.

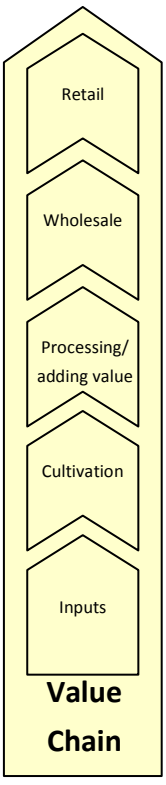


Figure 1.1 – Value chain activities

1.1.1 Evolution

The concept of the value chain as a tool for economic analysis has been derived from different theoretical backgrounds. In 1977, Hopkins and Wallerstein introduced an analysis where they would take a final product and trace back all the inputs (including labour, raw materials, transport, etc) that led to this product. This would provide a cluster of linked processes which would be termed the 'commodity chain' (Hopkins & Wallerstein, 1977, p.128). This concept originated from the school of world systems theories, a perspective on world history and social change that argues there is "but one world economy, driven by capital accumulation" (Desai & Potter, 2008, p.102) and that the unequal power relations have shaped the world into the unevenly developed regions (Hopkins & Wallerstein, 1977, p.117).

Arguably the first author to popularise the concept of value chains was Michael Porter. In 1985 he introduced the value chain as a management tool for within the firm (Porter, 1985). A simple representation of this concept is figure 1.2, below. With this value chain, he differentiated between primary activities and supporting activities of the firm. Most importantly, this was a tool for analysing the value added by each activity. The activities that add value should be kept within the firm, while the activities that do not should be either abolished or outsourced. In the subsections below, it will be shown how this question remains at the core of the organisation of value chains.

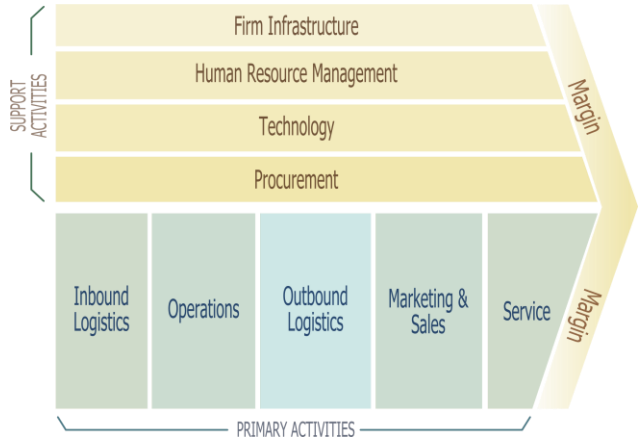


Figure 1.2 – Porter's Value Chain
Source: Wikimedia Commons (2010).

Porter's value chain received plenty of criticism. Clearly, his concept was limited to a firm-level analysis, thus "neglecting the analysis of up-or downstream activities beyond the company" (Faβe et al., 2009, p.5). This, amongst others, would be addressed by the 'global commodity chain' (GCC) approach of Gereffi and Korzeniewic (1994). The GCC was originally derived from the commodity chain from Hopkins and Wallerstein (1974), but there are significant differences between the two approaches. For one, the world systems theories focus on "how commodity chains structure and reproduce a stratified and hierarchical world-system" (Bair, 2005, pp.155-156). Contrariwise, the GCC approach would move its research away from the long-term historical analysis and "concentrate on an organisational approach to studying the dynamics of global industries" (Bair, 2005, p.158).

Gereffi would neatly summarise the concept of the global commodity chains as "functionally integrated, but geographically dispersed systems of production" (Gereffi, 1994, p.96). Gereffi and Korzeniewic would lay down the elements of the GCC framework in their book 'Commodity chains and global capitalism' (1994). There are four dimensions to the GCC framework by which to analyse the value chain:

1) Input-output flows – consist of the "products and services linked together in a sequence of value adding economic activities" (Faβe et al., 2009, pp.5-6).

2) Geographical configuration – where the geographically dispersed economic activities of the value chain take place.

3) Institutional framework – the enabling or constraining structures and processes which affect the conditions under which the value chain has to function.

4) Governance – which actor has the (bargaining) power, to what extent there is coordination within the chain, and how they are shaping the value chain.

All of the four aspects above will feature extensively in the coming chapters. The first, input-output flows, does not need extensive explanation as it is to a large extent also part of the other theories described here. The second dimension, the geographical configuration, stems from the known fact (and the rather forthright use of the word 'global') that the global commodity chains consist of economic activities that are geographically dispersed. Both have therefore been sufficiently discussed, and will be used in chapter 3 on value chains. With the third aspect, the institutional framework, Gereffi recognises that value chains are not closed systems, but are influenced by a large variety of institutions like trade unions, national governments or international organisations. In subsection 1.2.5 it will be seen that 'informal structures and processes' are also part of this institutional environment and are equally affecting value chains. Finally, the concept of governance ultimately deals with the question 'who gets what?' – not unimportant for an economic analysis. The academic discourse on this subject will be examined in section 1.1.2.

Before moving on, however, there is one final strand of value chain discourse which needs to be mentioned here. This latest schism in value chain research produced the 'global value chain' (GVC) approach. According to Bair (2005) the GVC approach distinguishes itself from the GCC approach by its focus on the meso- and micro levels of value chains, as opposed to the holistic and macro perspective of the GCC approach. She argues that this resulted in a greater interest on the policy implications of value chain research (Bair, 2005, p.154). Interestingly, it was Gereffi himself – the founder of the GCC approach – who argued that "the global commodity chains framework did not adequately specify the variety of network forms that more recent field research has uncovered" (Gereffi et al., 2005, p.82). Hence, the GVC approach examines the different forms of governance within chains more thoroughly, as will become clear in the following subsection, where coordination in value chains will be discussed.

On a side note: Scholars already concluded in 2001 that the terminology of the value chain "was adopted over several widely-used alternatives because it was perceived as being the most inclusive of the full range of possible chain activities and end products" (Gereffi et al., 2001, p.3).

Therefore, in this thesis the generic term 'value chain' will be used instead of the other concepts which were described above.

1.1.2 Value chain coordination

As mentioned before, one of the four core dimensions to the GCC framework of Gereffi & Korzeniewic (1994) is governance (or coordination). The value chain is fragmented amongst several geographically dispersed activities and actors. The term 'chain' already implies there is some structure or repetitiveness to the concept. The feature that most distinguishes the value chain from spot-market arrangements, therefore, is the extent of coordination. The dominant actors in the chain impose certain parameters under which all other actors in the value chain should operate (Humphrey & Schmitz, 2008, p.261).

The concept of chain coordination deals with the linkages between the actors and the distribution of power within the value chain (Faβe et al., 2005) and with defining the parameters to products, production processes, and logistics (Kaplinsky & Morris, 2001, p.29). This coordination can include for example quality, safety, labour and environmental standards. Therefore, an important issue for the firm is how to organise the value chain (in other words, what level of chain coordination is needed), which may be dependent on financial motivations, but also for example on the complexity of products and production processes (Humphrey & Schmitz, 2008, p.261).

From his GCC approach, Gereffi came to a distinction between producer-driven value chains and buyer-driven value chains, based upon the actor which is dominant and exerts its power throughout the chain. The first are chains where key-producers somewhere in the value chain handle the coordination of the chain. Usually these consist of capital- and technology-intensive industries. An example is the automobile-manufacturing industry, which coordinates both their backward (input suppliers) and their forward (car dealers) linkages in the chain. Second, the buyer-driven value chains are characterised by large retailers which are at the 'top' of the chain. These chains usually comprise labour-intensive industries (Kaplinsky & Morris, 2001, pp.32-33).

With his GVC approach, Gereffi elaborated on his organisational typographies. He distinguished three variables which would determine the extent of value chain coordination. They are: (a) "The complexity of information and knowledge transfer required to sustain a particular transaction", (b) "the extent to which this information and knowledge can be codified", and (c) "the capabilities of actual and potential suppliers in relation to the requirements of the transaction" (Gereffi et al., 2005, p.85). Combining these variables, Gereffi concluded that there are five value chain types which can be found. They are presented in figure 1.3 below.

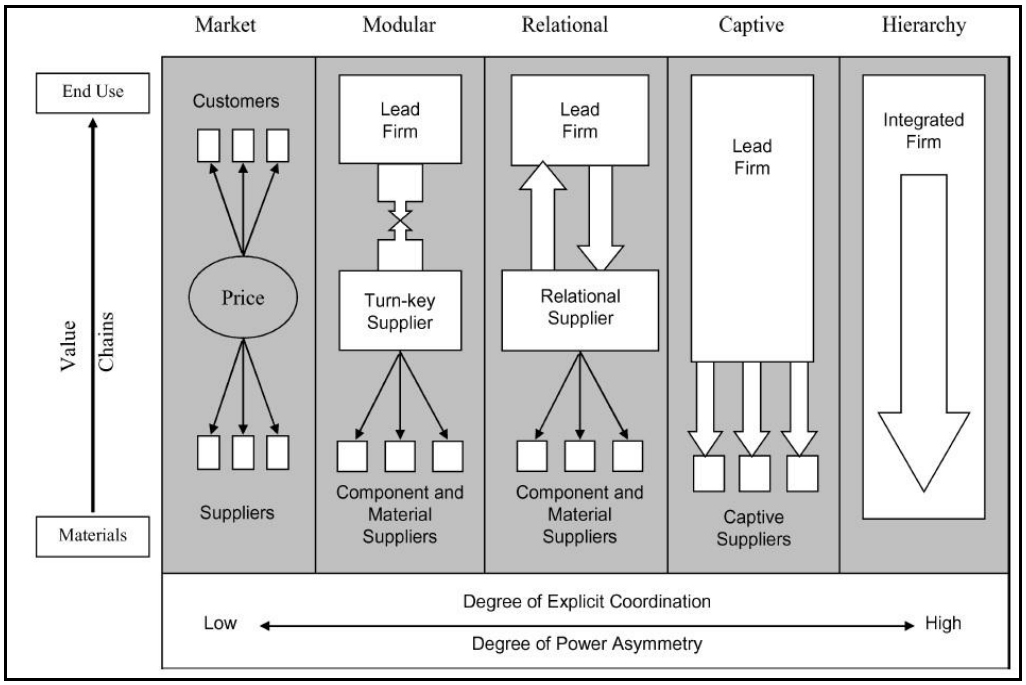


Figure 1.3 – Value chain governance types
Source: Gereffi et al. (2005) p.89.

These five types of value chains in figure 1.3 are positioned along an axis denoting the degree of governance (or coordination) and the degree of power asymmetry. At the far left, the spot-market knows little to no (explicit) coordination. Conversely, at the far right the integrated firm is found, which entails that all production activities are owned by the same firm and there is a large extent of coordination. In the middle, the modular, relational and captive value chains are presented. In modular value chains, substituting suppliers and buyers is still relatively easy. In addition, the degree of power asymmetry is relatively low due to the fact that both suppliers and buyers deal with multiple partners, which leaves them rather independent. In captive value chains, the power and coordination is applied directly by the anchor firm to its suppliers. This suggests a relatively high degree of explicit coordination and power asymmetry. Finally, in the middle of the horizontal axis the relational value chains are found, which are characterised by a more balanced degree of power asymmetry and coordination between actors because both suppliers and buyers have essential competences. Explicit coordination is established through dialogue between more or less equal partners, as opposed to the more unilateral flow of instructions and coordination from the anchor firm to its suppliers as in captive and hierarchical value chains (Gereffi et al., 2005, pp.85-87).

Building on Gereffi's framework, Riisgaard reformats the types of value chains in the context of small producers in developing countries. He arrives at three forms (Riisgaard, 2008, in Bolwig et al., 2008, pp.12-13):

> "(1) market (spot or repeated market-type inter-firm links), (2) hierarchy (vertical integration – when an actor performs several functions), and (3) contractualisation (between 'market' and 'hierarchy', encompassing 'modular', 'relational' and 'captive')."

Likewise, Simmons uses the same framework for agribusinesses. While here too there are many other arrangements possible along the continuums of vertical (dis)integration, power asymmetry and coordination of the value chains, three archetypes can be distinguished for agribusinesses. These are again spot-market and complete vertical integration, and thirdly contract farming (Simmons, 2002, pp.3-4). In the next subsection, contract farming will be discussed thoroughly.

1.1.3 Contract farming

In agriculture, the most common manner for producers to sell their crops is to sell on the spot-market, where they receive prices based on the quality and quantity of their products, as well as the value that buyers place on that particular crop, on that particular day (Simmons, 2002, p.3). In this kind of market arrangement, no explicit coordination takes place between buyers and suppliers before meeting on the marketplace. The other extreme is where agribusinesses vertically integrate the entire chain, so as to own all the activities in the chain from production to retail. An example of this practice in agriculture is a plantation. One alternative to these two extremes is contract farming.

Contract farming is commonly defined as “an agreement between one or more farmer(s) and a contractor for the production and supply of agricultural products under forward agreements, frequently at predetermined prices” (Eaton & Shepherd, 2001, in Bijman, 2008, p.3). A different definition from the US State Department of Agriculture recognises that the “market-quantity, grade, size, inspection, [and] timing” are often specified in the contract before the actual production takes place. An even more elaborated definition from Bijman suggests that contracts oftentimes also include the level of support to the producers in the form of inputs and technical assistance. He summarises the core of contract farming as “a commitment on the part of the farmer to provide a specific commodity in quantities and at quality standards determined by the contractor and a commitment on the part of the contractor to support the farmer’s production and to purchase the commodity” (Bijman, 2008, p.3).

The organisation of the agricultural value chain by means of contracts between the producers and buyers is widespread around the world. Recent trends in the international economic environment, including changing consumer demands and governmental policies, have resulted in an increase in the practice of contract farming, especially in developing countries. For instance, the proliferation of supermarkets throughout urban areas in both developed and developing countries require more vertical coordination as they favour centralised purchasing, (consistent) product quality, and an ensured supply (Bijman, 2008, p.1 and Da Silva, 2005, p.3).

In short, Da Silva can be followed in his conclusion that contract farming has resurged in agri-food value chains as “a way to lower costs by improving productivity, improve and ensure quality throughout the chain, control risks associated with markets and food safety and enhance responsiveness to demand”(Da Silva, 2005, p.10). Below, the chapter will elaborate on the types of contract farming arrangements that can be found, and the types of contracts that are used.

Contract farming models

Throughout the world, there is a wide range of different contractual arrangements between producers and buyers. The diversity is a direct result of the technical requirements of production, the production costs and the transaction costs (Bijman, 2008, p.3). Eaton & Shepherd make a distinction between five broad models of contract farming, which depend amongst others on the type of product, the intensity of vertical coordination of the chain, and the number of key stakeholders involved (Eaton & Shepherd, 2001):

a) Centralised model.

An anchor firm or trader buys products from a large number of (smallholder) farmers. There is strict vertical coordination, which includes quality controls and pre-determined quantities. Usually, the products in this model need a high degree of processing, like sugar cane, coffee, tea, etc. It is implied that this model also includes 'extension services'[3] from the contractor to the farmers.

b) Nucleus estate model.

The anchor firm owns production facilities himself, but besides that also buys from independent farmers. Sometimes, the estate is used only for research and breeding.

c) Multipartite model.

This model comprises a joint venture between a private firm and another organisation, which could be anything from a government agency to a village committee or NGO. The joint venture subsequently signs the contracts with the producers. In addition, partnerships with providers of credit, services or inputs may also be part of the arrangement.

d) Informal model.

Anchor firms are contracting informally with farmers, often on a seasonal basis with crops like fresh fruits and vegetables. These crops usually require little more processing than sorting, grading and packing. As the contractors do not provide supporting services, the success of the informal model depends on the availability of public supporting services.

e) Intermediary model.

In this model, at least three actors are part of the arrangement. An anchor firm contracts with a trader or processor, who successively trades (formally or informally) with the farmers. Clearly, this can be considered as a combination of the centralised and the informal contract farming models. However, there is no direct link between the anchor firm and the farmer, and it could therefore pose problems with regards to vertical coordination and providing incentives. The anchor firm has no control over the arrangements between the trader and the farmers. In fact, Eaton and Shepherd argue that "[t]his can result in lower income for the farmer, poorer quality standards and irregular production" (Eaton & Shepherd, 2001, p.55).

[3] In this context, agricultural extension means educating farmers about (new) agricultural practices (i.e. technical assistance), but can sometimes also encompass communication, business or other skills.

Type of contract

A widely used distinction between the different types of agricultural contracts is the typology of Mighell and Jones, originating from 1963. They distinguish three archetypes of contracts, which differ in their objectives, the level of decision-rights for farmers, and the transfer of risk between farmers and contractors (Bijman, 2008, pp.4-5 and Da Silva, 2005, p.11).

a) Market specification contracts: The contract stipulates what kind of products will be produced and what the quality attributes need to be, as well as the agreement on the future sale: the timing, the location, and the price.

The farmer's uncertainty of finding a market is reduced. While the farmer retains most of the decision rights over the production activities, he or she also bears most of the risk. Compared to spot-market conditions, this type of contract can reduce transaction costs (i.e. no need to find markets or products of the proper quality and price, all at the proper time) and coordination costs by increasing the information exchange. The latter is particularly important for crops which are perishable, of complex quality, or new (niche) products.

b) Production management contracts: The contract provides technical regulations to the farmers on how to produce their crops. This can entail production processes and/or specify the input usage, both of which will be controlled by the company.

In this type of contract, a significant part of the decision rights over the production activities is transferred from the farmer to the anchor firm. However, the anchor firm takes on most of the market risks. This type of contract specifies production processes to obtain better quality, timing and (presumably) least-cost production, thereby lowering the coordination costs even more.

c) Resource providing contracts: The contract adds the provision of inputs for the farmers (usually provided on credit and in-kind, the costs will be subtracted from the price on product delivery).

This type of contract can include some production management, whereby the firm stipulates the input usage. In this case, part of the decision rights and the market risks are transferred to the anchor firm. However, the firm can also limit itself to providing inputs and purchasing the products, thus leaving most of the decision rights and risks with the farmer. This type of contract reduces the costs of obtaining inputs, credit and supporting services. Usually, this type of contract is applied to crops for which the quality of the outputs is very dependent on the type and quality of the inputs.

1.1.4 Contract farming for smallholder farmers

This subsection will move beyond the top-down approach which focuses on linkages, chain coordination and abstract suppliers and buyers. Indeed, there is ample literature which focuses on the effects of contract farming on smallholder farmers.

Smallholder farmers in developing countries have to deal with three main constraints when trying to increase their income and their productivity (Bijman, 2008, p.14):

1) Lack of information about production methods and market opportunities
2) Lack of (access to) financial resources
3) Small subsistence farmers are more risk averse than large farmers

Bijman argues that contract farming has the potential to solve these constraints, through:

- Reduced risk in marketing and production
- Improved access to technical assistance, inputs and credit

Indeed, a contract reduces the uncertainty of demand for the product as it stipulates the minimum amount that will be obtained by the buyer and the price will be established beforehand. The access to technical assistance, inputs and credit are quite dependent on the provision in the contract, as was seen in the previous subsection. Finally, Bijman implies that the contract could partly solve the information gap, as there could be some information exchange between the anchor firm and the producer (Bijman, 2008, p.14). Interestingly, contract farmers sometimes mention intangible benefits, e.g. higher status, as a positive effect of contract farming (Masakure & Henson, 2005).

Negative effects of contract farming

Despite the high potential for poverty alleviation that is ascribed to contract farming, there are serious dangers and possible negative effects that need to be addressed. The relationship between the anchor firm and the producer is an unequal one. Most negative aspects of contract farming are a result from the dominant position of the anchor firm, who is able to exercise power in the negotiations and engage in monopsonistic[4] behaviour (Da Silva, 2005, p.17). In the simplest terms, firms with bad intentions can use their power to gradually impose lower prices or manipulate the farmers with complicated price formulas, delivery schedules, or contractual clauses. When inputs and technical assistance are provided, farmers could become dependent on the particular firm (thus greatly lowering their bargaining position). When access to credit is part of the deal, farmers can become indebted to the firm. In the absence of effective legal enforcement of contracts by the government, firms could renege on their contracts when other, more profitable opportunities come along.

Smallholder versus large-scale farmers

Despite the aforementioned potential to poverty alleviation for smallholder farmers, clear limits to the inclusiveness of smallholders can be found. Some scholars discovered an explicit preference of anchor firms to engage in contracts with large-scale farmers, as opposed to smallholder farmers. The main reason seems to be that there are lower transaction costs when dealing with fewer actors (cf. Singh, 2002; Asian Development Bank, 2005; Guo et al., 2005; Simmons, 2005; and Bijman, 2008). These transaction costs are not just limited to the signing of contracts, but include product collecting

[4] A monopsony is the market condition where there is only one buyer, and therefore the opposite of a monopoly.

and quality monitoring and could even extend to providing inputs and additional services. Furthermore, Bijman points out that the chance of contractual default (by the farmer) is reduced when dealing with large-scale farmers. He argues that large-scale farmers usually have more skills and resources available, thus limiting their chance of failure (Bijman, 2008, pp.15-16).

However, some scholars also recognised the opposite to be true in some value chains. For instance, in a vegetable value chain in Costa Rica the smallholder farmers were favoured because of their use of family labour, which is cheaper than hired labour, as well as their high dedication (Pomareda, 2006). An additional example is offered by Birthal and others, who observe that smallholders are preferred because of the following reasons (Birthal et al., 2005, p.21):

> a) In the event of crop failure of a few farmers, it will have less effect on the overall supply of the anchor firm.
>
> b) Using smallholder farmers allows the anchor firm to have more flexibility in responding to changing consumer demand.
>
> c) Smallholder farmers appear to comply more strictly to the anchor firm's prescribed production process, because 1) they use family labour and 2) they have lower bargaining power because of their small size.
>
> d) Smallholder farmers have a low marketable surplus (i.e. little opportunity of side-selling), and are therefore quite dependent on the anchor firm.

In short, the main advantages the smallholder farmers have over large-scale farmers are that they use cheap family labour and that this labour is self-supervised. Bijman concludes therefore that, with contract farming, "the more labour intensive the cultivation, the more competitive advantage the small family farm has compared to large farms" (Bijman, 2008, p.16).

Type of product

Finally, the type of product traded with contract farming is influencing the nature and the benefits of the value chain for smallholder farmers. High-value crops are usually more risky for smallholder farmers to produce than traditional crops. For instance, Simmons argues that the production costs of high-value crops are likely to be higher. Hence, more income is at risk in the case of crop failure. Other aspects he identifies to be common with high value crops are that the price volatility is higher; yield is more uncertain; and these crops are often perishable. In addition, it is already implied that there is some knowledge about or experience with 'traditional' crops, while high-value crops tend to be 'new' or imported. All of these aspects lead to higher (production and marketing) risks for the farmer. If smallholder farmers are to be motivated to produce these high-value crops, they should have some protection against these risks (Bijman, 2008, p.15; Simmons, 2002).

Not surprisingly, contract farming seems to be most suitable when it involves the production of traditional cash crops with a large local or domestic market. An example of this is the peanut value chain in Senegal, where Warning and Key found that farmers do not need to make large investments,

already have the skills and knowledge to produce the crop, and have little uncertainty about the market demand (Warning & Key, 2002).

1.2 Livelihood approach

The livelihood approach is a very useful tool for analysing the opportunities and constraints that people may have in all aspects of their lives. In present-day livelihood studies, the livelihood of a household at its most simple form can be seen as "the means that the household uses to achieve (...) well-being and sustain it" (Messer & Townsley, 2003, p.7). More elaborative, Carney states, in a definition which stems directly from an influential article by Chambers and Conway (1991), that:

> "[A] livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base" (Carney, 1998, p.4, in Kanji et al., 2005, p.4).

The livelihood approach aims to give a better understanding of the lives of people by means of identifying the main factors which affect their livelihoods. This approach is portrayed as providing a multidisciplinary and more comprehensive analysis, as opposed to other approaches which, for example, only have an economic focus (De Haan, 2006, p.139). The livelihood approach is lauded for adding human capital and social capital to the analysis, where previous approaches were limited to conventional resources like infrastructure, livestock and land. Moreover, it emphasised the importance of "flexible combinations of, and trade-offs between, different capitals" (De Haan & Zoomers, 2005, p.33).

In addition, this approach shows that livelihoods are influenced heavily by the shocks and stresses of a 'vulnerability context' (subsection 1.2.4) and the 'institutional environment' (subsection 1.2.5). It is now widely recognised that actors are actively maintaining or changing their livelihoods – often in response to these pressures – which at the time was an important transformation in de development debate. Clearly, these changes follow from an extensive legacy of several scholars, as the following section will highlight.

1.2.1 Evolution

While most contemporary livelihood studies draw heavily from the work of Chambers and Conway (1991), their concepts follow from a range of predecessors with an actor-oriented perspective, as De Haan and Zoomers (2005, pp.27-28) argue. After the 'structure-oriented' approaches of the *dependencia* and neo-Marxism paradigms, several 'actor-oriented' approaches emerged during the 1980s. Contrary to these structure-oriented paradigms, the actor-oriented approaches emphasised the idea that people shape their own future. In addition, they contested the conventional idea that economic matters are necessarily the dominant issue for poor people, and included the concerns for family, network and community (amongst others) into the debate.

Important progress in the debate was achieved with the publication of the Brundtland Report in 1987 (WCED, 1987), which included the most widely used definition of sustainable development up until now. In 1990, the United Nations Development Programme (UNDP) published the first Human Development Report (UNDP, 1990), which attempted to put people in the centre of the development debate. De Haan and Zoomers (2005, p.30) identify these publications as being amongst the direct predecessors of the aforementioned article by Chambers and Conway (1991). Soon, numerous projects and studies followed with livelihood frameworks of their own, which would bring important new insights to the paradigm. These new livelihoods studies of the early 1990s were, according to De Haan and Zoomers, both a reaction to disappointing outcomes of previous development policies based on the prevalent paradigms, and "an expression of the *Zeitgeist*" (De Haan & Zoomers, 2005, pp.29-30).

Another trend of those early actor-oriented approaches, which can still be seen in the current livelihood discourse, was the introduction of an active role of the poor in dealing with a lack of access to resources, as opposed to portraying the poor merely as passive victims. Increasingly, scholars recognised the ability of poor people to adapt to these circumstances. The idea that poor people are actively shaping their own future, based on their capabilities and their access to capitals, became deeply embedded in livelihood thinking (De Haan & Zoomers, 2005, pp.28-29).

The FAO guidelines for livelihoods research (Messer & Townsley, 2003, p.7) emphasise that livelihoods are not limited to "the activities that people carry out to earn a living" but constitute all the aspects that affect their ability to ensure a living for their household. This follows from Bebbington's argument (1999, p.2022) that capitals "are not simply resources that people use in building livelihoods: they are assets that give them the capability to be and to act". Consequently, besides the conventional use of capitals to 'make a living', they can also make living 'meaningful'. Lastly, it suggests that capitals give the ability for emancipatory action – i.e. "to challenge the structures under which one makes a living" (Kanji et al., 2005, p.6).

1.2.2 Sustainable Livelihoods Framework

One of the most widely used illustrations for the livelihood approach is the Sustainable Livelihoods Framework (SLF), which was developed by the Department for International Development (DFID) and is presented in figure 1.4 below. Succinctly and to the point, this framework was explained by Farrington (1999) as being:

> "not intended to depict reality in any specific setting (…) [but] rather [used] as an analytical structure for coming to grips with the complexity of livelihoods, understanding influences on poverty and identifying where interventions can best be made. The assumption is that people pursue a range of livelihood outcomes (health, income, reduced vulnerability, etc.) by drawing on a range of assets to pursue a variety of activities. The activities they adopt and the way they reinvest in asset-building are driven in part by their own preferences and priorities. However, they are also influenced by the types of vulnerability, including shocks (such as drought), overall trends (in, for instance,

resource stocks) and seasonal variations. Options are also determined by the structures (such as the roles of government or of the private sector) and processes (such as institutional, policy and cultural factors), which people face. In aggregate, their conditions determine their access to assets and livelihood opportunities and the way in which these can be converted into outcomes. In this way, poverty, and the opportunities to escape from it, depends on all of the above" (Farrington et al., 1999, p.1 in De Haan & Zoomers, 2005, p.31).

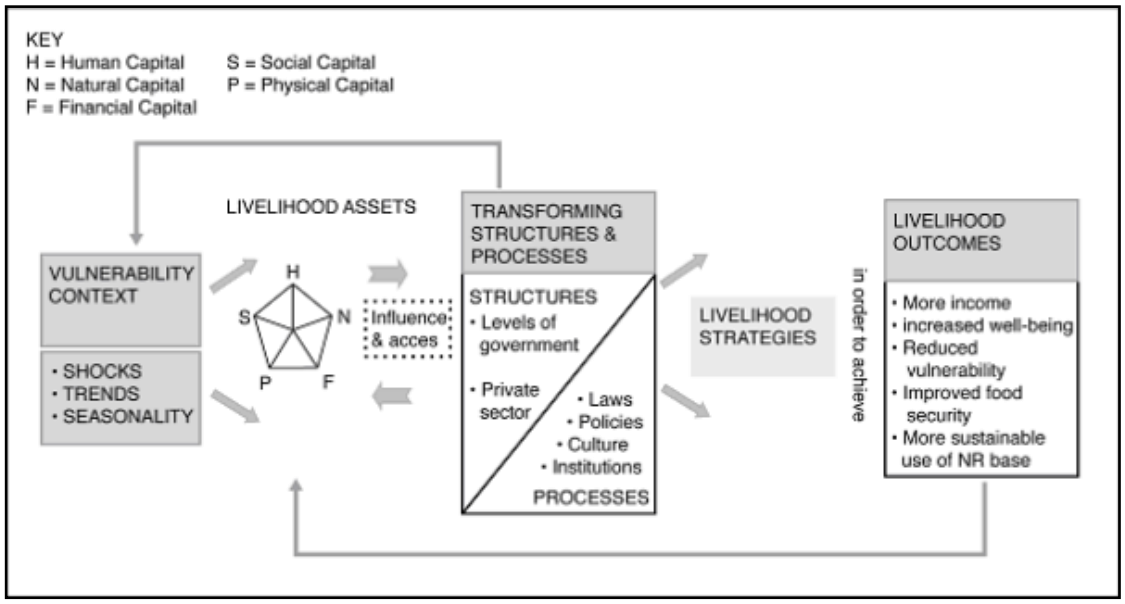


Figure 1.4 – The Sustainable Livelihood Framework
Source: DFID, 1999, in De Haan (2006), p. 144.

The SLF model is a very useful representation of the livelihood approach, as it contains the most important concepts and illustrates the linkages between them. Therefore, this framework will be used to further explain the livelihoods theory in this section and to discuss various opinions on core issues by several scholars.

Summarising Farrington's final point: The combination of livelihood strategies for the household – and the outcome of these strategies – is ultimately dependent on a) their access to capitals, b) their coping with the vulnerability context, and c) the impediment or support from the institutional environment ('structures and processes') in all these stages. The SLF model illustrates all these concepts, which will be elaborated in the subsequent subsections.

1.2.3 Livelihood capitals

The five capitals that make up a livelihood are traditionally presented in a pentagon. Arguably, this pentagon of the livelihood capitals forms the core of the livelihood approach. Combining these capitals in a research can ensure that all relevant assets and resources are taken into account, in

order to deliver a complete picture of the situation (Messer & Townsley, 2003, pp.7-8). The most widely used forms are natural, physical, human, social and financial capital, as presented in figure 1.5 below.

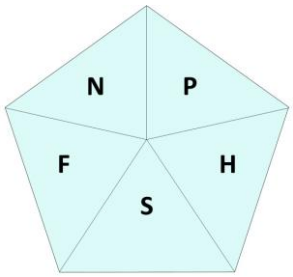


Figure 1.5 – Livelihood capitals

The five (common) capitals can be summarised as follows (Messer & Townsley, 2003, p.9; De Haan, 2006, p.139 and p.144):

(a) Natural capital consists of natural resources like land, water, forests, livestock and minerals. As the poor can lack ownership of these assets they are often reliant on common pool resources like rivers or community forests.

(b) Physical capital consists of manufactured assets like buildings, infrastructure, tools and market facilities.

(c) Human capital comprises people's skills, knowledge, experience, and labour productivity.

(d) Social capital is the "quality of relations between people" (De Haan, 2006, p.139) which can comprise family relations or cohesion in the community. It is argued by Bebbington that social capital is the most important asset for rural people because it allows them to gain easier "access to resources" (Bebbington, 1999, p.2022). In other words, social capital can be a catalyst to increase access to the other four kinds of capitals.

(e) Finally, financial capital includes all the financial means of the household like cash, savings, or credit.

1.2.4 Vulnerability context

The vulnerability context is the external environment that people live in, and which affects their activities and their assets. At this point, it is important to note that vulnerability consists of two aspects. First, the external aspects are the seasonality, shocks and stresses (described in detail in chapter 5) which are affecting people's livelihoods. This triad of external factors that constitute the vulnerability context is schematically represented in figure 1.6 below. While these factors directly influence the range of assets and strategies available to them, the poor have no or very limited control over them (DFID, 1999). Second, the internal aspect deals with people's ability to cope with these pressures (Chambers & Conway, 1991, p.10). The latter will be discussed in chapter 6 on coping strategies.

The external factors can be derived from a variety of sources, which includes political, economic, and environmental origins (De Haan, 2006, p.141 and Chambers & Conway, 1991, pp.10-11). 'Seasonality' encompasses the seasonal shifts in, for example, weather patterns and employment opportunities, and are amongst "the greatest and most enduring sources of hardship for poor people in developing countries" (DFID, 1999). 'Shocks' are quite severe and sudden, and may destroy assets directly. They may include natural disasters like floods or earthquakes, personal disasters like the sudden death of a household member, or political shocks like abrupt civil conflict. 'Stresses' will usually last longer, are usually less severe, and are often predictable to some extent. Nevertheless, they still negatively influence livelihoods, as the rates of return of their chosen strategies might be severely hampered. Examples of stresses include inferior education, a decline in quality and quantity of natural resources, or political instability.

Livelihoods are only sustainable if they can provide security against these external factors (Chambers & Conway, 1991, p.1). Change in the vulnerability context usually originates from the 'transforming structures and processes' (institutional environment), like adjustments in policies. However, people themselves can become more resilient to these external factors by obtaining better access to assets or by carrying out their livelihood activities differently. The theory associated with people's ability to cope with these external pressures will be discussed in the next subsection.

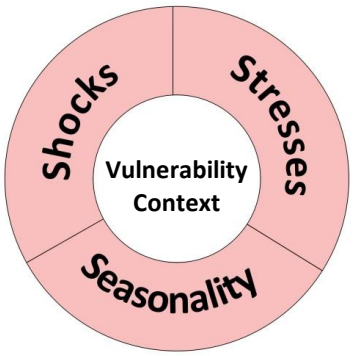


Figure 1.6 – Vulnerability context

1.2.5 Institutional environment

As can be seen in the SLF representation (figure 1.4), access to livelihood capitals and the ability to conduct livelihood strategies are heavily influenced by the institutional environment (or: transforming structures and processes). They can influence the choices of households and the types and amounts of assets that are accessible (Messer & Townsley, 2003, p.10). There is a myriad of definitions and explanations to what exactly constitutes an institution. It is clear, however, that the concept is not limited to the conventional organisations which are usually meant with the ordinary sense of the word 'institutions'. In fact, even more intangible notions like policies, laws, or even traditions are institutions. Douglas North contributed to this perspective with his well-known statement that "[i]nstitutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction" (North, 1990, p.3).

These institutions are represented in the SLF framework above as the 'transforming structures and processes'. According to De Haan, the 'processes' include "(a) formal rules and conventions, such as laws and property rights but also markets and (b) informal codes of behaviour, i.e. the norms that rule social relations, which then also comprise gender, caste, class, age, race or ethnicity, and religion" (De Haan, 2006, p.150). They influence the livelihoods and "should change or improve in order to improve livelihoods" (De Haan, 2006, p.146). On the other hand, the structures include the conventional organisations like government agencies, the private sector and NGOs (De Haan, 2006, p.146). Helme and Levitsky recognise that informal structures are also amongst the possibilities in this division (Helmke & Levitsky, 2004, p.727). These could comprise clans, organised crime or terrorist groups, for example.

What can be concluded from the theories above is that everything within the realm of institutions could, in theory, be neatly divided by the two axes of formal-informal and structure-process. This is represented in figure 1.7 below. This artificial but very useful division allows for the discussion of these elements in different places. In section 3.3, the formal structures and formal processes which are directly influencing the value chain are discussed. In section 6.2, the formal processes which influence the livelihoods are discussed, as well as the informal processes which affect livelihoods and the value alike. However, the informal structures will not be discussed any further because they are not very relevant for this thesis.

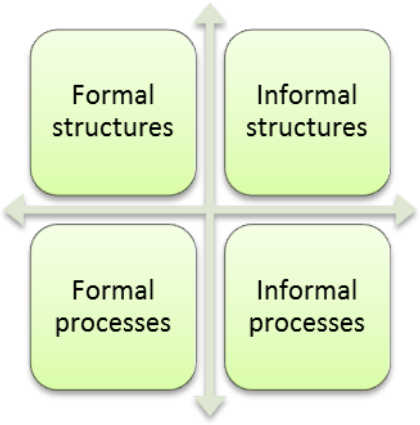


Figure 1.7 – Institutional environment

1.2.6 Livelihood strategies

Livelihood strategies are basically the activities and methods people employ to (maintain or) improve their livelihood assets and to reduce their vulnerability (De Haan, 2006, p.141). These strategies

> "depend on how they can combine their livelihood assets, take into account the vulnerability context in which they live, and the policies, institutions and processes that affect them. The livelihood outcomes that households achieve with their strategies can depend on any or all of these elements" (Messer & Townsley, 2003, p.8).

The term ‘strategies’ has a distinct intentional or premeditated ring to it. In line with this, De Haan states that “livelihood studies (...) aim to make clear that, instead of being victims, people play active roles in achieving their livelihood by continuously exploiting opportunities” (De Haan, 2006, p.152). Clearly, the term livelihood strategies emphasises the agency of the poor households. However, it is now understood that (even risk managing- or crisis averting-) “behaviour is not always intentional and conscious” (De Haan, 2006, p.152). Nevertheless, the common phrasing of ‘strategies’ will be used in this thesis for the sake of clarity and consistency.

Diversification and multilocality

Livelihood strategies can be very specialised, very diverse, or anything in between. Not surprisingly, however, there are few households which hold their wealth in just one asset or get their income from merely one source (De Haan, 2006, p.149). Instead, they attempt to use a variety of livelihood strategies, which can be called ‘diversification’. Diversification can create additional income or to help to maintain the standard of living, but it can also reduce their vulnerability to external factors (Ellis, 1998).

Another form of spreading risks is the ‘multilocality’ of livelihoods. This simply entails the “[pursuit of] livelihood opportunities in different places” (De Haan, 2006, p.149). Examples of this kind of livelihood strategies include temporary or seasonal labour migration (intra-household), but also exchanges of information and/or supplies with family members (inter-household) living in other places (De Haan, 2006, p.149).

Coping strategies

As stated before, people use livelihood strategies to obtain and maintain an adequate livelihood. In livelihood strategies, a distinction can be made between ‘proactive’ and ‘reactive’ strategies. The proactive component is the way households are “enhancing and exercising capabilities in adapting to, exploiting and creating change, and in assuring continuity” (Chambers & Conway, 1991, p.10). These are, in other words, the strategies employed in increasing the resilience of households to (future) external factors, and in increasing their standard of living.

In contrast, the reactive component deals with coping with these external factors *ex post facto* and are aptly named coping strategies. These strategies could for example (if indeed in response to a shock or stress) include selling livestock for cash, having only one instead of two meals per day, or migrating from the affected area.

Livelihood patterns

While the available combination of livelihood assets and strategies is unique for every household, patterns can emerge for “persons of the same social class, gender or caste” when they encounter similar problems and opportunities (De Haan, 2006, p.152). When certain similar livelihoods or

strategies can be distinguished which are typical for one group, they can be identified as so-called 'livelihood patterns'.

1.2.7 Households

Finally, a very relevant branch of discourse which contributed to the livelihood studies is that of the household studies. As can be deduced from the name, the focus in this branch is on households as the local actors. Since this paradigm's emergence in the early 1990s, the household became, not in the least from a pragmatic perspective, the preferred unit for the collection of information (De Haan & Zoomers, 2005, p.28).

However, it has since been shown that the household is hardly a single decision-making unit. In fact, within the household there are "differences in power, needs and expectations" (De Haan, 2006, p.149). Because of gender and generation gaps, household members are likely to have immensely different ambitions and abilities to pursue their own goals. As De Haan concludes on this topic, "households or families are still relevant to understanding livelihood strategies and targeting poverty eradication measures, but they can no longer be treated as homogeneous units" (De Haan, 2006, p.149).

Nevertheless, this thesis will continue to use the household as the main unit of data collection and will generally talk of the household as a single unit. The reasons for using this assumption are the constraints that were encountered during the research. It is extremely difficult to get information on gender or generation differences within a household for any researcher, let alone for a foreigner and/or male researcher because of cultural barriers. At best, it can only be assumed that the general differences within households which were observed by other scholars are also (partly) true for the research population. Therefore, while intra-household differences will be taken into account all the time, the research results will speak generally about strategies and characteristics 'per household'.

1.3 Research questions

As stated in the introduction, the main research question was formulated as follows:

> *Q_0: What new insights does the livelihood approach provide to the involvement of smallholder farmers in the apple value chain in Jumla?*

This question will be central throughout the thesis. To arrive at the answer, the query was divided amongst four research questions, which in turn will be central to chapters 3 to 6.

The first step is to look at the value chain arrangement, the market situation and the contract farming characteristics. The question which was formulated is:

Q_1: How is the apple value chain in Jumla organised and what are the implications for the cultivation of apples?

The answer to this research question will be examined in chapter 3. Here, the stakeholders in the value chain will be identified. In addition, a closer look is taken at the actors' participation in the chain, what their activities are, and to what extent they add value to the product. This includes taking a close look at the cultivation stage for the apple farmers. Finally, the influence of the institutions and their policies on the value chain is of great importance.

Second, the livelihood assets and strategies of the farmers in Jumla will be examined. For this, the following question is asked:

Q_2: What are the characteristics of the local livelihood assets and strategies and what are the implications for the cultivation of apples?

The answer to this research question will be obtained in chapter 4 by making an assessment of people's access to livelihood assets. In addition, the panoply of livelihood strategies employed by the households is reviewed. Thus, both the situation for smallholder farmers in Jumla is sketched, and the implications for the Jumla apple value chain are explained.

Third, it is necessary to look beyond the value chain and the livelihoods, as both are not functioning in a vacuum. Instead, they are influenced by external factors (the 'vulnerability context'). The related research question is:

Q_3: How do external factors influence the livelihoods and the cultivation of apples?

Chapter 5 will provide an outlook to the different external factors that farmers can encounter with the participation in the apple value chain, and with their other livelihood activities.

Finally, it will be discussed how the farmers are reacting to those external factors:

Q_4: To what extent and how are farmers in Jumla coping with external factors?

People's ability 'to cope' with the vulnerability context will therefore be discussed in chapter 6.

1.4 Conceptual model

As explained above, it is attempted to expand the value chain approach by using a livelihood approach in the context of the value chain. This can be seen as a broadening of perspectives, and hopefully produces some new insights into the workings of poverty alleviation projects through value chains.

But why is a multidisciplinary approach necessary? The value chain analysis and the livelihood approach have both their strengths and their weaknesses. To come to a comprehensive

analysis, it will be attempted to combine the strengths of both and to discard the weaknesses. Kanji and others summarise the need for combining these approaches as follows:

> "The importance of understanding the specific context cannot be underestimated – the history, politics, policies and institutions of a particular place have a bearing on how markets develop and interact with people's livelihood strategies. At the same time, markets for many goods now demand an understanding of global supply and demand and the role of changing private as well as public sector policies." (Kanji et al., 2005, pp.13-14).

For this reason, this thesis will expand the value chain approach with a livelihood assessment, as shown in figure 1.8 which is the conceptual model.

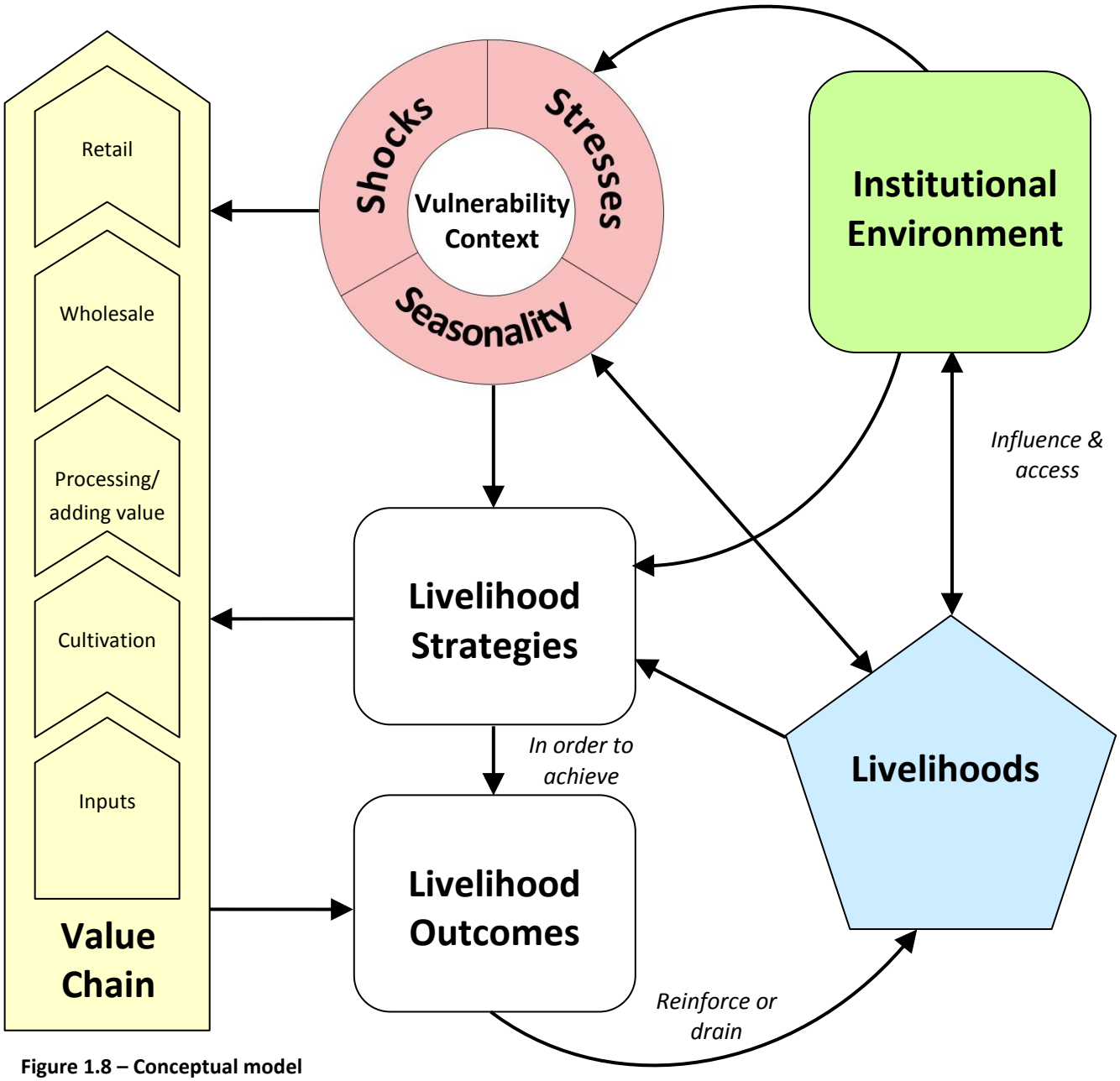


Figure 1.8 – Conceptual model

The conceptual model, shown in figure 1.8 above, schematically represents the concepts and linkages that are under scrutiny in this thesis. It was made clear in the introduction and the previous sections that, for this thesis, the smallholder farmers are central to the research: the effects of the value chain on their lives and livelihoods will be analysed. Likewise, the farmers' livelihoods, which have been described in detail in section 1.2, are central to the model.

The other concepts presented in this model are similarly reviewed to great extent in the previous sections. Most of the processes are similarly derivatives of the SLF framework as discussed in subsection 1.2.2. Nevertheless, the concepts and linkages in the model are reviewed once more.

(a) The vulnerability context influences every concept and process in the model directly or indirectly. As was described in subsection 1.2.4, it consists of seasonality, shocks and stresses. However, it is influenced on its part by other concepts, which are described below.

- The vulnerability context will be the subject of chapter 5.

(b) Like the vulnerability context, the institutional environment seems to influences all other concepts in the model, including the vulnerability context itself. In subsection 1.2.5, it was explained how the institutional environment can be divided into four categories along the formal/informal and structure/process axes. While the concept was discussed in the section on livelihoods, it is certainly relevant for the value chain approach. Value chains do not operate in a vacuum, and they are not closed systems. They are, like livelihoods and livelihood strategies, influenced by governmental policies, NGOs, trade unions and social structures (Laven, 2010, p.30).

- The formal structures and formal processes that directly influence the value chain will be discussed in section 3.3. Informal and formal processes that influence the livelihoods rather than the value chain, will be examined in section 6.2. The informal structures are not relevant for this thesis.

(c) It can be seen that the livelihoods – comprised of the people, their capabilities and their assets (subsection 1.2.3) – are influenced by both the institutional environment and the vulnerability context. Livelihood approaches recognise that people have 'agency', i.e. the ability to make a difference. They are therefore able to alter the institutional environment and/or the vulnerability context.

- The (access to) livelihood capitals will be discussed in chapter 4.

(d) The livelihood strategies that people can employ depend on their access to the livelihood assets, as was discussed in subsection 1.2.6. The (nature and success of the) strategies are influenced by the institutional environment and the vulnerability context. Interestingly, it can

be seen that one of the (several) livelihood strategies that farmers can employ, is to participate in the value chain.

- The livelihood strategies will, like the livelihood capitals, be discussed in chapter 4.

(e) The value chain (as a concept reviewed in section 1.1) is, as discussed above, influenced by the institutional environment and the vulnerability context just like any other concept presented here. However, value chain analyses oftentimes spend too little time examining the context (as Kanji's quote in the beginning if this section testifies). In this thesis, it is attempted to address this knowledge gap and to show how the external factors indeed have major consequences for smallholder farmers and other actors in the value chain.

- The characteristics of the value chain, as well as farmer's livelihood strategy of cultivating apples, will be examined in chapter 3.

(f) Finally, the livelihood outcomes are dependent on the success of the livelihood strategies, which are in their turn influenced by both the vulnerability context and the institutional environment. The livelihood outcomes are therefore reinforcing or draining the livelihoods, depending on their success or failure.

- This aspect will not be treated in a separate chapter. The livelihood outcomes of the participation in the value chain are discussed in section 3.4 (as added value) and again in section 4.7 (as income benefits).

1.5 Research design

This thesis consists of two components which differ greatly in their emphasis and their use of research methods, as was described in the previous section. The approach of this thesis therefore includes both qualitative and quantitative research methods.

Quantitative research methods, usually the weapons of choice for a value chain analysis, consist mainly of statistical analysis, data collection from randomised sample populations, and structured questionnaires. They intend to make their results representative for a broader population than the individuals researched, so to say. The main strengths of quantitative studies are that they have generalised and comparable results and that the results can be presented for example per social or socio-economic group for comparison. The main weakness, however, is that important information might be lost due to their aggregation and generalisation of data.

Scholars with a livelihoods perspective are mostly using qualitative research methods and narrative analyses. They attempt to take the local context into consideration, and look at a range of external factors and activities employed by individual farmers. Their research tools include e.g. observations, semi-structured interviews, life history narratives, and focus groups (Hulme, 2007, pp.6-7). The main strengths of qualitative analysis include that new or unexpected aspects can be

revealed, and that it provides more insight into the context of the research subject. However, the legitimisation of the data is often insufficient, especially to policy makers.

Hence, as was argued above with combining the value chain analysis with the livelihood approach, combining the strengths of both the qualitative and quantitative research methods (while minimising their weaknesses) would lead to conclusions which are more useful and persuasive to policy makers. Hence, for this thesis a combination of quantitative queries, together with semi-structured questions, were used in the household surveys (see appendix A for the questionnaire). In addition to using statistical datasets from the government authorities, interviews were conducted with key informants (see appendix B for a list of interviewees). Initially, it was the intention to conduct focus group discussions as well, but due to certain limitations (see section 1.6) these had to be discarded from the research design. Figure 1.9 below is an illustration of the final research design, whose aspects will be discussed in the subsequent subsections.

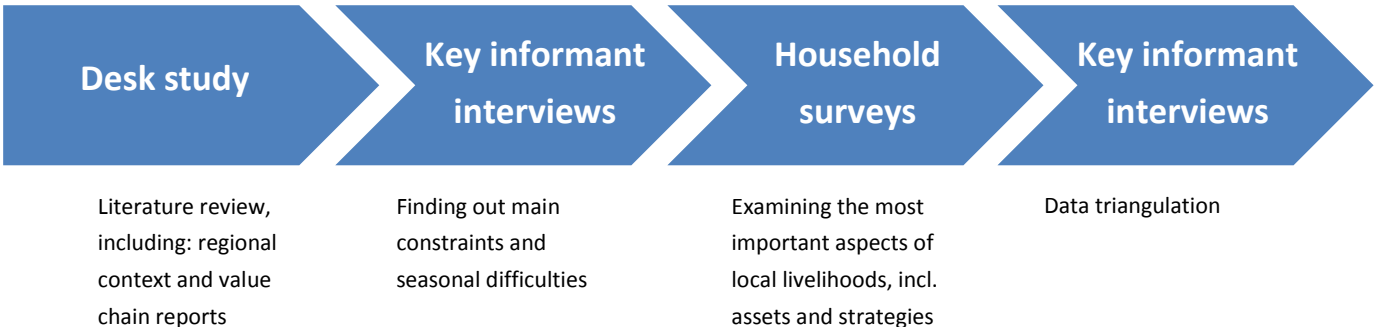


Figure 1.9 – Research design

The field research in Nepal took place from February to June 2011. For the value chain analysis component of the research, literature and reports were reviewed in Kathmandu and interviews were conducted amongst the major stakeholders. For the livelihood analysis, the author lived in Jumla for two months and conducted key informant interviews and household surveys. These methods are described in greater detail below.

1.5.1 Research Area

This research took place in the district of Jumla, which is located in the Mid-Western Development Region of Nepal. The characteristics of this part of Nepal will be discussed in the regional context which is chapter 2. The research was limited to the three VDCs of Patmara, Mahat and Kartikswami (see figure 1.10). The choice for these VDCs was based on the fact that SNV Nepal's HVA-IB pilot project was implemented here. In fact, while in Mahat and Kartikswami several villages participate and were therefore included in the research, there is only the village of Urthu in Patmara VDC which contains participants in the HVA-IB pilot project. Hence, all the interviewees from Patmara VDC were from Urthu village. The base of operations for the research was Khalanga Bazaar, the village which is the district capital of Jumla (see the red marker in figure 1.10).

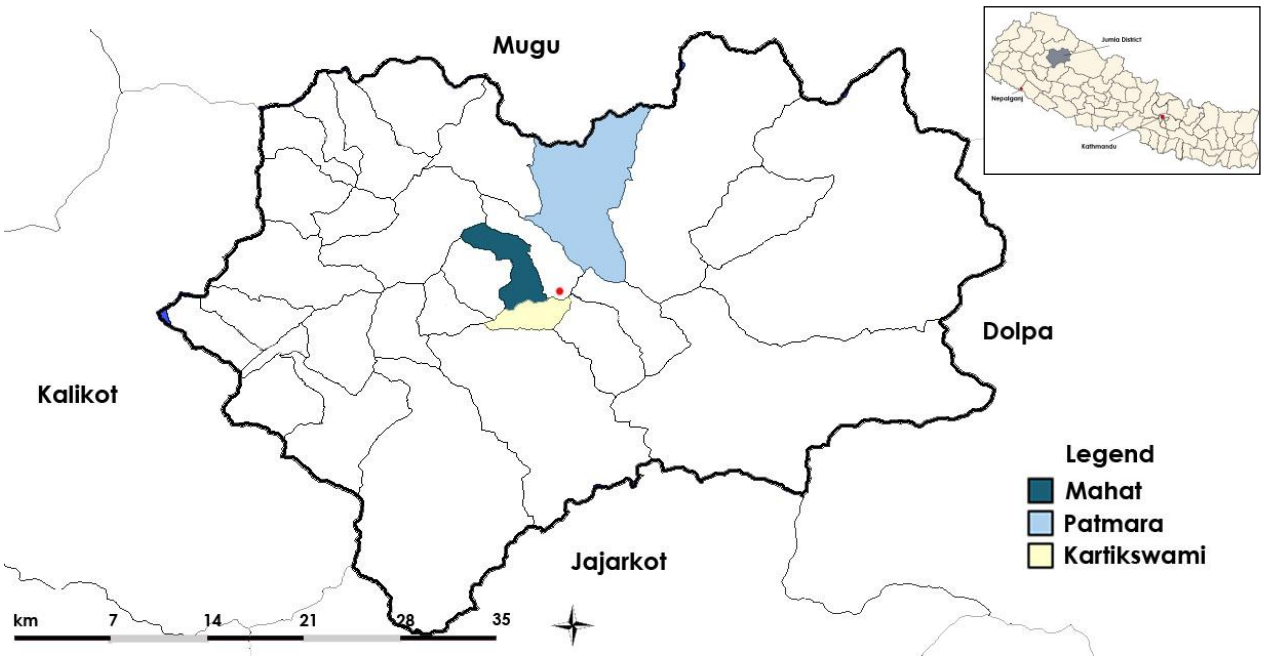


Figure 1.10 – Research location: Jumla district
Adapted from DDC (2011).

1.5.2 Literature study

Before setting off to the research location, extensive amounts of academic and project-based literature were reviewed in order to gain the necessary background information. Part of the results can be seen in sections 1.1 and 1.2, as a literature review of both the value chain analysis as the livelihood approach was conducted. In addition, the desk study included research on the regional context and opportunities for sustainable contract farming. Finally, reports and project documents were examined in SNV Nepal's office in Kathmandu.

1.5.3 Household Surveys

The household survey was conducted by using a structured questionnaire, but leaving enough room for in-depth questions. Hence, both quantitative and qualitative input could be obtained. Interviews usually lasted between 45-60 minutes. In order to arrive at statistically significant results from the household surveys it was important that the interviewees in the survey were selected randomly. For this purpose it was decided to make use of a multi-stage sampling plan, which was based on the guidelines from the Livelihoods and Forestry Programma of Nepal (LFP, 2004, pp.9-10). This sampling plan called for the random selection of VDCs in Jumla and the subsequent random selection of farmers amongst all the wards. However, this plan was quickly abandoned after arriving in Jumla.

First of all, the logistical challenges of visiting all the VDCs and visiting randomly selected farmers in all the different wards were too great, as all transportation had to be done on foot. For

this reason, the research area included merely the three VDCs of Patmara, Kartikswami, and Mahat, where the HVA–IB pilot project in Jumla took place.

Second, there was no sampling frame from which the apple producing farmers could be selected randomly. There was however a list of organic apple producers who had supplied to the District Federation of Cooperatives (DFC) in 2010. From this list, 50 farmers were selected randomly for the household survey. However, this list did not contain the apple producers who a) did not yet produce enough apples to sell them and/or b) did not benefit from the pilot project and/or c) supplied their apples to other traders than the cooperatives. To include these farmers as well, 30 farmers would be selected by a ´gatekeeper´ in the VDCs. However, the use of gatekeepers can be problematic as "[t]hey will guide you, not always intentionally, towards particular individuals, so leaving out certain sections of the (…) community" (Desai & Potter, 2006, p.147).

From this sampling plan it was expected to get a total sample size of 80 farmers. However, due to the time constraints this had to be limited to 68 in practice. More information on the characteristics of these households can be found in section 4.1. The interviewees of the household survey participated after their anonymity was guaranteed by the author, so no private information is disclosed in this thesis. All names from respondents in the household survey are changed to protect their privacy.

1.5.4 Key informants

In order to gain a deeper understanding on the local context, the workings of the value chain, the relevant policies, and the process of cultivating apple trees, detailed information was obtained from a range of key informants. These talks were semi-structured which gave a lot of room for detailed questions and discussion. Interviews lasted from 20 minutes up to 3 hours, depending on the theme and the interviewee. Especially important with this research tool is triangulation, so people from different background or positions should be interviewed and their answers compared (Kanji et al., 2005, p.7).

The key informants who were interviewed included staff members of SNV Nepal, Surya Social Service Society (4S), and World Food Program (WFP); managers of fruit wholesale businesses; local government representatives in Jumla; agriculture teachers in Jumla; and representatives from the cooperatives and the District Federation of Cooperatives (DFC) of Jumla. Their names and the dates of the interviews are listed in appendix B.

1.5.5 Limitations

While conducting the research for this thesis, several limitations were encountered. They ranged from minor practical issues to more serious setbacks which influenced the design of the research to some extent. Most of the minor limitations are to be expected when doing research in a different cultural setting as one's own. This included for example the necessity of interpreters, which could lead to misunderstandings and could distort the real meaning of people's answers. Another expected

limitation that comes with conducting research in a remote and deprived area like Jumla, is that the researcher had to cope with discomforts like the harsh climate and the lack of facilities and transportation. However, in this section it will be elaborated on the unexpected limitations that shaped the research to a considerable extent.

First, the timing was suboptimal. The fieldwork in Jumla was conducted at a time of basically no activity in the apple orchards. The pruning of trees (February) and the first bearing of fruit (from May onwards) could therefore not be observed. In addition, no other crops were harvested at this time, so visual assessment of yields or activities were impossible. The upside, however, was that people had relatively much time to be interviewed.

Second, the long period between the last apple harvest and the time of research (5-6 months) probably resulted in major inaccuracies. Few people in Jumla are keeping accounts of their harvest or income, so it was no surprise that most people had much trouble recalling the exact amounts.

Third, the use of very different idioms for surface area measurements is another factor that led to inaccuracies. The prevalent measurement in the region is the *ropani* (officially 0.05 ha) but some people use *hall* or other measurements when talking about their land. Confusing things even more is the fact that 1 *hall* in one village might have a different size than 1 *hall* in the next village. Even the local translators, one of whom was an agricultural expert, could not always make sense out of this. Other probable inaccuracies are due to the use of traditional weight units, like a *dhoko* (a wicker basket, containing up to 50 kg of apples) which are obviously also very imprecise.

Fourth, it was impossible to conduct a truly random and statistically relevant survey. The logistical difficulties and the lack of a sampling frame allowed for limited options. For this reason, the research design had to be altered. So-called ´gatekeepers´ had to be used in the communities to find the potential interviewees (as described in the previous section). Their choice of respondents – although hopefully influenced by instructions from the author – will most likely have led to some biased results.

Finally, the lack of capable interpreters in the area was arguably the greatest limitation to this research. There are few people in Jumla who speak English sufficiently, and most are already employed at NGOs or the local authorities. In the southern towns there are more students and graduates with spare time, but because of the remoteness of Jumla it was too expensive to let interpreters fly there. The loss of time with arranging interpreters turned out to be the limitation that negatively influenced the research design to the greatest extent. This resulted in for instance the decision to discard the use of focus group discussions, which was intended to triangulate the findings from the key informant interviews and the household surveys.

In the light of these constraints, it is important to remain realistic about the limits to the accuracy and comprehensiveness of the observations that are presented in this thesis. Nonetheless, the author has worked hard to present the information in this thesis objectively and truthfully to the best of his knowledge, and stands fully behind the conclusions.

CHAPTER 2 – REGIONAL CONTEXT

This research took place in the Federal Democratic Republic of Nepal. To understand the context in which the Jumla apple value chain operates and in which people's livelihoods are embedded, the geography, history, politics and culture of the country in general and Jumla in specific will be described in this chapter.

Nepal is a middle-sized country in terms of land surface (147,181 m2, which is 3.5 times the size of the Netherlands) and in the number of population, with 26.6 million people in the last census in 2011 (see table 2.1). However, as it borders India on the east, west and south and China in the north, its size is often underappreciated in relation to these two huge countries. In addition, the rugged geography (see section 2.1) has historically led to many communities being concentrated in isolated pockets. This resulted in an enormous ethnic and religious diversity (see section 2.5) which is not reflected in its size in terms of surface area or total population. This diversity is seen for Jumla's people and culture as well, so while the context of Nepal as a country will be provided as a background here, it is attempted to specify it to the unique situation in Jumla as much as possible.

	Nepal	***Jumla***
Total population	26,620,809	108,734
Annual population growth rate (%)	1.40	1.95
Average household size	4.7	5.6
Population density (persons/km^2)	181	43

Table 2.1 – 2011 census results

Source: CBS 2011.

2.1 Geographical and physical characteristics

Nepal is approximately 800 km long from east to west and about 200 km wide from south to north. All corners of Nepal vary immensely in both geography and ecology. This is mostly due to the fact that the country's lowest point lies at an altitude of only 70 m.a.s.l., while – as is well known – its highest point lies in the Himalayas at 8,848 m.a.s.l. To render some minimal justice to this diversity, the country can be divided into three ecological belts, all stretching from east to west (see figure 2.1). The three 'eco-zones' from south to north are:

a) The *Terai*, the low-lying plains which border the states of Uttar Pradesh and Bihar in India. With only 23 percent of the total land surface of Nepal, this eco-zone contains some 50 percent of the total population and accounts for by far most of the food production and economic activity.

b) The Hills region, which has altitudes from 700 to 4,000 m.a.sl. It comprises 42 percent of the land surface and 43 percent of the total population. The climate ranges from sub-tropical in the valleys and lower hills to gradually cooler climates at higher altitudes.

c) The Mountains region, the most northern eco-zone which in general lies above 2,500 m.a.s.l. Due to its rugged geography and harsh climate, the region has always been sparsely populated. While this zone comprises some 35 percent of the total land surface, only 7 percent of Nepal's total population lives here according to the latest census (Savada, 1991; CBS Nepal, 2011; Pariyar, 2005).

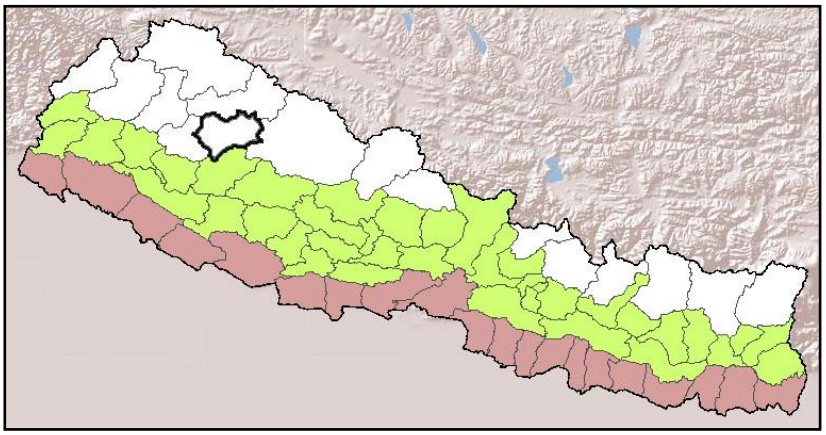


Figure 2.1 – Three eco-zones of Nepal
Source: ICIMOD (2011).

Figure 2.1 presents the *Terai* (red), Hills (green) and Mountain (white) eco-zones. Jumla district is highlighted in this figure and, as can be seen, belongs to the Mountain eco-zone. Like the rest of the Mountain eco-zone, the population density in Jumla is relatively low (see also table 2.1). This suggests there is ample land available per person. Access to land is essential for rural people, as they need the land to cultivate their crops. However, due to the rugged geography of the district, with its many steep hills and mountains, the availability of land suitable for crop cultivation is very low. In fact, the District Development Committee (DDC) claims that only 15.6 percent of the district's land surface is cultivated (DDC, 2003, pp.2-3), while reportedly only 5.8 percent of all the land is actually cultivated. Pasture land accounts for 26.2 percent of all the land, but is usually located on higher parts of hills and relatively far from villages (Development Vision, 2009, p.16). It is reported that in 2001, the land holdings averaged 11.0 *ropani* (0.55 ha) per household for Jumla district. This is lower than the national average of 16.0 *ropani* (CBS, 2001), which is undoubtedly caused by the district's geography. See also figure 2.2 to see the average landholdings per person compared to the other districts of Nepal (with only the densely populated Kathmandu Valley having lower landholdings per person). In conclusion, the people of Jumla have relatively little land to produce their own food compared to their compatriots.

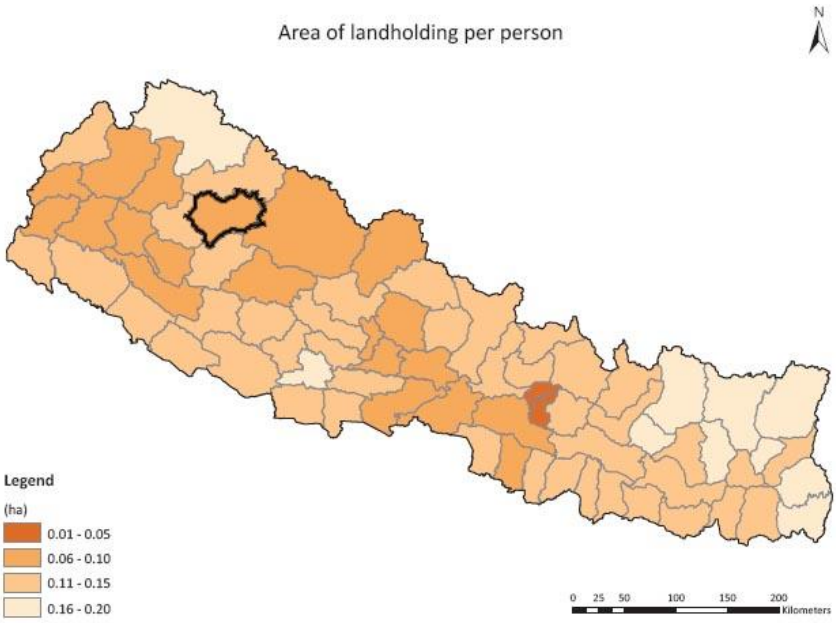


Figure 2.2 – Average landholdings per person per district
Source: NPC, 2010, p.5.

With its high altitude, Jumla district has cold winters with temperatures frequently reaching below -10°C. However, the summers are quite warm with maximum temperatures of 20-25°C. Another important effect of the geographical situation for Jumla is that the district is shed from most of the rainfall because of the surrounding mountain ranges. As can be seen in figure 2.3, the average precipitation levels show a significantly lower level for Jumla district. The overall average rainfall for the district is approximately 700-800 mm per year. In addition, the district experiences some 270-470 mm of snowfall per year (DDC, 2003, p.2).

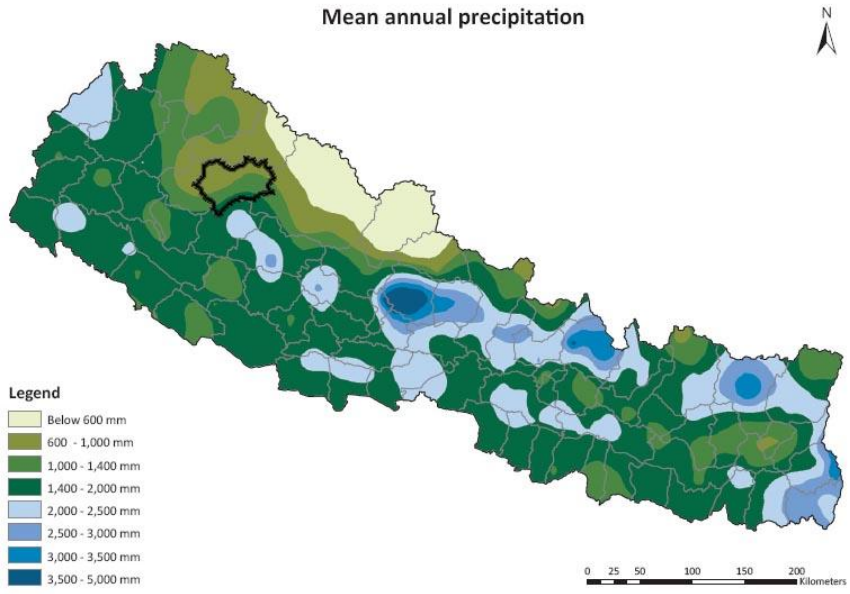


Figure 2.3 – Mean annual precipitation in Nepal
Source: NPC, 2010, p.14.

Shrestha claims that Jumla contains one of the 35 specific agro-ecological systems in Nepal, because the district has relatively little rainfall and cold winters with relatively warm summers (Shrestha, 2002, p.4). Because of this climate, the growing seasons for crops are shorter which impedes the production of food. Nevertheless, thanks to the relatively warm summer the district apparently contains the place with the highest rice cultivation in the world at 3,000 m.a.s.l. (Shrestha, 2002, pp.6-7). In the district a range of crops can be grown, including wheat and barley (winter crops) and maize, beans, buckwheat, rice, millet and potatoes (summer crops). The full list of the crops found in the household survey and their approximate growing times are presented in figure 5.1 (section 5.3.2).

Finally, as an illustration of the characteristics of Jumla district it is referred to plate 1 (appendix D) in which a snow-covered mountain can be seen in the background. The southern side of the mountain contains pastures which are used in summer. The slopes facing north are usually covered with extensive forests up to the snowline. On the right side of the plate, the tree-less southern side of a hill can be seen. On the terraces in the foreground the people cultivate wheat, barley, and rice.

How do these geographical and climatological characteristics of Jumla district relate to the cultivation of apples? Apples can be cultivated successfully throughout the mountainous areas of the country. The most suitable areas are relatively dry areas with altitudes from 1,800 to 2,800 m.a.s.l. In addition, apple trees should undergo a sufficient number of days of low temperatures (the minimum requirement of 'chilling hours', see section 5.2.4). Since Jumla receives relatively little rain and lies at an altitude which provides it with plenty of cold days, it should be a most suitable location for apple cultivation (SNV Nepal, 2011, p.14). However, the particular geographical aspects of the mountainous parts of Western Nepal provide significant difficulties as well (and not just for the apple trade), as is described in the next subsection.

Transportation

Nepal is a land-locked country which makes it quite dependent on India for port facilities. Due to this land-locked situation, Nepal has experienced difficulties when it comes to trade and development (Karan & Ishii, 1996, p.4). However, due to the mountainous character of both the Hills and Mountain regions, this problem is magnified in these regions. For this reason, air transportation plays an important role in the connection between various remote areas, as is also the case with Jumla.

The country's roads are mainly concentrated in the *Terai* region and around Kathmandu. Arguably the most important road is the East-West Highway which runs through the *Terai* for the entire length of the country, and in fact consists of over 1,000 km of tarmac. In turn, it is linked to another highway which leads to Kathmandu, which is located in the Hills region. However, these 'highways' do no honour to their names. They are mostly single lane roads for each direction, with seemingly never-ending hairpin turns. Most are of questionable condition.

Jumla is connected to Surkhet, and thereby subsequently to the *Terai* and the East-West Highway, by the Karnali Highway. This road qualifies for its designation as a highway only because of the breath-taking depth of the ravines it runs along (see plate 2, appendix D). Most of this road is merely a rocky or muddy path, depending on the season. The Karnali Highway is named after the Karnali River, which is the largest river in Nepal and a tributary to the Ganges River. Incidentally, the region is named 'Karnali' after this river, both in ancient (see section 2.2) and modern times (see section 2.3).

Before the construction of the Karnali Highway reached Khalanga Bazaar (the district headquarters of Jumla) in May 2007, all transportation had to be done by foot and/or by mules. It would take six or seven days to reach Surkhet by foot (CSD, 2006, p.1), while the journey now takes approximately two days by bus. The part of the Karnali Highway which connects Surkhet to Jumla is 232 km long and is the main transportation corridor for goods from Jumla, Kalikot, Surkhet, Dailekh, Acham and (to some extent) Mugu districts. A blacktopped road runs from Surkhet to Nepalgunj, which is a major city in the *Terai*.

Most of the Karnali Highway is a fair-weather road, which means that it is impassable during the monsoon rains in the months of July and August because of landslides, falling debris, and collapsing roads (WFP, 2010, p.13). This period of inaccessibility is often extended because of the slow pace of repairs. Although the World Bank is currently blacktopping the southernmost part of the road, it will take several years before a tarmac road reaches Jumla. It is therefore expected that landslides and collapsed roads will remain a frequent occurrence for years to come (SNV Nepal, 2011, p.23). In subsection 3.2.4, this situation will be discussed in the context of the apple trade, which is affected during the monsoon season.

Nevertheless, the opening of the Karnali Highway already offers many possibilities for other products, which are to a lesser extent dependent on transportation during the monsoon season. The availability of products in the local markets has improved, and prices of basic commodities have decreased in Khalanga Bazaar (WFP, 2010). However, the level of access to this road varies per VDC. For example, Mahat is situated right alongside the road, while Kartikswami is on the other side of the river. For people in Kartikswami, the river can only be crossed at a couple of bridges, which are relatively far apart when moving on foot. While the Highway is already extended almost up to Urthu village in Patmara, it is considerably farther away from the Bazaar than the other research locations. In addition, the road does not reach Urthu all the way because of a major collapse of the road just before the village. Most traffic on this road – except for a bus once or twice a day – is still pedestrian, which includes many porters who carry *dhokos*.

Unfortunately, the monsoon period coincides with the harvest of the apples, which means the fresh fruit cannot be transported by road. However, it is said that the Highway will become accessible throughout the year by blacktopping the road surface within the next five years (Bhujel, M.). This means a larger proportion of the apple production could be exported from the district than currently is the case (see chapter 3).

2.2 History

The first recorded mentions of Nepal stem from the 5th century B.C.E., when several kingdoms and chiefdoms in the south of the country started to flourish. In fact, the southern chiefdom of Lumbini would be the birthplace of Siddharta Gautama, who would later be known as the Buddha. In the subsequent centuries, parts of Nepal would be governed by a myriad of Indian and Nepali empires and kingdoms (Savada, 1993). They will not all be mentioned here, but instead a couple of important events and periods are pointed out.

In the 12th century C.E., the Malla dynasty emerged. Under the influence from Indian kingdoms, both Hinduism and the "stratified caste-system and fatalistic hierarchy" were introduced in Nepal. The Malla kings actively supported this system with occupational sub-castes because it helped to maintain the social stability of their kingdom (Bista, 1991, pp.24-25).

From the 15th to the 17th century C.E. the region around the Karnali River contained a wealthy and powerful kingdom with its capital in Jumla. It was located on an important trade route where salt from Tibet was traded with grains from Nepal and India (NPC, 2010, p.12). Amongst Nepali, Jumla is still famous as the cradle of the contemporary Nepali language and culture.

In the second halve of the 18th century C.E. king Prithvi Narayan Shah of the Gorkha dynasty succeeded in uniting several kingdoms in Nepal (Savada, 1993). The kingdom in the Karnali region became a vassal state and slowly lost most of its wealth, especially since trade routes started to shift to British India (WFP, 2010, p.7). Decades of competition for territorial expansion with the British East India Company eventually led to the brief Gorkha War or Anglo-Nepalese War. It ended with a decisive victory of the British and the signing of a treaty in 1816 C.E. wherein the boundaries of present-day Nepal are defined (Bista, 1991, p.26).

From the end of the 19th century until 1950 C.E., the country was ruled by hereditary 'Prime Ministers', although a king was the head of state in name. During this time, many Nepali served in the army of the British Empire, with whom the Prime Ministers maintained good relations (Savada, 1993). While Nepal is one of the few countries which were never colonised, a feeling of national pride or patriotism never developed (but was rather discouraged) because the rulers felt threatened by it. In fact, Bista argues that the Prime Ministers intentionally kept the country backward, resulting in a complete lack of infrastructure, strong government institutions, and any sense of national unity. Hence, by 1950, the country was still "a medieval society" (Bista, 1991, p.27).

After the Chinese invasion of Tibet in 1950 C.E., the (now independent) Indian government sought a counterbalance against this threat. With their support, the system of Prime Ministers was abandoned and the king who had ruled in name since 1911 (king Tribhuvan), became the new ruler together with a more or less democratic government. The annexation of Tibet by China also had great consequences for the Karnali region, as the borders were closed. Many livelihoods were still based on transhumance, selling livestock to Tibetans, or what was left of the salt trade (WFP, 2010, p.7)

The experiment with democracy of king Tribhuvan proved to be short as his successor, king Mahendra, dismissed parliament in 1959 and installed a party-less *panchayat* system. This entails a decentralised system in which small assemblies (*ayat*) of five (*pancha*) 'wise men', form the local government. In the following decades, the assemblies would become the scene of local patronage, corruption, and factional strife (Savada, 1993).

The *panchayat* system would remain in use until May 1991, when violent and nationwide protests forced king Birendra (ruled 1972-2001) to consent to constitutional reforms, and to let a multi-party parliament take seat (BBC, 2012a). The civil unrest would continue for several years, and was often met with repression by security forces. This arguably led to the radicalisation of many leftist activists who subsequently were active during the Nepali Civil War.

In February 1996, the Communist Party of Nepal-Maoist (CPN-Maoist) began a war against the government with the aim to overthrow the Nepalese monarchy and to establish a People's Republic. This so-called 'People's War' would last a decade, in which more than 13,000 people were killed and some 200,000 people were displaced (Do & Iyer, 2010, p.3). In addition, there are numerous accounts of human rights violations, including rape and torture by government forces and extortion and abductions by Maoist rebels (Valente, 2011, p.2).

Besides their call for land redistribution, the Maoist insurgents took a strong position against the gender-, caste-, and ethnicity-biased discriminatory practices in Nepal (see also section 2.5). Interestingly, up to one-third of all Maoist insurgents are reported to have been women (Valente, 2011, p.2). The anti-elitist rhetoric strongly appealed to the deprived population of Nepal's rural areas. In fact, the poor Karnali region was one of the regions most affected by the violence. Jumla district had one of the highest numbers of deaths in proportion to its population. The insurgency quickly spread, and by the end of the conflict there would have been casualties in 73 out of the 75 districts of the country (Do & Iyer, 2010, p.30).

In 2005, king Gyanendra dismissed the entire government and decreed a state of emergency, thereby effectively assuming full executive powers. Major popular strikes and protests against these measures in April 2006 forced the king to reinstate parliament. In November 2006, a coalition of the main political parties signed the Comprehensive Peace Accord (CPA) with the CPN-Maoist party, bringing an end to the Civil War (Valente, 2011, p.9).

2.3 Political context

Nepal is divided into five development regions, which are located from east to west. These development regions are then divided by the three eco-zones (see section 2.1) which results in a total of 15 geo-political zones. This research took place in the Karnali Zone, which is the largest (and poorest) of all the zones in Nepal. This administrative division is presented in figure 2.4. The geo-political zones are carved up into districts, of which there are a total of 75 in Nepal. For most government agencies, the district is their lowest government level.

However, districts are again carved up into Village Development Committees (VDCs), which consist of an elected local chief. In addition, they consist of other members from the different wards, which are the lowest political division in Nepal. Wards usually comprise a couple of villages at the most. Each VDC consists of nine wards (Gurung, 2006, p.73).

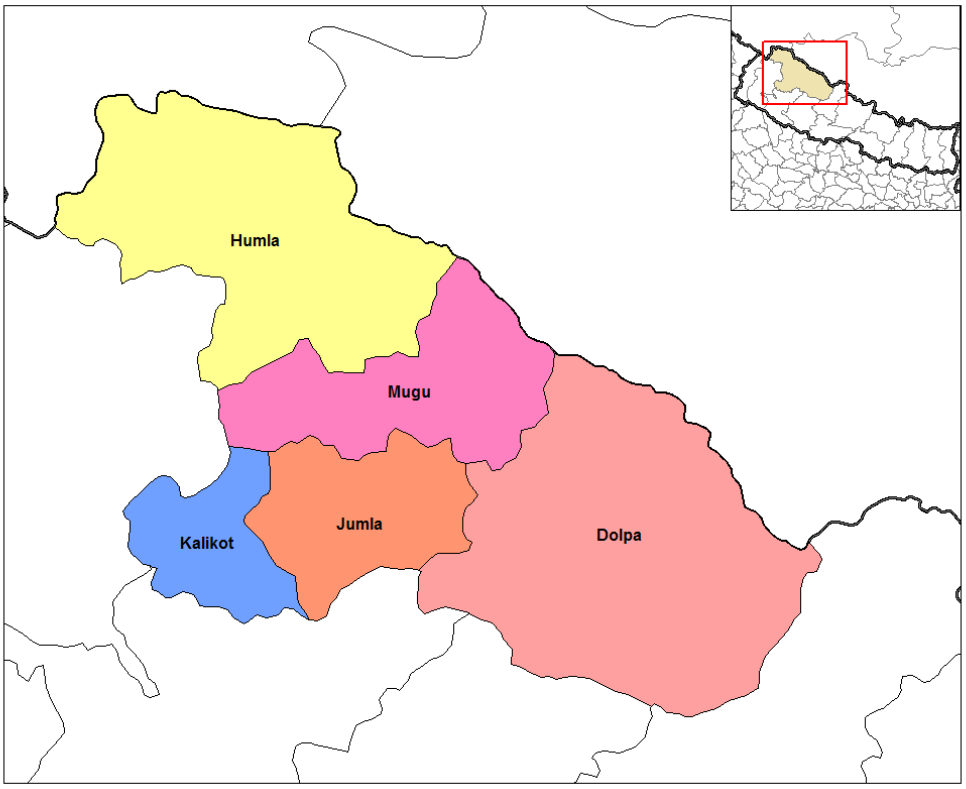


Figure 2.4 – Karnali Zone
Source: Wikimedia Commons (2011b)

After signing the CPA in 2006, an interim government was established which included the CPN-Maoist party. By the end of 2007 they had abolished the monarchy and the former Kingdom of Nepal was renamed the Federal Republic of Nepal. In the subsequent elections of April 2008 the CPN-Maoist party won the elections for the Constituent Assembly, and the former insurgent leader Prachanda became Nepal's Prime Minister (Do & Iyer, 2010, p.3). The CPN-Maoists were thus able to participate in mainstream politics and as part of a coalition government were able to carry out their political agenda.

While the signing of the CPA brought new optimism for the stability of the country, the CPN-Maoists were not satisfied with the progress of the peace process. The political debate was in deadlock for a long time over the implementation and interpretation of the main issues in the CPA, including the disarmament and rehabilitation of the former Maoist insurgents and the contents of the new constitution. The political parties continued to use aggressive rhetoric and seemed never ready for compromise.

In the first half of 2010, the Maoists threatened with another revolt, and violence once again hit the streets of Kathmandu when *bandhas* were imposed.[5] At that time, the International Crisis Group (ICG) stated that the coalition government "fails to meet popular aspirations and is unrepresentative, unsuccessful and unloved, teetering on the brink between fragility and failure" (ICG, 2010, p.1). The CPN-Maoist party frequently threatened to resume the Civil War, as most of its cadres were still residing in camps, awaiting their disarmament and rehabilitation.

The situation remains fragile, as the root causes of the Maoist uprising have not been addressed and the chance of repetition is quite large (ICG, 2010, p.2). Another critical trend in Nepal which was identified by the ICG, is the emergence of other violent groups with different agendas across the country. They range from political youth parties (urban areas) to ethnic activists (mainly the western *Terai*) many of whom are demanding autonomous states. However, most of them are small and there is no common agenda, so the risks remain relatively limited (ICG, 2010, pp.13-14 and pp.17-19).

The political situation improved somewhat after Baburam Bhattarai from the CPN-Maoist party was elected prime minister in September 2011, becoming the fifth prime minister in five years. In February 2012 it was reported that thousands of former Maoist insurgents were finally demobilising. It was agreed that some 7,000 former insurgents will be integrated into the army, while the other 12,000 will return home and will receive a lump sum of up to Rs 900,000 per person (BBC 2011a; BBC 2012b).

The new constitution is quite another matter. The Constituent Assembly was supposed to present their draft constitution but has missed four deadlines already, on which the interim constitution had to be extended (May 28th 2010; May 28th 2011; August 31st 2011; and November 30th 2011). Each of these dates was accompanied by heavy riots and long-lasting strikes. The most recent extension of the interim constitution was for a period of six months, which means the next deadline is set for the end of April, 2012 (EIU, 2011, p.8).

In conclusion, both the security situation and the political balance remain fragile. The sense of hostility between the different political factions continues to undermine chances for a sustainable peace process. The government are "currently making decisions on an ad hoc basis" (EIU, 2011, p.9), which seriously hampers the government's ability to carry out long-term policies which are beneficial to the country's development.

[5] A *bandha* is a general strike and literally means 'to close'. Markets, businesses, schools, public offices and roads are closed. This is often enforced by mobs that do not hesitate to use violence against those who do not comply, and can leave serious damage to property or even lead to injuries and deaths (NPC, 2010, p.25).

2.4 Economic characteristics

Nepal is a very rural country, with three-quarters of its population living in rural areas. Agriculture provides for nearly 80 percent of the employment in the country and roughly 33 percent of the GDP in Nepal's fiscal year 2010/2011. Therefore, the "crop-growing conditions will remain the most important determinant of the country's overall rate of economic growth" in at least the coming years (EIU, 2011, p.11). Another sector which provides a major share of the GDP is tourism. While still half a million people visit the country each year, the political instability will strongly influence the income from this sector. Finally, the remittances from Nepali working abroad are the equivalent of approximately 23 percent of the GDP (IOM, 2011).

As a landlocked country, Nepal is critically dependent on the port facilities of its neighbour India for its international trade flows. Moreover, 60.4 percent of all Nepal's exports have India as their final destination, while 65.2 percent of Nepal's imports are going to India. In this respect, the strong economic growth in India will likely be the only dependable source of growth for the Nepalese economy (EIU, 2011, p.11), as opposed to the political situation and crop-growing conditions. In addition, the Nepali rupee is pegged to the Indian rupee; there are open borders between the two countries; over 1 million Nepali work in India; and the *Terai* is home to many people native of India. Finally, the influence from India also seeps into the political sphere, as Nepali politicians continue to rely on support or pressure from India against their rivals (Economist, 2012).

Poverty

Nepal is one of the poorest countries in the world, which is reflected in the fact that the International Monetary Fund ranked Nepal 164th of 183 countries in its latest estimates of nominal GDP per capita (IMF, 2011). Although almost two-thirds of the population earns less than USD 2 per day (SNV, 2011), the government of Nepal uses its own poverty line of Rs 7,696 per person per year (CBS, 2006, p.4). This actually comes down to an astonishingly low EUR 0.20 per person per day. With this, the government of Nepal recognises that a sizeable part of its poor population depends on subsistence farming.

The country is characterised by a very unequal distribution of wealth, with half of the national GDP being earned by only 13 percent of the population. The most important disparity is between urban and rural areas, as urban incomes are almost five times as high as rural incomes (Van Dalen & De Vries, 2002, p.38). The Mid-Western Development Region is far behind the other regions in terms of most development indicators and has the highest concentration of poor people. The inhabitants of this region have the lowest access to health, education, roads, telephones, radio, electricity, water supply and sanitation services. As a result, many of the most productive people are said to leave the villages in search of better opportunities. This has generated a rising trend in the number of households being headed by women and the feminisation of agricultural labour. In response to the volatile economic conditions, an estimated 3 million Nepali are now working abroad (INF, 2011) with one in three households being sustained by remittances (IFAD, 2009, p.20). Finally,

the wealth is also unequally distributed amongst castes, with the lowest castes (*Dalit*) and indigenous peoples (*janajati*) generally being the poorest (see section 2.5).

These aspects are all valid for the Karnali Zone and Jumla as well, with Jumla being the 69th of Nepal's 75 districts in terms of HDI (4S, 2010, p.7). In fact, in the last decades Jumla has become known "for its relative poverty (...), unsanitary lifestyle, poor health and hygiene, and general infestation by flies" (CSD, 2006, p.1). However, Jumla has experienced some rapid social changes since the end of the Civil War. Practically all the households in the three researched VDCs now possess toilets[6] and improved cooking stoves.[7] These developments have greatly improved the health situation of the people in Jumla (Drucza, 2010, p.11).

2.5 Cultural characteristics

Most of Nepal's population is from Indo-Aryan, Mongoloid, or Tibeto-Burman descent, but can be further divided in several dozen ethnicities. In addition, many groups are identified by their caste (see below). However, the caste and ethnicity are sometimes interchangeable and sometimes overlapping in Nepal. This cultural and ethnic diversity provides an enormous complexity. For instance, the census of 2001 counted at least 102 castes and ethnic groups (CBS, 2001). The same complexity is observed in the religious makeup of Nepal. Some 80 percent of the people follow Hinduism while Buddhism is said to be followed by approximately 10 percent of the population (CBS, 2001). However, in reality there is a syncretic relationship between Nepalese Hinduism and Buddhism due to the long cohabitation of the two religions. The syncretism of these religions therefore results in many people worshipping the same deities in the same temples, and celebrating the same holidays. There are clear exceptions though, as for example Tibetan refugees or Buddhist tribes in the Mountain regions practice a form of Buddhism which is very different (Bista, 1991, p.34).

Social exclusion on basis of caste, ethnicity and gender was one of the main reasons behind the 10 year long Nepali Civil War (Bennett, 2005) and therefore remains very relevant. The extent to which the social inequality amongst the different castes continues to be visible in Nepal in general will be discussed below. Both the differences in caste and in gender with regards to the Jumla apple value chain will be discussed in subsection 6.2.2.

Caste system

The caste system in Nepal is very complex and moreover slightly different depending on the local situation (Bista, 1991, pp.42-43), but can be simplified to five main groups, presented hierarchically in figure 2.5 from highest to lowest social status.

- Brahmin – the 'priests';
- Kshatriyas – the 'warriors' or rulers;

[6] The toilets in Jumla district are almost exclusively pit toilets in a small outhouse.

[7] Improved cooking stoves have chimneys, which prevent the house from being filled with smoke.

- Vaisyas – skilled traders, merchants, minor officials;
- Sudras – unskilled workers;
- Dalit – outcastes and untouchables. This is a self-designated term for a range of lower untouchable castes.

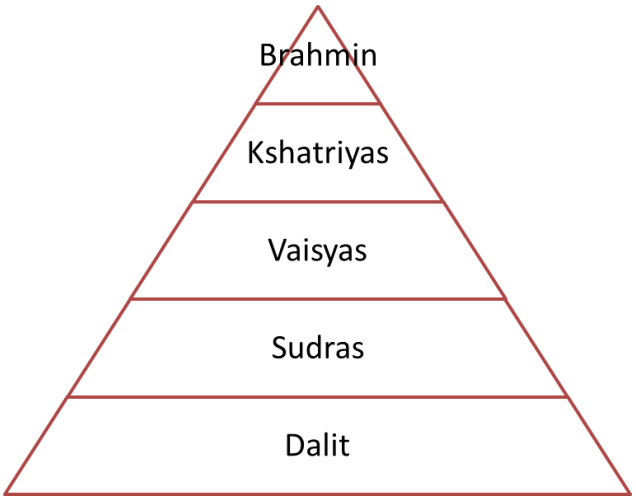


Figure 2.5 – Caste system in Nepal
Based on: Bista, 1991, pp.43-44.

In addition, the indigenous groups cannot be categorised in the traditional caste division, but have in practice the same low social status as *Dalit*:

- *Janajati* – or nationality groups, which are indigenous communities with their own language and culture and have no Hindu caste structure. They comprise approximately 22 percent of the population (Gurung, 2006, p.73).

The main castes which were identified in Jumla were Brahmin, who historically were the priests in the community and as such did not carry out manual labour; Thakuri, a high caste which can be categorised with the Brahmin, with the Chhetri or in between, depending on the author (cf. Bista, 1991 and Bennet, 2005); Chhetri, as part of the Kshatriyas in figure 2.5, which was the dominant caste in the central government and local authorities; and *Dalit*, which comprise a myriad of untouchable and occupational castes.

Interestingly, since there are no physical characteristics by which caste is determined, many people will change their name and their caste when moving to another village in order to have higher social status (Bista, 1991, pp.46-48).

In table 2.2 the caste makeup of Jumla district in 2001 is presented as an illustration of the complexity of this relative small district. It can be seen here that the Brahmin, Chhetri and Thakuri

Caste	***%***
Chhetri	49.34
Brahmin	10.65
Thakuri	8.07
Sarki	5.02
Kami	5.00
Damai	2.98
Sunar	1.67
Lama/Tamang	1.99
Giri & Puri	1.24
Kandara	0.09
Tiruwa	0.02
Newar	0.53
Magar	0.47
Gurung	0.15
Others	12.78
Total	100.00

Table 2.2 – Castes in Jumla (2001)
Source: DDC, 2003.

castes are the three most prevalent castes. The *Dalit* include at least the Sarki, Kami, Sunar and Tiruwa castes, making this group very numerous as well.

There is an enormous inequality between castes in Nepal. For instance, the Nepal Living Standards Survey of 2004 estimated that 48 percent of *Dalit* and 61 percent of *janajati* in the hills regions fall below the national poverty line, against a national average of 31 percent. In addition, it is estimated that Brahmins and Chhetri live on average 11 to 12 years longer than *Dalit*. Finally, the under-five mortality rate is 69 for Brahmins while 171 for *Dalit* (Bennet, 2005, p.15).

Nepal is clearly lagging when it comes to reaching social inclusion on the basis of caste, ethnicity, and gender (see below). This is mainly due to rigid cultural norms and traditions (Karan and Ishii, 1996, p.135). Discrimination on the basis of caste was prohibited by law in 1963 (Bista, 1991, p.44). However, the government has not been very active in enforcing anti-discrimination laws. Class consciousness is therefore still very much part of Nepal's culture (Bennet, 2005).

The practice of 'untouchability' consists of higher castes ostracising certain other groups like *Dalit,* but can also include criminals, lepers and foreigners. In Nepal, still over 200 forms of social discrimination based on caste have been identified, such as:

- Denying *Dalit* access to a water source (like public water taps)
- Forcing *Dalit* to carry out demeaning tasks, like removing dead animal carcasses
- Limiting *Dalit* to socially-sanctioned roles or occupations (carpenters, masons, tailors, etc.)
- Not letting *Dalit* sit on the same mat
- Avoiding bodily contact with *Dalit* – the literal practice of untouchability

These measures are still practiced most widely in the least developed regions in Nepal such as Jumla, and often remain unpunished (CSD, 2006, p.3; Bennet, 2005, p.26).

Gender inclusion

Although the Nepalese Constitution of 1990 guarantees basic human rights on an equal basis for all citizens, in practice Nepali women have to deal with an unequal position in their society. The Nepalese legislation is "quite effective in theory, but women's rights are poorly enforced" (Drucza, 2010, p.7). Violence against women remains a serious problem, especially in the mountain regions, and women's civil liberties are in effect almost absent. The 2009 Gender Gap Index ranked Nepal 110th out of 134 countries (Drucza, 2010, pp.7-8).

Box 1 – An average day for a Jumli woman

Laxmi wakes up at 5am. She starts cleaning and cooking, and prepares the children to go to school. She starts working on the farmland or to collect firewood for a few hours. Laxmi proceeds to cook lunch or her family. After the dishes are done, she returns to the farmland. She comes back home at approximately 6pm to cook dinner. She cleans till 9 or 10pm, after which she will go to bed. Every day, Laxmi will be the first to wake up and the last to go to bed.

In 2001, only seven percent of the women owned livestock, five percent of the women owned a house, and a mere four percent of all the arable land was owned by women (CBS, 2001). Although women do most of the work on the farm, less than 20 percent of the women in Jumla state they have decision-making power when it comes to the farming activities (AEC, 2010, p.27). Finally, the national average literacy rates are 70.7 percent and 43.4 percent for men and women respectively (CBS, 2008).

Across Nepal, the patriarchal traditions govern the woman's position in the household. The conventional notion is that a woman's place is in the home, where she is responsible for childrearing, taking caring of the elder family members and doing the household chores. In addition, Nepalese women make up 65 percent of the agricultural labour force, but most of them are unpaid family workers (Drucza, K., 2011). Arguably partly because of a very high workload, Nepal is one of the few countries in the world where women's life expectancy is lower than that of men (Drucza, 2010, p.8).

Nepal is experiencing change on many fronts, including the shifting position for women in society. The current situation in Nepal is aptly summarised by Drucza, when she stated that "while change has occurred in recent times, there are still some underlying deeply engrained beliefs that women are subordinate to men. These beliefs are reinforced daily within the household and within the community" (Drucza, 2010, p.11). One of the recent positive social changes is that many girls now attend school. However, it should be noted that this has increased the already heavy workload of women even more, as they can no longer be assisted by their daughters (Drucza, 2010, p.9).

2.6 The HVA-IB pilot project

In June 2011, the International Fund for Agricultural Development (IFAD), the Ministry of Agriculture and Cooperatives (MoAC) and SNV Nepal officially kicked off the High Value Agriculture (HVA) project. The main goal of this project was formulated as "the reduction of poverty and vulnerability of women and men in hill and mountain areas of the Mid-Western Development Region" (IFAD, 2009, p.27). The approach is to develop 18 high value agriculture and Non-Timber Forest Product (NTFP) value chains which are particularly suitable for improving the income of its target group "the rural poor, especially women and marginal groups" (IFAD, 2009, p.24 & p.27).

As a preparation for the larger project, SNV Nepal has been conducting the High Value Agriculture - Inclusive Business (HVA-IB) pilot project since October 2009 in three value chains in the Mid-Western Region, one of which is the organic apple value chain in Jumla district. Besides providing lessons learned for the HVA project, the other aim of the pilot project was to strengthen the capacities of cooperatives in order to "contribute to the reduction of poverty and vulnerability of women and men (…) to the improvement of their living conditions and to their food security" (SNV Nepal, 2010, p.4). Moreover, there is an explicit target of including the most marginalised groups, including *Dalit* and women, into the value chain (4S, 2011, p.5).

This research was conducted in cooperation with SNV Nepal, and in the context of the HVA-IB pilot project. The recommendations done in this thesis are aimed at strengthening the Jumla apple value chain and improving the livelihoods of the farmers involved in it.

Netherlands Development Organisation (SNV)

The Netherlands Development Organisation (SNV) is an NGO which tries to build the capacity of local partners in order to reach good governance and poverty reduction. As Brouwers argues, "SNV is different from other international development organisations in that it does not provide finances, but basically just advisory, knowledge and facilitation services" (Brouwers, 2010, p.46). SNV operates in 36 countries, one of which is Nepal.

The country office 'SNV Nepal' works in five sectors: Renewable Energy; Water, Sanitation & Hygiene; Forest Products; Pro-Poor Sustainable Tourism; and Agriculture. In the agriculture sector, SNV Nepal attempts to "initiate feasible interventions in the smallholder cash crops sector". One of their methods is the so-called Inclusive Business approach, which explains the name of the HVA-IB pilot project. This method can be summarised as linking smallholder producers to companies, thereby reaching the 'inclusion' of the poorest people into profitable economic activities (SNV, 2011).

CHAPTER 3 – THE APPLE VALUE CHAIN

Q_1: How is the apple value chain in Jumla organised and what are the implications for the cultivation of apples by smallholder farmers?

Apple cultivation was introduced in Jumla in 1968, when the Government of Nepal brought 73,000 saplings from Himachal Pradesh (India) to plant in Jumla district (Development Vision, 2009, p.59). Initially, apples were mostly consumed locally. In fact, often the apple trees were not planted on a large scale but just scattered through and around the fields. Hence, the apples were plucked by the workers on the fields and other people that passed by these trees. A kilogram of apples would cost no more than Rs 2 on the local market (SNV Nepal, 2011, p.30).

Around the year 2000, the first venture to export apples from the district led to increasing production and, because people now saw the real worth of the fruit, increasing prices. While this venture would eventually fail, the price of apples would remain at Rs 10/kg until the end of 2008 (SNV Nepal, 2011, p.25).

Because of the future prospects for apple trading, which became apparent when work started on the Karnali Highway in 2008, production would rise quickly. According to a report from the District Development Committee (DDC), a total of 953 hectares of the district was covered with apple trees in 2008. Of the 286,000 apple trees, only a third was 'mature', i.e. older than four years, and thus able to bear fruit (DDC, 2008). Astonishingly, it is reported that since 2006, more than 100,000 new saplings are planted each year (SNV Nepal, 2011, p.30). While an unknown amount of these saplings fail, and there is natural turnover from old trees, this does signify an amazingly rapid increase.

Interestingly, most of the apples on the markets in Kathmandu and other major cities in Nepal are imported from India and China. In 2010 it was reported that India's market share was about 9 percent, while China's market share totalled a stunning 90 percent (SNV Nepal, 2011, p.34). Indeed, apples seem to have a high potential for import-substitution. However, most of Nepal's domestic production is consumed locally because of a lack of infrastructure or because of their low quality.

In the year 2008, Nepal imported 15,000 mt of apples, while the estimated apple production in the Karnali Zone and Mustang district totals about 10,000 mt. Nevertheless, that year only saw 500 mt of apples from these regions commercially traded to Kathmandu and the other cities (Development Vision, 2009, p.92).

With respect to Jumla, the apple production is estimated to be approximately 5,500 mt per year. However, much does not have a commercial value because of its low quality or size. The marketable production is likely to be around 1,900 mt (SNV Nepal, 2011, p.30). Little over 10 percent of these apples was exported out of the district in 2008, as schematically represented in figure 3.1.

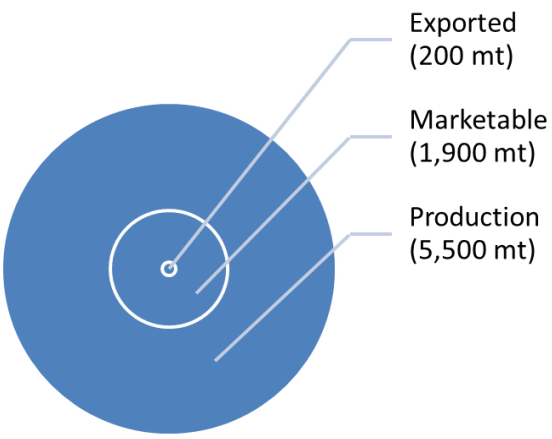


Figure 3.1 – Production and trading of apples from Jumla
Based on: SNV Nepal, 2011, p.30.

Clearly, there are infrastructural and quality constraints to the production of Jumla apples which prevent them from being marketed in Kathmandu and other Nepali cities. The Government of Nepal introduced some policies which were intended to address these barriers, which will be examined in section 3.3. Similarly, SNV Nepal started their project to increase the income for smallholder farmers, which was explained in section 2.6. Since then, a value chain has emerged in Jumla with their help.

This chapter will take a closer look at the market situation and the value chain characteristics of the aforementioned Jumla apple trade. Several actors and their functions will be examined, as well as the linkages between these actors. Section 3.1 will provide a detailed oversight of the value chain and these actors. Section 3.2 will look at the different production activities in the various stages of the value chain. Section 3.3 will describe the institutional environment. Finally, section 3.4 will provide an analysis of the value added in the chain and the income benefits for the smallholder farmers.

3.1 An overview of the value chain

The HVA-IB pilot project from SNV Nepal focuses on trying to involve smallholder farmers in a value chain in order to improve their income. However, SNV Nepal does not support the farmers individually, as this is not their normal *modus operandi* (as was described in subsection 2.6). Rather, SNV Nepal supports several cooperatives (by 'capacity building'), so they are able "to build their skills and better serve their (…) clients" (SNV, 2012). In other words, it is assumed the cooperatives use their improved capacity to assist the farmers. However, even the support of the cooperatives is not done by SNV Nepal directly, but through their 'local capacity builder', the local NGO Surya Social Service Society (4S). Finally, SNV Nepal does directly facilitate the negotiations and the signing of the contact with a fruit wholesale firm in Kathmandu, the so-called 'anchor firm'. However, the cooperatives which are supported by 4S do not sign the contracts with the anchor firm directly, but are organised in the District Federation of Cooperatives (DFC) in Jumla.

In subsection 3.1.2, it will be attempted to clarify the linkages in the value chain by means of a value chain flow chart. In subsection 3.1.3, the contract and its effects on the value chain will be discussed. Finally, in subsection 3.1.4, the actors in the entire apple trade from Jumla to Kathmandu, i.e. beyond the project of SNV Nepal, will be presented. But first, in the next subsection the main actors in the value chain which is supported by SNV Nepal will be discussed.

3.1.1 The actors

4S (Surya Social Service Society)

4S is a local NGO which was established in 1994. Its area of activities is supposed to extend throughout the Karnali Zone (as is proclaimed in the mission statement), but in practice it is active only in Jumla district. 4S has been implementing the HVA-IB pilot project for SNV Nepal since 2009. In this respect they have engaged in 'capacity building' by providing training to cooperatives on e.g. marketing, apple cultivation techniques, pest and disease management, organic certification, and cooperative management (Nagarkoti, G.).

Cooperatives

There are three cooperatives in Jumla which receive support through the HVA-IB pilot project. Their members who are cultivating apples are organically certified or 'in-conversion certified'[8]. Their most important characteristics are summarised in table 3.1 below. While these three cooperatives were selected to receive some support in the framework of the HVA-IB pilot project, there are actually ten cooperatives in Jumla which are engaged in the apple trade. As opposed to the three cooperatives discussed above, the members of the other seven cooperatives have not been organically certified. Nevertheless, their apples are *de facto* organic since Jumla is an 'organic district' (see subsection 3.3.2). These ten cooperatives (thus including the three described below) bought shares in the DFC 'apple fund', which allows the DFC to invest in the trade of the apples from the cooperatives' members. Of course, the cooperatives receive the dividends of their investment at the end of the season. How they spend this money will be under discussion in subsection 3.4.2.

[8] A mandatory stage before becoming fully organic certified. The production process is monitored for a certain period.

	Himalaya Multipurpose Cooperative	***Thakur Jyu Agriculture Multipurpose Cooperative***	***Agricultural Production & Management Cooperative***
Working in VDCs	Chandannath, Patmara, Dillichaur, Depalgaun, Patrasi	Mahat	Kartikswami
Location of office	Khalanga Bazaar (Chandannath VDC)	Mahatgaun (Mahat VDC)	Garegaun (Kartikswami VDC)
Main activities	Training in producing apple products; Credit & saving	Credit & savings; Buying and selling poultry; Advising members how to produce apple juice	Buying and selling vegetables; Processing apples (dried apple, jam, juice); Advising members on irrigation and fertilisers; Hiring LARFs to help members with pruning etc.
Number of members	92 individual members and 210 farmer groups as members	72 members	150 members
Investment in DFC apple business	Rs 100,000	Unknown	Rs 50,000

Table 3.1 – Main characteristics of the cooperatives

District Cooperative Federation (DFC)

The DFC is an umbrella organisation of cooperatives in Jumla. The DFC was established in 2007 with the support from the government as a tool for rural economic development through cooperatives. In early 2011, it had 52 cooperatives as members. While most of them are credit & savings cooperatives, some are multipurpose cooperatives (e.g. including agricultural or other economic activities). The 10 cooperatives which are engaged in the apple trade all fall under the last category.

Interestingly, up to now all the decisions regarding the apple trade were made by the DFC's executive board, which includes representatives from all the other cooperatives (not involved in the apple trade) as well. From the end of 2011 however, they have established a subcommittee made up of representatives from only the ten cooperatives involved in the apple trade, which will make all these decisions (Budthapa, R.K.). They will then manage the 'apple fund', a fund with an estimated total of Rs 300,000 – 400,000[9] in 2011, which is all contributed by these ten cooperatives. As can be seen from table 3.1 above, two of the ten cooperatives already provided Rs 150,000 of the estimated Rs 400,000 which signifies that the shares of the cooperatives are quite unequal.

[9] The DFC has been unable to provide the exact amounts to the author.

The anchor firm

Unfortunately, there is little that can be said about the anchor firm. The firm in question requested not to be mentioned by name in this thesis, so it will be referred to only as 'the anchor firm'. This firm is located in Kathmandu and is a wholesaler of fruit. It obtains its fruit from rural areas in Nepal and India, and sells it on the fruit markets of Kathmandu.

3.1.2 Value chain flow chart

Figure 3.2 shows the basic value chain of the Jumla apples which is (indirectly) supported by SNV Nepal. The apples go from the farmers to the DFC, and then to the anchor firm. The money flows are obviously going the other way as well, but there are additional flows as the cooperatives buy the shares and (after the harvest) receive their profits. As discussed above, it can be seen that SNV Nepal gives technical assistance to the cooperatives and to the DFC. This consists of training and equipment, for instance. In addition, they facilitate the realisation of the contract between the anchor firm and the DFC. The assumption that the technical assistance is trickling further down the chain, i.e. from cooperative to farmers, is also presented in this flow chart.

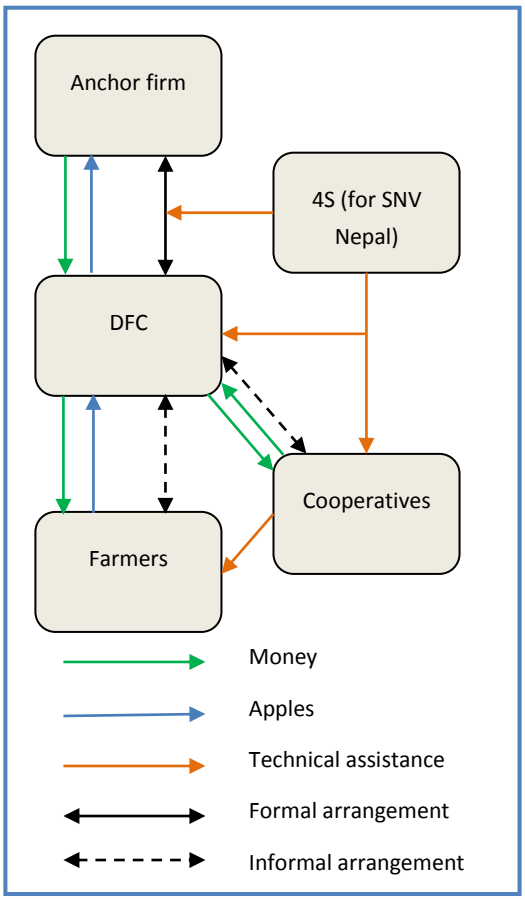


Figure 3.2 – Value chain flow chart
Adapted from: KIT & IIRR, 2010.

Interestingly, it can be seen that the only formal arrangement is between the anchor firm and the DFC. The cooperatives and the DFC have, despite the large amounts of money transferred, only an oral arrangement. Similarly, between the DFC and the farmers there is merely an informal arrangement. This will prove to be significant in the following subsections.

The different typologies found in value chain discourse that can help to characterise the value chain were extensively discussed in section 1.1. Firstly, the theory of Gereffi and others identified five types of value chains. From looking at figure 3.2 it should be clear that the Jumla apple value chain is most similar to the 'modular value chain', as the DFC plays the role of the 'turn-key supplier'. It is suggested that substituting suppliers and buyers is relatively easy, which leave the farmers, the trader and the anchor firm relatively independent (Gereffi et al., 2005, p.89).

Evidently, the relation between the DFC and the anchor firm in the value chain is governed through a contract arrangement, as opposed to spot-market arrangements or complete vertical integration which are clearly not the case. When the five contract farming models of Eaton and

Shepherd are applied, the observations made above give some clarity. The anchor firm signs a contract with the DFC, which subsequently obtains the apples from the farmers. Importantly, the arrangement between the DFC and these farmers is informal. Clearly then, the value chain of Jumla apples resembles the intermediary model of Eaton and Shepherd, where an anchor firm contracts with the trader (in this case, the DFC) who successively trades (in this case, informally) with the farmers.

3.1.3 The arrangements

As was seen in figure 3.2 above, there are basically three arrangements in the Jumla apple value chain, of which two are informal. The only contracts are signed between the DFC and the anchor firm. Unfortunately, the exact content of this contract was not shared with the author of this thesis. What is known, is presented in this subsection.

In the contract, the only aspects established are the quantity, the price, the location of delivery and the quality of the apples. There are no specifications for the production process, nor any provision of inputs or technical assistance by the anchor firm (Nagarkoti, G.). Clearly then, the contract would be characterised as a 'market specification contract' in the typology of Mighell and Jones (see subsection 1.1.3). For this type of contract, the supplier (the DFC) has the benefit of market certainty, in both the assured demand and the fixed price.

Subject	***Arrangement***
Product	Apples (any variety)
Quantity	100 mt (of which 40 mt organically certified)
Quality	Grade A or B (size, colour, undamaged)
Price	*See table 3.3*
Location	Delivered at Surkhet airport

Table 3.2 – The contract arrangement in 2010

Although the cooperatives are shareholders of the DFC, they have no signed agreements – only oral commitments. Technically, their only commitment directly related to the apple trade is to mobilise their members to bring their apples to the airport, where they are graded and boxed.

The farmers who supply apples have no obligations whatsoever: no contracts are signed by them and they are not asked to commit to anything. The farmers are aware of the fact that there are contracts between the DFC and the anchor firm, and they know that the DFC therefore accepts good-quality apples in the apple harvest season. However, at that time there seems to be some kind of 'first come, first served'. Surprisingly then, the linkage between the DFC and the apple farmers seems to approach a spot-market arrangement. In conclusion, the Jumla apple value chain has a 'hybrid' arrangement with both a formal contract and the informal spot-market arrangement.

These observations have implications for two important aspects of the contract arrangement, which will be discussed below: First, how the prices for apples arranged, and second, which party is bearing the brunt of the production and marketing risks.

Price

The contract between the anchor firm and the DFC contains a pre-determined price, to be paid on delivery of the products. When set (and made known to the farmers) at the beginning of the growing cycle, it reduces the farmers' uncertainty about the sales price (Da Silva, 2005, p.16). Unfortunately, an often heard complaint from the farmers' side was that the signing of the contract between the DFC and the anchor firm was completed in a very late stage, just prior to the harvesting season. Much of the benefit of market certainty is thus lost, as the farmer cannot make a well-informed decision as to what crop and/or other economic activities he or she should concentrate their time and efforts to. For instance, in 2010 the contract was signed as late as July 31st, which is indeed late as the apples grown in Jumla mature somewhere between July and September (depending on the variety).

For the harvest season of the year 2010 (the last harvest before this field research) the price between the anchor firm and the DFC was established as presented in table 3.3, according to the quality of the apple (more on grading in section 3.2.3). For the anchor firm, it apparently does not matter whether the apples are organically certified or not.

Grade	***Price/kg (Rs)***	
	Organic	***Non-organic***
A	68	68
B	62	62

Table 3.3 – Price of apples in the contract of 2010

For the prices from the DFC to the farmers, however, there is a significant difference between the organically certified and non-certified apples. In table 3.4 below, a difference can be seen between certified/non-certified of 20 percent and 15 percent for grade A and grade B apples, respectively. It is surprising that the driver for organic certification is not the anchor firm, but the DFC. Indeed, the expectation is that organically certified apples will be worth much more than non-certified apples in the (near) future. This shows some admirable foresight on the part of the DFC. Furthermore, some influence from SNV Nepal and its local partner 4S, both with their focus on certification, can be assumed.

Grade	***Price/kg (Rs)***	
	Organic	***Non-organic***
A	30	24
B	26	22

Table 3.4 – Price of apples for the farmers in 2010

Risk

Another factor which is very important for the sustainability of the contractual arrangement is the consideration of production risk in the contract design. With a market specification contract like the Jumla apple value chain, the risks of production (which are plentiful, as will be seen in chapter 5) remain with the producers. Any failure to deliver to the DFC, because of for example crop failure, will be the responsibility of the farmer. He or she therefore bears all the costs, which in this case are the losses in income (as there is no breach of contract). In case of failure to deliver to the anchor firm on part of the DFC, the costs are entirely borne by the DFC. Whether other costs than loss of income (e.g. fines and legal fees) are incurred depends on the extent of legal enforcement in Nepal (discussed in subsection 3.3.2).

Another risk which needs to be discussed here is the frequent civil unrest (see subsection 5.1.4). This often results in the inability to transport the apples to Kathmandu, in which case there are serious losses. Who has to bear those costs? Apparently the contract stipulates that DFC makes sure that the apples arrive in Surkhet, after which they are weighted and the total price is established. Since the transportation costs between Surkhet and Kathmandu are borne by the anchor firm, it can be assumed that the anchor firm is indeed responsible for the latter part of the transportation. Nevertheless, in 2010 there was a conflict between the DFC and the anchor firm because the anchor firm refused to pay for apples that could not reach Kathmandu because of strikes in the *Terai* (Nagarkoti, G.).

Apart from the (substantial) production risks which are mostly borne by the farmers, which of the actors in the value chain is bearing most of the other risks? At first sight this seems to be the DFC, which is bound by the contract on the one hand, but has no leverage to get any guarantee from the farmers. Then again, there really does not seem to be any effective contract enforcement in Nepal, let alone Jumla. Especially since the anchor firm pays advances to the DFC before the apples are transported, at least part of the risk seems to shift to this firm.

Therefore, the sharing of known (or predictable) sources of risk must be negotiated beforehand and included in the contract. For risks that are difficult to foresee, or difficult to include in a contract, strategies need to be in place to deal with these unexpected risks. For example, insurance can be arranged or arbitration mechanisms can be established. NGO's might function as conflict mediators in such cases of unexpected event (Da Silva 2005, p. 22), so SNV Nepal could seek an active role in this subject.

3.1.4 A broader perspective of the value chain map

While the portion of the Jumla apple value chain which is supported by SNV Nepal was portrayed in figure 3.2, the actual situation is broader and more complicated. As the farmers have a choice between supplying to the DFC or to other actors, it is important to sketch the entire situation of the apple trade in Jumla and beyond. In fact, while in figure 3.1 it was seen that 200 mt of apples were exported from the district, only 66 mt did so through the DFC arrangement with the anchor firm in Kathmandu.

The value chain map is a useful tool for looking at the different actors and linkages in a value chain by illustrating it as a process leading from the earliest stages of production (including its inputs) to final consumption (Herr & Muzira, 2009, p.64). Therefore, in figure 3.3 below the relevant actors in the apple cultivation and trade are presented, as well as the linkages between them. On the left hand side, the vertical arrows represent the different stages in the value chain, from inputs to consumption. In section 3.2, each of those stages will be discussed individually.

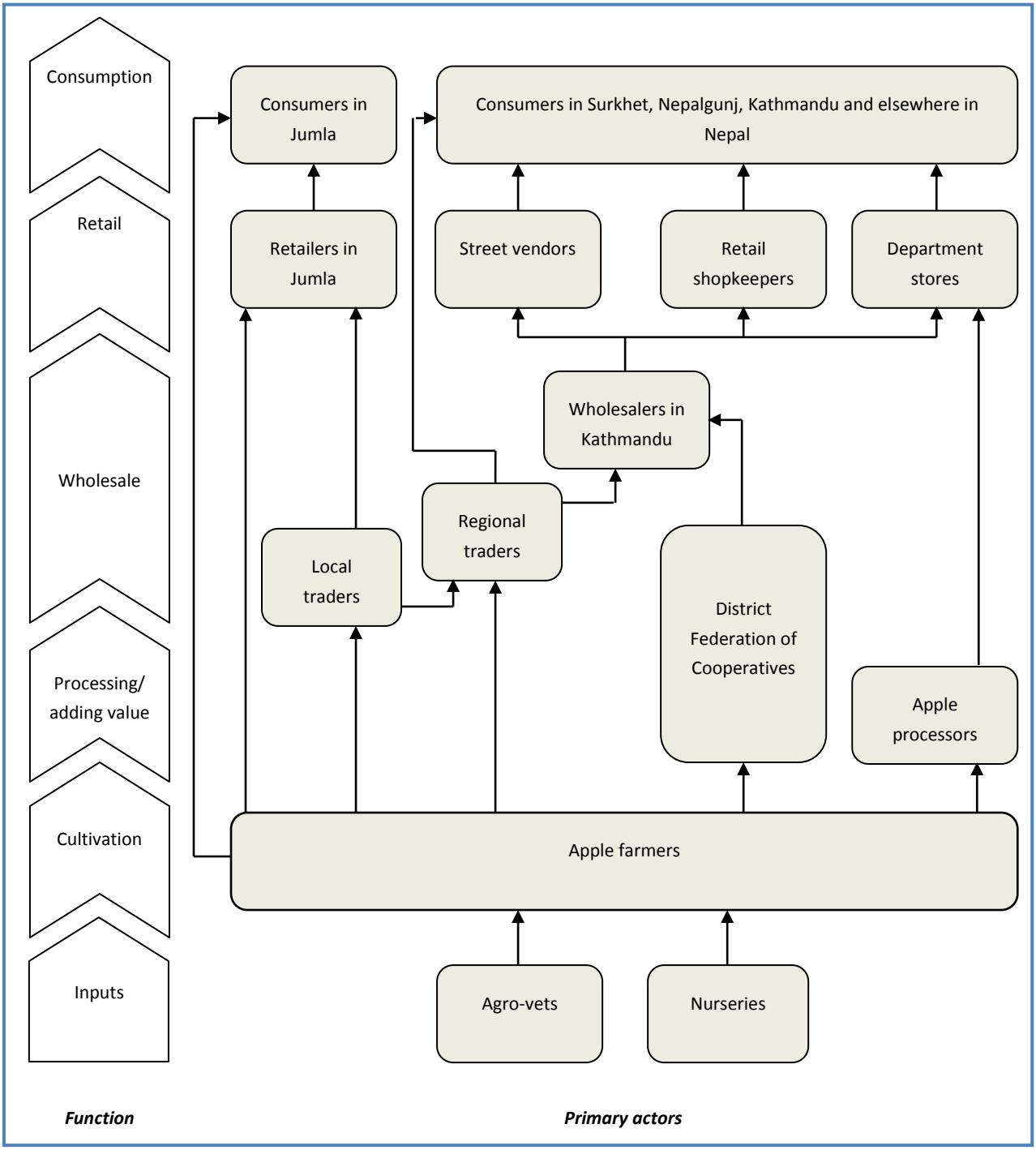


Figure 3.3 – The Jumla apple value chain

3.2 Value chain stages

In figure 3.3 above, several stages in the value chain were discerned, from the inputs needed for apple cultivation to the actual consumption of the apples. In this section, all of these stages will be discussed, with the exception of the consumption as this is not the focus of this thesis. In subsection 3.2.4, the issue of transportation will be discussed, which is not included in the schematic representation of the value chain activities as such, but is of course an essential part of the chain. Because of this thesis' focus on activities in Jumla and especially for the influences on the farmers, the wholesale and retail of apples which takes mostly place outside of Jumla, will be discussed together in subsection 3.2.5.

3.2.1 Inputs

In this subsection, the inputs that are needed for the cultivation of apples will be described. There are five main kinds of inputs for the cultivation which have been identified: land, water, labour, saplings, and fertiliser. In section 4.2, the farmers' access to the natural capitals that are land and water will be discussed extensively. In section 4.5, the human capital, which includes labour, will be examined. The discussion will therefore be limited here to the latter two (saplings and fertiliser), as well as other various agricultural inputs that can be obtained from so-called agro-vets.

Saplings

While apple trees in the wild grow from seeds, farmers prefer to buy saplings to plant in their orchards. A sapling is a young tree of approximately 50 cm high. The official providers of these saplings are so-called 'nurseries', farms which grow the apple saplings and sell them for profit.

Nurseries attempt to provide good quality (i.e. disease-free, fast growing, high-quality fruit, etc.) saplings by using the horticultural technique of 'grafting'. With this technique (portrayed in figure 3.4), tissue from two species are fused together to benefit from their respective strengths. In addition, this way it can be ensured that a whole bunch of saplings will produce the same variety and quality of apples. The 'scion' is selected for its good fruit (A). The 'rootstock' is selected for its good roots and stem (B). If all goes as planned, both of the tissues will fuse and the future apple tree will have strong roots and tasty fruit. The whole process takes about two years (Basnet, D.B. & Shahi, D.B.).

Figure 3.4 – Grafting
Source: Wikimedia Commons (2011a)

In Jumla, there are a total of 33 registered nurseries. They are all organised in the Fruit Nursery Association (4S, 2010,

p.3). Nurseries have to be registered before they can sell their saplings. Their saplings need to be tested and approved by the District Agricultural Development Office (DADO). The registration procedure is very extensive, and even requires the applicant to travel to Kathmandu in person (Maji, D.B.R.).

Nevertheless, it is indeed necessary that the quality of the saplings is guaranteed. A farmer who buys a bunch of saplings cannot see whether these will provide good fruit or not, as the fruit will only become visible after several years. Even with the extensive controlling by the local government, farmers often lose their investment when the apple tree turns out to be inadequate. In addition, diseases can spread quickly when saplings are infected and sold across the district (Maji, D.B.R.).

Fertiliser

Fertiliser is an essential input to make the soil productive. In Jumla, most people have both livestock and crops, both of which provide them with ingredients for homemade fertiliser. Plant detritus and manure from their livestock are mixed, thus resulting in homemade (organic) fertiliser. Usually, women collect large amounts of pine needles from the forest to add to this mixture (see plate 3, appendix D), as a certain degree of 'biomass' is necessary. However, the pine needles cause acidification of the soil, and decrease the soil fertility (4S, 2010, p.9). The homemade product is therefore inferior to the bio-fertilisers in the shops. In addition, when the availability of manure is limited (which is often the case), the supply of organic fertiliser is therefore also limited.

Agro-vets

People can buy bio-fertiliser in so-called agro-vets (agriculture and veterinary shops), which are the main (private) input suppliers in Jumla. These shops can supply all kinds of agricultural and veterinary inputs and equipment to the farmers, including seeds, bio-fertiliser, bio-pesticides and bio-herbicides. They import the products from wholesalers in Nepalgunj, Surkhet or Kathmandu. However, there are only six in the entire Jumla district, four of which are located in the district's capital Khalanga Bazaar (Maji, D.B.R.).

Apparently, shop owners complain that since the establishment of Jumla as an 'organic district' (see subsection 3.3.2) their sales have dropped (Shahi, D.B.). Chemical fertiliser and other inputs are cheaper and sometimes more effective, but they are now illegal. Organic inputs are less popular for this exact same reason: they are relatively expensive and not as widely applicable as generic chemical products (Development Vision, 2009, p.61). One example of another important input for apple cultivation is the pesticide 'Bordeaux paste' (a mixture of copper sulphate, lime and water), which is applied to stems to prevent pests and fungal diseases. It is not exactly organic, but allowed by most organic certification systems if used on a limited scale (VSO, 2011, p.17).

Contract farming and inputs

From the above, it can be concluded that the inputs for apple cultivation are generally quite expensive, or the quality is low (e.g. homemade fertiliser). How can these challenges for farmers be met? According to relevant literature, contract farming could provide a solution. When inputs are provided by the anchor firm, it reduces the uncertainty of a) input availability, b) quality of inputs, and c) costs. In addition, because the firm can buy the inputs on a large scale, the economies of scale which results in lower costs can be (partially) transferred to the farmer. It is assumed that the use of these inputs ensures a certain quality of the apples, and the farmer therefore has a higher productivity and subsequently a higher income (Bijman, 2008, p.1; Da Silva, 2005, p.15).

In the case of the Jumla apple value chain, there is no direct connection between the anchor firm and the farmers. Therefore, the DFC could fulfil the role of input provider to the farmers. Of course, this then needs to be formalised in a (contractual) arrangement between the farmers and the DFC: The latter would not want to invest in inputs if the high-quality apples are subsequently sold to a competitor (who did not make an investment, and can therefore offer a higher price).

3.2.2 Cultivation

As explained above, the farmers buy saplings to plant in their orchards. While the sapling is already two years old when planted in the orchard, it will take another five years before the fruit tree gives a steady and significant amount of fruits. When the tree is ten years old (i.e. after being in the orchard for eight years) the quantity and quality of the apples have reached their maximum. It can then be productive for another 20-30 years, if it gets regular attention with irrigation, fertiliser, trimming, etc. (Basnet, D.B. & Shahi, D.B.).

Before farmers can plant their sapling, they dig a pit ($1m^3$) and mix the loose soil with manure. The sapling is planted and supported with a stick, so the tree will grow straight. Trees need to be planted 5-6 meters apart from each other. This means that on one ropani of land (i.e. 500 m^2) a farmer will plant approximately 20 trees.

The young tree needs regular 'training', i.e. the cutting of branches to determine the shape of the tree, and thus the way it will bear fruit later. After the trees has borne its first fruit, it will need regular trimming to remove old branches and to get more sunlight into the inner parts of the foliage, which will improve the quality of the apples. This stage of trimming is called 'pruning', and will take place each year in February.

Every year when the tree begins to bear fruit in summer, the selective harvesting of apples ('thinning') takes place. Large apples are plucked so the branch does not snap under their weight, and damaged apples are removed so the other apples on the tree get more nutrients and grow faster. This process is thus done earlier than the large-scale harvest, which takes place in August and September.

The activities described here are presented in table 3.5. The upper part comprises the activities before the first harvest, while the bottom part shows the activities after the tree has

become productive. While these activities are quite important for obtaining high quality apples, and are as such common practice in basically all commercial orchards, the farmers in Jumla are not used to this yet. Pruning and training was never common practice, so DADO, 4S and the cooperatives all state to give much attention to these techniques (Maji, D.B.R; Nagarkoti, G.; Rokaya, Ganesh).

Month	***Activity***
June/July	Planting the sapling
January/February	Applying manure & training
March/April	Weeding
April – June	Irrigation
(…)	(…)
June/July	Thinning
August/September	Harvesting
January/February	Applying manure & pruning
March/April	Weeding
April – June	Irrigation

Table 3.5 – Cultivation activities
Source: SNV Nepal, 2011, pp.19-20.

Intercropping

Farmers can benefit from the agricultural practice of intercropping: the simultaneous cultivation of different crops on the same field. When a farmer plants apple trees on his field, much of the valuable land in between the trees remains unused. In the case of apple trees, intercropping is generally conducted with wheat, barley, maize, or potatoes. However, it is most successful if done with beans, because these plants have the ability to extract nitrogen from the atmosphere. When the plant dies (after harvesting the beans), the nitrogen is released in the soil, providing excellent nutrients for the soil (Basnet, D.). In addition, the harvest from these crops will be an alternative source of income (or food). This is especially useful in the case of apple trees, where farmers have to wait four to five years before they will bear fruit.

Harvesting

The harvesting period, the height of which takes place in August and September, is one of the most labour intensive periods with regards to apple trees (this will be discussed in subsection 5.3.2). Apples are mostly harvested by shaking the trees and picking up the apples from the ground, resulting in a high percentage of damaged apples. The bruises on the apple usually only become visible after a couple of days (SNV Nepal, 2011, p.22). This means it is mostly a problem for the DFC or even the anchor firm, after the apples have arrived in Surkhet. The farmers have thus little incentive to change their harvesting techniques.

Delivery to DFC

The cooperatives which have invested in the 'apple fund' of the DFC have agreed on a rotating schedule: their respective members are supposed to deliver their apples to the DFC storage at the airport in Khalanga Bazaar in subsequent 2-3 day periods. The apples are then brought to the airport in *dhokos* (see plate 4, appendix D), which is done mainly by the women.

The cooperatives have to inform their apple producing members about the days they are welcome to supply the apples to the airport. However, in practice it turned out to be less well organised. Farmers would bring their apples whenever they pleased, and the DFC had no choice but to accept all the apples (as long as they met the quality requirements), regardless of which cooperative they are affiliated with.

In previous years, the DFC staff responsible for buying the apples only looked at the persons who were selling their apples. If they were on the list of organic certified apples, all the produce they brought with them was designated organic certified apples. Clearly, it would be possible for these certified farmers to stock up on non-certified apples from another farmer, and sell them at a higher price at the airport. The disorganised manner of the apples trade is thus prone to mistakes or even fraudulent behaviour. The DFC recognised this problem and said to have been more stringent last year, when they "made sure the apples were from the certified districts". How exactly this was achieved remains unknown, however, as they claimed only that neighbours would be keeping an eye on each other.

3.2.3 Processing / adding value

After the farmers have brought their apples to the DFC, the apples are graded, sorted, and boxed. While these activities do not alter the product (the individual apple) directly, the apples' value has clearly increased after they arrive in Surkhet. Other value adding activities would include storage (as the value over time will be higher than without storage) and processing into other products. But first, the grading, sorting and packing activities in the Jumla apple value chain will be described.

Grading, sorting and packing

When the farmers bring their produce to the airport, the apples will be graded and weighed. They will get a receipt which states their name, the amount supplied, and the amount of money they will receive for it. After one week, they can come back to the airport with the receipt to collect their money.

The apples can receive grade A, B, C and D, with grade A being the best. The grade of the apple depends on the size, the colour, and whether it is undamaged. Only apples with grade A or B are accepted by the DFC, as these are the only apples accepted by the anchor firm (Neupane, K.). The prices received for these grades by the farmers and the DFC were presented in tables 3.3 and 3.4 (page 50), respectively. Finally, the apples are sorted by grade and then packed in cardboard boxes

(see plate 4, appendix D). Interestingly, the apples are not necessarily sorted by variety, as they cannot always be discerned (and farmers usually grow several varieties in one orchard).

The apples with grade C and D, which are not accepted by the DFC, will be sold on the market in Khalanga Bazaar. In times when there are no flights going out of the district (because of e.g. strikes or incessant monsoon rains), grade A and B apples will start to flood the market as well (SNV Nepal, 2011, p.22).

Apple processing facilities

In the Jumla apple value chain as supported by SNV Nepal (through 4S) no processed products are being traded, only the fresh apples. However, there are some opportunities for processing the apples into other products, and thereby adding value. Most apple farmers process part of their harvest with homemade provisional equipment. This mostly includes the damaged apples which cannot be sold on the market. The main products being produced in Jumla are apple cider, apple brandy, apple juice, dried apple slices, and jam. While this provides excellent alternatives for the share of the harvest which otherwise would be ruined, most of the farmers only use them for their own consumption and have not yet taken advantage of the economic potential.

Access to processing facilities with a larger capacity gives people the opportunity to add more value to their apples and to engage in an economically worthwhile business. There is one private processing facility in Mahat which charges small fees for people who want to process there. There is also a processing facility in Khalanga Bazaar, which is called the Jumla Apple Processing Centre (JAPC). This facility is owned and run by the department of Food Quality Control which is part of the Ministry of Agriculture and Cooperatives (MoAC). Processing in this facility is for free, but farmers need to bring all their own inputs (e.g. for making jam they would need sugar and apples).

With only a small percentage of the fresh apples being sold at relatively high prices at the moment, there is high potential for selling processed apple products. These products are generally not highly perishable and can therefore be stored and subsequently sold at high price levels throughout the year. In addition, the processing obviously adds value, possibly resulting in higher income effects.

As many as 12 households in the sample indicated they used part of their apples for processing them into one or more of these products. However, only 4 out of the 68 households (5.9 percent) say to have sold any processed apple products, which earned them an average of over Rs 4,000 per month. This can be explained due to the fact that the processing of apples on a commercially worthwhile scale requires access to equipment and skills which the average farmer does not possess. That is where the cooperatives could come in.

The three cooperatives in the HVA-IB project have the potential to accumulate enough funds (either from their members or from a bank) to be able to invest in processing equipment and/or facilities. However, there seems to be a lack of willingness on the part of the cooperatives to invest in such a venture. One of them even admitted that they expect the provision of equipment by NGOs to continue indefinitely.

In conclusion, while conducting a successful business with processed apple products is dependent on various factors (like access to funds, skills, the market situation, etc.) the prospect of this happening in Jumla seems to be thwarted by the lack of willingness to invest and wilful dependency on NGOs by the cooperatives.

Storage facilities

One of the main problems with regards to physical capital in the research VDCs, according to both farmers and key informants, is the lack of appropriate storage facilities. There are only two cellar stores in the entire Jumla district, which are both located in Khalanga Bazaar (DADO, 2010). Their capacity is far too small to store a large amount of apples. Households tend to store their apples beneath their own homes (in the basement where the livestock is kept) during the monsoon and the succeeding winter. These apples are still edible up to March, when the temperatures are starting to rise again. However, their appearance will have degraded enough by the end of October to make them unsuitable for sale.

If specialised storage facilities would be able to keep the apples fresh and attractive enough to be sold in the months after the monsoon (and before and after the heavy snowfall), they could be transported out of the district relatively inexpensively by the road. In addition, the supply from other apple producing regions will be considerably lower in this period, which leads to prices up to three times higher in Kathmandu in February, for example, than in the harvesting season. Nevertheless, suppliers from India and China are apparently to some extent already able to store apples, as these apples are more abundant than Nepali apples and can therefore benefit from the higher prices (VSO, 2011, p.34).

As a recommendation, the DFC or some joint venture by government, private sector and cooperatives should be able to build a storage large enough and of sufficient quality to solve this problem. A similar project is currently being developed in Urthu village in Patmara VDC, where the Italian NGO *Unraggiodiluce* (in collaboration with 4S) is building a storage facility for potatoes. This facility is designed specifically for this region, and requires no electricity but uses water for its cooling system (Nagarkoti, G.).

3.2.4 Transportation

Back to the Jumla (fresh) apple value chain, where the apples have been graded, sorted, and boxed. The contract stipulates that the apples will be weighed and received by the anchor firm at Surkhet airport. The DFC therefore takes care of the transportation by plane from Jumla to Surkhet, although they do get government subsidies for this (which will be discussed in subsection 3.3.2).

As harvesting starts in the monsoon season, transporting apples over the road is near impossible. This remains the situation for some time, as it is difficult and time-consuming to repair the parts of the road which have been washed away. Hence, the costly transportation by air remains the only option. However, the flights are also affected by weather events. In addition, the cargo has

to compete with the number of passengers that can be on flights. Especially before the *Dashain* festival[10] the number of air travellers increases manifold.

One alternative to both the truck and the airplane is transportation by tractor (i.e. on a trailer towed by the tractor). Tractors can sometimes already pass over the Karnali Highway while it is still impassable to trucks. While they are also cheap, the losses of damaged apples due to the bad road conditions can be incredibly high. For example, in 2008 it was reported that 50 percent of the apples transported by tractors was damaged (SNV Nepal, 2011, p.23). Nevertheless, the difference in costs between the transportation methods by air and by land is huge. Transport by air from Jumla to Surkhet costs Rs 21/kg, while with a truck or tractor it costs Rs 4/kg (SNV Nepal, 2011, p.24).

In 2010, a total of 66 mt of apples was bought by the DFC from the farmers. 61 mt was sent by plane to Surkhet and the other 5 mt were sent by truck, although part of this cargo was damaged (Budthapa, R.K.). From Surkhet, the anchor firm provides for the transportation by truck to Kathmandu. There, they trade it on the fruit markets of the city.

3.2.5 Wholesale & retail

There are two major fruit markets in Kathmandu: the Balkhu Fruit Market and the Kalimati Vegetable and Fruit Market. The total amount of apples estimated to have been traded in Kathmandu in 2010 was approximately 27,000 mt. It was reported that 9,000 mt of this was consumed in the Kathmandu Valley, while the other 18,000 mt was transported to other regions in Nepal (SNV Nepal, 2011, p.34). The anchor firm of the Jumla apple value chain confirmed that all their apples were sold to retailers in Kathmandu and therefore ended up in the Valley.

Retail

There are three main types of retailers of apples in Kathmandu. The largest are the department stores (or supermarkets) which are increasingly being seen in Kathmandu. Their customers are willing to pay more for high-quality and attractive looking products. Since the apples from Jumla are organically certified, the supermarkets may be the retailers with just the kind of clientele that is willing to pay extra for this niche product. However, they only have a market share of 5 percent of the apples consumed in Kathmandu.

Second, the retail shopkeepers are basically small greengrocers which sell vegetables and fruits and are spread around the city. Reportedly they only go to one of the wholesale Fruit Markets for fresh produce once a week. Nevertheless, they have a market share of 45 percent (SNV Nepal, 2011, pp.36-37).

Third, the street vendors (see plate 5, appendix D) go around the city with large baskets filled with fruit mounted on their bicycles. Street vendors get their products on the wholesale market daily, and

[10] Dashain is a 15-day long Hindu festival in September or October, before the rice harvest. Celebrated throughout Nepal by people of all castes, this harvest festival also has an emphasis on community and family ties.

have therefore the freshest products (SNV Nepal, 2011, p.36). Of course, they also do not have storage facilities and have their fruit out in the open all day. Of the three main retail groups, the street vendors have the lowest prices for their apples. In addition, they have the largest market share (50 percent) of the apples consumed in Kathmandu.

3.3 Institutional environment (formal)

The Jumla apple value chain operates in an institutional environment of (government) institutions and policies. The institutional environment can create both advantages and disadvantages for economic activities. While government institutions (the 'formal structures', see also subsection 1.2.5) do not take actively part in the apple trade as such, they influence the cultivation and the trade of apples to a great extent. They do that by means of policies, taxes and laws, which are the so-called 'formal processes'.

3.3.1 Formal structures

Most of the government institutions described in this subsection have already been mentioned in this chapter. Here, it will be described which formal structures are active in Jumla.

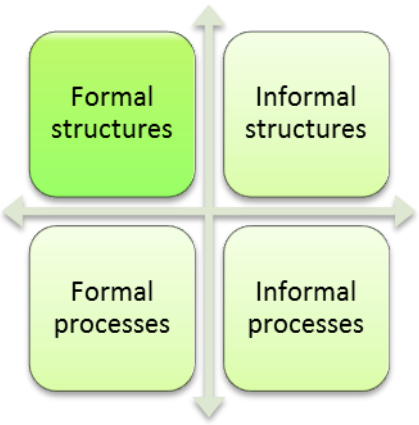


Figure 3.5 – Formal structures

District Agricultural Development Office

The District Agricultural Development Office (DADO) in Jumla is the main government body dealing with the development of agriculture (and horticulture) in the Jumla apple value chain. It is the local office of the Department of Agriculture, which is part of the Ministry of Agriculture and Cooperatives (MoAC). This is the government body on the national level that attempts to address food security and poverty alleviation through the development of agriculture and the support of cooperatives.

DADO provides technical assistance and trainings to the local farmers (Maji, D.B.R.). However, while their staff may be experts in general agricultural, they are incompetent when it comes to specific techniques for apple cultivation like training, pruning, and (apple-specific) pest management. In addition, they are inexperienced when it comes to post-harvest management (Development Vision, 2009, p.61).

District Development Committee

The District Development Committee (DDC) coordinates all district level policies and development programmes (including those of NGOs). It is the local office of the Ministry of Local Development. An

even lower tier of local government is the Village Development Committee, which provides the people a platform to discuss elements of education, water supply, health, etc. with the more centralised authorities (Bhujel, M.). Nevertheless, the real operations and the funding are all directed by the DDC, which for Jumla is based in Khalanga Bazaar.

Nepal Agricultural Research Council

The Nepal Agricultural Research Council (NARC) is an autonomous research institute which was established in order to achieve more efficient agricultural practices and higher outputs. NARC is present in several regions of Nepal, and has a research centre in Jumla as well. In fact, the Jumla Horticulture Research Station (JHRS) is located in Kartikswami VDC, one of the three VDCs that were the focus of this research.

The JHRS has done much research on the cultivation of apples. This has increased the quality of saplings throughout the district. In addition, the JHRS has some of the best experts with regards to proper pruning, training and pest management. While JHRS has provided several trainings to farmers, their capacity to reach a great number of apple farmers remains limited as they are a research station first and foremost (SNV Nepal, 2011, p.38).

3.3.2 Formal processes

Formal processes consist of rules and resolutions like laws and property rights, which are all influencing the apple trade. Policies which directly influence the value chain, like subsidies, will also be discussed here. There are other formal processes which are indirectly influencing the value chain. However, these are not usually included in value chain research. Those processes will therefore get more attention in subsection 6.2.1.

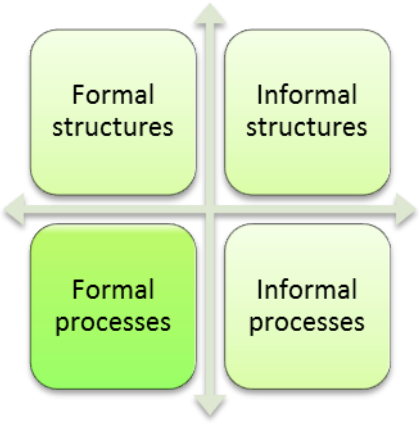


Figure 3.6 – Formal processes

Organic district

In 2007, DADO and DDC declared Jumla to be an 'organic district', which entailed the banning of all chemical fertilisers, pesticides and herbicides (Development Vision, 2009, p.61). Until then, only five percent of farmers said to have used chemical fertilisers regularly. They are mostly the large scale farmers who can afford to buy these inputs regularly (AEC, 2010, p.26).

Jumla is the only district in Nepal that encourages organic production through a policy like this (VSO, 2011, p.17). Government officials have recognised the challenges that Jumla faces due to its isolation, so the organic certification can give the apples a market premium which will make it worthwhile to export them. However, organic certification needs to be done by an internationally registered certifier, and is therefore quite expensive.

As most of the farmers in Jumla have used traditional farming methods without chemical inputs for years, they are already *de facto* organic farmers. However, chemical inputs have been available and have been used by farmers across the district (and will have left residues in the soil). Before farmers will be certified as 'organic', they will therefore have a transition period in which they are 'in-conversion organic' for about two or three years, in which their production process is monitored. This is done through (annual) inspections by the certifiers, but also through record keeping by the farmers themselves (4S, 2011, p.17).

Apple cultivation subsidies

The cultivation of apples has become a priority sector for poverty alleviation in the district since approximately 2008. The DDC and DADO have implemented several policies with regards to the cultivation of apples.

First, they attempt to make the cultivation of apples common practice throughout the district by their policy called "each household, one apple orchard". They have set an official maximum price of Rs 30 per sapling. In addition, they subsidise the provision of saplings to poor, *Dalit* or woman-headed households in the district, who can obtain saplings for as little as Rs 2 per sapling (Development Vision, 2009, p.61; SNV Nepal, 2011, pp.37-38). DADO has an annual supply of 20,000 saplings per year which can be obtained for only Rs 2 each. Surely, the subsidies and supply of cheap saplings are preventing the private sector from investing properly in input provision.

Second, they support the training of Local Agriculture Resource Farmers (LARFs). The aim is to have one LARF for each of the 285 wards of Jumla district. They are trained in training, pruning, and organic orchard management. DADO provides them with basic equipment like trimming scissors and a sprayer (SNV Nepal, 2011, p.38). Thus, they are the local resource persons who can assist their neighbours and thereby spread the knowledge. However, they are supposed to ask small fees for their services.

Finally, some other activities from DADO and DDC with regards to apple farming include the training of nurseries (discussed in subsection 3.2.1) and the experimentation with bio-pesticides.

Packaging subsidy

For the post-harvest stage of the apple trade, DADO provides a subsidy for the packaging of the apples. The apples need to be placed in specific cardboard boxes to be eligible for export. This way, not only do they look more professional but it also results in less apples being damaged. Each of these boxes costs Rs 150 and holds around 20-25 kg of apples, so the packaging costs are around Rs 7 per kg. DADO reimburses 75 percent of the costs for these cardboard boxes.

Transportation subsidies

Arguably the most influencing provision for the apple value chain in Jumla is the subsidy on transportation of the apples by airplane. The DADO can legally only provide this subsidy to registered cooperatives or, as is the case in Jumla, to the DFC. In 2010 the subsidy was 75 percent of the transportation costs (i.e. the airfare) of Rs 21 per kg. In other words, the DFC only pays Rs 5.25 per kg of apples transported, which is just slightly more than transportation by truck or tractor (when possible), as can be recalled from subsection 3.2.4.

The reasoning behind this subsidy is that the apple exporting industry needs to be able to compete with apples from India, China, and the other regions in Nepal. Unfortunately, however, Jumla is extremely inaccessible and the transportation is therefore only feasible by plane. The high costs associated with this make them no match for the cheaper competition, so the subsidy was implemented to make the Jumla apple more competitive.

Every year, DADO needs to commit a certain amount of funds available for this subsidy. This seems to be a major problem for the DFC, as they complain that this decision is always made at a very late stage. Another problem emerged when, in 2010, the DADO promised available subsidies for 100 mt of apples but eventually only paid out for 55 mt because of a shortage of funds. While that year the DFC only exported 61 mt of apples by air, and the damage therefore remained limited, the unreliability of DADO poses some serious management risks. Finally, the regulations of the provision seem inconsistent as the subsidy was reserved for organically certified apples (Maji, D.B.R.), but in practice was given to any box of apples exported by the DFC (Budthapa, R.K.).

While the financial support from the government on transportation costs looks like it is supporting the apple trade, it could be detrimental for the apple sector in Jumla in at least one aspect. The farmers who are not supported by the subsidies cannot compete with the farmers who are targeted. This is worrying, because the supported farmers are already likely to be the smallholder farmers (as they are the target group of the project), with relatively low-quality apples. The subsidy could therefore be maintaining inefficient practices by these farmers and decrease the overall quality of the exported apples, while putting other entrepreneurs out of business. To what extent the subsidy is affecting the apple trade from a purely financial perspective will be discussed in subsection 3.4.1.

Legal enforcement

One other aspect of the institutional environment which is especially important for a value chain which works through contract farming (but actually for all economic activities) is the legal enforcement of those contracts by the government. It is the extent of intervention by the government which to a large extent determines the DFC's bargaining position (Da Silva 2005, p. 22; Kirsten and Sartorius 2002, p. 16; Simmons 2002, p. 13; Singh 2002, p. 1635).

When an anchor firm is very opportunistic, it might renege on the contract when the market circumstances change and there is no legal enforcement. The rationale behind this is simple, as a better deal is to be had and there are no costs for breaking the contract. Without the effective

enforcement of contracts, the DFC can do little to avoid the negative effects of this contractual hold-up (Da Silva, 2005, p.17). Of course, this works both ways: The DFC is equally held to the contract as the anchor firm.

Respondents from both sides, i.e. both the DFC and the anchor firm, confirmed that legal enforcement in Nepal is seriously lacking. In the case of contractual hold-up, the cooperatives would not want to take the trouble to start a legal process but preferred to "engage in dialogue". The arrangement between the anchor firm and the DFC is a fragile alliance indeed.

3.4 Value added and income effects

During the discussion of the different value chain stages, different sales prices for apples and different costs were encountered. How are the costs and the incomes distributed along the chain? How do the (production) costs, the value and the income relate to each other? In subsection 3.4.1, the value added in the value chain will be discussed, while in subsection 3.4.2 the income effects for the farmers will be examined.

3.4.1 Value added in value chain

Figure 3.7 below presents the value added of the apples in the Jumla apple value chain. While the costs and the prices differ per actor, over time, and per product, it is attempted to give an estimate of the build-up of the price for a greengrocer selling organically certified A grade Jumla apples in Kathmandu.

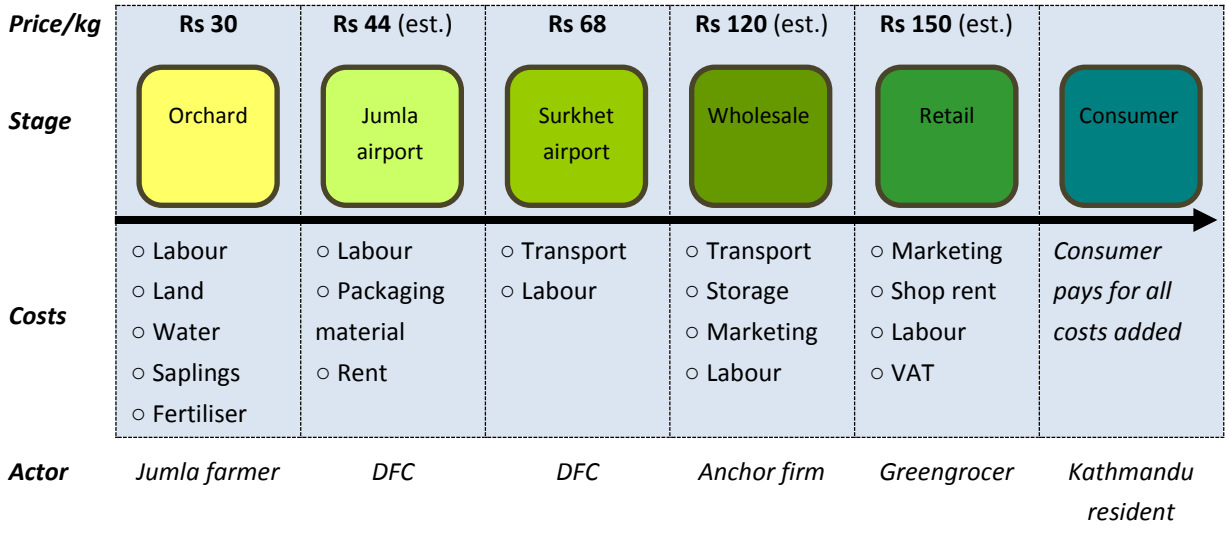


Figure 3.7 – Value added to apples

Based on: Herr & Muzira, 2009; SNV Nepal, 2011, pp.36-37.

The figure above is based on what was described in the previous sections. At the far left is the farmer who gets a price of Rs 30/kg for A grade certified apples, which has to include all his costs and his profit. It is unknown what the exact costs for the DFC are with regards to the sorting, grading and packing of the apples in the second stage, but the estimate is that the costs are around Rs 14/kg (as explained below). The value of the apples after the third stage is known, when the apples are delivered to the (representative of) the anchor firm. As both the second and the third stage are conducted by the DFC, an estimated profit can be seen for the DFC of Rs 16 per kg for grade A certified apples. The prices in the fourth and fifth stages (wholesale and retail) are also estimates, as the prices fluctuate quite heavily. Finally, the consumer pays all the added costs with the final retail price, which is Rs 150 per kg in this example. This figure makes clear that the farmer receives only 20 percent of the final price in this example.

Subsidies and profit

The transportation subsidies were discussed to some extent in subsection 3.3.2. What is still unknown, however, is whether the subsidies are indeed making the apple trade profitable where it would not have been without the subsidies. This, at least, is what both the local administrator of DADO and the president of the DFC claimed (Maji, D.B.R; Budthapa, R.K.). Unfortunately, it was not allowed to review any financial records from the actors involved in the apple value chain. Some figures were obtained from key informants, but they will be rather inaccurate. Nevertheless, it is hoped to shed some light on this interesting question with these figures.

First of all, it was stated that the profit for DFC (after the subsidies were paid out) in 2010 were about Rs 1,000,000. Since the height of the subsidies is known, and there are some estimates of the costs, the total amounts for each of them can be calculated, as presented in table 3.6 below. To export the 61 mt of apples by plane, the DFC would have needed approximately 3000 boxes. At Rs 150 per box this would give costs of Rs 405,000 for the boxes alone. However, the subsidy reimburses 75 percent of the costs. The DFC had to pay transportation fees over 61 mt of apples, resulting in expenses of Rs 1,281,000. In 2010, DADO gave reimbursements for the airfare over only 55 mt of the apples, as can be seen in the table. With regards to the apples bought from farmers, it was found that the DFC purchased roughly 66 mt but it is unknown what amount of each grade, so an average was taken of Rs 28 per kg. The same problem applies for the price received in Surkhet, so again it is an estimate.

After all the costs, subsidies and income are added up, a profit can be seen of Rs 1,000,000 for the DFC. In other words, without the subsidies (Rs 1,281,000 + Rs 337,500) there would have been losses of Rs 618,500. However, one could also argue that the subsidies on boxes are not necessary, or that the subsidies on airfares are too high.

In fact, it can be argued that one major problem is overlooked by the authorities: there is a lack of flights going out of the district. (Part of) The government subsidies could therefore be more appropriate in making it more attractive for airlines to transport apples from Jumla. When indeed a

higher proportion of the produced apples in Jumla are exported, a higher proportion of the people could benefit.

	Quantity	*Cost/income per kg*	*Total (Rs)*
Apples bought	66 mt	- 28	- 1,848,000
Hired labour	Varied	- 6	- 350,000
Packaging costs	3000 boxes	- 7	- 450,000
Packaging subsidies	3000 boxes	5	337,500
Transportation costs	61 mt	- 21	- 1,281,000
Transportation subsidy	55 mt	15.75	866,250
Sold apples in Surkhet	61 mt	65	3,965,000
Other costs	-	- 4	- 239,750
Total			1,000,000

Table 3.6 – Estimated costs overview for the DFC

3.4.2 Distributing the wealth

In the previous subsection it was already seen that farmers who trade organically certified grade A apples obtain only 20 percent of the final retail price for a kg of apples (in that particular example). In the meantime, the DFC has made a profit of Rs 1,000,000. Part of these profits is used for strengthening the capacity of the DFC and the cooperatives, giving indirect benefits to the farmers who are members, and part of the profits will be shared with the apple farmers directly.

The DFC divided its profits as follows: 10 percent was spent on the management costs of the DFC, 45 percent was divided among the cooperatives according to the share they invested[11], and 45 percent was divided among all the farmers (member or not) who supplied apples to the DFC, based on the amount supplied. This means that these people would receive a bonus on top of the price they already received when delivering the apples in the airport. These direct disbursements were actually transferred to the cooperatives, which are responsible for handing out the dividends among the farmers in their working districts. In short, according to these sources the farmers would get a bonus of Rs 6.8 per kg of apples supplied. However, at the time of the interviews these last disbursements had not yet taken place. It is therefore unknown whether these ideas were carried out as planned. Further information on the income of farmers from the cultivation of apples is discussed in subsection 4.7.2.

[11] Reportedly, the profit from DFC was 126% of the initial investment. Therefore, a cooperative which invested Rs 100,000 will have received Rs 226,000 (in other words, they will have made a profit of Rs 126,000).

3.5 Conclusion

Q_1: How is the apple value chain in Jumla organised and what are the implications for the cultivation of apples by smallholder farmers?

Paralleled to the value chain types of Gereffi and others it appears that the Jumla apple value chain is a 'modular value chain', with the DFC as the 'turn-key supplier' (Gereffi et al., 2005). Hence, it is implied that the DFC can substitute suppliers and buyers quite easily. For the Jumla apple value chain the implication is that therefore the farmers do not have any market certainty, as substituting can be done at any time.

It was observed that the only formal arrangement takes place between the anchor firm and the DFC, while between the cooperatives and the DFC, as well as between the farmers and the DFC, there are merely informal arrangements. Hence, the value chain resembles the intermediary model of the contract farming models (Eaton & Shepherd, 2001) which results in the argument that there is a hybrid arrangement in the Jumla apple value chain. Furthermore, as the contract does not specify the production process, nor any provision of inputs or technical assistance by the anchor firm, it can be characterised as a 'market specification contract' in the typology of Mighell and Jones (Mighell & Jones, 1963 in Bijman, 2008). Hence, these theories suggest that the DFC reaps most of the benefits of market certainty, from the assured demand and the fixed price, as well as the assured supply of apples. The majority of the production risks would be borne by the farmers. However, in practice the linkage between the DFC and the apple farmers looks more like a spot-market arrangement than (informal) contract farming, which undermines the certainty of the supply. The findings from the value chain in Jumla are compared to the assumptions of the theories in table 3.7.

Secondly, the lack of legal enforcement and the ambiguity of the stipulations in the contract increase the risk for both the DFC and the anchor firm. It is therefore recommended that in the negotiations for the contract, the sharing of risk must be firmly and clearly established. As the facilitator of the value chain arrangement, SNV Nepal could play a mediating role in this.

Aspect	*Theory & assumptions*	*Reality for Jumla*
Value chain governance (1.1.2)	Gereffi et al. (2005): In modular value chains, substituting suppliers and buyers is easy. The degree of power asymmetry is low as both suppliers and buyers have multiple partners, which leaves them independent	Substituting farmers as suppliers to the DFC is indeed very easy, which leaves the farmers without lowered market certainty. However, the farmers (suppliers) do not have the assumed 'independence', as they cannot substitute their buyers. There is, in effect, a monopsony of the DFC in Jumla from a) the absence of a local market for apples, and b) being the only entity which can use the transport subsidies to export.
Contract farming model (1.1.3)	Eaton & Shepherd (2001): In the intermediary model, there is no direct link between the anchor firm and the farmer, and it could therefore pose problems with vertical coordination and incentives, possibly leading to "lower income for the farmer, poorer quality standards and irregular production" (Eaton & Shepherd, 2001, p.55)	Indeed, in Jumla there is no direct contact between anchor firm and farmers, or any indication of coordination for that matter. However, there are no signs this leads to lower incomes and quality standards, or irregular production.
Type of contract (1.1.3)	Mighell & Jones (1963) in Bijman (2008): A market specification contract stipulates type and quality of products, the timing, the location, and the price. The farmer's marketing uncertainty is reduced. The farmer retains most of the decision rights over the production but also bears most of the risks.	This theory assumes there is a contract between the individual farmers and the trader, which is not the case in Jumla. Therefore, the marketing uncertainty is not reduced. In addition, the farmer does bear most of the production risks.

Table 3.7 – Combining theories and findings in Jumla

In this chapter, it was observed that of the 5,500 mt of apples produced each year in Jumla, only 200 mt is exported. One explanation is that the quality of the apples is low, leaving only 1,900 mt of apples to be marketable. The inputs used for apple cultivation in Jumla are either of low (homemade) quality, or too expensive to be used by smallholder farmers. Here, theory suggests that contract farming could provide a solution. Inputs provided by the anchor firm, can reduce the uncertainty of input availability, the quality of inputs, and the costs. Hence, the quality of the apples will increase and the farmer will have a higher productivity. The anchor firm, the DFC, and the farmers will benefit from higher incomes. In conclusion, the current contract arrangement could benefit from an expansion into input provision by the anchor firm or DFC.

Furthermore, the farming techniques that will bring improvement to the quality of apples (e.g. harvesting techniques, pruning, etc.) are well-known to the NGOs, the government and the cooperatives, but the bottleneck seems to be the transfer of this knowledge to the farmers.

Especially the LARFs seem to be excellent tools for spreading this knowledge, but their capacity (and their number) needs to increase.

An entirely different way of improving the 'quality' (i.e. increasing its value) is to process the apples into higher-value products. These products (e.g. dried apple slices, brandy, etc.) are generally not highly perishable and can therefore easily be stored and sold at higher prices throughout the year. However, while entrepreneurs would need access to funds and develop additional skills, the main issue seems to be a lack of proper processing facilities.

A second explanation for the fact that only 200 mt of the apples are exported, is found in the problematic state of the infrastructure and the barriers to transportation. It was seen in the previous and this chapter that transporting apples over the road during the monsoon season is unmanageable. The only option that remains is the expensive transportation by air. The DDC and DADO implemented a transportation subsidy to make the Jumla apple more competitive, but this research identified that it could be counterproductive in at least one aspect: It drives farmers who are not supported by the subsidies out of the market. Hence, the subsidy could be maintaining inefficient practices and decreasing the overall quality of the exported apples, while putting other entrepreneurs out of business.

In addition, one major problem with regards to the transportation issue is overlooked. The lack of flights out of the district is not addressed by the subsidies. Government subsidies could therefore be more appropriate in making it more attractive for airlines to transport apples from Jumla, which would motivate them to direct more planes to this district. When a higher proportion of the apples in Jumla are exported, a higher proportion of the people could benefit.

Alternatively, the timing of the export could be adjusted so a larger part of the export would take place in the season when prices are highest. If the apples need to be stored until more planes can fly out and trucks can pass the Karnali Highway, the recommendation from this research would be to construct specialised storage facilities which are be able to keep the apples fresh and attractive enough to be sold. Not only would the apples be sold on a far larger scale, but the prices of apples throughout the country will have risen significantly at that time, leading to additional income for the farmers in Jumla.

CHAPTER 4 – THE DIVERSITY OF LIVELIHOODS

Q_2: What are the characteristics of the local livelihood assets and strategies and what are the implications for the cultivation of apples?

The aim of this chapter is to outline the livelihoods of households in the research VDCs by means of the household surveys, community observations, and district data sets. As stated in previous chapters, the livelihoods approach aims to give a better understanding of the lives of poor people by means of identifying the main factors which affect people's livelihoods. At the same time, however, it recognises that livelihoods are multidisciplinary and very complex. It is clearly impossible to describe all the different livelihoods of the research subjects entirely in detail. So, while it is attempted to be as comprehensive as possible, a clear focus must be kept on the most important trends that were observed and the implications they have on the farmer's participation in the organic apple value chain.

First, the general household characteristics will be discussed. This will give an illustration on what kind of households were included in the sample. Next, the main livelihood strategies that are employed will be summarised by identifying several livelihood patterns amongst the respondents of the survey in section 4.2. Subsequently, the most important livelihood assets in relation to the local context as well as apple farming will be examined. Traditionally, development workers focused primarily on the conventional sectors like physical and financial capital. However, it should be noted that it is the interaction between all the five capitals that make up peoples' livelihoods (Messer & Townsley, 2003, p.8). Below, the five capitals are described in detail with a particular focus on the situation for apple farmers in Jumla (sections 4.3 – 4.7). At the end of this chapter, it should be clear which assets and strategies are relevant for the production and trade of apples and what the current livelihoods situation is for the apple farmers in Jumla.

4.1 Household characteristics

A total of 68 households from the study area were included in the household survey. Of these 68 households, a total of 17 households did not have any income from apples, mainly because their apple trees were not mature or because the amount harvested is so low it is used merely for own consumption.

From the 68 households included in the sample, information was gathered from a total of 421 household members. This gives an average of 6.2 people per household, which is similar to the district-wide average of 6.3 persons per household (DDC, 2011). In table 4.1, the social and gender composition of these households is presented per VDC.

VDC	*Number of households interviewed*		*Female heads of household*		*Caste of household*							
					Brahmin		*Thakuri*		*Chhetri*		*Dalit*	
Mahat	27	*(39.7%)*	4	*(14.8%)*	0	*(0.0%)*	1	*(3.7%)*	15	*(55.6%)*	11	*(40.7%)*
Patmara	17	*(25.0%)*	1	*(5.9%)*	0	*(0.0%)*	0	*(0.0%)*	15	*(88.2%)*	2	*(11.8%)*
Kartikswami	24	*(35.3%)*	5	*(20.8%)*	8	*(33.3%)*	5	*'20.8%)*	10	*(41.7%)*	1	*(4.2%)*
Total	68	*(100.0%)*	10	*(14.6%)*	8	*(11.6%)*	6	*(8.7%)*	41	*(59.4%)*	14	*(20.3%)*

Table 4.1 – Gender & social composition per VDC

The research areas contain mainly villages dominated by Chhetri, the caste which constitutes almost 60 percent of the sampled households overall. Brahmin households, which are the highest caste in the Nepali caste system, were only encountered in Kartikswami. In some of the main villages in both Mahat and Kartikswami there are some distinct sections where the *Dalit* – the lowest caste, i.e. untouchables – are concentrated. Nonetheless, in the survey a large number of *Dalit* households were only interviewed in Mahat.[12]

The age distribution of the 421 people encountered in these households is presented in the population pyramid (figure 4.1) below. The shape is rather surprising, as it would be expected that the lowest age groups are overrepresented due to relatively high birth rates and high mortality rates, like in most developing countries. Surely this is also the case in Jumla. Might there then be another reason why people would suddenly have given birth to fewer children in the last, say, 10 years? Interviewed key informants are unaware of any major birth control projects in the area, so it is suspected that people just 'failed to mention' the smallest children under the assumption that this research was primarily about their apples.

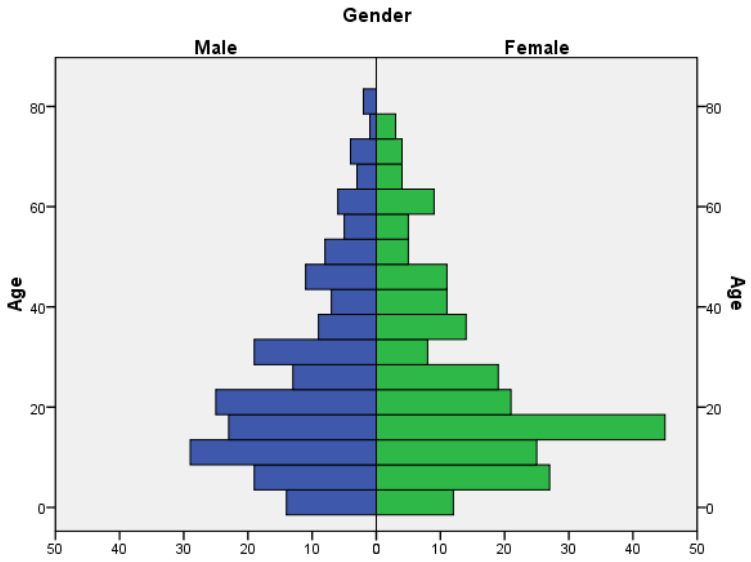


Figure 4.1 – Population pyramid of the surveyed households

[12] Part of the reason is that the random sample simply produced a couple more *Dalit* members. The other part of the reason is the use of a ´gatekeeper´, who apparently decided to introduce more *Dalit* than other castes in this VDC.

4.2 Livelihood patterns

The livelihood strategies comprise the myriad of activities and methods people employ to maintain or increase their livelihood assets, to reduce their vulnerability, and altogether improve their wellbeing. People can choose any activities or strategies within the limitations of their local context, their assets and their capabilities. The range of activities is therefore in theory inexhaustible. In the sections on the five livelihood capitals, the access to livelihood assets and a variety of related livelihood strategies will be described (sections 4.3 – 4.7).

In this section, the 'proactive' activities and strategies employed by the people in Jumla are discussed. This is done by distinguishing livelihood patterns amongst the people in the research area with similar backgrounds who make similar choices in their livelihood strategies. In contrast, the coping strategies, which are 'reactive' to external factors like stresses, shocks and seasonality (chapter 5), are examined in chapter 6.

Seven livelihood patterns were distinguished amongst the respondents in the research area, as presented in table 4.2. Since most of the respondents have in common that they cultivate apples, this is not recognised as a separate livelihood pattern.

Livelihood pattern	*N*	*Percentage*
Subsistence farmer	12	18,2
Day labourer	8	12,1
Job holder	17	25,8
Business owner	6	9,1
Livestock keeper	6	9,1
Diversified household	11	16,7
Welfare dependents	6	9,1
Total	66	100,0

Table 4.2 – Livelihood patterns identified

The bar charts of the average income sources per activity for each household are presented in appendix C. Here it can be seen that, although very few households are entirely dependent on just one income source and their portfolio of assets and activities is never completely the same, these patterns give a good idea of their main income sources and livelihood strategies. With the exception of the subsistence farmers (who barely have any income at all) and the diversified households (who obtain their income from several sources), the criterion for the categorisation of the households in one of the patterns listed below is that the denominating activity should contribute at least 50 percent of their household's total income. The exact criterions for these patterns will be stated in more detail in the subsections below.

4.2.1 Subsistence farmer

Although the concept of a 'subsistence farmer' is widely used, the lack of a clear classification makes it difficult to link this segment of the population to standardised data. The closest thing to an encompassing definition of subsistence farming is provided by Barnett and others (Barnett et al., 1997 in Morton, 2007, p.19680) who define the concept of subsistence farming as:

> "farming and associated activities which together form a livelihood strategy where the main output is consumed directly, where there are few if any purchased inputs and where only a minor proportion of output is marketed."

Accordingly, the people from the household survey who are classified as being subsistence farmers are consuming most of their own agricultural production instead of selling it, and purchase little to no inputs, as is represented in figure 4.2. Their means of living are sometimes slightly supplemented by remittances, government support (e.g. pensions, child grant, student allowance, etc. – see subsection 6.2.1) or selling forest products. However, their participation in markets (be they commodity, financial or labour markets) is minimal. This pattern was identified for 12 households (18.2 percent of the sample) who have an average annual household income, excluding income from apples, of Rs 7,500.

As these farmers have few financial resources, they also buy little to no agricultural inputs. It can therefore be assumed that their productivity is relatively low. Combined with their relative inexperience of market participation, this makes the subsistence farmer segment an especially vulnerable group in the Jumla apple value chain.

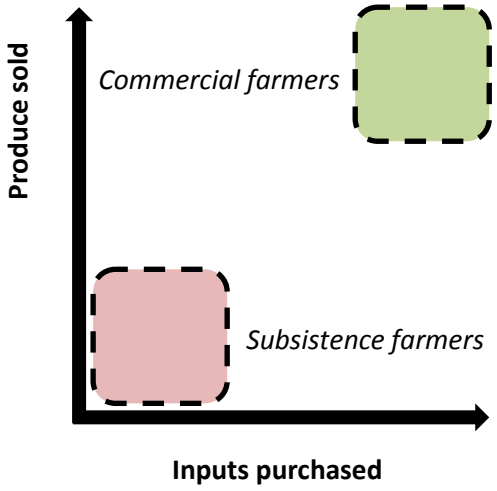


Figure 4.2 – Subsistence and commercial farmers

A first comparison of table 4.2 and figure 4.2 above would lead to believe that the livelihood pattern of commercial farmers (as opposed to subsistence farmers) seems to be lacking, which is exceptional in a rural context like this one. Indeed, several farmers in the research area were found to have some surplus production of cereal crops, which they do sell. In addition, for farmers who grow crops like beans or potatoes it is quite common to sell the majority of the production of those crops. However,

the sales of crops (other than apples) constituted for none of the interviewed households anything near the majority of the household's income. Therefore, households selling crops can be found amongst all the other livelihood patterns described below and 'commercial farmer' was not identified as a separate livelihood pattern.

Farmers who are selling part of their crop production need to have at least enough land to produce sufficient food crops. For example, of the 21 households with less than four *ropani* of land holdings, only one household is able to sell some beans. Therefore, the main difference between the subsistence farmers and farmers who actually do sell some surplus produce seems to be the size of land holdings (see subsection 4.3.1).

4.2.2 Day labourers

Debraj Ray argues that there is no such thing as a "single, homogeneous labour market", but that a distinction needs to be made between two types of hired labour (Ray, 1998, p.484). On the one hand, there are day labourers who are employed on a casual basis, usually for manual labour in construction or farming. On the other hand, there are labourers who have a long-term arrangement with an employer, and are therefore to a certain extent assured of employment and a salary. In subsection 4.2.3, the latter labour arrangement will be discussed.

Day labourers are employed and paid per day, so there is a very low degree of income certainty. In addition, these households are often almost landless and often of the *Dalit* caste (see table 4.8 in subsection 4.6.4). The jobs from *Dalit* respondents included (depending on their sub-caste) carpenters, stonemasons, and tailors. In addition, several families are dependent on work like carrying stones or working on other people's fields. The day labourers are clearly very dependent on human capital (their skills and health) to conduct their work (see section 4.5).

The families who depend on daily labour for their income are generally very food insecure. Additional income sources typically include selling firewood. From the sample, eight households (12.1 percent) were identified as belonging to this pattern. Their average annual income, excluding income from apples, amounted to Rs 77,400.

4.2.3 Job holders

There are very few private sector full-time jobs available in Jumla. However, many government offices and NGOs are concentrated in Khalanga Bazaar because it is the district's headquarters. People who have a full-time job at one of these organisations have a relatively high degree of income certainty. As it is mostly skilled labour, the wage level is often considerably higher than those of the day labourers. 17 households (25.8 percent) are relying on one or more of their household members to earn an income from a job. Their average total household income, excluding income from apples, is Rs 203,200 – which is the highest average income of all the identified livelihood patterns. While

this segment of the population has to – like the day labourers – rely mostly upon human capital for their livelihood, they are better able to convert it into financial capital.

There is a difference in the prevalence of the jobholder and day labourer livelihood patterns amongst the VDCs. Mahat and Kartikswami are very near to Khalanga Bazaar, where basically all the district-level government offices and NGOs are located. Therefore, it is not surprising that a higher proportion of households belonging to the jobholder livelihood pattern can be found in these VDCs: 35.3 percent and 58.8 percent, respectively, versus only 5.9 percent for Patmara. The high proportion of day labourers in Mahat (87.5 percent) is related to the fact that more *Dalit* were interviewed in this VDC, whose economic role in society has traditionally been one of manual labour.

4.2.4 Business owners

During the research, six households (9.1 percent) were encountered whose total household income mainly consisted of earnings from their business. The businesses found in the survey include apple nurseries, blacksmiths, a construction contractor, a drug store, a distillery, grocery stores, hotels, and selling walnuts. The amount of investment (financially and time-wise) obviously vary widely per business, as does the profitability. In general, however, this group makes a decent living for themselves (when comparing their income levels to other groups). They often have to make a considerable investment in the business, e.g. to buy equipment or the building, which means a great deal of their wealth will be contained in physical capital (section 4.4). Their average annual income, excluding income from apples, is Rs 96,100.

4.2.5 Livestock keepers

The people who receive a significant share of their income from trading in livestock (or their products) are mainly the ones with goats and sheep, which are kept for their meat and wool, or horses, which are sold individually as pack animals. A total of six households (9.1 percent) earned income from livestock which constituted more than half of their total annual income. Their average annual income, excluding income from apples, totalled Rs 111,200. Their reliance on natural capital (section 4.3) makes them rather vulnerable to specific external factors (see e.g. subsection 5.1.2).

4.2.6 Diversified households

Households whose income sources are divided amongst different sectors – agriculture, day labour or salary, livestock, remittances, business, forest products, or government sources, are categorised as being households with diversified livelihoods. 11 households (16.7 percent) were sorted in this particular group, with average annual incomes, excluding income from apples, of Rs 135,200 per household.

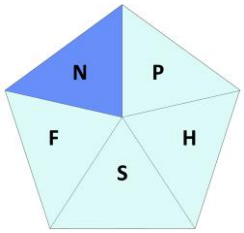
In light of the five livelihood capitals, one could say people with this livelihood pattern succeed in obtaining access to multiple capitals. When no single activity dominates their household income, this implies they are relatively resilient to the vulnerability context (see chapter 5).

4.2.7 Welfare dependent households

Finally, there are six households (9.1 percent) which are quite dependent on social welfare and pensions. Hence, they do not have to put in any effort or time at all to get their income. While some of them use their pensions to run a small business, these people remain very dependent on the continuation of governmental social security payments. Their average annual income, excluding income from apples, amounts to Rs 104,600.

4.3 Natural capital

Natural capital comprises land, water, livestock and forest resources, all of which are very relevant in the context of Jumla. In this segment, the resources the households make use of, the way they are used, and the terms of access to them will be discussed.



4.3.1 Land

The access to land for poor rural people is important, as they cannot grow their crops for food or for money without this land. The scarcity of arable land in Jumla was already mentioned in chapter 2, which indeed provides challenges for the food production capacity of the district. In addition, access to land is essential in the context of cultivating apple trees, as without access to land the apple trees cannot be planted. The average ownership of land from the households in the sample is 10.1 *ropani*, i.e. slightly under the district's average of 11.0 *ropani* (CBS, 2001). However, IFAD reports that the population of Nepal is growing faster than the expansion of cultural land in the country, which has led the average landholdings to decline (IFAD, 2009, p.13). While there are few exact numbers on these indicators for Jumla, it will be seen below that there are some signs which suggest the same holds true for Jumla. For one, the population growth rate of Jumla district is still significantly higher than the national average (see table 2.1, page 29).

During the fieldwork it was observed that Urthu village in Patmara VDC has access to significantly less plain land than the other research locations. Kartikswami and Mahat are located in the densely populated valley where the district's headquarters are located. Here, the land besides the Tila River is relatively flat and fertile. While Urthu is also situated next to a tributary of that same Tila River, there is a lack of plain land as the hills rise steeply directly from the river banks.

Land types and population density

Jumli people generally distinguish two kinds of land; the plain land found alongside the rivers (*beshi*) and the slopes of hills (*pahat*). Sometimes farmers indicated their land could not be characterised in either category, but was located in between. Hence, the category of middle land was added. See figure 4.3 below for a schematic illustration of these land types.

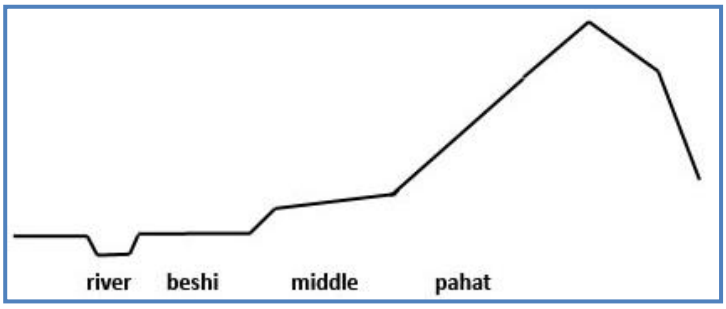


Figure 4.3 – Land types in Jumla

The average landholdings are disaggregated by VDC and by type of land in figure 4.4. The average size of land holdings per household seems to be considerably larger for residents of Patmara than the other VDCs in the sample. As can be seen from the bar graph above, this difference stems mostly from the holdings of *pahat* land. At the same time, Patmara has a similar average in land holding of *beshi* land, but it has less *beshi* land available overall. This is a sign that the population density is considerably lower in Patmara, compared to the other VDCs. In other words, the relative high average of sloped land holdings is caused by the relative abundance of sloped land, as it can be divided amongst fewer people. It should be noted, however, that the *pahat* land is generally less fertile and farther from the villages.

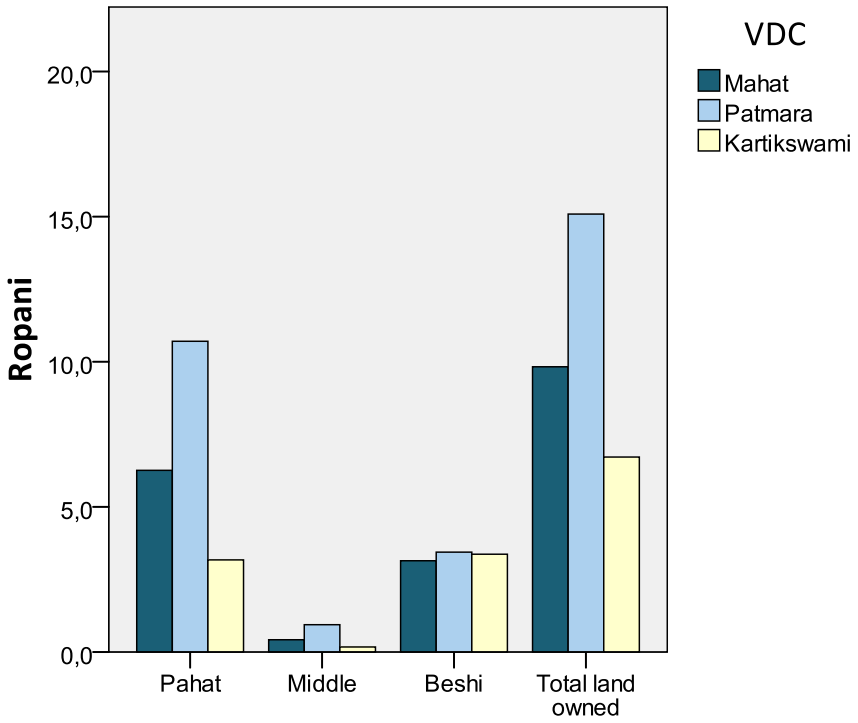


Figure 4.4 – Land holdings by type and per VDC

(In)equality in landholdings

When looking at the distribution of land amongst the households in the VDCs in figure 4.5, it can be observed that just 41.2 percent of the households in the sample from Patmara have landholdings of less than 10 *ropani*, which is one of IFAD's criterions for disadvantaged households (IFAD, 2009, pp.21-22). The percentage of households in Mahat and Kartikswami with less than 10 *ropani* landholdings is significantly higher, with 70.4 percent and 79.2 percent respectively.

The overall inequality in land holdings amongst the households in the sample is shown by the fact that the 10 percent least endowed households own only 0.9 percent of the land, while the 10 percent of the households with most land own 40.2 percent of the all the land. Clearly, the respondents from the survey are not all equally deprived from access to land.

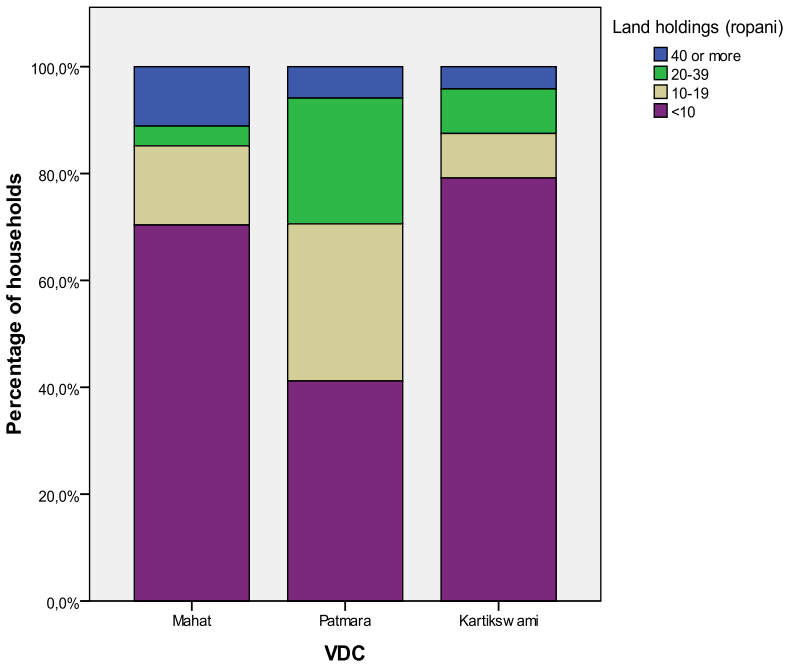


Figure 4.5 – Distribution of land over households

What patterns emerge when disaggregating the data per caste? As can be observed from figure 4.6, the interviewed Chhetri households have significantly larger landholdings than the other castes, with 10.5 ropani for Chhetri while the other castes combined have an average of 3.8 ropani. According to 4S staff, the disproportional division of land is one of the main reasons why Chhetri would benefit more from the project (Shahi, D.B.).

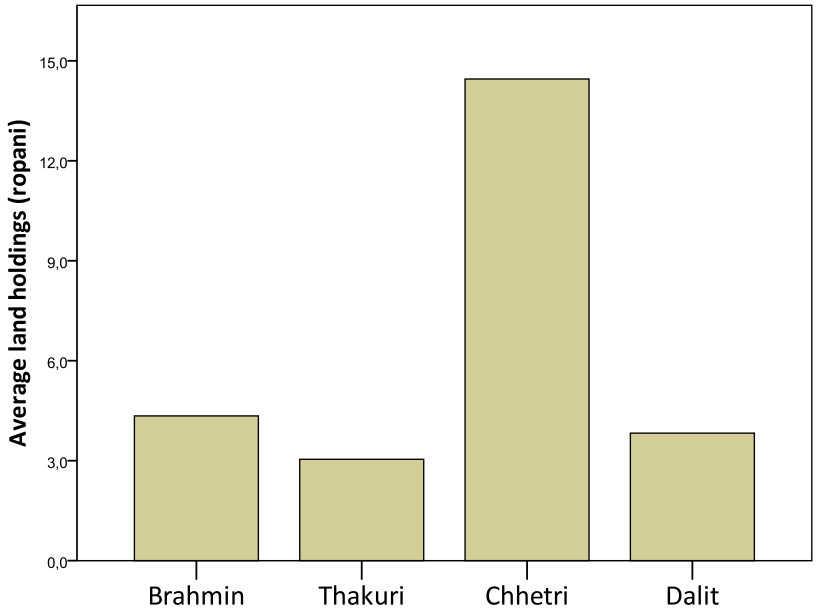


Figure 4.6 – Land holdings per caste

The disproportional size of the land holdings per caste can be explained partly by historical and religious factors. As described in chapter 2, the Chhetri have long been the dominant caste in the government and local authorities, while the Brahmin – although a higher caste – were the priests in the community and did not engage in manual labour. The *Dalit* were the occupational castes, who therefore could not claim large plots of agricultural land. As such, the Chhetri had access to the best land in the fertile valleys. In addition, the exclusion of lower castes continues up to this day despite the formal criminalisation of such practices. With all the (social, financial and other) barriers they encounter, *Dalit* in Jumla have in general been unable to alter this skewed distribution of land.

What differences in landholdings can be seen amongst the livelihood patterns? In table 4.3, it can be observed that the day labourers have extremely little land available. Hence, their crop production potential is also very low. Interestingly, the households which are livestock keepers own on average the most land, but is unknown whether these lands are croplands or pastures.

Livelihood pattern	***Landholdings (ropani)***	***N***
Subsistence farmer	11.1	12
Day labourer	1.6	8
Job holder	10.1	17
Business owner	7.1	6
Livestock keeper	16.8	6
Diversified households	15.3	11
Welfare dependents	5.9	6
Total	10.1	66

Table 4.3 – Landholdings per livelihood pattern

Acquiring land

Because of the high population growth rate (see table 2.1, page 29), the demand for agricultural land in Jumla is increasing rapidly (Maji, D.B.R; Nagarkoti, G.). Part of the land acquisitions is done by buying land. However, this was not very common for most respondents of the household survey and seems to be done mainly by the more affluent families who buy up plots of land for new houses or their business ventures in Khalanga Bazaar.

A more common way of acquiring land in smaller villages is to claim land, which until then would be uncultivated land. This is usually only feasible when the village (or the farmer's own plot) is adjacent to a forest. However, again this is mainly done by the more affluent families as it is said they have the clout and wealth to be able to bribe the government officials (Thakuri, D.B.).

In practice, when looking at the sample population it can be seen that very few plots were either bought or claimed by the respondents themselves. The vast majority of landholdings were inherited from their fathers or fathers-in-law. An interesting tradition is of importance here: When the young men in a household come of age and begin to start their own family, it is customary for the father to divide his land equally amongst his sons. Obviously, combined with the population growth, this leads to smaller average landholdings over time, as many respondents confirmed. This fragmentation therefore results not just in decreasing amounts of food grown per household, but also decreases the yield as no economy of scale can be achieved.

Another noticeable trend in Jumla is the huge increase in construction activity around Khalanga Bazaar, which is also decreasing the available agricultural land. Dozens of new houses, office buildings and hotels are currently under construction, most of which are concentrated near the Karnali Highway. The land prices in Khalanga Bazaar, although still lower than in the big cities of Nepal, are skyrocketing (Nagarkoti, G.). Interestingly, this land near the Highway is plain, fertile land where rice and other crops used to be grown. About this development around Khalanga Bazaar, one villager said: "soon, no rice will be grown in this valley anymore". While this is an exaggeration, this trend of increasing land prices and decreasing availability of fertile land is noteworthy and will have major consequences for the district.

Apart from ownership, a different way of obtaining access to land is, for example, renting land. However, both renting and renting out of land does not seem to happen much in Jumla. Only one household in the sample rented out a few *ropani* for money. Only two respondents said to be sharecropping, i.e. part of their harvest will go to the landowner. While they still own some other land themselves, both of them owned less than 10 *ropani*. Their particular arrangement for sharecropping is called *adhiya,* in which the landowner and the sharecropper divide the harvest equally. This is the most common sharecropping arrangement in Nepal, although the practice is more prevalent in the *Terai* than in the Hills and Mountain regions (Kanel, D.).

Apple farming

It was seen that most respondents have access to very little land. What implications does this have for their ability to engage in apple farming, or any other cash crops for that matter? Most agricultural projects concerning cash crops require farmers to plant a (to the farmer) unknown crop on their limited farm land. People with fewer landholdings generally cannot take the chance of using part of their precious land for a risky new crop. This, however, seems not to be the case with apple trees. Apple trees can be planted on a field in such a way that enough space is left to plant other crops, as was explained in subsection 3.2.2.

There are significant differences in the amount and type of land available per VDC, as was discussed above. Table 4.4 made clear that the apple orchards in Patmara are indeed significantly more often located on *pahat* land. This land is generally located farther from the farmer's house, which (albeit a small addition to the two hours it already takes to reach Khalanga Bazaar from Urthu village) is therefore also farther from Jumla airport.

It was nevertheless observed that most respondents preferred to use only the *pahat* land for their apple orchards, which is less fertile (see plate 6). Hence, there will be some limits to the quality of the apples.

VDC	Land type (for majority of apple trees)			Apple orchard to house (minutes)	N
	Pahat	Middle	Beshi		
Mahat	53.8%	15.4%	30.8%	23	26
Patmara	75.0%	12.5%	12.5%	28	16
Kartikswami	39.1%	34.8%	26.1%	13	23
Total	53.8%	21.5%	24.6%	20	65

Table 4.4 – Land type and distance to apple orchards

4.3.2 Water

Besides being a basic necessity for all people, farmers need water also for the irrigation of their fields. All of the villages in the research area were very close to a river, like nearly all settlements throughout the district. This means that water from the river (or small streams) is generally within 30 minutes walking distance from the house. However, as discussed in the section above, large parts of the land holdings are situated on *pahat* land. Therefore, there is less access to water sources for irrigation than on *beshi* land. The holdings on *beshi* land are often irrigated to some extent by canals or streams, while most *pahat* land is dependent on rainfall. The use of irrigation canals will be discussed in subsection 4.4.4 below, as it is an example of physical capital.

Apple trees need a lot of water in the first year after planting. For example, in the first week after planting the sapling, it needs to have either continuous irrigation from an irrigation canal or a bucket of water per day for each sapling. Hence, that is carrying up ten buckets of water to the apple

orchard every day. The rest of the year, the saplings should receive the same amount of water at least every two to three days (Basnet, D.B. & Shahi, D.B.). While irrigation is less essential in the time after that, it remains an input which could significantly influence the yield from apple trees and, obviously, other crops.

4.3.3 Forest products

Large parts of the hill and mountainsides of Jumla which face north are covered with extensive forests up to the snowline. There are three important kinds of resources found in the forests of Jumla which contribute to people's livelihoods. First, people can gather Medicinal and Aromatic Plants (MAPs) to earn an income. Second, firewood can be collected in the forests. Third, the women often collect dry pine needles (biomass) from the forest floor. These needles are mixed with manure, resulting in homemade organic fertiliser (as was discussed in subsection 3.2.1). Besides these three main Non-Timber Forest Products (NTFPs) for the respondents of the survey, on a very small scale there is some hunting of wildlife in the forests (including deer, wild boar, and pheasants) as well as logging. Below, the collecting of MAPs and firewood will be explained in more detail.

Medicinal and Aromatic Plants

In the forests of the Karnali Zone there are many different kinds of valuable herbs and MAPs, notably *panchaunle*, *jatamansi*, sea-buckthorn, Himalayan edelweiss, *timur*, *rittha* and *sugandhawal* (VSO, 2011, p.32; IFAD, 2009, p.29). These plants grow only in the inaccessible Himalayas and the season to collect them is very short, so the limited supply leads to relatively high prices. This is recognised in the design of the HVA project which includes several of these MAPs due to their pro-poorness potential (IFAD, 2009, pp.14-15). However, a study conducted by VSO in the winter of 2010/2011 revealed that only 0.3 percent of the income of households in Mahat, Patmara and Kartikswami was sourced by the collection of MAPs (VSO, 2011, pp.14-15).

Similarly, for the sample population in the survey for this thesis, it amounted to no more than 0.73 percent for the entire year. Only three respondents from the household surveys stated that they have earned any income from collecting MAPs last year. Two of these households sent one of their sons each to Dolpa district to collect *yarchagumba*,[13] and earned Rs 10,000 and Rs 30,000, respectively. It is important to note that *yarchagumba* is one of the most famous and highly priced 'herbs' in the region, and whole families will spend weeks in the neighbouring Dolpa district in the summer to gather this commodity (Rokaya, Govinda). The third respondent mentioned above said to have earned Rs 30,000 from collecting and selling saffron.

Clearly, while the income effects can indeed be great, the number of households making money from NTFPs is significantly lower in the studied VDCs than in other areas of Jumla district. One

[13] *Ophiocordyceps sinensis* – a fungus grown in infected caterpillars. It is collected on mountains between 3,000 – 5,000 m high between the months of May and July, when the snow has melted. Known popularly as 'Himalayan Viagra', it is used mainly in Chinese medicine as an aphrodisiac.

reason cited for this is that the households in Patmara, Mahat and Kartikswami are farther located from the productive forests and pastures than most other VDCs in Jumla (Budthapa, R.).

Firewood

A second source for people's livelihoods they can gather from the forest is firewood. This is the main fuel source used in Jumla for cooking and keeping the house warm. Seven households regularly sell firewood, which provides them with earnings ranging between Rs 1,000 and Rs 12,000 annually. Six of these households are from Kartikswami, which is not surprising taking into account that this VDC is densely forested[14] – especially compared to Mahat and Patmara (DFO, 2009). Nonetheless, even households from these two VDCs gather firewood for their own use. It is important to note that the collection of firewood is almost exclusively done by women. Most of the collection takes place during the winter when the wood is still dry and the trees are bare of leaves, and therefore easier to clear of branches or cut down.

4.3.4 Livestock

The prevalent farming method in the Karnali Zone is a mixed farming system whereby keeping livestock and cultivating crops are combined (Basnet, D.). Livestock is of central importance as it can be a source of income or an enrichment to people's diet. In addition, households with livestock have the availability of manure, which is vital for increasing crop yields. For example, for apple farming some 0.5 to 1 mt of manure (mixed with biomass) is needed per ropani per year. The manure from 1 cow can be sufficient to fertilise approximately 2 ropani (Basnet, D.B. & Shahi, D.B.). Finally, the various kinds of livestock can be used for traction on the fields or for other animal products like meat, wool, milk, *ghee*,[15] and eggs.

Most of the people in Jumla keep their livestock solely for their own use or consumption. Only 22 out of 68 households (32.4 percent) earn an income from livestock, which on average constitutes a share of 25.7 percent of their total income. The main livestock species present in the research VDCs are water buffalos, cows/bulls/oxen, goats, sheep, horses, and poultry. Animals kept on a smaller scale include donkeys or mules, pigs, angora rabbits and bees.

Water buffalos are very useful for traction, especially in muddy rice paddies (see plate 7, appendix D). In addition, they are important sources of milk and, sometimes, meat. However, only 12 households own one or two buffalos. Cows, bulls or oxen are very common with 61 out of 68 households owning at least one. With Hinduism being the prevalent religion in the district, cows are sacred and their meat is therefore not consumed. Buffalos and oxen/bulls are sometimes lent out to neighbours for ploughing. It seems no money is being earned by lending out these animals, but one person did mention her household received some compensation in the form of crops.

[14] Nevertheless, some respondents claimed the forests of Kartikswami contained relatively few MAPs, which explains the apparent paradox with the paragraph before.

[15] Ghee is clarified butter which is used for cooking throughout South Asia, but is also used in religious rituals in Hinduism.

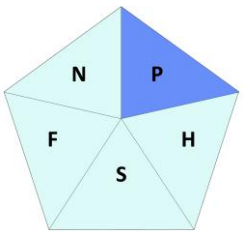
Goats and sheep are actually not counted separately by the respondents, because they are used for the same purposes (mainly wool and meat) and kept in the same herds. While 18 households own at least one goat or sheep, only four households have herds of more than 10 goats or sheep which they keep for commercial purposes. A total of 25 households own chickens, whose eggs are mostly consumed in their own household. Only in rather exceptional cases (like festivals, weddings, etc.) will a chicken be killed for its meat. Only two households have more than six chickens, and get an income from selling the eggs.

Horses and donkeys or mules are the main form of transportation in the district, besides going on foot and using human porters. A mere six households in the sample own horses, but five of them keep these animals for the purpose of breeding and selling. The herds consisting of dozens of animals which can be encountered on the trails in the district are often kept by people living close to pastures, which explains the relative scarcity of them amongst the respondents of the survey.

People need a solid amount of cash to buy livestock, with the possible exception of the relatively cheap poultry. In addition to this financial barrier to obtaining livestock, many people also cited major constraints with keeping or sustaining their livestock. This includes the lack of fodder to feed them, often due to a lack of cropland; a lack of or bad quality of grass, when there is no access to pastures or overgrazing of pastures; and no time to herd the animals, because of a lack of manpower. On top of that, livestock often suffers from diseases. Especially poultry seems to be prone to diseases, which can potentially kill all the chickens in the coop at the same time. Farmers need money to buy medicine from agro-vets, but this can be very expensive.

In conclusion, for keeping livestock one would need access to significant amounts of natural capital (land, water, biomass), human capital (labour, skill), and financial capital (money), in addition to a substantial amount of luck.

4.4 Physical capital



Physical capital is comprised of manufactured assets like buildings, infrastructure, tools and market facilities (Messer & Townsley, 2003, p.9). They therefore include e.g. roads, landing strips, irrigation canals and health care facilities, but also cell phones and farming equipment. Arguably one of the most important aspects of physical capital in Jumla is the Karnali Highway, but it was already extensively discussed in the previous chapters. Below, some other important examples of physical capital in the context of Jumla and apple farming are examined.

4.4.1 Communication facilities

The telecommunications infrastructure in Jumla is limited, and consists of very few landlines and internet connections (most of which are in Khalanga Bazaar). In contrast, the mobile coverage has

skyrocketed in recent years (Bhujel, M.). Almost 80 percent of the respondents declared that someone in their household owned a cell phone. However, in Patmara the proportion of households with cell phones was significantly lower, as can be seen in table 4.5. This can be explained by the fact that Mahat and Kartikswami are located in the same valley as the district capital Khalanga Bazaar, where there is coverage from two network providers. Patmara, on the other hand, is mostly out of reach of these networks.

VDC	*Ownership of cell phones*	*N*
Mahat	80.8%	26
Patmara	58.8%	17
Kartikswami	91.3%	23
Total	78.8%	66

Table 4.5 – Ownership of cell phones per VDC

One advantage of having access to the mobile network is the potential availability of market information. One interviewee gave the example of calling acquaintances in the market of Surkhet, in order to find out the current market price for apples. The price turned out to be so high that it was lucrative for him to transport his apples and sell them directly on that market, for a higher profit than he would have obtained from selling to the DFC at the airport. Hence, the access to telecommunications infrastructure has given him an extra opportunity to make money. In addition, Kirsten and Sartorius argue that the access to market information is important to prevent exploitation of farmers and to strengthen their bargaining power (Kirsten & Sartorius, 2002, p.21). Indeed, if the DFC can capitalise on their networks and find competitors to the current anchor firm, their bargaining power increases.

In conclusion, access to communication facilities can be an important tool to stay connected with a network, and thereby to get information and more opportunities. The high number of cell phones in the otherwise remote region now makes it easier for the people to keep in contact with relatives and friends. This makes their social network even more effective and relevant. People's networks will be further discussed in section 4.6 on social capital.

4.4.2 Electricity

Access to electricity is another form of infrastructure which has various positive implications for people's livelihoods. It gives access to a range of appliances like television and radio, which are potential sources of information. It also lets them charge their mobile phones, which (as stated above) can improve social capital. In addition, it gives the possibility to use electric lighting instead of candles. This gives them and their children the possibility to study in the evening, for example, thereby improving their human capital.

In Mahat and Kartikswami almost all interviewed persons have access to the power grid, with 92.6 percent and 100.0 percent respectively. This power grid is an extension of the grid which covers

Khalanga Bazaar, and is obtained from a small hydropower plant. In Urthu village in Patmara VDC, only two out of 17 respondents have access to electricity. This is due to the fact that there is no (micro) hydropower plant near this village. However, the community is currently working on a new installation (see further the section about social capital) so the access to electricity may increase in the near future.

Another form of access to electricity is the ownership of solar panels. Unsurprisingly, an inverse relationship between the access to electricity and the ownership of a solar panel was found from the sample. In the absence of access to the power grid, there is still a high a demand for electricity for solar panels. While 11 households (16.2 percent) have access to both electricity and a solar panel, there are only 3 households (4.4 percent) that have neither, as can be seen in figure 4.7 to the right. There is a large difference in the mean income levels between these two groups: Rs 229,000 and Rs 42,450 respectively. This is not surprising, as the more affluent households have a) more money so they can buy a solar panel as insurance against power outages, and b) they have the means to live in the villages which are connected to the Khalanga Bazaar power grid.

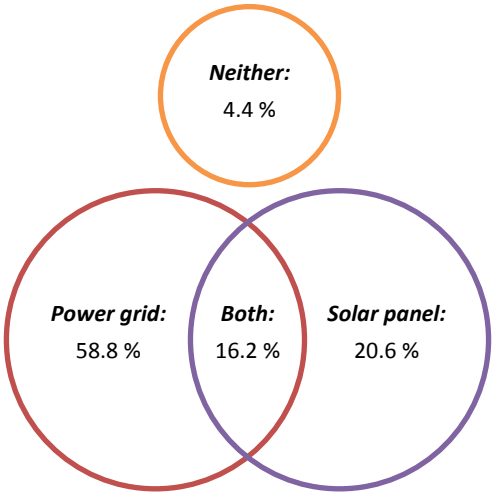


Figure 4.7 – Access to electricity sources

4.4.3 Shelter

An example of ownership of physical assets which provides relatively much security and general wellbeing is the possession of a house. All the households included in the sample own their house. Traditionally, people in Jumla have always owned their own dwellings which were built with help from family and neighbours (Maji, D.B.R.). Only recently families have started to rent rooms in small apartment buildings which are built by contractors. However, this practice has so far been limited to Khalanga Bazaar and has not yet been the case in the three researched VDCs.

Interestingly, nearly 15 percent of the respondents said to have a tin or galvanised roof as opposed to the traditional roof made of wooden beams, stone slates and mud (see plate 8, appendix D). This implies that at least those households had enough money to construct or modify their house in rather recent times. This does not even take into account the completely traditional houses which are still being (re)built as well. Clearly, people are willing to invest in their shelter.

4.4.4 Irrigation

As mentioned in the section on natural capital, access to water is very important for irrigating the fields and orchards. In figure 4.8 below, the main irrigation methods for people's apple orchards are

presented, disaggregated by VDC. Of these irrigation methods only the irrigation canal is an example of physical capital.

Normally, the fields on *pahat* land (where most of the apple orchards are located) are not covered by irrigation canals, as serving the *beshi* land is easier and more effective. Interestingly, from figure 4.8 it can be seen that farmers from Mahat VDC have significantly more access to irrigation canals for their apple orchards than farmers from other VDCs. The DDC explained this was due to an irrigation canal which was constructed through the hills, and serves a couple of the villages in Mahat with water. This results in a relatively large part of the apple orchards in Mahat being covered by irrigation (Bhujel, M.).

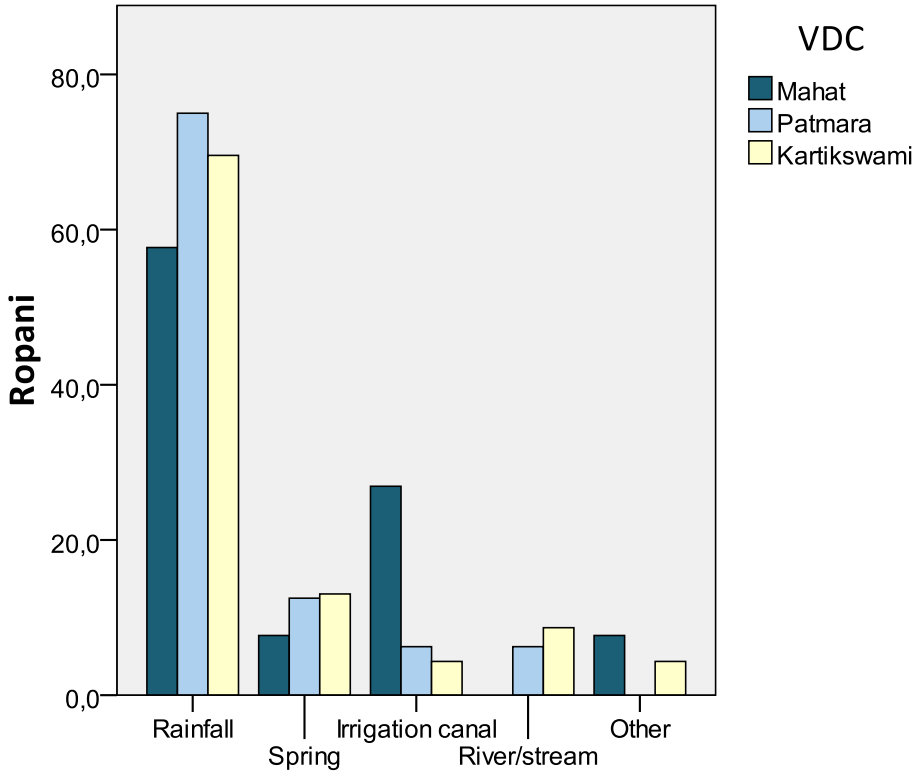
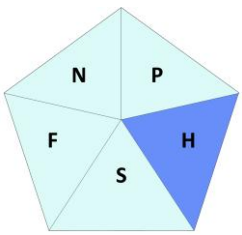


Figure 4.8 – Irrigation methods for apple orchard

4.5 Human capital



Human capital comprises "[p]eople's health and ability to work, and the knowledge and skills they have acquired over generations of experience and observation" (Messer & Townsley, 2003, p.9). Debraj Ray made a useful contribution to the concept of the 'ability to work'. With labour as a production factor, there should be a distinction between the number of labourers and the labour power (Ray, 1998, p.487). Hence, two labourers with different education or technical training will have a different 'ability to work', depending on the task at hand. In addition, a worker who is malnourished will have a hard time producing the same output as a well-fed and

healthy worker. In short, all of the aspects mentioned above determine the capacity of people to work.

The food security situation of the households will be discussed in section 5.4, although it will only give a very basic indication of their health. Rather, in this section the focus lies on the educational attainment, the extent of traditional knowledge remaining, and the technical training. These aspects are particularly important in the context of the Jumla apple value chain.

4.5.1 Education

First, the level of education is important as it "(…) can help to improve people's capacity to use existing assets better and create new assets and opportunities" (Messer & Townsley, 2003, p.9). Jumla has district-wide literacy levels of 56.1 percent for men and 37.0 percent for women (DEO, 2010). This is considerably lower than the national average of 70.7 percent and 43.4 percent, respectively (CBS, 2008). The educational attainment levels found in the sample also shows that almost half of the people over 16 years old lack any formal education (figure 4.9). On the other hand, it was indicated without exception that all the children under 16 within the households are currently enrolled in schools, which is obviously a positive development.

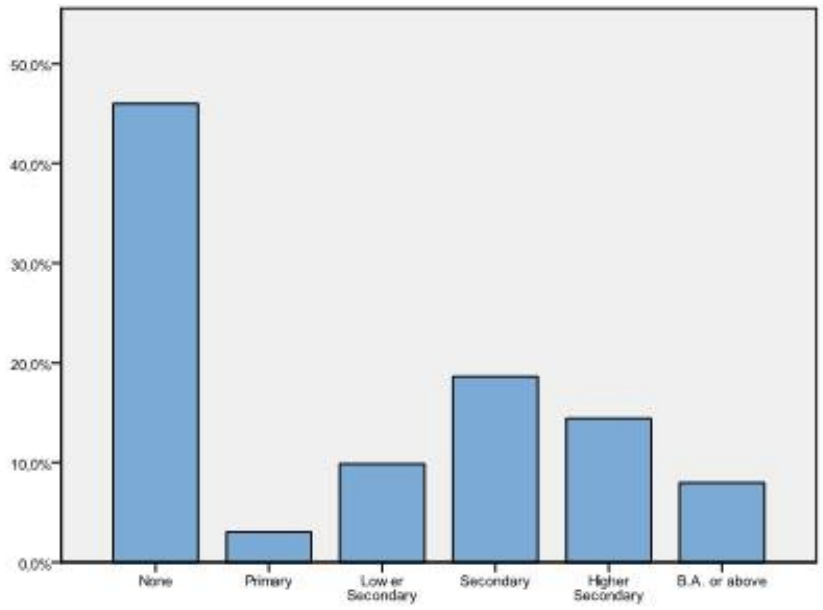


Figure 4.9 – Highest attained education of >16 years olds

4.5.2 Traditional knowledge

People in Jumla have cultivated their land in 'traditional ways' for generations. There are still no mechanical tools available except for the occasional tractors. In fact, these are not even used for ploughing the land but as a means of transport for heavy goods. Ploughing the land is still exclusively supported by strapping buffalos, bulls or oxen to a wooden plough. Other land cultivation practices are also conducted by using hoes or pickaxes. In other words, people generally already have the skills

and experience to (more or less) effectively and efficiently cultivate their land with the sparse resources available.

In addition, the traditional farming methods include the use of homemade manure and other organic inputs. When Jumla was declared to be an organic district in 2007, the use of chemical fertiliser and pesticides in the district were effectively banned, as was explained in subsection 3.3.2. Hence, the smallholder farmers do not need to adapt to different inputs and products, but can continue to use their homemade organic manure (although these are not without problems, see subsection 3.2.1).

However, there still seems to be a need for the smallholder farmers to start to use artificial organic fertiliser, bio-pesticides and bio-herbicides in order to be able to prevent diseases, produce high-quality products, and prevent soil degradation. Unfortunately, these products are new to most farmers, so they would require some additional training or instructions on how to use these products properly.

4.5.3 Technical training

Especially with high-value and riskier crops, which thus includes apples, farmers tend to avoid producing these crops when they are not well known to them. With technical assistance, it is argued, the production uncertainties are taken away and farmers will be able to produce those new crops in a productive and efficient manner (Da Silva, 2005, pp.15-16).

Apple trees have been cultivated in Jumla since the 1970s, which implies that at least some experience is already present with a certain number of farmers. When looking at the data from the sample, presented in table 4.6, nearly 8 percent of the respondents say they cultivated apple trees for less than five years, which means their trees would have given fruit for the first time last year, at best. A total of 40 percent of the households have grown apple trees for five to nine years, which gives them the experience of at least a couple of seasons of fruit-bearing. On the upper end of the scale, almost 17 percent of the interviewed farmers have cultivated apple trees for 30 years or more.

However, these farmers mostly cultivated apples for own use or for small-scale selling on the local market (see also the introduction to chapter 3). To cultivate apple trees in a way that gives high quality apples and high yields, additional training is essential. 4S and the District Agricultural Development Office (DADO) have given farmers instructions on planting, irrigation, training, pruning, applying bio-pesticides, etc. All stakeholders seem to agree that if farmers in Jumla want to have any chance of producing quality apples which can compete with apples from India, China, and Mustang district, they need to be educated on these cultivation practices.

As was explained in subsection 3.3.2, DADO has trained one Local Agricultural Resource Farmer (LARF) for each of the 285 wards in Jumla. They are supposed to share their experience with the other farmers in their ward for a fee. Two of the three cooperatives in the project actually also hire LARFs who can instruct their members. However, at the moment far too few people are reached by the services. Both DADO and SNV Nepal should work to extend the coverage and the intensity of

the support by the LARFs. Not only are they cheaper than outside hired experts, but their involvement is an excellent example of promoting local entrepreneurship.

The experience with selling apples per livelihood pattern is presented in table 4.7. Interestingly, the livestock holders in the sample have significantly more experience selling apples than the other livelihood patterns, while day labourers and business holders have on average only been selling apples for one year. As can be seen in subsection 4.7.2, this finding can have implications for the success within the Jumla apple value chain. However, the reasons behind these differences in experience are unknown.

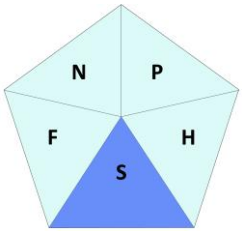
Years experience cultivating apple trees	*Percentage*	*N*
<5	7.7%	5
5-9	40.0%	26
10-14	21.5%	14
15-19	6.2%	4
20-24	3.1%	2
25-29	4.6%	3
30 or more	16.9%	11
Total	100.0%	65

Table 4.6 – Experience cultivating apple trees

Livelihood pattern	*Years selling apples*	*N*
Subsistence farmer	6.7	12
Day labourer	1.0	8
Job holder	4.7	17
Business owner	1.0	6
Livestock keeper	17.5	6
Diversified households	4.7	11
Welfare dependents	4.5	6
Total	5.4	66

Table 4.7 – Experience selling apples

4.6 Social capital



Social capital is an important part of the livelihood framework, but one of the less conventional ones. On a very local level, social capital can be described as "[t]he way in which people work together, both within the household and in the wider community (…). In many communities, different households will be linked together by ties of social obligation, reciprocal exchange, trust and mutual support, all of which can play a critical role, particularly in times of crisis" (Messer & Townsley, 2003, p.9). As will be seen below, social capital is also very relevant on a larger scale as increasing migration increases the reach of these networks.

4.6.1 Civil society

A total of 55 households (80.9 percent) from the sample have at least one household member who is a member of a cooperative. It can be assumed that being member of such an organisation opens them up to repeated social contact with neighbours and other farmers, potentially increasing their social network. The same is true for Community Forest User Groups (CFUG), which are groups formed by the Ministry of Forests and Soil Conservation (MoFSC) consisting of people living close to community forests. These groups should manage and conserve the forest resources and utilise the forest products in a sustainable way. Nevertheless, only 27 percent of the households in the sample are member of one of these CFUGs. As described in subsection 4.3.3, Kartikswami is the VDC most densely covered by forest. Therefore, it was no surprise to find that this VDC also has relatively more people who are member of CFUGs.

4.6.2 Family networks

Arguably the most important kind of social networks is formed by people's families. It was observed that nearly all (95.5 percent) of the respondents have family members in other households in their village. These family members can be of great assistance during times of need. They could, for example, be a source of additional labour during the busy harvesting season, or give food or financial support during the lean months. Incidentally, only one person said she did not receive any of these forms of assistance from their family members in the village, because they are too poor themselves to be of any help.

Of course, family networks might extend beyond their own village. Most respondents indicated they have some family members in surrounding villages or other VDCs of Jumla district (i.e. within two days walking distance), who could therefore provide similar support. In addition, there are eight households who have family members in Nepalgunj, five with family in Surkhet, and another five households with family in Kathmandu. These households in Jumla often receive some financial support from their relatives, although usually as a loan.

When the migration happens in response to external shocks, stresses or seasonality, migration is a coping strategy. Therefore, this subject will be discussed from this perspective in subsection 6.1.1.

The importance of these family ties for the apple business, is that these families have some connection with the major trade hubs. This is exemplified by one trader who, partly thanks to family support in Nepalgunj, set up a venture whereby he could buy up apples from his neighbours, then transport them to Nepalgunj and eventually received higher profits than he would have obtained from selling them to the cooperatives at Surkhet airport. Clearly, these family connections can be of great importance to people who know how to put them to use.

4.6.3 Neighbours

Relations with the neighbours of households could influence the livelihoods to a great extent, as these people live close by and there is daily contact. In fact, nearly all respondents (93.9 percent) indicated that in busy periods they will ask (and receive) their neighbours' help on their fields. In Urthu village in Patmara VDC, there is a rotating scheme wherein all neighbours go to each other's fields together to get the farming work done. In the villages visited in Mahat and Kartikswami, there was no system like this, but people would still help each other.

A prime example of how social capital can work in these small communities is the following: In Urthu village, the households started working collectively on a community project which consists of building a canal to divert water from the river to a small powerhouse, so they could have electricity in the village. All households have sent at least one member to work on this project, for which they obviously did not get paid. In fact, when the canal will be finished all the households still need to contribute Rs 5,000 each, in order to buy the turbine. Their ability to mobilise the entire village shows the great potential for organised action in this setting.

Box 2 – Neighbours

Mr Pradhan* from Urthu village died 3 years ago from cancer, leaving behind his wife, his retired mother and 4 children. While Ms Pradhan obviously could do nothing to prevent her husband from dying, for some reasons she is 'blamed' for the death of her husband by her neighbours. The local consensus seems to be that her husband must have died because she was a bad wife, rather than from the disease. Nonetheless, she does report that her neighbours still help with farming, and her relatives in the village support this household with work, food and money.

**[name changed for anonymity]*

4.6.4 Caste system

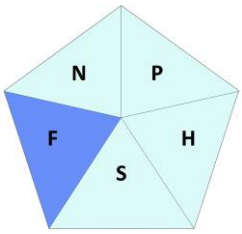
Despite the enormous potential of social capital in small, rural villages, a major constraint to the full utilisation of people's social capital is the caste system in Nepal. As was described in chapter 2, the caste system has a long history and is deeply rooted in Nepali society. It appears that the dogma of the caste system is thus still inhibiting the access of lower castes to benefits like community work or even neighbourly help. This has been confirmed by several key informants, but is largely denied by both high and low caste respondents and was therefore not evident from the household survey. The continuance of the caste system will be discussed further in section 6.2.2.

In this chapter, the prevalence of certain job types amongst the different castes was already discussed. The main findings from setting off the livelihood patterns against the household's caste result in clear differences in opportunities, as can be seen in table 4.8 below. The percentages are the proportion of the livelihood patterns that are identified. Hence, if the percentage in this table is higher than the relative proportion of the caste in the entire sample, it can be concluded they are disproportionally represented in the particular livelihood pattern. Hence, it is observed that *Dalit* are mostly involved in day labour (as explained before) as they present 87.5 percent of the day labourer pattern, while their caste only constitutes 19.7 percent of the sample. Interestingly, they are not present among the subsistence farmers, because of their lack of land. Finally, two business owners can be seen among the *Dalit*. However, they were both blacksmiths, which is an occupation reserved for the lowest caste, thus again confirming the continuing (occupational) segregation between the castes.

Livelihood pattern	***Caste***							
	Brahmin		***Thakuri***		***Chhetri***		***Dalit***	
Subsistence farmer	3	*(25.0%)*	-		9	*(75.0%)*	-	
Day labourer	1	*(12.5%)*	-		-		7	*(87.5%)*
Job holder	1	*(5.9%)*	2	*(11.8%)*	12	*(70.6%)*	2	*(11.8%)*
Business owner	1	*(16.7%)*	-		3	*(50.0%)*	2	*(33.3%)*
Livestock keeper	-		1	*(16.7%)*	4	*(66.7%)*	1	*(16.7%)*
Diversified households	1	*(9.1%)*	2	*(18.2%)*	7	*(63.6%)*	1	*(9.1%)*
Welfare dependents	1	*(16.7%)*	1	*(16.7%)*	4	*(66.7%)*	-	
Total	8	*(12.1%)*	6	*(9.1%)*	39	*(59.1%)*	13	*(19.7%)*

Table 4.8 – Livelihood pattern and caste

4.7 Financial capital



The fifth and final type of capital includes the financial assets, which consist of all financial means of the household and therefore includes cash and savings, but may also be available "from the conversion of their production into cash in order to cover periods when production is less or to invest in other activities" (Messer & Townsley, 2003, p.9). In addition, they can use "formal and informal credit to supplement their own financial resources" (Messer & Townsley, 2003, p.9).

The income sources of households in the sample vary widely, and are very dependent on people's occupation. In the pie chart below (figure 4.10) the different income sources as part of the surveyed households' aggregate income are presented.

The incomes from land, livestock and NTFPs were already discussed in section 4.3 on natural capital. Nevertheless, it can be observed in figure 4.10 that a relatively large part of the natural capital that is livestock is converted into financial capital. The 2.9 percent of aggregate household income that is contributed by selling crops originates actually from a total of only 20 households who occasionally sell their surplus production of buckwheat, beans, or potatoes.

The largest proportion of the aggregate income earned is wages (44.5 percent), hence from converting human capital into financial capital. Note that this segment is disproportionately large because of some high income earners in the sample. The several different businesses found in the sample were already discussed in subsection 4.2.4.

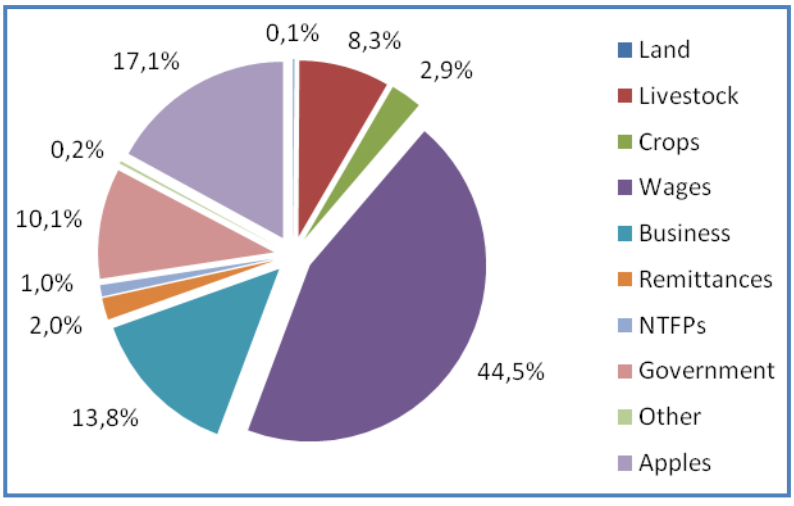


Figure 4.10 – Income sources as part of total household income

As was described in section 4.6 on social capital, there are only four families who receive remittances, which is why this income source makes up only 2.0 percent of the total income amongst the households. The subject of migration will be discussed in greater detail in section 6.1.1. The income from government sources is surprisingly large. A total of 40 out of 68 households (58.8

percent) receive some government support. In section 6.2.1, the programmes which provide this support, the methods they employ, and the effects these have on people's livelihoods will be examined. Finally, the income from cultivating apples will be discussed in subsection 4.7.2.

4.7.1 Income distribution

There are great differences in the amount of income that households can earn from their economic activities. In figure 4.11, the yearly incomes from the households in the survey are arranged in ascending order. Clearly, there is some significant income inequality. In the far right of the figure, two households can be seen with more than Rs 400,000 income per year, while 28 households (41.2 percent of the sample) earn less than Rs 100,000 per year. In fact, the poorest households on the far left of the graph have hardly any income at all.

Nevertheless, only 19 households (27.9 percent) from the sample have income levels lower than the poverty line of Rs 7,696 per person per year when not taking into account the income from apples. When adding the income from apples, only 16 households (23.5 percent) have an income per person lower than this poverty line. Interestingly, the proportion of people living under the poverty

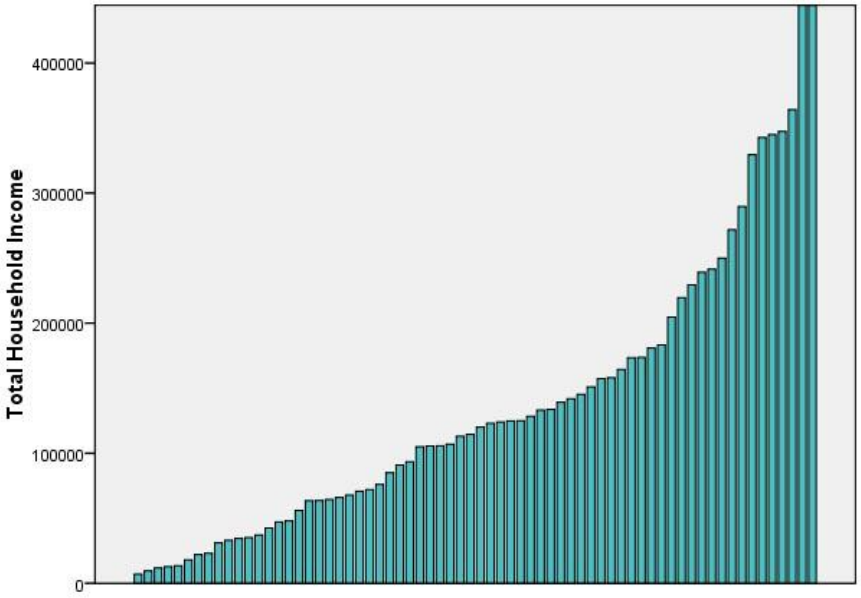


Figure 4.11 – Income per household per year

level for the whole of Nepal lies around 31.1 percent (WFP, 2010, p.17) and Jumla's district-wide poverty incidence is even 34.4 percent (CBS, 2006, p.146). Hence, this leads to the conclusion that, purely on income levels, the HVA-IB pilot project is not yet succeeding in reaching the poorest of the poor to the extent it was trying to (as was discussed in section 2.7).

With regards to the income differences between the livelihood patterns, there is also a distinct inequality. In table 4.9 it can be observed that especially the subsistence farmers (who by definition hardly participate in markets, and therefore do not have much income) and the day labourers earn significantly less than the other patterns. The job holders have by far the highest incomes, with diversified households following after a respectful distance.

Livelihood pattern	*Annual household income (excl. apples)*	*N*
Subsistence farmer	7,500	12
Day labourer	77,400	8
Job holder	203,200	17
Business owner	96,100	6
Livestock keeper	111,200	6
Diversified households	135,200	11
Welfare dependents	104,600	6
Total	114,000	66

Table 4.9 – Household income per livelihood pattern

4.7.2 Income from apples

To give a general idea about the income from apples, there are two different sources available: first, the information on income sources from the household survey, and second, from a list of apple suppliers to the DFC in 2010.

From that list, there is information about the suppliers of organic apples in 2010, but only their name, their ward, the amount of apples and the total income from these apples. It was observed that 237 farmers supplied a total of 24,486 kg of organic apples[16]. This comes down to an average of 103.3 kg apples sold and average revenues of Rs 2,918 per farmer. Unfortunately, from this list there is no information available about the share that selling apples contributed to their total income.

From the respondents of the household survey, 47 households sold (part of) their apples in 2010 to different buyers.[17] Together they earned a total of Rs 867,305 from the sale of apples. Their revenues ranged from Rs 1,000 to Rs 86,000 per farmer, with a relatively high average (compared to the suppliers list above) of Rs 18,453 per household. Their total household income averages Rs 129,728 which means that the share of sales from all apples in the total household income amounts to 14.2 percent in the sample.

Of these households, 37 of the respondents said to have supplied to the cooperatives or the DFC at the airport. Their revenue was an average of Rs 12,603 (12.4 percent of their total household income) which is still over four times as much as the average of the people on the list of organic apple suppliers. Where does this difference between the sample and the list come from? When cross matching the list with the sample, it becomes clear that most of the farmers indicated to have sold larger amounts to the cooperatives at the airport than is presented on the list. For example, a certain

[16] The list contains 24.5 mt of organically certified apples. This means that the other 36.5 mt of apples purchased by the DFC were not certified.

[17] Actually 51 households, but two cases were discarded as statistical outliers because of a disproportional amount of apples sold, and two cases were discarded because of missing data.

villager from Mitsa village, Mahat VDC, is on the suppliers list from the DFC for 23.5 kg at a total price of Rs 621, but indicated in the survey to have sold 500 kg for a total of Rs 17,500. This discrepancy most likely stems both from problems with recalling figures and prices (e.g. the price he remembered was Rs 35/kg, while in fact it was Rs 26/kg) and the possibility that only 23.5 kg of his apples were accepted by the DFC after grading and he sold the rest to traders or on the marketplace.

Table 4.10 shows that the income from apples is very different per livelihood pattern. Since the subsistence farmers had hardly any monetary income at all, the increase in income from apples constitutes a 217 percent increase in their income. Coincidentally, their substantial income from the apples can be explained somewhat by the fact they have more experience selling apples (see table 4.7, subsection 4.5.3) and have presumably more trees which are mature. The really surprising results, however, are as follows. First, the income from apples for livestock keepers is very high compared to the other livelihood patterns. Again, however, it can be referred back to table 4.7 where it was seen that on average people with this livelihood pattern have been selling apples for a very long time. In addition, they have the highest average landholdings amongst the livelihood patterns, which increases their capability to plant trees.

Livelihood pattern	*Annual income from apples*	*Share from total income*	*N*
Subsistence farmer	16,300	217.3%	12
Day labourer	11,800	15.2%	8
Job holder	11,300	5.6%	17
Business owner	3,300	3.4%	6
Livestock keeper	38,200	34.4%	6
Diversified households	11,600	8.6%	11
Welfare dependents	3,700	3.5%	6
Total	13,300	11.7%	66

Table 4.10 – Income from apples per livelihood pattern

Furthermore, the relatively low incomes from apples for the business owners and welfare dependent households can be seen. How can their failure to participate in the apple trade be explained? One explanation could be that their relatively low landholdings (see table 4.3, section 4.3.1) might prohibit them from cultivating apple trees. However, how would then the income from apples for day labourers, who have the lowest landholdings of all livelihood patterns but have nevertheless just slightly below average incomes from apples, be clarified? The explanation cannot be found in land, in caste or in which VDC they are located. Unfortunately, therefore, this question remains unanswered.

4.7.3 Credit

Credit is a source of financial capital which has enormous potential as it can amount to many times more than a household could raise on its own. In addition, loans can be taken out when the need is

highest, and can thus form a coping strategy. The aspect of credit as a coping strategy will be discussed further in subsection 6.1.2. From the sample, 42 respondents (61.8 percent) said to have taken out loans last year. The 42 respondents had a total of 50 loans last year, with a total sum of Rs 1,940,000. That amounts to the equivalent of 35.7 percent of their combined income. Clearly, access to credit is extremely important for the households in Jumla to be able to conduct their livelihood strategies. The use of the loans is presented below in figure 4.12.

Some of the highest loans were taken out for building houses or buying land, which is often subsequently also used to build a house on. It is not uncommon for these families in Jumla, who can afford these high loans, to have these houses built in cities like Birendranagar or Nepalgunj. Other regular expenditures from loans include paying for their children's education. Expenditures on medicine are arguably done in reaction to illnesses (see subsection 5.1.3), and are therefore a coping strategy. Similarly, buying food (second from below) with credit would only be done in case of lower food security (see section 5.4).

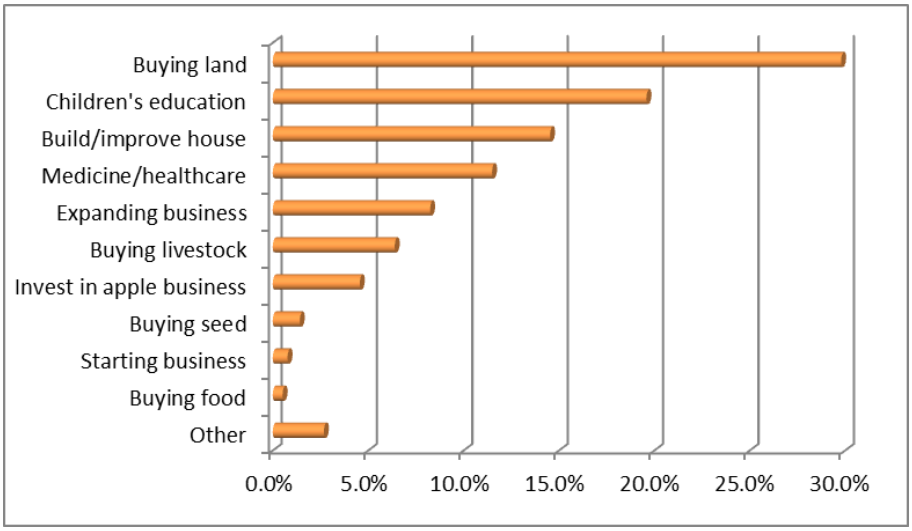


Figure 4.12 – The use of credit

Figure 4.12 shows that the loans are less frequently used for productive investments like starting or expanding businesses, and buying livestock or seed. For instance, only five percent of the loans are used to invest in the apple business. A 'productive' use of the loan entails that the investment of the loan amount generates new income. The rather obvious goal should then be to pay back the principal and the interest, and then have some profit left. However, the total amount of productive loans as counted from the survey constitutes merely 21.3 percent of the loans. In this light, it is interesting to see that a positive correlation was found between the total income levels of the household and the amount of loans taken out. Part of the explanation could be that households with collateral usually have more access to credit providers. However, all respondents appeared to have equal (in)access to cooperatives and more formal institutions which provide credit (see also below).

This leads to the conclusion that households with very limited (financial) resources take out fewer loans because they do not have any income sources to ever pay back the loan (especially since

the loans are not used productively). In contrast, households with relatively large wealth or regular income sources can afford to take more risks by taking out a loan (without it necessarily being productive), and using their other income sources to pay back the loan. In conclusion, the bottleneck issue with regards to credit, besides the general lack of access to credit providers, is the lack of knowledge or capacity to invest loans productively. This can be addressed by training in entrepreneurship, accounting, and etcetera.

Most of the loans are obtained from cooperatives (52.4 percent) and NGOs (33.3 percent). Only 7.1 percent of the loans are obtained from a bank, and they only include the highest loans for buying land or building houses. People's access to the credit providers is problematic, however. Especially banks demand unreachable assurances like regular incomes or collateral. Cooperatives and NGOs are less demanding, but their available loan amounts are lower. Finally, 2.4 percent of the loans were obtained from family members[18], and 4.8 percent of the loans are arranged through informal moneylenders, usually from the same village.

The loans taken from informal moneylenders are subject to high interest rates: a 3 percent monthly interest rate was reported, which comes down to a 36 percent interest rate per annum. In comparison, one cooperative from the project claims to have an interest rate of 12 percent per annum for loans with a 'household expenditure' purpose, but 9 percent for loans which are intended to be used for agriculture (Rawal, H.B.).

The aspect of contract farming can actually offer access to credit for farmers in several ways. For instance, in a resource-providing contract (see subsection 1.1.3), working capital is provided in kind by the anchor firm, by providing inputs. Investment credit, for buying e.g. machinery or tools, can also be provided by the anchor firm. The contractual arrangement then works as a guarantee for the anchor firm (Da Silva, 2005, p.16 and Asian Development Bank, 2005, p.21). In conclusion, as credit can provide the much-need boost to quality and productivity levels, this aspect of the contract farming arrangement can be an area of improvement either the DFC, the anchor firm, or both.

4.7.4 Savings

A total of 42 households are keeping savings[19], with a total of Rs 639,010 which constitutes 9.8 percent of these households' total annual income.[20] Interestingly, there is a significant difference in the average amount saved between the households with savings with a bank (Rs 43,333) and households who save with their cooperative (Rs 10,133). The farmers who save with their cooperatives are mostly from the poorest households, who have to do their compulsory monthly savings of several hundred rupees, as a requirement for being member of the cooperative. Another

[18] Not including the small amounts of cash (approx. < Rs 3,000) lent from family, which are not recorded and/or recalled.

[19] N.B. Not all of these are the same households who have credit, which are incidentally also 42 households. In fact, only 25 households have *both* credit and savings.

[20] In this calculation, the savings and income of one respondent were discarded because his disproportionate amount of savings (Rs 800,000) constitutes a statistical outlier.

reason for the relatively few people who have savings at banks, which was mentioned several times, is the fact that people's trust in the banking system faded after the incident during the Nepali Civil War (see box 3).

Box 3 – Savings

During the Nepali Civil War, there was heavy fighting in Khalanga Bazaar (2003 C.E.). During this fight, the bank burned down completely. All of the bank's records were lost in the fire. The management decided that the receipts of the bank's customers were not evidence enough of their deposits, which meant that all the people lost their savings which were deposited here. For instance, Mr Tiruwa* reports he had a total of Rs 80,000 saved in this bank at the time, and he has not been able or willing to conduct any more savings since then.

**[name changed for anonymity]*

4.8 Conclusion

Q_2: What are the characteristics of the local livelihood assets and strategies and what are the implications for the cultivation of apples?

This chapter contains an extensive examination of the various livelihood capitals and strategies. Its complex outcomes proof that there is value in the livelihood approach, in order to get a better understanding of the lives of people in Jumla. From this chapter, it should be clear that besides being the cornerstones of peoples' lives, the five livelihood capitals are also very important in the context of apple farming.

Seven livelihood patterns were distinguished amongst people with similar backgrounds and who make similar choices in their livelihood strategies. These patterns give a good idea of their main income sources and livelihood strategies. First, subsistence farmers have minimal participation in markets and are consuming most of their own agricultural production instead of selling it. The basis of their livelihoods lies in natural capital (their land and livestock). Second, day labourers are employed and paid per day, so they have little income certainty. In addition, they are often nearly landless and mostly of the *Dalit* caste. Day labourers are very dependent on human capital (their skills and health). Third, job holders are employed for a longer term, mostly at one of the many government offices and NGOs in Khalanga Bazaar. They have a relatively high degree of income certainty. Fourth, business owners can own a variety of businesses and have generally average income levels. As they mostly invest financial capital in the business, e.g. to buy equipment or the building, it's actually converted into physical capital. Fifth, livestock keepers hold mainly goats, sheep or horses. Their reliance on natural capital makes them rather vulnerable to specific external factors like diseases among their livestock. Sixth, households with diversified livelihoods draw their income sources from different sectors amongst the five livelihood capitals. As no single activity dominates their household income, it implies they are quite resilient to the vulnerability context. Finally, welfare dependent households mainly have incomes from social welfare and pensions, for which they do not have to put in any effort or time. They are very dependent on the continuation of governmental social security payments, without which they will have hardly any alternative income sources.

With regards to the income from apples, it was interesting to see that both subsistence farmers and livestock keepers have relatively much income, seemingly thanks to their higher experience with apples than other livelihood patterns. Conversely, business owners and welfare dependent households have relatively low incomes from apples, presumably due to their low landholdings. However, this does not explain the relatively high incomes for day labourers, who have neither land nor experience. This question remains unanswered.

Within the realm of natural capitals, access to land was identified as being essential for the people in Jumla to be able to grow both apple trees and food crops. Interestingly, Chhetri households have

significantly larger landholdings than the other castes. With regards to the livelihood patterns, the day labourers have extremely little land available. Hence, their crop production potential is also very low. There are two trends which are lowering the average holdings of agricultural land. First, there is a fragmentation of plots because of inheritance customs and population growth. Second, a lot of agricultural land in favourable locations is being purchased and converted into houses or offices. Finally, it was concluded that apple farming is not significantly taking up cropland at the cost of food crops, as most of the land in the apple orchards can be used with intercropping.

Water is another natural resource which is essential to both food crops and apple trees. While large parts of the apple orchards are located on *pahat* land, there is less access to water sources. While the use of irrigation canals (physical capital) can address this problem, they are rarely servicing *pahat* land.

From the forest, women collect dry pine needles to use as biomass for the homemade organic fertiliser. For this, they need to mix it with manure, obtained from livestock. Hence, the prevalent farming system in Jumla uses mixed farming whereby livestock and crops are used simultaneously. However, people with fewer livestock will have a lack of manure, and therefore low yields. However, for keeping livestock it is necessary to have access to significant amounts of natural capital (land, water, biomass), human capital (labour, skill), and financial capital (money).

With regards to social capital, the people in Jumla seem to have extensive networks which include their neighbours, members of their cooperatives or CFUGs, and their family. For instance, in busy periods they will have their neighbours' help on their fields, and family can assist financially during times of need. These family ties can become important for the apple business when they have family members or acquaintances in the trade hubs like Surkhet, Nepalgunj or Kathmandu. Since the mobile coverage in Jumla has greatly increased in recent years (physical capital), it means people with a social network and a mobile phone have potential access to market information.

The main components of human capital in this context were described as apple cultivating skills and traditional knowledge. There is much experience with using traditional farming methods in Jumla, which include the use of homemade manure and other organic inputs. However, there is a need for the smallholder farmers to start to use artificial organic fertiliser, bio-pesticides and bio-herbicides in order to be able to prevent diseases, produce high-quality products, and prevent soil degradation. Secondly, apple trees have been cultivated in the district for some time already, so some farmers are experienced with this as well. However, their skills and knowledge on farming techniques like pruning are still insufficient. Therefore, they would need additional training, for which the coverage and the intensity of the support by the LARFs should be extended.

Taking out loans is a quick and easy source of financial capital, which can be used to invest in more productive farming methods or equipment by the households. However, the households are currently using less than 5 percent of the total loan amount to invest in the apple business.

Interestingly, a positive correlation was found between the total income levels of the household and the amount of loans taken out. This can be explained by the fact that the poorest households do not have any income sources to ever pay back the loan (especially since the loans are not used productively), while households with relatively large wealth or regular income sources can afford to take more risks by taking out a loan (without it necessarily being productive), and using their other income sources to pay back the loan. Nevertheless, credit can provide the much-need boost to quality and productivity levels. The lack of loans with productive objectives can be addressed by the contract arrangement, as credit could be provided by the anchor firm.

Finally, an overview of how access to the five livelihood capitals can improve the cultivation of apples, and therefore the Jumla apple value chain, is presented in table 4.11.

Livelihoods	***Aspect***	***How is it aiding the cultivation of apples?***
Natural capital	Land	Potential to grow (more) apple trees
	Water	Saplings need plentiful water. In addition, apple trees serviced by irrigation are more productive than trees dependent on rainfall
	Forest products	Pine needles are an ingredient for homemade fertiliser
	Livestock	Livestock provide manure, which is an essential ingredient for homemade fertiliser
Physical capital	Roads	Essential for allowing large-scale export of apples
	Airport	Allows export of apples when the road is impassable
	Mobile phones	Potential access to market information
	Irrigation	*See 'water' above*
Human capital	Traditional knowledge	Ability to use homemade fertiliser and other cheap, organic inputs
	Technical training	Ability to use improved farming techniques to improve the quality and yield of apples
Social capital	Family networks	Potential access to market information
	Neighbours	Access to additional labour pool
Financial capital	Regular income	Ability to purchase inputs, hire labour, etc.
	Credit	Ability to make larger investments
	Savings	Depending on the amount, the same as for regular income and/or credit

Table 4.11 – Summary of livelihood capitals and apple cultivation

CHAPTER 5 – THE VULNERABILITY CONTEXT

Q_3: How do external factors influence the livelihoods and the cultivation of apples?

This chapter will study the vulnerability context, which consists of the external factors that affect people's livelihood assets and strategies but are (to a certain extent) beyond their control. For example, floods can be the cause of thawing glaciers or excessive rainfall, both certainly beyond a single household's control.

The vulnerability context consists of shocks, stresses and seasonality (see subsection 1.2.4). These are the events or trends that have an impact on people's livelihoods. The differences between these three components of the vulnerability context will be examined successively, and it will be analysed how they are relevant to Jumla. Finally, special attention is paid to the issue of food insecurity, which is a result of one or, more likely, a combination of these three components. This special attention is warranted by the fact that the Karnali Zone is the most food insecure region in Nepal. For Jumla, this has meant that it needed emergency food aid on numerous occasions in the last decades (NPC, 2010, p.12).

5.1 Shocks

Events that are quite severe and happen suddenly are called 'shocks'. These kind of external factors in Jumla have included (but are not limited to) the events in the subsections below. The choice to elaborate on these particular subjects was made in order to examine both the most severe and/or most frequent kind of shocks, and the kinds of shocks that were encountered during in-depth interviews with the respondents.

5.1.1 Natural disasters

As with other districts in the High Mountain eco-zone, the district of Jumla is prone to natural disasters. The most common natural disasters are hailstorms, which have the potential to destroy a farmer's entire harvest. Particularly severe hailstorms seem to occur approximately every five years, which has already resulted in losses of approximately 30 percent of the entire apple harvest (Development Vision, 2009, p.53). Heavy snowfall is common in the winter because of the altitude (and not necessarily a damaging event), but its unreliability can cause bad harvests. Landslides are a regular occurrence both during and after the monsoon rains, and may cause roads to collapse or houses and fields to be buried by mud. However, despite being subject to heavy rains in the monsoon season, the Karnali Zone is actually the driest part of the country because it is shed from most regular rainfall by its mountainous characteristics. Therefore, the region suffers from frequent droughts which can obviously be detrimental to harvests (NPC, 2010, pp.11-12).

5.1.2 Infectious diseases or pests in crops or livestock

Other examples of environmental shocks which are common in Jumla are diseases and pests. When crops are suffering from diseases or pests, they can spread quickly to their neighbours' fields (Thakuri, D.B.). The destruction of (a part of) the harvest is a shock to their livelihoods that few people can cope with. Important diseases (including fungi) that specifically affect apple trees are apple scab, powdery mildew, stem black, and peppery bark. Common pests cited by experts included woolly aphid and San Jose scale (VSO, 2011, p.18; SNV Nepal, 2011, pp.20-21).

As stated in subsection 4.3.4, diseases in livestock are a common occurrence. Respondents confirm that their livestock is suffering from diseases especially during the monsoon, when leeches are common, and during the harsh winter, when temperatures can drop below -20˚ Celsius. As livestock can roam around the village more or less freely, infectious diseases spread quickly. Especially rearing chickens is susceptible to this, as infectious diseases regularly wipe out an entire chicken coop at once. Unfortunately, medicine from agro-vets is often too expensive for all but the most affluent households.

5.1.3 Health crises

Several respondents have stated that, in recent years, one of the income earners of their household had died or was incapacitated by diseases. Consult for example box 2 (page 93), which contains a story about a mother of four who has lost her husband to cancer. Other untimely deaths or disabilities are commonly attributed to work-related or traffic accidents (due to the abysmal state of the infrastructure). Various illnesses (including diarrhoea, polio, respiratory infections and tuberculosis) have affected both children and economically active members of the population (NPC, 2010, p.20).

One thing the three shocks thus far described have in common, is that there are securities to these events around the world. In the western world, health insurance is a common occurrence. However, such insurances might not be so easy to implement in Jumla district. More often seen in developing countries is the insurance against crop failure due to droughts, natural disasters and pests, for example. It is strongly recommended that the anchor firm and/or supporting authorities and NGOs research the feasibility of such insurances for apple farmers in Jumla.

5.1.4 Civil unrest

The most obvious example of civil unrest, or in this case, downright civil war, is the decade long conflict commonly known as the Nepali Civil War, which lasted from 1996 to 2006 (see subsection 2.2). The impact for the people in Jumla was severe, as public services delivery and trade grinded to a halt, and the violence of the conflict was felt in full force (see e.g. box 3). Most development programmes were abandoned, government offices were burned down, and irrigation systems were destroyed (Maji, D.B.R.). With the signing of the peace agreements in 2006, the civil war officially ended. However, many grievances that were fought over have still not been addressed, which leaves

the country vulnerable to a resurfacing of the violence (NPC, 2010, p.25). The political unrest, which plagues the people of Nepal nowadays, is most common in the form of extortions or threats with a political nature or general strikes called *bandhas* (see section 2.3).

Bandhas can have severe consequences for the people in Jumla as well. It should be noted that the west of Nepal (including Surkhet and Nepalgunj, which are connected to Jumla by air) is connected to Kathmandu by one route only; most of this route is part of the East-West Highway which runs through the *Terai*. When these *bandhas* are being proclaimed, all transportation on this road will be stopped. For Jumla, this means that the tractors or trucks with goods can neither arrive at nor leave the district, leaving many people out of work and without essential commodities. These strikes most often only last a single day, but sometimes they can continue for as long as three weeks, especially when several (opposing) political groups call strikes on subsequent days. As the NPC notes, "[w]hen this population is prevented form earning a day's wage this often means missing a day's meal" (NPC, 2010, p.25).

With regards to the apple trade, the same conditions apply. Last year, for example, the road between Surkhet and Kathmandu was closed during the height of the apple harvest for almost two weeks because of *bandhas*. The result was that a large amount of apples could not be sold to the anchor firm in Kathmandu, leading to a loss of revenue (as many apples lay waiting in Jumla) for both the cooperatives and the farmers (Nagarkoti, G.). In addition, the contract was unclear with regards to which party would bear the losses of such unfortunate events (see subsection 3.1.3).

Finally, the civil unrest sometimes presents itself in Jumla as well, which is not surprising taking into account the socio-economic situation of the district (see section 2.4). For example, in late February 2011, the private airlines servicing the airports of the Karnali Zone decided to increase the price of flight tickets with 30 percent because of increasing operating costs (Himalayan Times, 2011a). After negotiations failed, the disgruntled citizens of Khalanga Bazaar decided to shut down the airport and its offices, an action that was quickly copied in several remote airports in the region like Mugu, Dolpa and Humla (Himalayan Times, 2011b). For two weeks, students were unable to take their exams, sick people could not get to a hospital, and traders could not transport their commodities.

5.2 Stresses

When external factors last longer and are more or less predictable, they take the shape of the long term trends known as 'stresses', which undermine the livelihood potential. While they are usually less severe than shocks, they still decrease the rates of return of the livelihood strategies to a considerable extent. For example, an obvious stress on people's human capital is the substandard education in the region. The lack of proper learning institutions leads to very low educational attainment and literacy rates, and is therefore hampering people's ability to make use of their full potential. However, this is a common situation in many developing

countries. This research identified other important stresses which are especially relevant to the farmers in Jumla.

5.2.1 Political instability

While political instability can manifest itself in shocks similar to the civil unrest described above, it can also have characteristics of stresses. In the latter sense, the lack of effective local authorities is severely hampering the ability of people in Jumla to change their livelihoods.

As a result from the Civil War, the local authorities are still operating at a substandard capacity. Like in several other former bastions of Maoist resistance, the higher echelons of the local authorities in Jumla are appointed by the central government. Most of the appointees actually originate from other districts. While the interim constitution demands the organisation of local elections to set up the local governments (CCD, 2007, article 139, paragraph 1), this has not yet been done for Jumla. Government officials are uncertain what progress is being made to change this temporary arrangement (Bhujel, M.). Clearly, the government officials sent here are not representing a constituency and are therefore not accountable to anyone except their direct superiors in the ministries in Kathmandu.

The current political instability on a national level is exemplified by the fact that the former prime minister had to resign after being in office for only seven month. The current prime minister (inaugurated on August 29, 2011) is the fifth since the Comprehensive Peace Accords were signed in 2006 (BBC 2011a). Because of the 'spoils-system'[21] used in Nepal, the ministers and highest government officials are immediately replaced once a new party seizes power. In the ensuing months, this change in management trickles down to the lower echelons of the government as well. For Jumla, this meant that several local officials were replaced within just a couple of months after their initial placement (Rokaya, Govinda).

On a side note, one significant part of local government ineffectiveness originates from the fact that most government officials have for decades resented being sent to Jumla. The image of this district as being a backwater with a harsh climate and unfriendly locals is widespread (Bhujel, M.). Other reasons like wanting to be close to their family and wanting to be close to the capital where decisions are made are likely playing a role as well (VSO, 2011, p.22). This results in efforts by the government officials stationed here to leave as soon as possible, and gives them no motivation to try to change anything substantial in the district.

5.2.2 Distorted markets

Because an extensive amount of food (see subsection 5.4.1) needs to be imported, the price levels in Jumla are considerably higher than elsewhere in Nepal, especially so since transportation is difficult,

[21] Also known as a patronage system. The political party that won the elections give government jobs to their supporters as both a reward for supporting and an incentive to continue supporting this party as opposed to giving government offices on the basis of merit, independent of party politics.

dangerous and expensive. For example, while the agricultural wages can be more than two times as high in the High Mountain eco-zone compared to the *Terai* (Rs 150-250 and Rs 80-120 per day, respectively), the food prices can be as much as three times higher in the mountains (NPC, 2010, pp.9-11). In other words, the purchasing power of people in Jumla seems to be considerably lower than in the *Terai.*

Incidentally, the labour wages are relatively high in Jumla partly because of a lack of supply of young, poor workers from India (as opposed to the *Terai*) which is clearly caused by the relative distance. However, several sources also cited the cultural phenomenon where Jumla people find it 'beneath themselves' to work for the neighbours in their village, which therefore requires them to obtain workers from other places. This drives up the price of labour, which is also part of the explanation for the wage levels in the district (Keulen, R. van).

5.2.3 Declining natural resources

As described in subsection 4.3.3, people in Jumla still rely on firewood for their lighting, cooking and heating. The increasing population is putting more pressure on the availability of dead trees and branches which can be gathered from the forest floor. As a result, the people have to resort more often to cutting down trees. This is most noticeable around villages, as the population pressure is highest there. Unfortunately, these forests are often also located above or around the fields of these villages.

This leads to another important natural resource of which the quality is steadily declining: The soil fertility of people's fields. The main factor identified for the decrease in soil fertility in Jumla is soil erosion, which is caused mainly by deforestation. As trees are being cut down, the fertile topsoil is washed away when the monsoon rains begin. Incidentally, this also often results in the most destructive landslides in the district. One other reason for the decreasing soil fertility is the use of traditional compost with dried pine needles, which causes acidification of the soil (see subsection 3.2.1).

It is imminent that government and civil society create awareness of this problem and promote sustainable tree felling in the district. One example of sustainable tree felling would be to spread out the felling of trees, instead of deforesting an entire area. Alternatively, biogas installations could diminish the demand for firewood. With regards to the soil fertility, the anchor firm could supply bio-fertiliser to its farmers as part of the contract.

5.2.4 Climate change

Climate change is categorised here as a stress, as it brings long term effects which are more or less predictable (for example, the warming trend). However, it should be taken into account that this phenomenon is affecting the environment in the form of shocks, stresses and seasonalities, as can be seen below.

Although Nepal is one of the countries in the world with the smallest CO_2 emissions per capita (or even in absolute amounts) to the atmosphere (United Nations Statistics, 2011), the effects of climate change are clearly visible throughout the country (NPC, 2010, p.23). As described in the sections above, the people of Nepal already have to endure a myriad of environmental shocks, stresses and seasonalities which have major influences on their livelihoods. It is suspected that climate change will increase most of these damaging external factors. Unfortunately, the availability of data on the extent of climate change and its possible effects for the region is grossly inadequate. It can, however, be assumed that the changes in the local climate which have been witnessed in the last decades will be amplified, therefore resulting in warmer winters, more rain in the monsoon season, less rain in the other seasons, and a general decrease of reliability of weather patterns (SNV Nepal, 2011, pp.20-21; NPC, 2010, pp.23-24).

Undoubtedly though, climate change is affecting all three aforementioned kinds of external factors, which creates new vulnerabilities, but sometimes also new opportunities. Adverse effects include the fact that the country has experienced more frequent floods, droughts and hailstorms. The International Centre for Integrated Mountain Development (ICIMOD) estimated that between 1977 and 2000, the temperature increased 0.6 degrees per decade on average. This rise of temperatures has caused glaciers to melt, thus increasing floods and altering the flow of rivers (ICIMOD, 2007). In addition, it is reported that during the winter in Jumla, the frost arrives gradually later and snowfall overall is decreasing (Dewan, E.).

The change in temperature is very relevant for the cultivation of apples, as a good harvest is dependent on a sufficient number of 'chilling hours'[22] for the trees. This could implicate that apple orchards would have to be located higher on the hills, i.e. farther from villages and/or irrigation, or that new varieties of trees, which require less chilling hours, should be imported (SNV Nepal, 2011, pp.20-21; Basnet, D. & Shahi, D.).

On the other hand, it is often forgotten that climate change can also have positive effects on people's livelihoods. For example, some experts argue that the increasing temperatures in Jumla could make the district suitable for more varieties of vegetables or fruits than are currently being cultivated (Keulen, R. van; Basnet, D.). In addition, this change could make forests regenerate faster, which is therefore a counter force against the deforestation from population growth (Thakuri, D.B.). However, these are merely educated guesses as there is a lack of reliable data on this phenomenon.

Despite this careful positive note, it should be clear that climate change in Jumla is (already) mainly an adverse trend. The frequency and intensity of droughts in the district has increased, which has led several authorities to designate climate change as a factor worsening the lack of food security in the Karnali Zone (VSO, 2011, p.8; NPC, 2010, pp.23-24; Shrestra, D.).

[22] The general chilling requirement for the apple varieties used in Jumla is roughly a minimum of 1200 hours (i.e. 50 full days) of temperatures below 4° Celsius (Basnet, D. & Shahi, D., 2011).

5.3 Seasonality

Seasonality comprises the periodic fluctuations in, amongst others, weather patterns, food availability, and employment opportunities, which are amongst "the greatest and most enduring sources of hardship for poor people in developing countries" (DFID, 1999). Below, the most relevant patterns for people in Jumla are described.

5.3.1 Monsoon

The yearly monsoon rains, which take place roughly from June to August, are the cause of much hardship for the people in Jumla. The rains often lead to the closing of the Karnali Highway[23] as landslides become more frequent. The import of food comes to a complete halt, and food prices in Khalanga Bazaar are rising in this period. For example, Nepal Rastra Bank estimated that, during the monsoons of 2010, food prices throughout Nepal were 15 percent higher than 'normal' (Himalayan Times, 2010). It can be safely assumed that the figure is much higher for a remote location like Jumla.

However, there are major fluctuations in the price levels in both directions. While on the one hand local prices of imported goods rise considerably because of lower supply, in contrast local prices of commodities which are being exported (i.e. cash crops) are falling rapidly because the supply in Jumla is high but there are no means to export them. This is noticeable, for example, when taking a look at the supply of apples in the harvesting season. While a small fraction of apples can be purchased by the District Federation of Cooperatives (DFC) and is exported by plane for a high price (Rs 30 per kg in 2010), the bulk of apples harvested in Jumla flood the local market with prices sometimes as low as Rs 8 per kg.

Nevertheless, the average price for apples purchased by traders other than the DFC was Rs 17.5 in 2010, according to the data obtained in the household survey. The higher prices (i.e. Rs 20-30) were predominantly obtained by farmers who sold to traders near the airport, who presumably exported the apples from Jumla themselves. It would seem that, if the apples are kept fresh in a proper cold storage facility, the apples can be sold later in the season when the prices in Nepalgunj and Kathmandu have risen again, thus providing higher profits. Investing in the construction of such a cold storage facility in Jumla would be a solution for the enormous (and growing) amount of apples produced in the district.

Finally, the rainfall is obviously also very important for growing other crops, as most of the land owned by Jumla's farmers depends on rainfall for its water. Fluctuations in (the notoriously unreliable) rainfall can therefore have significant disruptive or destructive effects. Only a very small share of people's land in Jumla obtains water from irrigation systems (Development Vision, 2009, p.82). These systems also draw from rivers and streams and are therefore ultimately also dependent on rainfall (although to a far lesser degree).

[23] Most recently, part of the highway was closed between the third week of June until the end of August, 2011 (Himalayan Times, 2011d).

5.3.2 Work and income

The lives of most rural people in Jumla revolve around the work on their fields. The times which demand the most work are when they have to plant or harvest their crops. As can be seen from figure 5.1, the busiest periods are generally May and June, which are the months before the monsoon, and especially September to October, which is after the monsoon and before the winter sets in. It does not need extensive explanation that when a household, for example, is struck by an illness of a household member in one of these periods their ability to harvest their food or make an income from their crops is additionally hampered. In these months, the demand for labour is very high and therefore labour prices rise accordingly (Rokaya, Govinda). This makes it even more difficult for households without abundant human capital (i.e. both the number of economically active household members and their ability to work) to obtain sufficient labourers to work on their fields. Clearly, they will have great difficulties obtaining the maximum output from their fields.

The cultivation of apple trees, as one of the high-value products in the HVA-IB pilot project, was seen as a suitable additional income source partly because of a relatively low workload associated with growing these trees (Development Vision, 2009, p.32). This presumed low workload was an important part of the motivation for choosing the apple value chain for this particular project. Unfortunately, this motivation is a good example of the narrow view of which value chain analyses are sometimes accused of. Granted, the analysis did recognise that the notable exception of the low workload is when the apples need to be harvested, but it failed to link the obvious implications for their other crops to this observation.

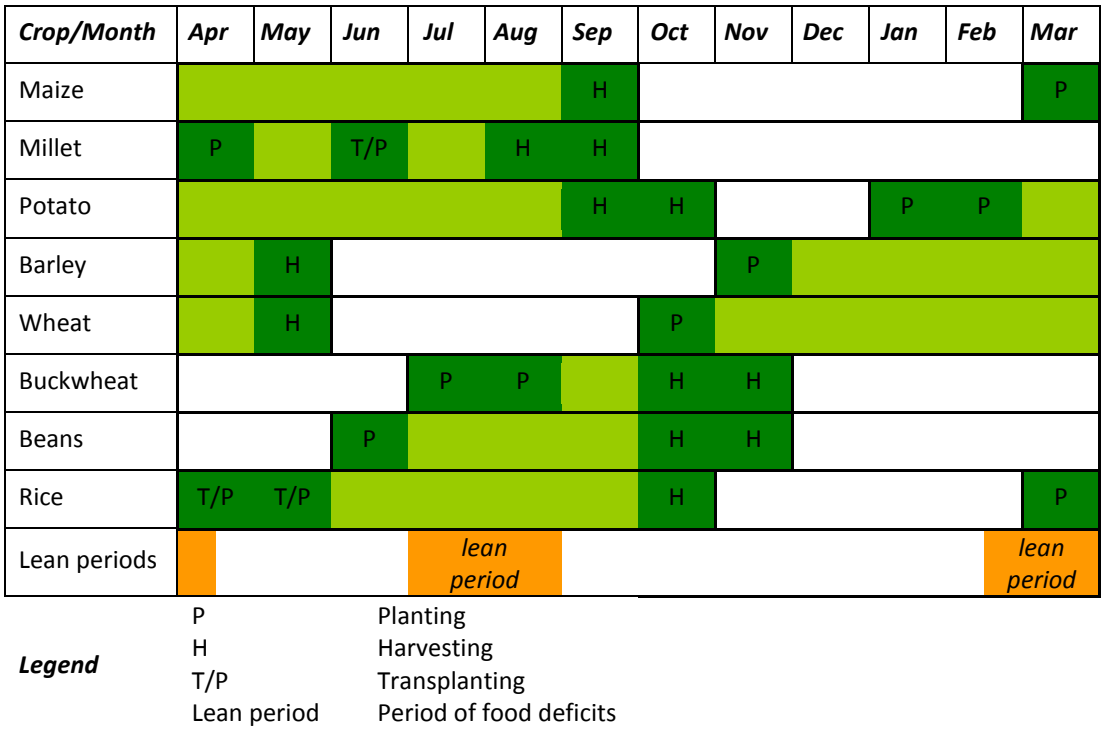


Figure 5.1 – Seasonal calendar for crops in Jumla (2,500 m.a.s.l.)

The apples in Jumla usually mature somewhere between July and September, depending on the variety grown (Basnet, D. & Shahi, D.). Therefore, it should have been obvious that the apple harvest partly coincides with the harvest of other major crops like maize, millet and potatoes. This results in a growing demand for labour which cannot always be met. In the worst case, farmers would have to choose between harvesting apples and harvesting their food crops.

5.4 Food security

A lack of food security can be a result of seasonality, shocks or stresses, but more often it results from a combination of these. The causes and severity of this insecurity in Nepal depend on the timing and the local context, and is therefore a most complex issue. The food shortages in Jumla have been a recurring problem ever since the 1990s (VSO, 2011, p.8). Because the lack of food security is arguably the harshest and at the same time the most recurrent kind of vulnerability that people in Jumla have to deal with, it will be discussed here in its own section.

Food security was defined during the World Food Summit in 1996 to exist "when all people at all times have physical and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (NPC, 2010, p.1).The WFP and NPC identify three factors which together determine the level of food security. First, the food availability is made up by the local production of food and the ability to trade and transport the food from surplus areas (the *Terai*) into Jumla district. Second, the food accessibility entails the ability of a household to obtain enough food for the household, either by producing or purchasing it. Finally, food utilisation is the way the food is selected, prepared and distributed amongst the household members (NPC, 2010, p.1). In other words, the food security is analysed on three progressively smaller levels, i.e. district-wide, per household, and individually. In the next subsections these factors are explained and examined in further detail.

5.4.1 Food availability

Jumla is located on a high altitude which results in significantly longer gestation periods for crops (VSO, 2011). This results in the land being only available for one or – at the most– two crop cycles per year, as opposed to for example the *Terai* where multiple crops per year can be grown subsequently on the same field. Figure 5.1 (page 112) reveals that the combination of crops possible in Jumla is quite limited, as was confirmed during the household survey. Still, these crop combinations are only possible when it is presumed that the soil is fertile enough to allow almost continuous cultivation. In the case of Jumla, this is rarely the case.

Another cause of the relatively low agricultural production in Jumla is the fact that the cereals (rice, oats and pulses) grown in the district are usually conventional, low yield varieties (Development Vision, 2009, p.80). Sometimes the use of 'traditional' varieties is done out of necessity, as other varieties are simply not growing well in the particular climate of Jumla. A notable

exception is the local rice variety of *Jumli Marshi*,[24] which reaches only 60 percent of the productivity of most other species of rice in the country (Sapkota et al., 2010, p.58). The decisive factors for continuing production with this variety are both cultural (the variety has been famous throughout the country for centuries)[25] and gastronomical, as this variety is known for its exceptionally rich flavour (Dewan, E.).

The food production of the entire Karnali Zone, whose districts share most of the characteristics with Jumla, is sufficient for its own consumption for only three to six months per year on average (NPC, 2010, p.12). The figures of the aggregate food balance on a district-level for Jumla support this supposition. For example, according to data from the MoAC, the district experienced a shortage of 5,414 mt of edible cereals in 2010, which constitutes 27.2 percent of its total edible cereal requirements (MoAC, 2011).

Given the aforementioned results, it is unsurprising that an examination of the household surveys in Jumla shows that most households have insufficient food production to feed the entire family throughout the year. On the whole, a total of 98 percent of the households stated that at least one month per year their food production was insufficient to provide for their own household (4S, 2010, p.12). On average, households in all three VDCs had sufficient food production for approximately 5.3 months per year. However, the *Dalit* households were worse off with having only enough food production for 3.7 months, as opposed to an average of 6.0 months for the other caste households. This is not surprising, as it was already established in subsection 4.3.1 that *Dalit* households own less land than *Chhetri*. In addition, they generally have the least income certainty from their jobs (subsection 4.2.2).

From the above it is clear that the inadequate food production leads to the insufficient availability of produced food in Jumla. Hence, it means food needs to be imported into the district. However, the markets are not functioning well in Jumla. It was already described in this chapter and in section 2.1 how the lack of an all-season road is hampering the import of food into the district. The food stays scarce, and prices become heavily inflated during the lean months.

Unfortunately, this is not just an exceptional situation created by singular and rare events. Even in 'normal' times the markets are insufficient. The range of food products for sale is marginal. For example, the only fresh fruit available in Khalanga Bazaar in spring were mandarins from the *Terai* and old apples which had been stored in barns and cellars since the previous autumn. In short, the highly dysfunctional markets are prohibiting the people in Jumla from buying sufficient food.

5.4.2 Food accessibility

The figures on food security stated in the section above were retrieved from several researches, including those of the WFP, VSO and SNV. These figures have in common that the food (in)security is

[24] As the myth goes, some 1,300 years ago a Hindu saint named Chandan Nath brought a handful of rice from the Kashmir Valley to the priests in Jumla. This particular variety, Jumli Marshi, has been cultivated here ever since (Shrestha, 2002, p.8).

[25] For instance, under several different rulers in medieval times, Jumla was the only region which was allowed to send their precious rice to the capital city as the mandatory tribute, instead of commodities like gold and timber (Savada, 1993).

measured by the amount of food production. However, it should be noted that these figures do not take into account the fact that not all people in the research area are subsistence farmers. Therefore, the figures are giving an incomplete image of the food deficiency situation. Indeed, the food production on a household level is insufficient just like the food production on the district level. Nevertheless, most of the respondents in the survey actually earn incomes from wages, businesses, or livestock, and are therefore in theory able to buy food from neighbours or on markets. As a result, these income sources can compensate for a lack of own agricultural production. Of course, the statement about the dysfunctional markets in the previous subsection hampers this ability.

Especially in VDCs like Patmara, where hardly any rice is grown (but is nevertheless part of the daily diet), looking at the food deficiency situation purely from a production point of view is too short-sighted. It is therefore surprising that a range of studies in the region have merely measured the food production of individual households when they were trying to measure the food security (cf. VSO, 2011; Drucza, 2010; 4S, 2010). In contrast, in this research the people were asked in the household survey whether their food production and income combined were sufficient for providing their family with enough food.[26]

Income, land and food security

When measuring food security with own production and purchases combined, the number of months that households consider themselves to be food secure is on average 9.5 months. This is a stark difference from the 5.3 months when taking only the food production into account. In fact, from the 68 respondents there were 37 (54 percent) who said to have enough production and income for their household throughout the year.

Therefore, the question which needs to be asked is to what extent people's food security is primarily dependent on income levels, on production, or on both. Interestingly, when setting off the results from both researches against each other in table 5.1, it can be seen that there is a considerable difference between the VDCs when taking into account the purchases from income. In contrast, there are hardly differences between the VDCs when looking at just the production. This implies that the differences in food security between the VDCs might be primarily influenced by the household's income.

[26] They were told explicitly that other measures (i.e. coping strategies) like selling livestock, taking out credit, or getting support from family, were not to be taken into account here.

VDC	*Food security (production and purchases) **	*N*	*Food security (production only) Ψ*	*N*
Mahat	9.3	27	5.2	135
Patmara	8.4	16	5.3	139
Kartikswami	10.6	24	5.3	311
Total	9.5	67	5.3	585

Table 5.1 – Food security per VDC

*Source: Krap, T.D., 2011 *; and 4S, 2010 Ψ*

However, it is difficult to compare these two researches as they both have different methodologies, different respondents, and obviously asked very different questions. This analysis will therefore continue with the data obtained from the household survey, which was conducted for this particular thesis, and examine the relations between income, production and food security.

To examine the conventional notion of food security as a production issue, it should be asked to what extent the state of the household's food security is dependent on their food production. Unfortunately, there is no data on the food production per household. The next best thing is the data on the amount of arable land owned by them. The latter cannot be presented as a perfect substitute for food production, but it is hoped to obtain some indication of the potential food production for the household from this variable.

The relationship between the amount of land owned and the number of months a household is food secure is presented in table 5.2. There is a significant positive relationship between these variables. Indeed, from these results it can be safely assumed that the food production is an important part of a household's food security situation.

Land owned (ropani)	*Food security (production and purchases)*	*N*
0 – 2	6.6	9
2.1 – 4	9.4	17
4.1 – 10	9.9	25
10.1 – 20	10.3	7
20.1 and above	11.1	9
Total	9.5	67

Table 5.2 – Food security and land ownership

Next, the extent to which a household's food security is influenced by the monetary means available to them is tested. In table 5.3 a positive relationship between the household income and their level of food security can be seen. The exception is the income class of Rs 160,001 – 200,000 which has a very high average of food security. However, this can be explained from the small size of this class (n=5). All in all, there is a significant correlation between the income level of the household and the number of months that their production and income are sufficient to feed their household members.

Household income[27] (Rs)	*Food security (production and purchases)*	*N*
0 – 40,000	6.5	13
40,001 – 80,000	9.5	11
80,001 – 120,000	9.9	10
120,001 – 160,000	10.3	13
160,001 – 200,000	11.4	5
200,001 and above	10.7	16
Total	9.5	67

Table 5.3 – Food security and household income

Livelihood patterns and food security

Clearly, it can be concluded that there is more than one side to a household's food security. It would therefore be good to look at how different portfolios of livelihood strategies and assets lead to different levels of food security. In table 5.4, the average levels of the households' food security are presented per livelihood pattern. In addition, their average income levels and the average amount of land that these households own can be seen.

Livelihood pattern	*Food security (production and purchases)*	*Household income[28] (Rs)*	*Land owned (ropani)*	*N*
Subsistence farmer	7.9	7,500	11.1	12
Day labourer	5.4	77,400	1.6	8
Job holder	11.1	203,200	10.1	17
Business owner	9.5	96,100	7.1	6
Livestock keeper	9.2	111,200	16.8	6
Diversified	11.2	135,200	15.3	11
Welfare dependent	11.0	104,600	5.9	6

Table 5.4 – Food security, income, and land per livelihood pattern

Interestingly, day labourers are the most food insecure amongst the livelihood patterns with an average of 5.4 months of food security per year. The other vulnerable livelihood pattern, the subsistence farmers, has an average of 7.9 months food security per year. In this table it can be observed that there is an extremely low income combined with an average amount of land[29] owned for subsistence farmers, against a below-average income and extremely low amount of land owned

[27] Including income from apples.

[28] Not including income from apples.

[29] The district average of land ownership is 11.0 *ropani* per household.

for day labourers. Apparently, having 11 *ropani* of land is helping the food security more than Rs 77,000 is doing.

From this example it can be conclude that the food security situation is very complex and dependent on the various livelihood portfolios of the households. Both livelihood patterns arguably have to deal with different vulnerability contexts. That is, farmers are likely to be more affected by natural shocks, stresses and seasonality, while day labourers are more affected by market fluctuations and civil conflict, as was explained in section 4.2.

Unsurprisingly, the diversified households and job holders are clearly the least vulnerable amongst the respondents in the survey. The only real surprise from this table is the relatively high food security that the households which are welfare dependent enjoy, despite their average income and below-average amount of land. Unfortunately, there is no clear-cut explanation for these results.

Food crops versus cash crops

There is one final aspect with regards to the concept of food accessibility which needs to be discussed here. In the case of a contract farming arrangement whereby the farmer is persuaded to cultivate cash crops, there are less land and other inputs available for the basic food crops which had presumably been planted on his fields before. One farmer can arguably use his income to compensate for the loss of basic food crops produced. However, especially when a large number of farmers in a community choose to shift their production from basic food crops to cash crops, it may seriously decrease the food supply in the community. The rising food prices can negate the new income from the cash crops, and thus even increase the food insecurity in the community (Bijman, 2008, p.17). Please note that the argument is not whether this is or will be the case in Jumla, but it is important to be aware of the possibility of this scenario.

5.4.3 Food utilisation

Food utilisation looks at how the food for the household is selected, how it is prepared, and ultimately how it is distributed amongst the household members. These processes may be influenced by gender, culture, age, and knowledge on nutrition. For example, the low position of women in Nepali society might lead to the practice of them eating least and last, after the boys and men have had their meal. However, to examine these issues in all its complexity would be too much for this thesis. In addition, as was described in subsection 1.2.7, it was beyond the scope of this research to examine intra-household dynamics in detail.

Nevertheless, one example of food utilisation which deserves some attention was singled out: the preference for rice as the main staple food. Originally, rice formed a relatively small (and luxurious) part of the local diet, because the climate forced people to have potatoes, wheat and barley as the main staple food. Despite some progress in the absolute amount of rice being produced in the district, it could not keep up with the population growth, so the available produced rice per capita has even decreased (Maji, D.B.R.). The consumption of rice is no longer just a status symbol,

but it has become the minimum standard for even the poorest families in the VDCs around Khalanga Bazaar. This unsustainable consumption pattern cannot be serviced by regular imports alone (due to transportation issues and dysfunctional markets as stated before), so the WFP and NPC provide tonnes of rice to the district each year in the form of food aid. This will be discussed in greater detail in subsection 6.1.3.

5.5 Conclusion

Q_3: How do external factors influence the livelihoods and the cultivation of apples?

It was seen that the people in Jumla have to cope with a myriad of shocks, stresses and seasonality. In this chapter there were multiple recommendations for the local authorities, civil society and the private sector to mitigate or prevent the harmful effects of the shocks, stresses and seasonality which are affecting the people in Jumla as well as the apple value chain. A selection of these recommendations is presented in table 5.5 below.

Examples of shocks which affect the cultivation of apples are natural disasters like hailstorms or droughts, which can destroy parts of or entire harvests. Apples are also prone to a variety of pests and diseases. It would therefore be good if farmers were insured against crop failures from those kinds of shocks. Hence, it is recommended that the anchor firm, the DFC, the local government or the NGOs research the feasibility of such insurance schemes for apple farmers in Jumla. A different kind of shock which affect the apple trade are the *bandhas*. These strikes or demonstrations lead to significant losses of revenue for the anchor firm, the DFC, and the farmers alike. However, as argued in chapter 3, the contract is still unclear with regards to handling the sharing of the risks and the costs in the case of these unfortunate events. This would need to be addressed in the next negotiation rounds with great priority.

The stresses which were examined in this chapter included for example the political instability and the distorted markets in Jumla which results in considerably higher price levels than elsewhere in Nepal. Furthermore, among the declining natural resources the on-going soil degradation was discussed. Without trivialising the need to address this serious problem at its roots, the recommendation for at least the apple value chain is to the DFC or anchor firm to increase the soil fertility for the apple trees by supplying bio-fertiliser to the farmers as part of the contract (as similarly discussed in chapter 3). Finally, the issue of climate change remains a problematic one. It can be argued that one probable effect is that natural disasters ('shocks') will happen more frequently. Furthermore, the changes in temperature will also be very relevant for the cultivation of apples, as the minimum 'chilling hours' requirement determines the quality of an apple to a great extent. Nevertheless, it has to be admitted that the data on climate change in Jumla remains seriously deficient, and further research would be necessary before definite claims can be made.

One of the major seasonalities affecting the apple trade entail the monsoon rains, during which the Karnali Highway is closed, and the import of food comes to a complete halt which results

in rising food prices in Khalanga Bazaar. Simultaneously, no export of apples can take place. Instead, the high supply of apples results in a flooding of the local market with apples, whereby prices plummet. However, if the apples are kept fresh in proper storage facilities, the apples can be sold later in the season when the prices in Nepalgunj and Kathmandu have risen again, thus providing higher profits. Therefore, the recommendation stands (like in chapter 3) for the relevant parties to invest in the construction of such a cold storage facility in Jumla. A second seasonal factor which needs to be taken into account is the pattern of (agricultural) work. In the planting and harvesting seasons, the demand for labour is very high and consequently the labour prices rise. The apple harvest partly coincides with the harvest of other major crops, which in the worst case would force a farmer to choose between harvesting their apples and harvesting their food crops.

With regards to food security, it was seen from the different results on food security levels for all the different livelihood patterns that this subject is immensely complex. The causes of the lack of food availability on a district-level are on the one hand the insufficient food production, and on the other hand the dysfunctional markets (caused by the lack of infrastructure) which prohibit the import of sufficient food. On a household-level, the outcomes from this chapter indicate that the food security is indeed influenced to a great extent by both production (in this case indicated by land ownership) and household income. Indeed, the conclusion that food security from a 'production-only' point of view gives an incomplete image of the food deficiency situation for a household. As for the livelihood patterns, it appears that subsistence farmers (who have land but not income) enjoy a higher level of food security than day labourers (who have some income but hardly any land). This chapter confirms that the situation becomes quite more complex, when taking into account the fact that subsistence farmers are likely more affected by natural shocks, stresses and seasonality, while day labourers are more affected by market fluctuations and civil conflict. In conclusion, while the exact determinants of food security may not be pinpointed so easily (if ever), this chapter pertinently provides the evidence why such a research on the livelihoods in general and the vulnerability context in specific are of the utmost importance.

	Vulnerability context	*Negative effect*	*Recommendations for value chain*
Shocks	● Natural disasters	Destroyed crops	Provide insurance (NGOs, government or anchor firm)
	● Diseases and pests ● Health crises	Decrease in production and income	
	● Civil unrest	Impossible to deliver apples on time	There should be clear clauses in the contract on how the losses will be shared.
Stresses	● Declining natural resources	Deforestation Soil erosion	Work with government and NGOs to increase access to biogas-installations, promote sustainable tree felling, etc.
		Decreasing soil fertility	Provision of bio-fertiliser by anchor firm.
	● Climate change	Increasing temperatures unsuitable for apple trees	Invest in researching other apple varieties
Seasonality	● Monsoon rains	Impossible to export apples	Invest in a cold storage facility

Table 5.5 – Selection of recommendations

CHAPTER 6 – COPING WITH CRISES

Q_4: To what extent and how are farmers in Jumla coping with external factors?

Livelihoods are considered to be sustainable only if they can adequately respond to shocks, stresses and seasonality, by providing the people's self-defined needs. The livelihood strategies that people employ in reaction to the vulnerability context are the coping strategies. Like the proactive livelihood strategies, the coping strategies also draw from the livelihood capitals that are available to the household. In section 6.1, the most widely used coping strategies among the households in the survey will be discussed, and three particular coping strategies which are especially interesting in Jumla will be clarified: migration, credit, and food aid.

The manner in which the vulnerability context is experienced by the household is significantly influenced by the institutional environment. In section 6.2, the formal and informal processes will be discussed. They are affecting the impact of these external factors and at the same time also influence the households' access to assets and strategies.

6.1 Coping strategies

Coping strategies are the household's reactions to the vulnerability context. In other words, in times of shock, stress or seasonality, the coping strategies are the safety mechanism of a household (De Haan, 2006, p.141). With the great diversity of the vulnerability context (see chapter 5) comes a range of coping strategies which, in theory, is just as diverse. However, people are limited in their range of safety mechanisms by their access to livelihood capitals (see chapter 4). Note that many of the coping strategies mentioned in this chapter, like selling firewood and NTFPs, could be used in 'normal' times as well (i.e. as proactive livelihood strategies). However, only if a household resorts to these activities outside their regular livelihoods portfolio in response to the external factors, they take on the shape of coping strategies.

The objective of a coping strategy is to undo the harmful effects of an external factor. For example, when an income earner in the household becomes ill, a farming household might have less production and therefore less income and/or food (depending on the crops they grow). In addition, there could be a need for additional money to buy medicine. Interestingly, the coping strategies that this household would have to choose would need to address either the lack of food or the lack of income. It will be seen that this is no coincidence, and actually all coping strategies can be reduced to having one of these two aims.

Below are three examples of how certain external factors could negatively affect a household, and subsequently force a household to choose one or more coping strategies as a response (tables 6.1, 6.2 and 6.3 below). In the first columns of the three figures, different examples of external factors were found, being seasonality, a shock and a stress, respectively. In the second columns, the negative effects of these external factors are described. The information in both these

columns was already extensively described in chapter 5. The third column shows the direct or indirect consequences for the household, which can ultimately all be deduced to a lower income and/or lower food production (or a need for more money). Hence, the coping strategies in reaction to all kinds of shocks and stresses are ultimately aimed at a) increasing income and/or b) increasing the availability of food. Finally, the fourth columns show examples of copings strategies which would concordantly address those money and food deficiencies. Keep in mind, the different coping strategies are to some extent interchangeable, so in practice the combination of responses varies per household. They are not limited to the possible household responses presented here.

Vulnerability context	*Negative effects*	*Consequences for household*	*Possible household responses*
Monsoon rains (seasonality)	● Destruction of crops (e.g. by flooded fields) ● Washing away of fertile topsoil ● Inability to transport apples to Surkhet ● Proliferation of diseases (both human and animal) ● Loss of natural capital (when livestock dies)	--> Lower production = Less income = Lower food security --> Need for money to buy new livestock	● Asking help from relatives ● Selling produce against lower prices ● Buying less expensive, less preferred food ● Selling firewood

Table 6.1 – Examples of responses to seasonality in Jumla

Vulnerability context	*Negative effects*	*Consequences for household*	*Possible household responses*
Sickness of income earner (shock)	● Not enough manpower to work the fields ● Need for medicine	--> Lower production = Less income = Lower food security --> Need for money to buy medicine	● Keeping children out of school to work ● Reducing number of meals per day ● Taking out loans ● Selling household non-productive assets (e.g. jewellery, furniture) ● Resorting to traditional medicine

Table 6.2 – Examples of responses to shocks in Jumla

Vulnerability context	*Negative effects*	*Consequences for household*	*Possible household responses*
Soil erosion (stress)	● Declining soil fertility ● Increase in frequency of landslides ● Higher risk of injury (because of landslides)	--> Lower production = Less income = Lower food security --> Need for money to invest in manure --> Need for money to buy medicine (if injured)	● Selling livestock ● Work for food at neighbours ● Food-for-work programme ● Selling productive assets

Table 6.3 – Examples of responses to stress in Jumla

At this juncture, an important distinction needs to be made between 'normal' and 'negative' coping strategies. When first exposed to the external factors (the vulnerability context), people may resort to short-term coping strategies like eating less expensive food or obtaining extra income by selling firewood. These strategies would (normally) not have long-term negative side effects. However, when these normal strategies are exhausted, or if the situation calls for more drastic measures, people might need to resort to 'negative' coping strategies. These could include selling livestock or even selling land. The household's productivity will decline because of this, leaving it more vulnerable when next shocks or stresses manifest themselves. The use of negative coping strategies can therefore lead a household into a downward spiral (NPC, 2010, p.27).

The continuum in figure 6.1 represents the frequency of the various coping strategies used in Jumla. Note that chosen strategies by households depend upon the particular external factors people have to deal with, and that the model is merely a simplification of reality. From this model it becomes clear that, in response to greater food insecurity, many households use the coping strategy of buying less expensive and less preferred food (e.g. eating porridge from local maize instead of the imported, more expensive rice) as it is not very intrusive in their way of life. Similarly, the reduction of the number of meals per day is used rather frequently, as is buying rice from the Nepal Food Corporation (NFC, see subsection 6.1.3). Nonetheless, it should be noted that reducing the number of meals per day or even eating less diverse, can definitely be harmful in the long term as it can result in malnutrition (WHO, 2011).

The use of savings or credit (which can be used for e.g. buying food or medicine) is also a common way of coping with the stresses or shocks. While taking out credit can provide immediate relief, it must be noted that an unsustainable debt can be very harmful to the household (see subsection 6.1.2). Finally, the negative coping strategies that are indeed very harmful to the household's resilience are the selling off of assets like jewellery, tools, livestock, and even land (NPC, 2010, p.27). By selling these assets, they lose some ability to make an income or to produce food (especially for instance with selling land or tools) and are therefore less capable of responding adequately to future impacts from the vulnerability context.

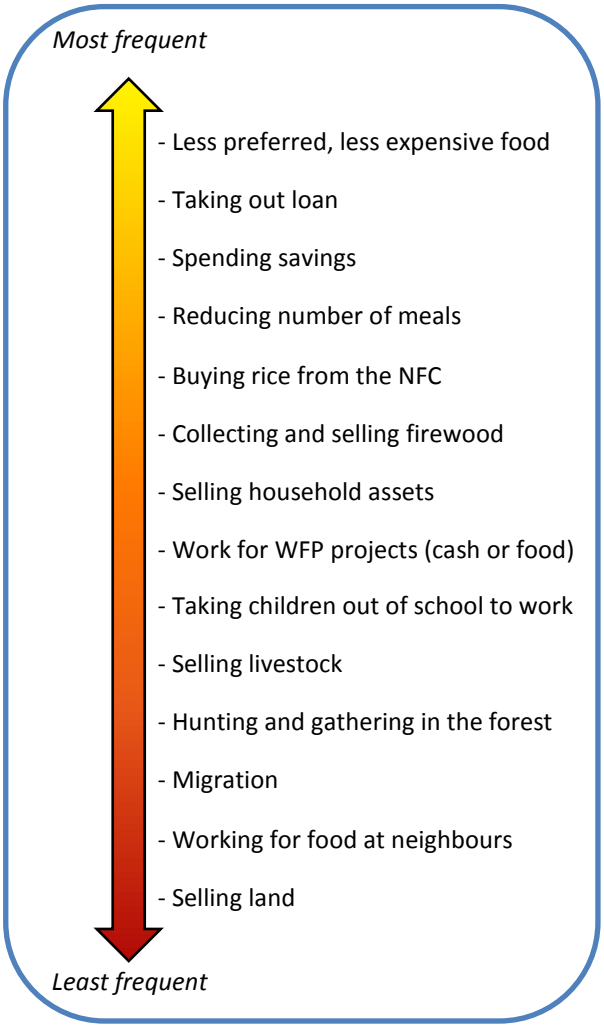


Figure 6.1 – Coping strategies in Jumla

In the subsections below, the coping strategies of migration and taking on credit will be discussed in greater detail, as the findings are especially interesting in the context of Jumla.

6.1.1 Migration

Labour migration is a significant phenomenon in Nepal. An estimated 3 million people (i.e. 11 percent of the entire Nepali population) are working abroad. By far the most Nepali migrants are living or working in India, but large numbers are also found in the six nations of the Gulf Cooperation Council,[30] Myanmar and Malaysia (INF, 2011). This results in a flow of remittances which amounts to the equivalent of an astonishing 23 percent of the GDP of the country (IOM, 2011). In addition, there is a high incidence of domestic labour migration as many Nepali from the mountain and hill regions are going to the *Terai* to find work. In addition to the macro-level data, village-level studies have confirmed that there is mass-scale migration, especially from the hills and mountain regions in the

[30] The Gulf Cooperation Council is a political and economic union of six states on the Arabian Peninsula which border the Persian Gulf. The six member states are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

west of Nepal (Gill, 2003, p.1). Finally, there is also seasonal migration in the opposite direction when people go to higher altitude hills and mountains to collect NTFPs like *yarchagumba* (discussed in section 4.3.3).

Labour migration by itself is not necessarily a coping strategy. The greater employment opportunities and higher incomes in other parts of the country and abroad can persuade people to improve their livelihood assets and to reduce their vulnerability by choosing labour migration as their (proactive) livelihood strategy (ICIMOD, 2011). However, it is reported that in the case of Jumla one major driver for labour migration is the food security situation (Shrestha, D.). Hence, in periods of food deficits people (mostly men) will seek employment in other regions of Nepal and abroad, thus having more access to food themselves and lowering the food demand in their household and the district as a whole.

The CSD reports that, during the 1990s, some 75 percent of the men from Jumla from 15 to 50 years old would migrate to India or other cities in Nepal to earn an income (CSD, 2006, p.4), although it is unknown to what extent the migration was part of proactive or reactive strategies. The traditional pattern would be that the men would depart for the *Terai* or India before the winter sets in. They would return to Jumla in the spring to help during the busy agricultural season and would stay until after the *Dashain* festival in the autumn (CSD, 2006, p.28).

In the schematic representation of the seasonality of these labour migration movements in figure 6.2, it becomes clear that these movements can have major effects on the community. When the labour migrants depart after they have harvested in autumn, they reduce the demand for food, leaving more food available to the people staying behind. However, they also decrease the supply of labour available, both on a household- and on a community-level. In the household, the major implication is that the women are burdened with even more work. On a community-level, it can be seen that this outflow of the most able men is creating labour scarcity. Consequently, the labour prices (which were already high, see subsection 5.2.2) are soaring in these periods (Gill, 2003, p.18).

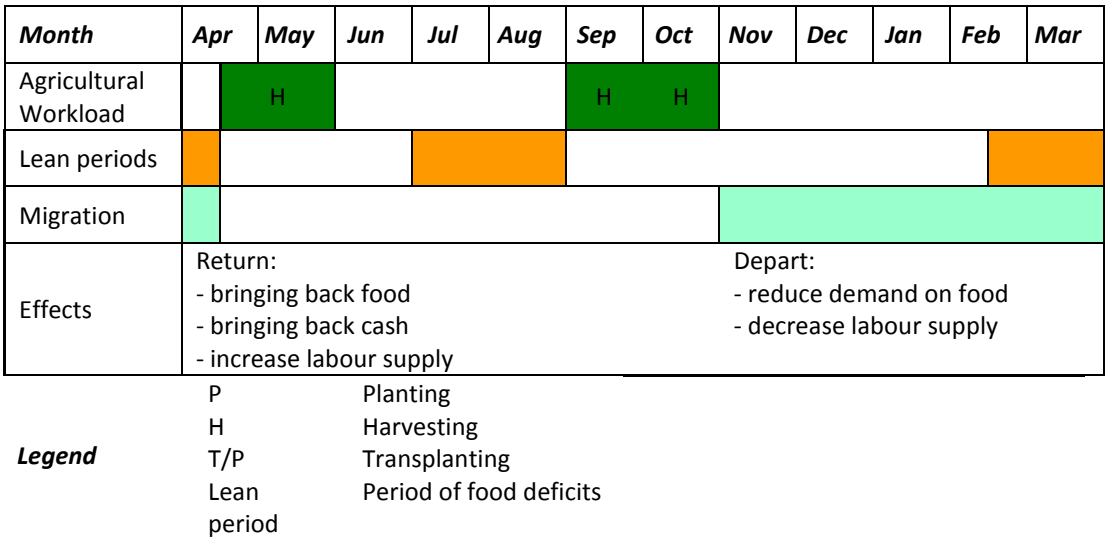


Figure 6.2 – Seasonal calendar for migration

The migrants return usually right before the harvest in spring. This period is clearly the most desperate in terms of food availability. Food stocks have dwindled in the winter months, and the return of the men means there are even more mouths to feed. While arguably the returning men brought money and possible some food, the only thing that will bring relief to the fragile balance between food availability and number of people to feed at that particular time, is a good harvest (Dewan, E.).

From all respondents in the household survey, only two households have family members working in other parts of Nepal and are actually receiving regular remittances. In addition, two other households have family members abroad. One of them works in Qatar, which is indeed one of the hotspots for Nepali migrant workers, with an estimated 70,000 Nepali labour migrants (INF, 2011). The other person works in Bhutan. The remittances that these households receive constitute a hefty 41.4 percent and 27.7 percent of the household's total income, respectively.

Interestingly, while remittances clearly form a major part of these two particular households' income, the extremely low number of Jumli people migrating is completely contrary to the usual reports that remittances are one of main income sources for most people in the region. It is argued that the pattern in Jumla has changed in recent years, as Khalanga Bazaar began to offer more business and employment opportunities (CSD, 2006, p.28; Nagarkoti, G.). This explains to some extent the low number of households with migrants found in the survey. A different explanation could be offered by the fact that labour migration as a coping strategy is only conducted at times of food shortages. This would imply that at the time of research, the food deficiency situation was not as pressing as it had been in earlier years. Indeed, the WFP reports that in the period between January and June, the food insecurity in the Mid-Western Development Region reached its lowest point in almost three years due to a good harvest of winter crops (wheat and barley) and an increase in employment opportunities (WFP, 2011b). Nevertheless, the low number of labour migrants found in the survey does indicate a possible change in the livelihood strategies in Jumla, and therefore calls for further research.

While thus few households with (seasonal) labour migrants were found, it can be seen at the same time that most households (90 percent) do have family elsewhere in Nepal. As was described in subsection 4.6.2, the family networks extend to as far as Kathmandu. Almost 95 percent of the households with a family network beyond their own village receive some support from their family, be it in the form of food, money, or labour. Why and when these family members migrated, or what relation they have with the examined household, did not become clear. Hence, whether they emigrated from the district as a proactive strategy to improve their livelihood, or as a reactive strategy to flee from the hardships of Jumla's vulnerability context, remains unknown.

6.1.2 Credit

Loans are a useful source of money, as they can be taken out at a time when the need is highest. In this aspect it differs from other sources of wealth (like land, the house, jewellery, etc.) which cannot

immediately be converted into cash. Hence, it was seen in figure 6.1 (page 125) that people in Jumla resort to this coping strategy quite frequently.

It was already described in subsection 4.7.3 how most of the loans were actually taken out by the most affluent households to buy land or houses, which is therefore a proactive strategy. However, the poorest households which did take out loans usually did so as a coping strategy, as a response to adversity or a crisis. For example, several respondents had to take out a loan to buy food for their households during especially lean times. Other frequent uses of loans as a coping strategy includes buying medicine or paying for healthcare when someone falls ill. Therefore, the use of credit is the quickest and easiest way (in the short term) to have the availability of money.

The household which takes out a loan becomes per definition indebted, but intends to be so only for the short time that the shocks, stresses or seasonalities are manifesting themselves. The expectation is that the loan can be repaid when things return to 'normal'. However, there are serious dangers to households becoming indebted, of which an example is given in box 4. There were two respondents who had to use the new credit to repay their previous loans, which is a clear indication their indebtedness has reached an unsustainable level.

Several respondents claimed the fear for indebtedness to be the reason they have never taken a loan. Nonetheless, in the sample 42 respondents (61.8 percent) said to have taken out loans last year, as was described before.

Box 4 – Indebtedness

Mr Sunna Nepali* is the 26 year-old head of a *Dalit* family from Mitsa village, in Mahat VDC. This year, he took out a loan of Rs 20,000 with an informal moneylender in his village. He pays 3 percent interest per month on the principal, (i.e. a 36 percent interest rate per annum), totalling costs of Rs 7,200 per year. Mr Nepali says he used this loan to repay a previous loan, which was also intended to repay a loan before that one. Obviously, this vicious cycle of indebtedness is a major concern to him.

While he owns two cows, his landholdings are less than 2 *ropani*. The production from his fields is barely enough to feed his wife, their two children, and himself. Their only income is what he brings in as a day labourer as a stonemason at construction sites, which means every day comes with great uncertainty whether or not he will get some income.

**[name changed for anonymity]*

6.1.3 Food aid

In the lean months, when their own food production has come to a halt and food stocks are dwindling, the people of Jumla rely heavily on the government (through the Nepal Food Corporation, the NFC) and the World Food Program (WFP) to provide additional food. The NFC in Jumla district is

located in Khalanga Bazaar. Here, people can obtain rice below market prices[31] (NPC, 2010, p.31; WFP, 2010, p.23). As rice can only be obtained in the district headquarters, and anybody can obtain the rations (there is no proper targeting mechanism), there are concerns that this rice is not reaching the poorest, most needy people (WFP, 2010). In fact, this lack of targeting is actually an advantage for the people from the research districts Mahat, Kartikswami, and (although to a lesser degree) Patmara, because of their close proximity to Khalanga Bazaar.

The WFP addresses food insecurity in Jumla by food- or cash-for-asset programmes. From all respondents, a total of 30 people (44.1 percent) stated to have participated in one of the WFP's programs the past year. People working with these programmes build essential community assets like roads or irrigation systems in exchange for food or an equivalent in cash. Participants work for an average of 10 days per month for a period of four months, for which they receive 4 kgs of rice and 0.5 kgs of lentils per day (WFP, 2010, p.24).

Other organisations which have handed out food aid in the district include numerous NGOs like World Vision or KIRDARC. It was found that 44 out of 68 households (64.7 percent) received food aid from WFP or one of the other NGOs active in the district. Unfortunately, these food aid arrangements heavily distort the mechanism of local markets and discourage farmers to work for themselves (Nagarkoti, G.). As one respondent stated, working on the road construction was an easier way for him to obtain rice than if he would have cultivated it himself. He admitted to have left some of his fields fallow the past year, and worked in the WFP programme instead. If this occurs on a larger scale, the food aid is actually maintaining the food deficiency situation.

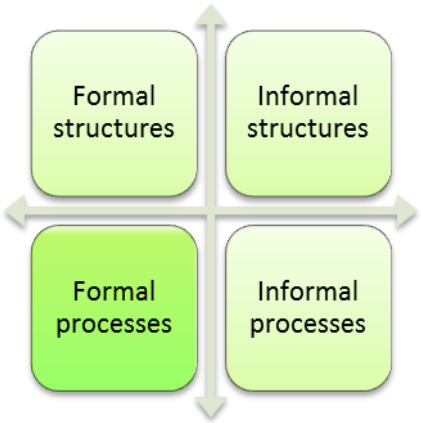
Clearly, there are several significant issues to resolve with food aid. In addition, the provision of additional rice in the lean months is only a short term solution, thus keeping people from starving. The situation can only become sustainable when there is a long-term solution which ensures that the communities become self-sufficient in food production and can cope with the shocks, stresses and seasonality.

6.2 Institutional processes

The access to livelihood capitals and the ability to conduct livelihood strategies are heavily influenced by the institutional environment (described in subsection 1.2.5). They can be enabling or constraining factors in the ability of people to carry out their livelihood strategies, including the coping strategies. It was explained before that in the institutional environment, a distinction can be made between structures and processes. The structures, which are to some extent the conventional notion of an institution, were examined in subsection 3.3.1. The reason for this is that the value chain analysis tends to hold a narrow definition of institutions. In this section the focus therefore lies on the processes and how they influence the farmer's livelihoods. As discussed before, processes can be either formal or informal and will therefore be discussed as such in the following subsections.

[31] For example, in September 2009 the market price in Jumla for coarse rice was Rs 47/kg, and the NFC's price in Khalanga Bazaar was Rs 33/kg (WFP, 2010, p.23).

6.2.1 Formal processes



Formal processes consist of rules and resolutions like laws and property rights. However, also the notion of 'markets' can be categorised under this heading. Arguably, this is one of the few processes that are already examined extensively in a value chain analysis. Concordantly, this topic is examined in chapter 3 and will therefore not be discussed here. The same holds true for the 'formal processes' which had a direct influence on the value chain, like the subsidies and agricultural policies, which were therefore also discussed in that particular chapter (subsection 3.3.2). In contrast, this subsection will examine the formal processes that are not included in a narrow analysis of the markets or value chains, but which nonetheless have a significant influence on the livelihoods of Jumla's farmers and thereby affect the choice and use of coping strategies.

Social welfare

This research found that almost 58.8 percent of the households receive financial support from the government or NGOs through social welfare programmes. For these 40 households, the welfare support constituted 16.8 percent of their household's income on average. What kind of programmes are in place and how do they influence the livelihoods and people's choices to use livelihood strategies? Table 6.4 provides a brief overview of the social welfare programmes in Jumla.

Programme	***Funding organisation***	***Allowance per person, per year***
Child grant	UNICEF	Rs 2,400
Student allowance	Ministry of Education	Rs 1,000
Old age allowance	Ministry of Local Development	Rs 6,000
Disability allowance	Varies	Varies

Table 6.4 – Social welfare programs in Jumla

First, the 'child grant' is an allowance of Rs 200 per month per child under the age of five. However, there is a maximum of two allowances per mother. This grant is available for all families in the Karnali Zone, irrespective of caste or affluence. The child grant is funded by UNICEF, but distributed by local NGOs. For the research area, this is done by the NGO named 'Karnali Integrated Rural Development & Research Center' (KIRDARC). Interestingly, besides providing a much needed financial contribution, the program also promotes (birth) registration, which should give access to formal institutions and its programmes (Nagarkoti, G.).

Second, the Ministry of Education distributes allowances to students. It is reported that it can amount to Rs 1,000 per person per year, but no further requirements were known to both the respondents and the key informants. However, some informants did mention that the government is using these scholarships to target *Dalit* children and victims of the Civil War, but this could not be confirmed by the key informants.

Third, the old age allowance is funded by the Ministry of Local Development and distributed by its local extension, the VDC (Rajan, 2003). The eligible people are women older than 65 and men older than 75 years. The allowance amounts to Rs 500 per person per month, which is a significant amount for anyone with some independent income, but if the allowance is the only income it will keep them under the poverty line of Rs 7,696 per year.

Finally, different kinds of disability allowances are apparently funded by several organisations. It is still unclear which organisations are responsible, and when someone is eligible to receive the allowance, although it is suggested that victims from the Civil War are primarily targeted. Nevertheless, amongst the respondents there were several beneficiaries who suffered from their disability since birth. The amounts received from the programmes seemed to depend on the type of disability they suffer from and whether they were one of the wage earners of the family.

What all the programmes have in common, is that potential beneficiaries need to register for the particular programme. For this the potential beneficiary needs the proper identity papers and of course the knowledge that this programme exists. Herein, the flaw of most of these programmes is found, as the lack of awareness of the people about these programmes became apparent during the survey. Many families which were visited would presumably be entitled to one or more contributions from these programmes, but were unfortunately unaware of their existence.

Other financial provisions

Former employees of the government have a right to pensions after the legal retirement age of 55 years. This includes employees of local governments, ministries, the police force and the army. The pensions in the sample ranged from Rs 6,000 to Rs 11,000 per person per month. This is an incredibly high amount compared to the incomes of all other people without a full-time job.

The Department of Industry is responsible for an incentive for *Dalit* households with their own 'home-industry'. Although last year it amounted to Rs 15,000 per year, in 2011 it was lowered to Rs 9,000 per household. Among the respondents were two *Dalit* blacksmiths who benefited from this provision. However, the other home industry *Dalit* are often employed in is tailoring, which is exclusively a women's occupation. None of them were benefiting from this provision, but it remains unclear whether this industry is not supported by the provision or to what extent other reasons for not getting access – like a lack of awareness on part of the respondents, or possibly gender based discrimination – played a role.

Another incentive for businesses is the subsidy on the usage of electricity by cold stores. This subsidy amounts to 50 percent of the electricity bill and – like the home industry incentive for *Dalit* – was envisioned to promote local ownership of small businesses (Development Vision, 2009, p.31).

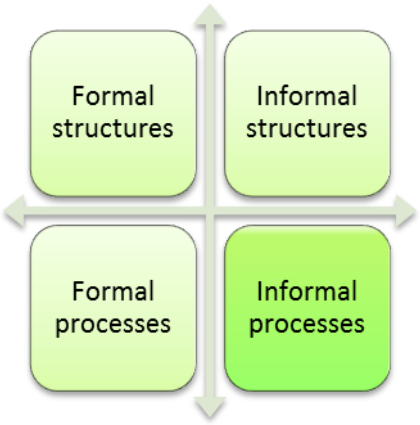
Property rights

Women generally have a disadvantaged position in Nepali society; this was to some extent discussed in section 2.5. This position in society will again be under discussion in the next subsection, but first an example of women's status with regards to formal processes will be discussed.

One consequence of the lower status of women is that they are often less entitled to the ownership of houses or land. Some legislation now exists in order to protect women's rights. For example, one regulation provides a 20 percent discount on land title registration if the plot is registered in the woman's name (Drucza, K.). However, in the survey there were only 10 households which had some land registered in the woman's name. Again, it seemed that there was a lack of awareness on the existence of this rule.

One reason often stated for the fact that some pieces of land are registered on a woman's name, is that they have inherited the land and/or house from their father. In this light, there is another part of legislation that attempts to promote ownership by women. The 11th Amendment of the Civil Code proclaims that a daughter gets the right of inheritance until she is married; a widow keeps her right to her husband's property even when she remarriages; and a divorced woman has a right to part of her husband's property (Drucza, K.). However, lack of proper enforcement of this kind of legislation results in the continuation of women's disadvantaged position in Jumla (Dewan, E.).

6.2.2 Informal processes



The informal processes comprise the norms and values that define social relations, like gender, caste or socio-economic class. Unlike structures and to a lesser extent unlike formal processes, informal processes are not tangible. While it is possible to identify an approximation of these processes, they are volatile and are differently perceived in each region, village or household. At the outset of this subsection it must therefore be admitted that we have only scratched upon the surface of some of these processes, as each of the following topics could easily fill a book. They will nevertheless be briefly discussed, in order to give some general understanding of the informal processes in the district and how they are relevant for the Jumla apple value chain.

Caste system

The general characteristics of the caste system and the practice of untouchability were discussed in section 2.5. While it is extremely difficult for an outsider to assess the current caste and ethnic discriminatory situation and its implications on people's livelihoods, it is evident that they affect them negatively. So how does this system influence the ability of lower caste people to produce apples?

The district-wide figures show that 61.6 percent of Brahmin and Chhetri households in Jumla are producing apples. In contrast, only 44.9 percent of *Dalit* households are cultivating apples (DDC, 2008). When looking at the list of suppliers to the DFC at Jumla airport, only 9 out of the 237 (3.8 percent) suppliers were found to be *Dalit*. Apparently, *Dalit* households do not have the same opportunities for cultivating apples as the higher castes. How can this be explained?

First, the *Dalit* have on average less land than the Chhetri (see section 4.3.1), therefore less apple trees and consequently a lower production of apples. In addition, this would make them more risk averse. In other words, they are less likely to try (new) cash crops on their land. Their livelihood strategy is, therefore, one of minimising risks rather than maximising returns. Second, they have lower incomes and therefore less opportunity to invest in the apple orchards. Third, few of the *Dalit* have the farming experience (because they are usually restricted to different occupations) that other castes do, so they lack the human capital. To clarify, the *Dalit* households in the survey had on average 8.5 years of experience cultivating apple trees, while the other castes combined had on average 14.9 years of experience. On all these counts, the *Dalit* are disadvantaged compared to the higher castes. Arguably, these disadvantages are at root the result of the social ostracising of this group, both in the past and in the present.

In conclusion, the *Dalit* lack the resources for successful apple production. In addition, since the proportion of Brahmin and Chhetri households that took up apple cultivation is greater than the proportion of *Dalit* households, it implies that the inequality between the castes might actually increase. Indeed, apple cultivation does not seem to be the most obvious opportunity to lift the *Dalit* out of poverty.

Gender

The general background of gender inclusion in Nepal was previously discussed in section 2.5, and again briefly in subsection 6.2.1 in relation to property rights. However, the specific position of women in Jumla's society in relation to the apple production deserves a closer look.

As was discussed before, the fact that the women do most of the agricultural work is part of the social and cultural values in Nepal. For the Jumla apple value trade, this would mean that the increased amount of work from cultivating apples would disproportionately fall on the shoulders of the women as well. The Agro Enterprise Center (AEC) estimates that as much as 80 percent of the workload for apple production is borne by the women (AEC, 2010, p.27). Table 6.5 presents the work distribution between men and women for several activities with regards to apple production.

The results from table 6.5 support the claim that almost 80 percent of the workload would be borne by the women. Men seem to be especially involved in the preparatory stages, except for the application of manure,[32] and the pruning of the trees for which significant skill is needed (and for which the LARFs are often hired). The most labour intensive activities, harvesting and transportation, are done by women. Interestingly, women are heavily involved with selling the apples on the local

[32] There is a cultural taboo in Jumla for men (or unmarried women) to handle manure. Therefore, this is done exclusively by married women.

markets. It should be noted that this does not include the produce which was sold to the DFC. Of the apple suppliers to the DFC in 2010, only 28.7 percent of the suppliers were, in fact, women.

Description of activities	*Work days required per ropani (20 apple trees)*	*Estimated work load (%)*	
		Male	*Female*
Land preparation	4	70	30
Planting saplings	1	100	–
Applying manure	5	–	100
Pruning of apple trees	10	80	20
Harvesting	15	–	100
Transportation to home or market	5	–	100
Selling at the local market	5	–	100
Total	45	26.2%	73.8%

Table 6.5 – Work distribution on apples by gender
Source: SNV Nepal, 2011.

The phenomenon of women selling their produce on local markets is a recent one, claims Drucza, as it used to be reserved for men (2010, p.13). Unfortunately, their inexperience on the market and the low social position they have in the Jumla society makes them reluctant to negotiate with the male buyers on the market. Too often they simply agree to the suggested price from the man, which leaves them deprived of fair profits (Drucza, K.).

An SNV report argues that, as mainly women carry apples in *dhokos* to the market or airport, it provides them with the opportunity to engage in the formal economy. This could increase their independence and their decision-making power (SNV Nepal, 2011, p.33). However, the low proportion of women supplying to the DFC implies that they are still deprived of the profitable business.

Da Silva argues that in traditional societies where the division of labour and the decision-making roles in the household are firmly established in the culture, like is the case in Jumla, the contract farming arrangement can be a threat to this traditional pattern. Especially when the labour is conducted by one gender, but the payments are made to the partner, it could lead to social tension (Da Silva, 2005, p.18). To what extent this is or will be the case, remains to be seen. Furthermore, more intra-household research is needed to get insight into the decision-making between the spouses and to gauge the extent to which women are allowed to independently wield the profits from selling apples.

6.3 Conclusion

Q_4: To what extent and how are farmers in Jumla coping with external factors?

The question that was attempted to be answered in this particular chapter was how the people in Jumla are coping with the external factors which influence their livelihoods and the cultivation of apples. The array of coping strategies available to the Jumla people is in theory as varied as the external factors they have to deal with, although most people are severely constrained in their choice of coping strategies by their limited access to livelihood capitals.

An important finding is that all the coping strategies in reaction to these shocks and stresses are ultimately aimed at increasing income or increasing the availability of food. In this respect, some of the most common coping strategies were examined. First, people buy less expensive and less preferred food, or temporarily reduce the number of meals per day; second, the use of savings or loans, e.g. to buy food or medicine.

Labour migration from Jumla to other regions of Nepal and abroad was extensively examined in this chapter, and was identified as a coping strategy as a response to food insecurity. By leaving the district, the migrants would arguably have more access to food and simultaneously lowering the food demand in their household. However, the labour force in the household decreases too, which means the women who stay behind are burdened with even more work. In addition, it can be seen that on a community-level this outflow of men is creating labour scarcity and therefore higher labour costs. However, in the survey a very low number of Jumli people were found to be migrating, which is thus contrary to several reports which claim that remittances are one of main income sources for this region. One explanation is that Khalanga Bazaar now offers more business and employment opportunities. Secondly, taking into account that labour migration as a coping strategy is only conducted at times of food shortages, this low number of migrants can be explained by the fact that the food insecurity in the Mid-Western Development Region reached its lowest point in almost three years during this research.

The aspect of food aid as a coping strategy was also discussed in detail. In months of food insecurity, many people in Jumla rely on the NFC and WFP to provide additional food. However, the rice from the NFC is not reaching the poorest people in the district, but mostly the people who live close to Khalanga Bazaar. Hence, this is an advantage to the people from the research districts compared to other Jumli people. Importantly, the food- or cash-for-asset programmes from the WFP arrangements seem to distort the local market mechanism, and discourage farmers to work for themselves. These disincentives need to be addressed. While the provision of additional food is supposedly a short term solution, the situation can only become sustainable when there is a long-term solution which ensures that the communities become self-sufficient in food production.

Finally, there are some coping strategies which may help in the short term, but are quite destructive in the long term. Therefore, a distinction needs to be made between ‘normal’ coping strategies, which would not have serious long/term negative effects, and ‘negative’ coping strategies which will decline a household’s productivity and leave it more vulnerable against subsequent shocks

or stresses. Examples of these negative coping strategies include the excessive use of credit which leads to unsustainable debts, of which examples were seen in this chapter. In addition, selling productive assets like farming equipment or land will hamper a household's ability to produce food or make an income. It is thus important to recognise that the use of these negative coping strategies can therefore lead a household into a downward spiral.

There are several institutional policies which influence the households in Jumla, of which the child grant, student allowances, old age allowances and disability allowances were discussed. The major flaw of the implementation of all these policies is that the potential beneficiaries lack the awareness of these policies and therefore have not registered.

Other financial provisions which were identified include government pensions, and a subsidy on the usage of electricity by cold stores. Finally, there is an incentive for *Dalit* home-industries, which were received by *Dalit* blacksmiths (who are men) but not by *Dalit* tailors (who are women). It remains unclear whether the tailoring industry is not supported by the provision, whether a lack of awareness on part of the tailors was the cause, or whether gender based discrimination played a role.

Indeed, the position of women in the context of the social and cultural values, which is therefore part of the institutional environment, is problematic. Women do most of the agricultural and domestic work is in Nepal, which implies that the brunt of the work from cultivating apples would fall on their shoulders as well. Indeed, it was confirmed that nearly 80 percent of the workload from cultivating apples would be borne by the women. As most of the labour is conducted by women, but the payments are made to the men, this could lead to social tensions. However, more intra-household research on this subject would be needed before clear/cut conclusions can be drawn. Another example of how the lower social status of women affects their livelihoods, is that they are often less entitled to the ownership of houses or land. Despite the guarantee of equal rights by law and the incentives to attain gender equality, there continues to be a lack of enforcement.

The caste system and the practice of untouchability are similarly part of the institutional environment. They negatively affect the livelihoods of *Dalit*, as can also be seen in the fewer opportunities they have for cultivating apples than the higher castes. *Dalit* have on average less land than the Chhetri, they have lower incomes and therefore less opportunity to invest in the apple orchards, and they lack the human capital (apple cultivation experience). This group continues to be socially ostracised, which has resulted in their disadvantaged situation.

The Nepalese government has been (more or less) working on these subjects for over two decades, but major progress fails to occur. While it is therefore well known that stigmas like caste and gender will not disappear overnight, all stakeholder in the context of Jumla should continue to address this problem.

CHAPTER 7 – CONCLUSIONS & DISCUSSION

By combining the value chain analysis with a livelihood approach, the interactions between markets and livelihoods could be examined. This provided insights which can be used to improve the value chain and to reduce poverty. The conclusions from the main research question are presented in section 7.1. In section 7.2, a discussion is provided on how the findings from this research relate to the existing literature, which was reviewed in chapter 1.

7.1 Conclusions

The conclusions which were drawn from the preceding chapters have provided the means to answer the main research question of this thesis:

> *What new insights does the livelihood approach provide to the involvement of smallholder farmers in the apple value chain in Jumla?*

The insights obtained from combining the value chain analysis and the livelihood approach are presented below.

Income

While value chain analyses often see the beneficiaries as a homogeneous group, the livelihood approach has contributed greatly to the comprehensive understanding of the situation in Jumla by identifying seven livelihood patterns amongst the respondents. The people included in these livelihood patterns have to some extent similar backgrounds and make similar choices in their livelihood strategies as the other members of that particular pattern. The people in the different patterns draw their livelihoods from very different sources and are therefore also benefiting differently from the cultivation of apples. Hence, before the income effects from the Jumla apple value chain can be understood, it is necessary to first understand the livelihoods of these people. For instance, while the overall benefits from apple cultivation can be simply expressed as being on average 11.7 percent of their income, these figures actually differ greatly between the livelihood patterns (and amongst individuals, of course). It was found that some livelihood patterns benefit only marginally from the apple trade, while others seem to do very well. The livelihood approach identified the amount of landholdings (natural capital) as well as the experience in apple cultivation and trading (human capital) as important determinants for the amount of income the farmers can get from apples. However, it is recognised that these indicators are far from all-encompassing as the situation is infinitely more complex.

Two other very important aspects with regards to the income from apples which have come to light from the livelihood approach are the facts that a) *Dalit* are benefitting less from the cultivation of apples, and b) the women in the household have to carry out most of the work in cultivating apples, while most of the profits are reaped by their husbands. Indeed, it was revealed that *Dalit* have fewer opportunities for cultivating apples than the higher castes, originating both

from their landholdings, their lack of experience, the lack of income which can be invested (financial capital), and finally the continuing ostracising of their caste in the community (lack of social capital). Women also have a lower social status which results, amongst others, in the fact that they have to bear nearly 80 percent of the workload from cultivating apples. Hence, the livelihood approach shows the importance for the Jumla apple value chain to become inclusive of the poorest and most deprived people (*Dalit* and women).

The value chain

The value chain analysis shows that the particular value chain arrangement of the Jumla apples lets the DFC, as the middle-man and only contracted party, enjoy most of the benefits such as assured demand and fixed prices. Meanwhile, the farmers bear most of the production risks. These production risks are numerous and very diverse, as the livelihood approach identified a myriad of 'shocks, stresses and seasonalities' which affect the livelihoods and the cultivation of apples. The shocks included natural disasters like hailstorms or droughts, and several pests and diseases which are common in the cultivation of apples. In conclusion, not only do the farmers not have the benefits of market certainty that usually accompany contract farming, as relevant theories suggest (cf. Bijman, 2008), but their production certainty also remains low. While on the one hand the contract arrangement could be changed to extend the market certainty to those farmers, the production risks could be mitigated by an insurance scheme provided by the other stakeholders in the Jumla apple value chain. Another type of shock that affects the Jumla apple value chain is the occurrence of *bandhas*. Unfortunately, the contract is still unclear on which actor in the value chain bears the costs associated with these events or how they could be shared. The value chain analysis identified this aspect of the contract as a risk, while the livelihood approach gave the broader understanding of the how and why of these *bandhas*.

Furthermore, the monsoon was analysed by the livelihood approach as being a seasonality which affects the livelihoods and the apple value chain. During the monsoon, the road becomes impassable and the transportation by plane is difficult at best. The high supply of apples in Jumla results in plummeting prices, and a large amount is spoiled while waiting for the transportation to resume. In addition, apples which are not exported within a short time after the harvest will degrade quickly, making them unsuitable for sales outside Jumla. While the livelihood approach analysed this seasonality and its effects on livelihoods and the value chain, in the value chain analysis it was also recognised that in the months after most of the export has taken place, the prices of apples in the *Terai* and Kathmandu rise quickly. The opportunities for profitable exports of apples are therefore present, but only if the apples are kept fresh in proper storage facilities. Therefore, the reasoning behind the livelihood approach and the value chain analysis both reach the same conclusion, which is that storage facilities are necessary to expand the Jumla apple value chain and to let more poor farmers benefit from the export of apples.

Another issue with regards to transportation is the transportation subsidy from the local government. The main stakeholders argue that the subsidy for the export of apples by air is necessary to improve the competitiveness of the Jumla apple. However, the subsidy could be

counterproductive if it drives the farmers out of the market who are not supported by the subsidies. If this is the case, the subsidy would be retaining the inefficient farming practices and decreasing the overall quality of the exported apples, while putting other entrepreneurs out of business. Hence, the stakeholders should be vigilant of this potentially harmful effect of the subsidy. Another aspect of the subsidies that needs attention is that they do not address the lack of flights leaving Jumla. This leads to the conclusion that at least part of the subsidies should be used to increase the availability of flights leaving the district, because if a higher proportion of the Jumla apples can be exported, a higher proportion of the people could benefit.

Inputs and credit

Both from the value chain as from the livelihood perspective, problems with regards to the quality and availability of inputs for apple farming were identified. In addition, both recognised that there is a lack of access to credit facilities. Bijman suggests that the inputs and credit can be provided by the anchor firm or by the DFC. By arranging this in the contract it could improve the availability and quality of the inputs, as well as decreasing the costs for the farmer (Bijman, 2008, p.14). Indeed, the livelihood approach confirmed that loans are a quick and easy source of financial capital, which can be used to invest in more productive farming methods or equipment. However, it was found that poorer households are reluctant to use credit, as they do not have any income sources to be able to repay the loan. Moreover, most of the loans are not used productively but only as a coping strategy by the poorest households. The livelihood approach identified some cases where poor farmers had accumulated unsustainable debts. Therefore, while the use of credit can bring benefits to the cultivation of apples and subsequently to the farmer's household, the findings from this thesis lead to the recommendation to use caution with providing credit.

Food security

The food security in Jumla was examined as part of the broader context in which the livelihoods of the farmers and the Jumla apple value chain are embedded. On a district-level it was found that there is a lack of food availability because of insufficient food production in the district on the one hand, and dysfunctional markets (caused by the lack of infrastructure) which prohibit the import of sufficient food, on the other hand. By means of the livelihood approach it was discovered that the food security on a household-level is influenced by both the household's food production and the household's income. A related finding is that all the coping strategies in reaction to the vulnerability context (of which food insecurity is a result) are ultimately aimed at either increasing the income or increasing the availability of food. This provides an important lesson for other researches which have often looked at food security from a 'production-only' point of view. With regards to the Jumla apple value chain it can be concluded that the cultivation of apples is not crowding out the production of food crops by means of competition for land, because 'intercropping' allows for simultaneous production of food crops and apples on the same plot. However, the seasonality aspects of the farming-related workload, labour prices and migration do suggest that farmers might be forced to

choose between harvesting food crops and harvesting the cash crops (the apples) because of a lack of labour.

Combining approaches

As Kanji and others argue, combining the value chain analysis and livelihoods approach should give a more comprehensive and realistic understanding of the structure of certain markets and their potential to improve the livelihoods of poor people (Kanji et al., 2005). In this thesis, the use of the livelihood approach has given guidance on how to cautiously attempt to improve the value chain by e.g. providing inputs and credit, and taught that the income benefits are not shared equally among livelihood patterns, castes and gender. The insights provided into the risks that the farmers have to deal with while cultivating apples, and indeed in their other livelihood activities as well, show the need to mitigate these risks and to reduce their vulnerability. In some cases, the livelihood approach did effectively provide new insights, while in other cases the conclusions from the value chain analysis were confirmed. This, too, is a valuable aspect of combining these approaches, because data triangulation is very much a criterion of good research. In short, the livelihood approach has provided many additional insights into the linkages between the value chain and the livelihoods. Nevertheless, many questions and uncertainties remain. Therefore, further research on the livelihoods in general and the vulnerability context in Jumla in specific is of great importance.

7.2 Discussion

This thesis has provided an extensive analysis of the Jumla apple value chain and the livelihoods of the farmers involved, as well as the cross linkages between them. It was already seen in the previous section how the findings contribute to the methodological discourse by arguing for combined approaches when researching market-based livelihoods. But how do the conclusions of this thesis relate to the theories on value chains and livelihoods described in chapter 1?

Value chains

The characterisation of the Jumla apple value chain commenced with the value chain types distinguished by Gereffi and others. It was found that the Jumla apple value chain closely resembles the 'modular value chain', as substituting between suppliers and buyers is relatively easy. There is little power asymmetry and all actors are rather independent in this type of chain, they argue (Gereffi et al., 2005, pp.85-87). Their argument is applicable to the Jumla situation in as far that for the DFC, it is indeed easy to substitute its suppliers, as many other farmers are eager to supply their apples against high prices. Hence, the farmers have little market certainty. Where the theory of Gereffi and others fails for the Jumla situation, is that the farmers themselves do not have the assumed independence, because they cannot substitute their buyers. The DFC has in effect a monopsony on the apple trade in Jumla, resulting from both the absence of a local market for apples and the fact that the DFC is the only entity which can use the transport subsidies to export.

Eaton and Shepherd attempt to provide contract farming models which should be more applicable for value chains like the one in Jumla. Their 'intermediary model' recognises there is no direct link between the anchor firm and the farmer, which could pose problems with incomes, quality standards and production (Eaton & Shepherd, 2001). However, these problems as a direct result of the lack of a direct link were not observed in the case of Jumla. Interestingly, Humphrey & Schmitz argued that the extent of governance or coordination is the most distinguishing feature for a value chain, as opposed to spot-market arrangements (Humphrey & Schmitz, 2008, p.261). In the absence of a direct link, as with the intermediary model from Eaton and Shepherd, it can therefore be argued that there are two separate market arrangements in the Jumla apple value chain. The first is the contract arrangement between the anchor firm and the DFC. The second is the relation between the DFC and the farmers, which approaches a spot-market arrangement. Hence, the current literature on this subject does not yet recognize a 'hybrid' contract farming model like was presented in figure 3.2 (page 48).

With regards to the contract arrangement, the typologies of Mighell and Jones still seem applicable. The Jumla apple value chain makes use of a market specification contract, which according to Mighell and Jones would reduce the farmer's marketing uncertainty while leaving them with most of the production risks (Mighell & Jones, 1963 in Bijman, 2008). While the production risks indeed do remain with the farmers, the fact that there is only a contract between the DFC and the anchor firm means that the marketing uncertainty is reduced only for the DFC, and that the farmers receive no benefits from the contract farming arrangement as such.

In conclusion, the theories described here have been useful tools for analysing the value chain coordination in Jumla. However, the hybrid market arrangement and the monopsony from the DFC (arguably as a result from the limits to transportation) have provided a value chain arrangement which cannot be grasped by one theory or model alone.

Livelihoods

One of the elements for which the livelihood approach is praised, is the introduction of the notion of the livelihood capitals into the development debate and the emphasis on "flexible combinations of, and trade-offs between, different capitals" (De Haan & Zoomers, 2005, p.33). Indeed, in this thesis many examples of combinations of different livelihood capitals were found, and the importance of converting e.g. human capital (skills and labour) into financial capital (wages) for people's livelihoods was established.

With regards to the specific livelihood capitals, Bebbington claimed that social capital is very important because it allows people to gain easier access to other resources, which means it can be a catalyst to increase access to the other four kinds of capitals (Bebbington, 1999, p.2022). For Jumla, it was found that the networks of family and acquaintances can indeed provide access to, for example, financial resources (e.g. remittances) and access to market information. However, in Bebbington's theory the aspect of limitations to the social capital remains underexposed. For example, it was

discovered that in Jumla there are very specific limits to the social capital due to the 'institutional environment', which in this case mostly consists of the discriminatory practices in caste and gender.

Furthermore, De Haan describes the diversification of livelihoods, and argues that livelihoods are rarely based on one livelihood capital alone (De Haan, 2006, p.149). This was confirmed by the research in Jumla, as nearly all respondents spread at least some part of their livelihood activities amongst different livelihood capitals. Ellis argues that this diversification can reduce people's vulnerability to external factors (Ellis, 1998). For Jumla it was indeed found that this was the case, as for example diversified households enjoyed a greater food security than day labourers (mostly dependent on human capital) or subsistence farmers (mostly natural capital). De Haan further mentions multilocality as a form of spreading the livelihoods (De Haan, 2006, p.149), examples of which were identified in Jumla as both labour migration and the exchanges of information and assets with family members in other places.

Finally, De Haan argued that patterns of livelihood combinations can be discerned between the different castes, genders, or social classes (De Haan, 2006, p.152). In this research several of those livelihood patterns were identified, where people of similar backgrounds encounter similar problems and opportunities. However, in the context of Jumla it was found more appropriate to differentiate between occupations rather than class, caste or gender. The number of possible occupations is very limited, and income levels and other livelihood assets are quite similar in those cases. It is believed that the conclusions from these livelihood patterns have provided more insight into the choices that people can make in their livelihood strategies.

7.3 Closing remarks

The added value of using complementary approaches has become obvious from this thesis. It is therefore argued that the use of multidisciplinary and complementary approaches should become common practice in development research, in order to arrive at comprehensive interpretations and recommendations which are policy-oriented. The results from this kind of research are more likely to reach inclusive conclusions and actually convince policy makers to address the relevant issues.

This research has identified many knowledge gaps which deserve to be addressed in further research. These include the broader understanding of the context by studying the changes in Jumla's climate, by examining intra-household dynamics, or by analysing the changing social structures (in relation to both migration and the caste system). In addition, the main questions which need to be answered for the Jumla apple value chain relate to the feasibility of improvements to the chain like the construction of storage or processing facilities. Finally, some expected developments in Jumla district in the coming years will provide ample new questions. These developments include the finalisation of the Karnali Highway and the changes in prices of labour, apples, and other

commodities. Furthermore, it can be questioned whether the low price differences between organic certified apples and non-certified apples will be high enough to keep this certification process going. Finally, arguably the most important question for the Jumla apple value chain is whether the stakeholders will continue their activities independently and sustainably when the project partners like SNV Nepal withdraw from the project. Time will tell, but hopefully further research will provide additional guidance in order to arrive at the desired outcome.

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GLOSSARY

Adhiya	A local sharecropping arrangement, whereby the landowner receives half of the sharecropper's harvest (Kanel, D.)
Anchor firm	The firm at the top of the value chain (also known as 'lead firm'), which is distinguished from other firms because it can assert some extent of coordination on the value chain
Bandha	A general strike which literally means 'to close'. Markets, businesses, schools, public offices and roads are closed. Often enforced by mobs, and can leave serious damage to property or even lead to injuries and deaths (NPC, 2010, p.25)
Beshi	Plain land, mostly found alongside the rivers
Brahmin	Hindu priestly caste (highest caste)
Chhetri	Hindu warrior caste (high caste)
Dalit	A self-designated term for a variety of groups of people who are regarded as untouchables, hence the lowest (collection of) caste(s)
Dashain	A major Hindu festival (15 days long) in September or October. Celebrated throughout Nepal by people of all castes, this harvest festival has an emphasis on community and family ties
Dhoko	A bamboo or wicker basket which can be carried on the back (see plate 4) and contains up to 50 kg of apples
Extension services	In this context, agricultural extension means educating farmers about (new) agricultural practices (i.e. technical assistance), but can sometimes also encompass training in communication, business or other skills
Ghee	Clarified butter used for cooking throughout South Asia, but also used in religious rituals in Hinduism
Hall	A local measurement of surface, and usually defined as land surface that can be ploughed by a man and a pair of oxen in one single day
Household	The Food and Agriculture Organization (FAO) defines a household as "a group of people who eat from a common pot, and share a common stake in perpetuating and improving their socioeconomic status from one generation to the next" (Messer & Townsley, 2003, p.7)
Janajati	The Nepali word for so-called 'nationality groups', which are indigenous communities with their own language and culture. They

	have no Hindu caste structure. They comprise approximately 22 percent of the population and are mostly found in the Hills and Mountain regions (Gurung, 2006, p.73)
Karnali Zone	The largest administrative zone of Nepal, and part of the Mid-Western Development Region
Khalanga Bazaar	The village which is the capital of Jumla district. Located in Chandannath VDC, this village harbours all district-level government offices; most headquarters of local NGOs; the largest market; and the Jumla Airport.
Lakh	100,000 (also used for units other than currency)
Monopsony	The market condition where there is only one buyer
Pahat	The Nepali word for hillsides or sloped land
Panchayat	A decentralised system (used in ancient times) in which small assemblies (*ayat*) of five (*pancha*) 'wise men', form the local government. Again in use between 1962 and 1991
Pruning	Cutting branches (e.g. which are old, block sunlight, or have diseases on them) to improve the quality of the apples
Ropani	The ropani is a Nepali unit of measurement for land area, and mostly used in the Hills or Mountain eco-zones (see conversions on page xi)
Sapling	A young and small tree, but bigger than a seedling
Terai	The low-lying plains in the south of Nepal. With only 23 percent of the total land surface of Nepal, this eco-zone contains some 50 percent of the total population and accounts for by far most of the food production and economic activity (section 2.1)
Thakuri	A high Hindu caste, which can be categorised with the Brahmin, with the Chhetri or in between, depending on the author (cf. Bista, 1991 and Bennet, 2005)
Training	The practice of cutting branches before the trees give fruit, in order to influence the way the tree grows
Transplanting	The (rice) sprouts are taken from a 'nursery field' and re-planted in their 'final' field
Yarchagumba	*Ophiocordyceps sinensis* – a fungus grown in infected caterpillar larvae. It is collected on mountains between 3,000 – 5,000 m high between the months of May and July, when the snow has melted. Known popularly as 'Himalayan Viagra', it is used mainly in Chinese medicine as an aphrodisiac (subsection 4.3.3)

APPENDIX A – Household survey

Start End

VDC/ward: _____ Village: _____ Date: / /2011 Time: –

Name of respondent: _____ Name of interviewer: _____

Namaste. My name is …….. On behalf of Tim Krap, a student from The Netherlands, I would like to ask you some questions about you and your household and how you make a living. This research will be used for writing his Master thesis. He will also report to SNV Netherlands Development Organisation so they can better understand the reality of the production of apples and its potential for improvement in the area and the region.

We are conducting a survey of farmers throughout several communities in Jumla district. It will take approximately 45 minutes to answer the questions. All information you provide will be handled with complete confidentiality and anonymity, and only for the purposes of this study. If you feel uncomfortable about certain questions you can refrain from answering them or end the interview at any time. However, we would highly appreciate your cooperation.

Do you have any questions to me or Tim before we start?

Household characteristics

S/N	A. Name	B. Relationship (to head of household)	C. Gender	D. Age	E. Highest attained education	F. Literacy	G. Main occupation
	What are the names of the people who have been living together in this house for at least six months the last year? [PUT THE NAMES OF MEMBERS IN ORDER OF RELATIONSHIP. BEGIN BY ASKING WHO THE HEAD OF THE HOUSEHOLD IS]	1. Head of household 2. Spouse/partner 3. Son/Daughter 4. Brother/Sister 5. Father/ mother/parent-in-law 6. Other relative 7. Employee 8. Other non-relative	M/F	(years)	None Primary (1-5) Lower Secondary (6-8) Secondary (9-10 /SLC) Higher Secondary (11-12) B.A. or above Other (specify) [NOTE HIGHEST GRADE S/HE FINISHED]	Can s/he read and write? 1. Yes 2. No	1. Farmer 2. Wage labourer 3. Business owner 4. Housewife 5. Student 6. Retired 7. Unemployed 8. Other (specify)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

H. What is your caste/ethnicity? 1) Brahmin 2) Chhetri 3) Thakuri 4) Dalit 5) Janajati 6) Other (specify):_____

Apple farming

A. On what type of land do you grow your apples? 1) Pahat 2) Middle 3) Beshi

B. How is this land irrigated? 1) Rainfall 2) Spring 3) Irrigation canal 4) Well 5) River/stream 6) Other (specify):_____

C. How long do you have to walk from your apple orchard to your house? _____ Minutes

D. Do you grow any crops in between the apple trees? If yes, which ones?_____

E. For how many years have you had apple trees? _____

F. For how long have you actually been selling (part of) your apples? _____

G. Do you grow organic? 1) Certified 2) Certified-in-conversion 3) Yes, but not certified 4) No 5) I don't know

H. What variety of apples do you grow? 1) Red Delicious 2) Royal Delicious 3) Golden Delicious 4) Jonathan 5) Macintosh 6) Other (specify):_____

I. How many fruit bearing apple trees will you have next harvest? _____Trees And non-bearing: _____ Trees

J. How many apple trees did you harvest last year? _____ Trees K. How many kilograms of apples did you harvest in total? _____ Kgs

L. What did you do with the harvested apples? _____ Kg sold _____ Kg own consumption _____ Kg (other, specify:)_____

To whom did you sell your apples last year? Specify the volume, the price you received, and the location where you received this price.

S/N	M. Buyer *	N. Volume (Kg)	O. Price (NPR)	P. Delivery point **
1				
2				
3				
4				
5				

** Buyer*
1) Cooperative
2) Trader
3) Market-place
4) Other (specify)

*** Delivery point*
1) At field or house
2) Collection centre
3) Market-place
4) Cooperative
5) Airport
6) Other (specify)

Q. How much money have you spent last year on your apple orchard with;

1) Fertiliser: _____ NPRs 2) Herbicides and pesticides: _____ NPRs 3) Hired labour: _____ NPRs

4) Technical assistance: _____ NPRs 5) Packaging material: _____ NPRs 6) Transportation:_____ NPRs

7) Saplings: _____ NPRs 8) Other (specify): _____ NPRs

R. How many new apple saplings have you planted last year? _____ Saplings

S. How has your income from apples changed over the last three years? 1) Increased 2) Stayed the same 3) Decreased

What are the most important reasons for this? _____

Crop cultivation

[EXCLUDE APPLES]

What are the main crops you have grown last year?

How many ropani harvested last year?

How many Kgs harvested last year?

How many Kgs have you sold last year?

Against what price per kg have you sold it?

What were total costs for this crop last year?

Where did you sell (the majority of) your harvest?

	Crop 1	**Crop 2**	**Crop 3**	**Crop 4**	**Crop 5**
A. Crop name					
B. Harvested (ropani)					
C. Harvested (Kg)					
D. Crop yield					
E. Sold (Kg)					
F. Price (NPRs/kg)					
G. Costs (NPRs)					
H. Net income					
I. Selling location					

J. How has your income from these crops changed over the last three years?

1) Increased	1) Increased	1) Increased	1) Increased	1) Increased
2) Stayed the same	2) Stayed the same	2) Stayed the same	2) Stayed the same	2) Stayed the same
3) Decreased	3) Decreased	3) Decreased	3) Decreased	3) Decreased

K. What are the most important reasons for these changes?_____

Land ownership

How much land does your household use? Please fill out the table below.

Land type	***B. Ropani***	***C. Irrigation?***	***D. Type of ownership? ****	***E. How acquired? *****	***F. Three main crops***
Plain (beshi)					
Middle					
Slopes (pahat)					
A. Total					

** Ownership*
1) title on man's name
2) title on woman's name
3) sharecropping (Adhiya)
4) cash fixed rent
5) leasehold forest land
6) community land
7) unclaimed land
8) other (specify)

*** Acquired*
1) inherited
2) bought
3) claimed
4) other (specify)

G. Does your household own any land that you are renting out to other farmers?

If yes, what is your monthly income from this? _____ NPRs

H. Does your household rent any land from other people?

If yes, what is your monthly expenditure for this? _____ NPRs

Livestock

S/N	***1***	***2***	***3***	***4***	***5***	***6***	***7***
Livestock owned	**Buffalos**	**Cows/bulls**	**Goats or sheep**	**Pigs**	**Poultry**	**Horses**	**Other (specify)**
A. Number of productive animals							
B. Income: What is the income from livestock per month (NPRs)?							

C. How has your income from livestock changed over the last three years? 1) Increased 2) Stayed the same 3) Decreased

What are the most important reasons for this? _____

Non-agricultural income sources

Do any of the household members earn a wage? [FILL OUT THE TABLE BELOW]

Household members [S/N FROM FIRST HOUSEHOLD SHEET, PLUS FIRST NAME]	**A. Wage activity**	**B. Seasonality** 1. All-year 2. Temporary 3. Seasonal (specify)	**C. Time** How many hours per week do you spend on this activity?	**D. Income** How much do you earn per week?

E. Do any of the household members own a business? If yes, what kind? _____ What is the income from this per month?_____NPRs

F. Do any of the household members seasonally migrate to earn income? If yes, which member(s)? _____

If yes, where do they go? _____ What work do they do? _____

If yes, how much have they earned for this household last year? _____ NPRs

G. Does your household earn income from gathering forest products? If yes, what products do you sell? _____

If yes, what has your household earned from this activity last year? _____ NPRs

H. Does your household receive any government funds like a pension or child grant? If yes, what amount per month? _____ NPRs

I. Does the household have any other income sources which have not been discussed yet? If so, please specify:

Activity 1: _____ Amount: _____NPRs per _____ Activity 2: _____ Amount: _____NPRs per _____

J. How has your income from the activities above changed over the last three years? 1) Increased 2) Stayed the same 3) Decreased

What are the most important reasons for this? _____

Food security

A. For how many months last year were your harvest and income combined sufficient to feed your family? _____ Months

B. Did any of the household members work for the World Food Program's *Food-for-Assets* program? 1) Yes 2) No

C. Did your household receive any other food aid the last year? 1) Yes 2) No

D. Did any of the household members work for other people in exchange for food? 1) Yes 2) No

Cooperatives

A. Is any household member part of a cooperative? 1) No 2) Yes, member 3) Yes, board member 4) Other: _____

B. If yes, what is/are the name(s) of the cooperative(s)? _____

C. What services from the cooperative(s) do you make use of? 1) Credit 2) Savings 3) Certification 4) Equipment
5) Market information 6) Selling of your products 7) Technical assistance 8) Other (specify): _____ [MULTIPLE ANSWERS POSSIBLE]

D. Is any household member part of a Community Forest User Group? 1) No 2) Yes, member 3) Yes, board member 4) Other: _____

E. If yes, what is the name of the Community Forest User Group? _____

Social capital

A. Do you have relatives in the village? 1) Yes 2) No If yes, do you help each other with farming and/or other work? 1) Yes 2) No
Do you give or receive food to/from these relatives? 1) Yes 2) No Do you give or receive cash to/from these relatives? 1) Yes 2) No

B. Do you have any relatives outside this village? 1) Yes 2) No Do you receive help from them (money, food, goods, etc.)? 1) Yes 2) No
Specify location: _____

C. Do your neighbours (non-relatives) help you with farming activities like planting and harvesting? 1) Yes 2) No

Credit & savings

A. Have any of the household members taken on any loans? If yes, what is the total of current loans taken in this household? _____ NPRs

B. Who is the lender of the loan(s)? 1) Credit union 2) Nepal Rastra Bank 3) Micro-finance agency 4) Rural development bank
5) Trader 6) Informal moneylender 7) Cooperative 8) Neighbour 9) Other (specify):_____

What was the main use of the credit? Give the three most important destinations of the money with an estimate of the amount:

	C. Use	D. Amount (NPRs)
1		
2		
3		

E. Does your household have any savings? If yes, where? 1) Bank 2) Cooperative 3) At home 4) Other (specify):_____

F. If yes, how much in total? _____ NPRs

General

A. What material is the roof of your house? 1) Traditional flat 2) Tin/galvanised 3) Other (specify): _____

B. Is this house owned or rented by a household member? 1) Owned 2) Rented 3) Other (specify): _____

C. Does the house have electricity? 1) Yes 2) No

D. Does your household own a solar panel? 1) Yes 2) No

E. Does your household own a cell phone? 1) Yes 2) No

Closing

[FIRST, CHECK WHETHER YOU HAVE NOT SKIPPED ANY QUESTIONS. SECOND, ARE ALL THE NOTES YOU MADE CLEAR?]

Thank you for your time and cooperation. Do you have any questions or comments?

APPENDIX B – List of key informants

Kathmandu

Name	***Organisation***	***Position***	***Date (2011)***
Rik van Keulen	SNV Nepal	Senior Value Chain Advisor	February 10 February 11 March 3
Rolf Schinkel	SNV Nepal	Inclusive Agribusiness Advisor	February 10 February 11 March 3
Kristie Drucza	SNV Nepal	Gender & Social Inclusion advisor	March 3
-	Anchor firm	Managing Director	March 7
Govindra Ghimire	Alternative Herbal Products (AHP)	Founder & Managing Director	March 9
Deepesh Shrestha	UN World Food Programme	Public Information Officer	March 7

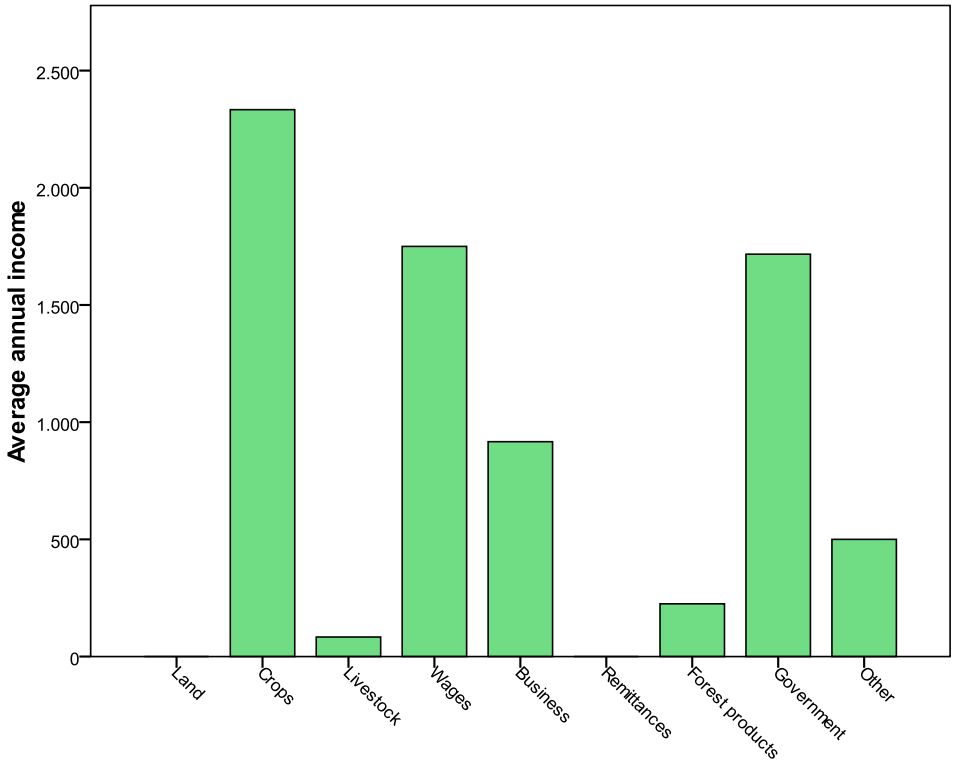
Jumla

Name	***Organisation***	***Position***	***Date (2011)***
Dur Bohadra Raj Maji	District Agricultural Development Office (DADO)	Extension Officer	March 17
Ghanashyam Nagarkoti	Surya Social Services Society (4S)	Chairman	March 17 April 25 April 26
Dan Bahadur Thakuri	Karnali Technical School	Lecturer in Agriculture Department	March 18
Madan Bhujel	District Development Committee (DDC)	Local Development Officer (LDO)	March 20
Dinesh Bahadur Basnet	4S	HVA-IB Project Coordinator	March 21 April 18 April 29
Edwin Dewan	Karnali Technical School	Lecturer in Agriculture Department	March 23
Dharma Bahadur Shahi	4S	HVA-IB Project Agriculture Promotor	March 31 April 18 April 29
Govinda Raj Rokaya	SNV Nepal	WASH advisor	April 11 April 18 – April 23

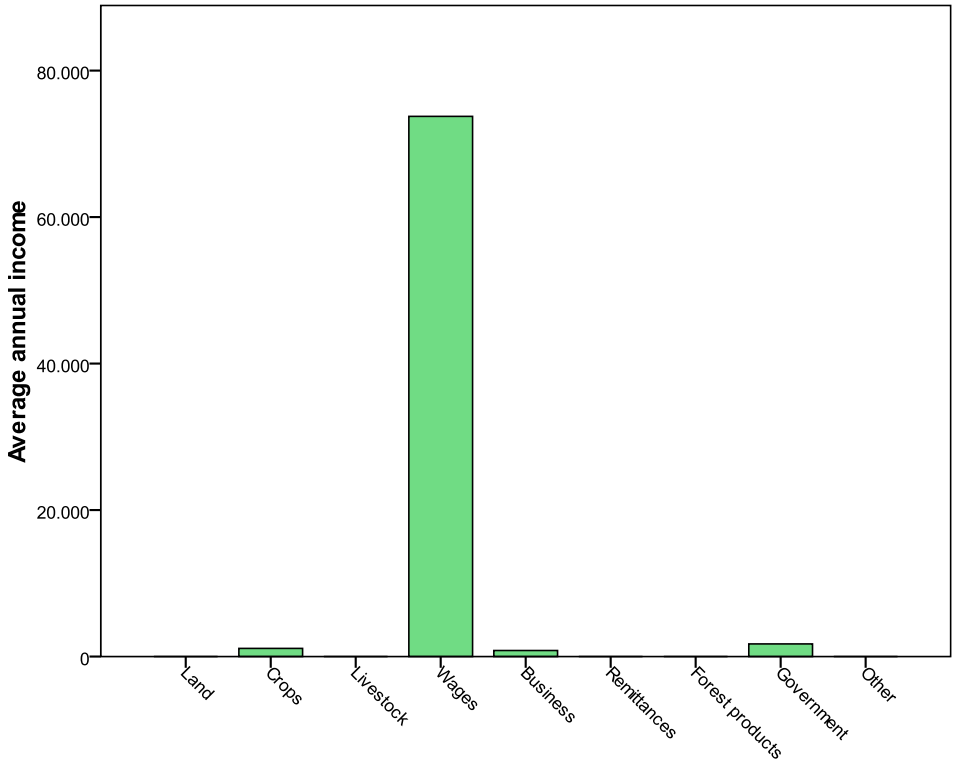
Him Bahadur Rawal	Thakur Jyu Multipurpose Cooperative	Secretary of the Organic Subcommittee	April 17
Raj Bahadur Budthapa	DIDC	IT specialist	April 27
Ganesh Rokaya	Himalaya Multipurpose Cooperative	Chairman	April 28
Khadananda Neupane	Agricultural Production & Management Cooperative	Chairman	April 30

APPENDIX C – Income sources per livelihood pattern

Subsistence farmers
Number of households: 12 (18.2%)
Average annual household income: Rs 7,525



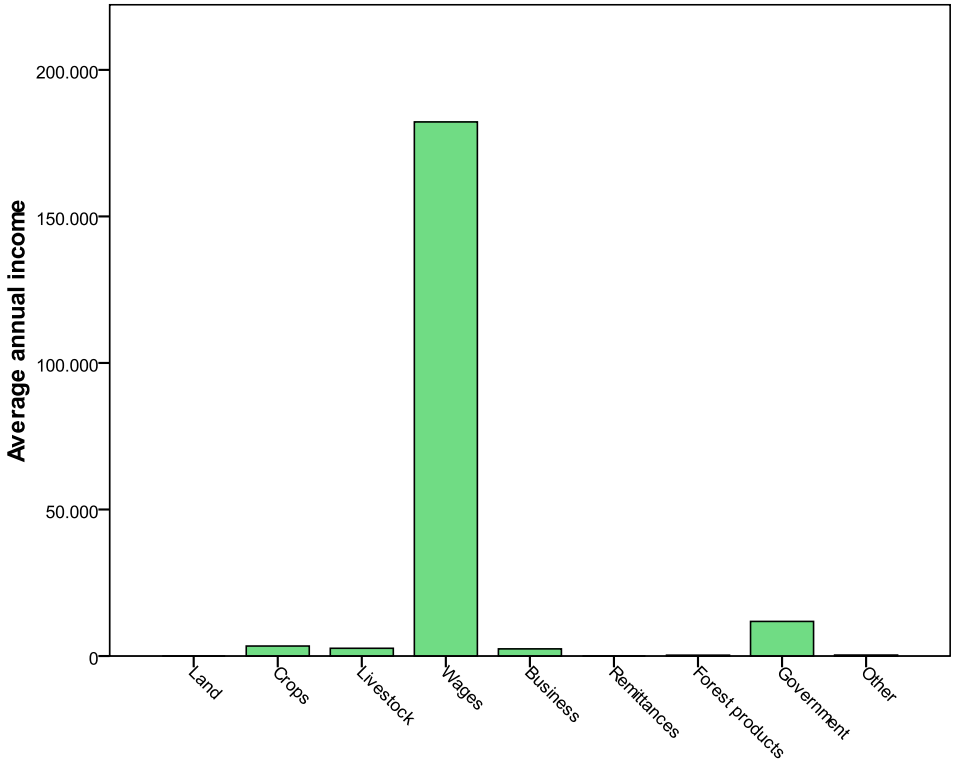
Day labourers
Number of households: 8 (12.1%)
Average annual household income: Rs 77,413



Job holders

Number of households: 17 (25.8%)

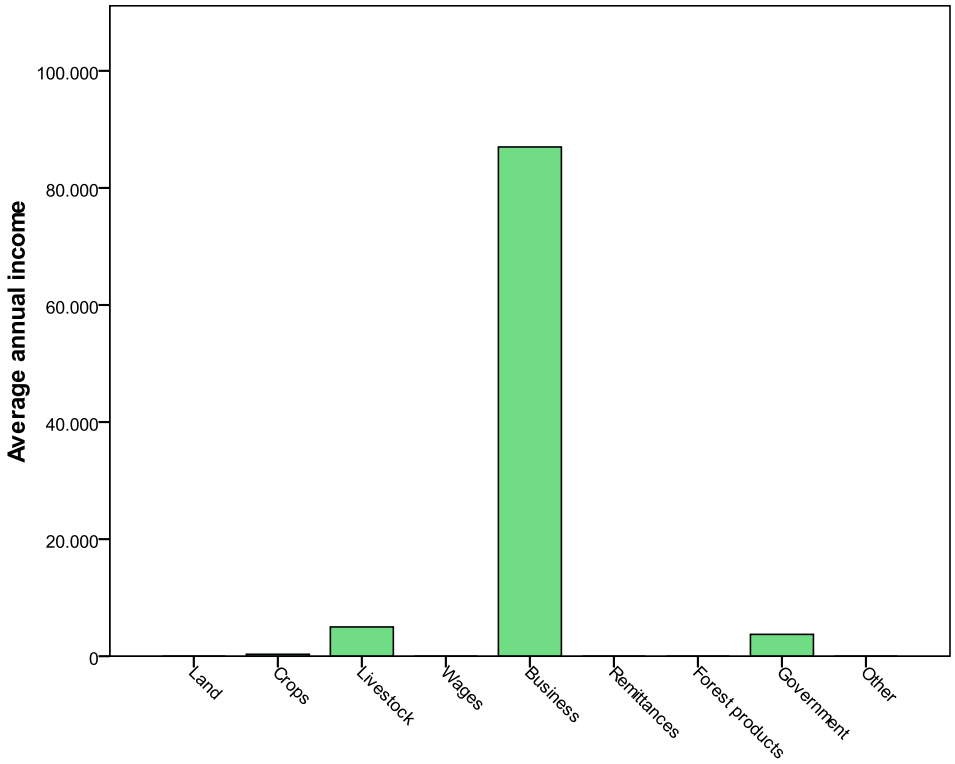
Average annual household income: Rs 203,182



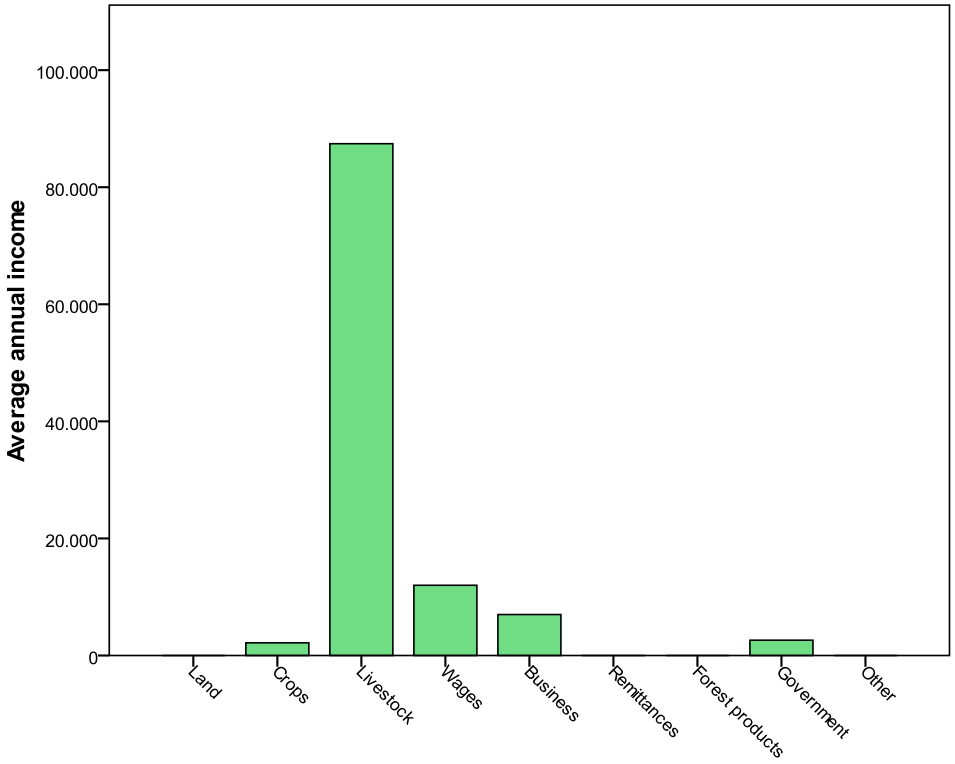
Business owners

Number of households: 6 (9.1%)

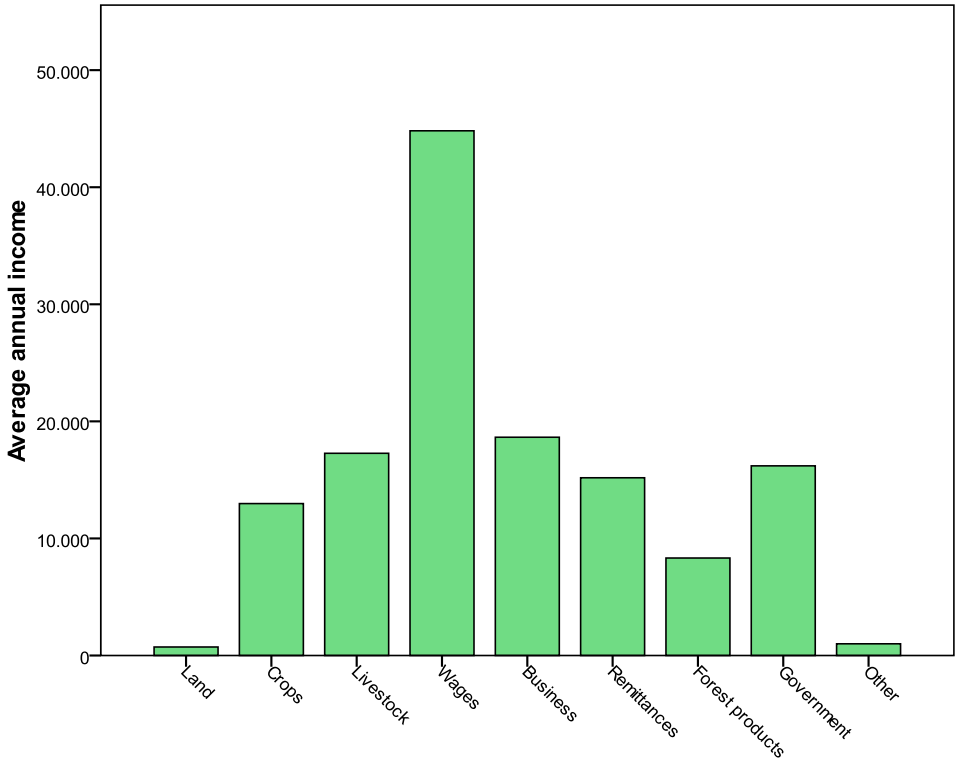
Average annual household income: Rs 96,067



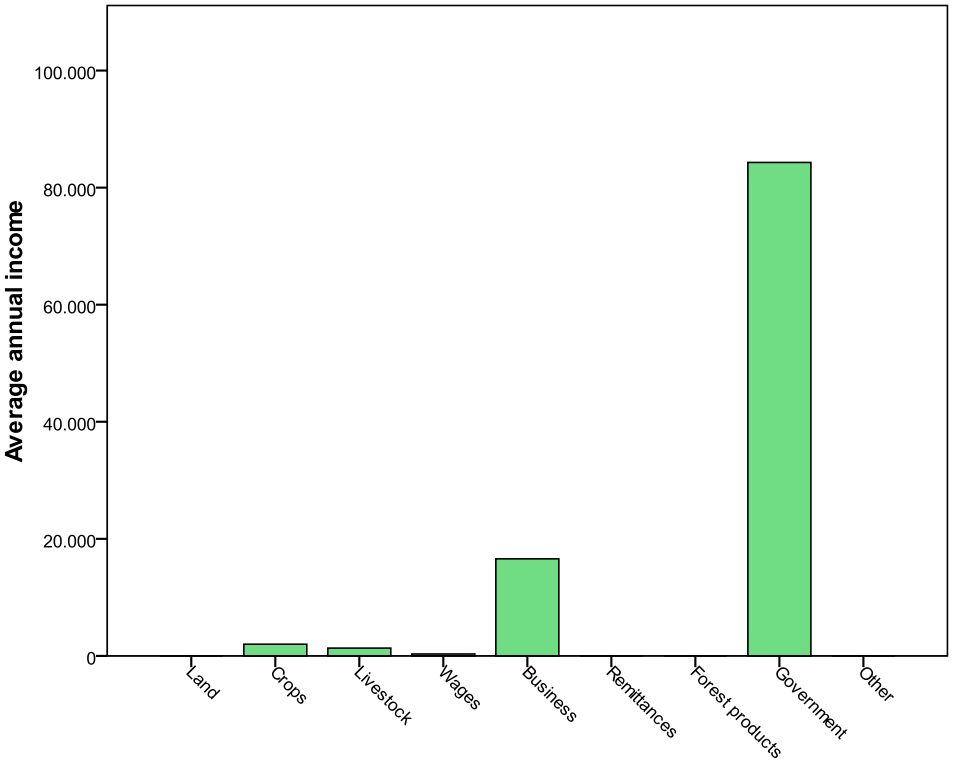
Livestock keepers
Number of households: 6 (9.1%)
Average annual household income: Rs 111,217



Diversified households
Number of households: 11 (16.7%)
Average annual household income: Rs 135,150



Welfare dependent households
Number of households: 6 (9.1%)
Average annual household income: Rs 104,550



N.B. the y-axis of each bar graph has a different scale.

APPENDIX D – Illustrative plates

Plate 1 – Mountainsides in Jumla district

The snow-covered mountain provides passage to the pastures in summer. Slopes facing north are usually covered with extensive forests up to the snowline (section 2.1).

Plate 2 – The Karnali Highway

The ironically named Karnali Highway is the only route by land to Jumla for motorized vehicles. Accidents happen frequently and are often fatal (section 2.1).

Plate 3 – Collecting pine needles

The dry pine needles are collected from the forest floor. At home, they are mixed with manure to create homemade fertiliser (subsection 3.2.1).

Plate 4 – Proper packaging for apples

The boxes in which the apples need to be exported from the district (subsection 3.2.3). In the background, you see women with traditional *dhokos* (wicker baskets) on their back.
Source: 4S, 2010, p.22.

Plate 5 – Street vendor in Kathmandu

Street vendors have the highest turnover of all fruit retailers in Kathmandu (subsection 3.2.5).

Plate 6 – Apple orchard on *pahat* land

An apple orchard in Mahat VDC, where the steep slopes have been prepared in terraces (subsection 4.3.1).

Plate 7 – Oxen used for traction

Cattle like oxen, bulls or water buffalos can be used for ploughing the fields (subsection 4.3.4). Here, a rice paddy is prepared for the planting of rice sprouts in April.

Plate 8 – Traditional house in Jumla

The traditional houses in Jumla are unique in Nepal. The scarcity of level land makes the flat roofs very useful for drying crops or seeds. On the ground floor, people keep their livestock (as well as their apples). Their living quarters are on the first floor (subsection 4.4.3).