

Sustainable use of medicinal and aromatic plants

Linking different spheres of knowledge in Dolakha, Nepal



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"May Goddess Saraswati, who is fair like the jasmine-coloured moon, whose pure white garland is like frosty dew drops; who is adorned in radiant white attire, on whose beautiful arm rests the veena, and whose throne is a white lotus; who is surrounded and respected by the Gods, protect me. May you fully remove my lethargy, sluggishness, and ignorance".

Summary

The sustainable use of natural resources is a very much debated topic in global science. The use of natural resources is the most important human activity in terms of global environmental effects (www.pedz.uni-mannheim.de, 2009). Since 2002 Nepal's forest are governed by so-called: Community Forestry User Groups (CFUGs). Previously, these forests were national forests regulated by the government. The CFUGs were established after the implementation of decentralisation policies of Community Based Natural Resource Management. "According to the database of the Community and Private Forestry Division of the Department of Forests, over 854.000 hectares of forest were handed over to 11.095 Forest User Groups by the end of May 2002. Most activities have been undertaken in the Mid-hills with little attention to areas above 2500m" (NBS, 2002).

The focus for this thesis is on the sustainable use of medicinal and aromatic plants by linking different spheres of knowledge. There are global concerns about the biodiversity of species in the world, which led to forest conservation and the re-introduction of sustainable harvesting practices, which have certain consequences for local situations. I wondered about the local situations after the implementation of forest conservation policy in Nepal.

The following questions were raised throughout the fieldwork and were an incentive to write the thesis and make the documentary. How does forest conservation policy affect the access of local people to resources in Nepal and what is its impact on community development? Along with the deterioration of natural resources, the "cultural heritage of medicinal plant use disappears as well"¹. Is knowledge on sustainable plant use really disappearing and if so, could this be a problem and for whom?

This thesis and the documentary supporting this thesis illustrate how different actors recognize Non-Timber Forest Products (NTFPs). Many organisations are involved in the protection of natural resources. However local people often have different ideas about sustainability and conservation practises. How do local people provide a biography for medicinal plants and deal with innovations from external institutions?

Moreover, there is unequal distribution of resource wealth. Pharmaceutical companies and Western researchers have far more benefits from local knowledge on medicinal plant use than vice versa. There is a huge focus on commoditisation of medicinal and aromatic plants in Nepal. The process of commoditisation of natural resources may generate unequal distribution of wealth and may generate unintended negative effects on local farmers. Hence, the discussion chapter and documentary supporting this thesis will focus on the following question: Could local knowledge and global science profitably inform each other in terms of sustainability? (Sillitoe, 2009).

In addition, with the documentary I try to show that the use of film is an interesting research methodology. I am convinced that images add something to the words of people and can give a powerful overview of local situations. A thesis or report is often just read by other students or researchers looking for literature on a specific topic. This documentary can be understood by a wide audience and is fun to watch. Video as a research tool could assist local people to attain more voice for their every day situations.

¹ Source: ntfp.inbar.int, 15 November 2008.

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List of abbreviations

CAM	Complementary and Alternative Medicine
CBNRM	Community Based Natural Resource Management
CBS	Central Bureau of Statistics
CF	Community Forest
CFUG	Community Forestry User Groups
DFO	District Forest Office
FUG	Forest User Groups
GDP	Gross Domestic Product
IK	Indigenous Knowledge
IPR	Intellectual Property Rights
LK	Local Knowledge
MFSC	Ministry of Forest and Soil Conservation
NBS	National Biodiversity Strategy
NGO	Non Governmental Organisation
NSCFP	Nepal Swiss Community Forestry Project
MAPs	Medicinal and Aromatic Plants
NBU	National Biodiversity Unit
NTFP	Non Timber Forest Products
PRA	Participatory Rural Appraisal
RF	Religious Forests
SK	Scientific Knowledge

Chapter 1 General introduction

My curiosity was called upon the recent offer of many herbal products in various pharmacies and supermarkets in The Netherlands. Where do all these products come from and what is the impact in the countries of origin of this (sudden) increase in demand for herbal products in the West? I asked some shopkeepers about their products and learned that many products contained plant ingredients and that these plants come from many different countries including India and Nepal. I wanted to see for myself what were the local effects from the (over) harvest of these herbal products. I thought it could be interesting to collect different points of view on camera. I believed that local images could add something to my thesis. Images of the people saying the actual words could have more impact than solely writing the words down on paper. My initial questions were: “What is the environmental impact of this (sudden demand) growth in export of medicinal plants?” And “do the farmers who harvest these plants benefit financially?” I was also curious to know whether farmers and other locals use medicinal and aromatic plants and whether they have enough access to use the plants for themselves.

Dr. Alberto Arce pointed my attention to a proposal of Maria Torri about her idea to examine the socio-economic impact of bio-prospecting activities at the local level. “Research undertaken so far has not addressed how benefit sharing agreements affect access to resources inside the community and on community development in general” (Torri, 2008). I became fascinated with her idea about how these benefit-sharing agreements affect access to resources inside the community and what is the impact on community development. Due to a time constraint it was not possible to solely focus on these benefit-sharing agreements for my research. Nevertheless, I decided to focus on local situations after the implementation of forest conservation policy & sustainable harvesting practices of medicinal and aromatic plants in Dolakha, Nepal. I wanted to find out what were the situations and opinions of locals on the sustainable use of medicinal plants; these also incorporated their relationships with traders and institutions that implement such ‘beneficial for all’ policies. In addition I wanted to look into whether or not local knowledge on the use of medicinal and aromatic plants was disappearing and if this could become a problem.

The focus for this thesis is on the sustainable use of medicinal and aromatic plants by linking different spheres of knowledge. There are global concerns about the biodiversity of species in the world, which led to forest conservation and the (re)introduction of sustainable harvesting practices, which have certain consequences for local situations. I wondered about the local situations after the implementation of forest conservation policy in Nepal. How does forest conservation policy affect the access of local people to resources in Nepal and what is its impact on community development? Along with the deterioration of natural resources, the “cultural heritage of medicinal plant use disappears as well”². Is knowledge on sustainable plant use really disappearing and if so, could this be a problem and for whom?

Moreover, there is unequal distribution of resource wealth. Pharmaceutical companies and Western researchers have far more benefits from local knowledge on medicinal plant use than vice versa. There is a huge focus on commoditisation of medicinal and aromatic plants in Nepal. The process of commoditisation of natural resources may generate unequal distribution of wealth and may generate unintended negative effects on local farmers. Hence, the discussion chapter and documentary supporting this thesis will focus on the following question: Could local knowledge and global science profitably inform each other in terms of sustainability? (Sillitoe, 2009).

² Source: ntfp.inbar.int, 15 November 2008.

1.1 Nepal

Nepal is a land locked country in between China and India. Nepal can be divided into five climatic zones: Tropical (plains, Terai region), Subtropical, Temperate (Mid-hills), Sub-alpine and Alpine (mountainous region). The distinction between the Tropical, Temperate and Alpine zone is shown in Figure 1 below. Today, almost 90% of Nepalese rely on subsistence agriculture, with plants performing a vital role as arable crops, fodder, fruit and vegetables, fuel, building materials and medicines (rbg-web2.rbge.org.uk/nepal, November 15, 2008). “Three years after Nepal's decade-long civil war came to an end, the World Food Programme (WFP) states that many people are still living in near-crisis conditions, with 41 percent of the population undernourished. Almost one in four Nepalese people live on less than a dollar a day, and around 2.7 million depend on WFP food aid” (www.wfp.org/feed visited on June 19, 2009). In the mountainous regions, eco-tourism, and gathering of medicinal and aromatic plants are being promoted as extra income generation activities (www.new-ag.info visited on June 19, 2009).

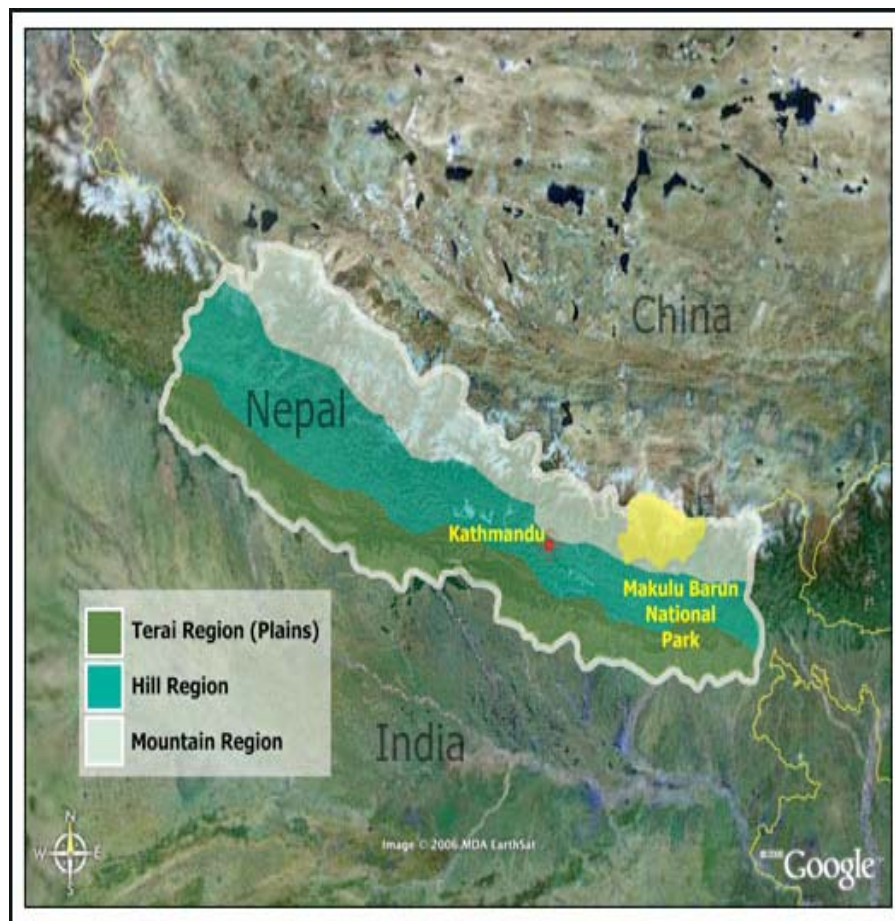


Figure 1.1 Nepal

1.2 Nepal and Community Forestry User Groups

Since 2002 Nepal's forest are governed by so-called: Community Forestry User Groups (CFUGs). Previously, these forests were national forests regulated by the government. The CFUGs were established after the implementation of decentralisation policies of Community Based Natural Resource Management (CBNRM). "According to the database of the Community and Private Forestry Division of the Department of Forests, over 854,000 hectares of forest were handed over to 11,095 Forest User Groups by the end of May 2002. Most activities have been undertaken in the Mid-hills with little attention to areas above 2500m" (NBS, 2002).

According to the Nepal Biodiversity Strategy, compared to uncontrolled use, Community Forestry lead to lower levels of grazing within the forest, fewer incidences of fire, increased numbers of threatened plant species and the control of illegal hunting which increased the number of wild animals. However "training programmes available under community forestry initiatives do not cover the importance and potential of biodiversity conservation in community forests" (NBS, 2002). Major constraints are scattered areas of forests, population pressure and priority in meeting peoples' needs. People needs include the collection of fodder for cattle, wood to build houses, firewood and medicinal plants from forest areas. Throughout the fieldwork it became apparent that some of the local people (mainly the landless people) repeatedly told me that many of their goats died because they could not feed them anymore after the forest was closed for animals to graze.

With 'sustainable use' I mean "the use of components of biological diversity in a way and at a rate that does not lead to the long term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations" (NBS, 2002).

Sustainable production of forest products is the main objective of Community Forestry User Groups, which may have negative implications for biodiversity conservation (NBS, 2002). For instance Forest User Groups have included phrases such as "removal of unwanted species" in their forests operational plans, yet these species may be ecologically important and biodiversity may suffer as a result of their removal" (NBS, 2002). During the fieldwork some local men informed me that when institutions assisted them with the replanting of the forest, many trees were of the same kind: the "*salla*" tree. These men told me that *salla* trees do not allow any other tree species to grow near it. Two men suggested that they would like to remove these "*salla*" trees and replant other tree species that are more useful for a variety of purposes to the local people living in that area.

According to the NBS (2002) Forest User Groups have the right to determine management options for a variety of plants and forest products. However, there is a lack of socio-economic and biophysical information, which hinders the development of plants that integrate biodiversity conservations issues. Knowledge transformation is not for free. Not all people know about the various medicinal and aromatic plant uses of local vegetation. Nevertheless, there is a huge focus on commoditisation of medicinal and aromatic plants in Dolakha. But only a few benefit from these practices. Some include local people, for instance, in the process of making *Dhasingare* (Wintergreen) oil. But predominantly the process of commoditisation of natural resources is generating more unequal distribution of wealth and may generate unintended negative effects on local farmers (Auty, 1993; Turner, 2004). Throughout the fieldwork farmers told me they feel sad that 'others' come to take away 'their' medicinal and aromatic plants and that they would like to learn about medicinal plant uses so they could use it for themselves. The concept of a "Community" in terms of Community Forestry User Groups is further explained in paragraph 1.3.

1.3 Community, social difference and dynamics

Assumptions that communities are homogeneous groups with little difference of interests and norms have been criticized by many authors in social science literature (Carney and Watts, 1991; Moore, 1993; Leach, 1994; Kabeer and Subrahmanian, 1996; Li, 1996; Mosse 1994, 1997). This conventional view defines community as a small spatial unit, and a homogenous social structure, with shared norms (Agrawal & Gibson 1999, p.630). “These notions refer to some level of static commonality among the individual members, such assumptions are attractive in natural resource management because they permit easy contestation of dominant narratives that favour state control or privatisation of resources and their management (Li, 1996) cited in Gurung, 2006). This conventional view of community is problematic, because communities consist out of people who have different views and interests who are often conflicting.

Communities are not always small, homogenous and comprised of shared norms and do not always share customs or ethnicity. Instead, its members have different interests, problems and needs, which vary according to wealth, occupation, culture, religion, gender, class, caste, age (Agrawal & Gibson 1999). A lot of differentiation might even exist for one individual, since individuals belong to different communities and have different social roles. For example a woman can be the daughter of a farmer, a mother, a primary school teacher, the wife of a village chief, a medicinal plant collector and a member of a women’s rights NGO. People actively monitor, interpret and form their own sense of reality (Long and van der Ploeg, 1989; Long and Long, 1992). “Reality is socially constructed and the sociology of knowledge must analyze the process in which this occurs” (Berger and Luckmann, 1966 p.13).

“Linking agency and structure emphasizes how structures, rules and norms emerge as products of people’s practices and actions, both intended and unintended” (Leach, Mearns and Scoones, 1999 p.230). A change of rules may change local action into illegal actions, which have major impacts for people wanting to make use of resources in such suddenly labelled “illegal ways” (Benda-Beckmann, 2003; 2006). For instance when the Community Forestry Group majority decided to forbid animals to graze inside the Community Forests it became illegal for farmers to let their animals graze inside the community forests. Some farmers (the landless) could not collect enough fodder for their cattle. When some goats died of hunger, tension arose and some farmers wanted to beat up the Community Forestry Group chief. Some farmers decided to let their cattle graze illegally. Negotiation is crucial and in this case largely depended on the skills of the Community Forestry Group chief, which resulted in the availability of community land for fodder. Some actions may reproduce rules and institutions, while other actions have agency and may serve to change the system (Giddens, 1984). For example by going to court to get user rights confirmed by a judge, demanding re-negotiation by means of a demonstration or by threatening to beat up a Community Forestry chief, a roadblock, or by demolishing a resource distribution system (Pradhan, 2000; Norgrove and Hulme, 2006).

“Simplified conceptions of community such as: “Local empowerment can often serve to reinforce existing social structure and entrench inequity (Mowbray 1985)” offer a weak foundation on which to base policy or operational programs (Agrawal & Gibson 1999)”. Conventional notions often overlook how differences can have an effect on project management outcomes and local politics.

“A more dynamic approach to the understanding of social change is therefore needed which stresses the interplay and mutual determination of ‘internal’ and ‘external’ factors and relationships, and which recognises the central role played by human action and consciousness. The different patterns of social organisation that emerge result from the interactions, negotiations and social struggles that take place between several kinds of actor, not only those present in

given face-to-face encounters but also those who are absent yet nevertheless influence the situation, affecting actions and outcomes” (Long, 2001).

One of the theories that are particularly useful for analysing Community Forestry processes is an actor-oriented approach and the notion of social networks (Long, 2001), which will be further explained in Chapter 2. Let us return to the concept of community. “Despite many ways of defining the term, the role of community in bringing about positive social change has been increasingly highlighted for decentralization, meaningful participation, cultural autonomy and conservation (Chambers & McBeth 1992 cited in Gurung, 2006). Nevertheless, “serious attention to social difference and its implications has been remarkably absent from the recent wave of ‘community’ concern in environmental policy debates” (Leach, Mearns and Scoones, 1999 p.230). Therefore, to incorporate such a view of a dynamic community formed by differentiated social actors seems useful in order to analyze local situations before, during and after the implementation of community-based natural resource management policies. I believe that this view captures the complex system of community forestry in which a wide range of communities are involved in forest management.

1.4 Knowledge, power configurations and the notion of social interface

The following definitions in this paragraph are all derived from Long’s book (2001) on actor perspectives. These concepts seemed useful in the actor analysis of sustainable use of medicinal and aromatic plants; linking different spheres of knowledge in Dolakha, Nepal as will be further explained in the theoretical framework in Chapter 2. The processing of knowledge refers to:

“constituting the ways in which actors come to grips with the world around them cognitively, emotionally and organisationally. They do this on the basis of their own and others’ experiences and understandings, thus generating new bases for understanding (i.e. knowledge construction). Although the basis for their ‘truth claims’ and ‘authority’ will vary, this applies to ‘scientific’ as well as to ‘non scientific’, ‘everyday’ forms of knowledge. Knowledge construction is, at one and the same time, ‘constructive’ in the sense that it is the outcome of many decisions and selective incorporations of previous ideas, beliefs and values, and ‘destructive’ in the sense of transforming, dissembling or ignoring other existing frames of conceptualisation and understanding, and ‘localised’ in specific institutional domains and arenas whether of global or local scope” (Long, 2001).

“A social interface is a critical point of intersection between life-worlds, social fields or levels of social organisation where social discontinuities, based upon discrepancies in values interests, knowledge and power, are most likely to be located” (Long, 2001).

“Power configurations are depicted in terms of the idea of interlocking actors’ projects made up of heterogeneous sets of social relations imbued with values, meanings and notions of authority and control, domination and subordination, and sustained by specific patterns of resource distribution and competition (i.e., power construction). Power cannot simply be possessed or accumulated. No can it be precisely measured in terms of quantity or quality. It emerges out of social processes and is better considered a ‘product’ rather than ‘a given’. Having power does not entail that others are without it: there is no zero-sum game. However, power may become reified in social life, that is, people often think of it as a unitary coercive force wielded by ‘the ruling class’, ‘agents of the state’ or ‘the establishment’ (Long, 2001).

1.5 Community Forestry

Community Forestry is a rather new approach. Decentralisation policies led to the handover of national forests in 2002 by the Nepali government through the District Forest Offices to the local people, which were labelled as “Community Forestry User Groups. In 2002 over 30 Community Forestry Groups were established in Dolakha. "Successful community forestry requires... genuine

popular participation in decision-making... Experience has proven time and again that participation is more than a development cliché; it is an absolute necessity if goals are to be met. But working with people rather than policing them is a new role for many foresters” (Eckholm et al, 1984 www.rainforestinfo.org.au visited on August 8, 2009). For an elaboration on the history of forest governance see Appendix III: Forest management in the mid-hills and the Terai during the Ranas regime.

Major energy sources, animal fodder, timber and medicine are all found in the forest. “Forest catchments are the main sources of water used for hydroelectric power, irrigation and household consumption. Pristine forests are also a major attraction for tourists” (NBS, 2002 p.11). However, a forest is more than trees and natural ecosystems; it is a complex organisation of interdependent natural, social and spiritual elements. A community forest for this thesis is the “interdependent organisation of natural, social and spiritual organisation managed by local people ‘legally’ sharing the control over resources and who have mutual use-rights (but not always access) to use specified forest products. The term ‘legitimate’ includes customary rights of access, use or control over resources. For example, command over natural resources derived by rights over plants and trees gives the ability to cook, feed cattle and use or sell medicine, see Chapter 1.5. However, in order to appreciate the broader institutional and use of natural resource issues apparent to the community forests I would like to make use of the concept “dynamic ecologies” used by Leach, Mearns and Scoones (1999).

1.6 Dynamic ecologies

A parallel discussion to the one about communities goes for dynamic ecologies. Leach, Mearns and Scoones explain that since the 1970ties critiques on succession theory, equilibrium and conservation thinking resulted in “the new ecology”. What is new in this “new ecology” thinking is: 1) An understanding of variability in space and time, 2) non-equilibrium perspectives that suggest a need to explore the implications of scaling on dynamic processes, and 3) a recognition of the importance of history on current dynamics (Leach, Mearns and Scoones, 1999). An understanding of variability in space and time “has led to work on time-series population analysis, stochastic and dynamic modelling and an interest in the relationships between disturbance regimes and spatial patterning from patches to landscapes” (Leach, Mearns and Scoones, 1999). Point 2 “has led to work on hierarchies and scale relationships in ecosystem analysis” (Leach, Mearns and Scoones, 1999 p. 231). The last point has led to work on environmental change at a variety of time scales, it “parallels the historical emphasis of much recent social theory, and invites analytical attention to the historical relationships between environmental and social change” (Leach, Mearns and Scoones, 1999 p. 231).

What these three new ecology points mean in practise is clearly illustrated by the case study of Fairhead and Leach (1998) of deforestation in Ghana and Feely (1987) in South-Africa. “Changes in soils, shifts in fallowing systems, manipulation of fire regimes, alterations in grazing patterns and climatic re-humidification have combined to change the relationship between forests and grasslands” (Leach, Mearns and Scoones, 1999 p. 231). Many people were convinced that the forest was disappearing; and many organisations were operating in the field to ‘save the forest’. However, Fairhead and Leach found amongst other by means of interviewing elderly local people that the local people planted the trees there in the first place; and that the forests were increasing as a result of a combination of disturbance events instead of decreasing. These interviews were supported by satellite images over the past few years.

“This dynamic interaction is thus less the outcome of a predictable pattern of linear succession, but more the result of combinations of contingent factors, conditioned by human intervention, sometimes the active outcome of management, and often the result of unintended consequences. With a view of ecology that stresses spatial and temporal variability, dynamic, non-equilibrium processes and histories of disturbance events, a different view of the landscape emerges: A landscape that is transforming, not simply degrading, and one which is emerging as a product of both social and ecological history, not simply the result of deterministic patterns of environmental change” (Leach, Mearns and Scoones, 1999 p. 232).

These “new” ecological themes have increased the interest in understanding dynamics and their implications for sustainable forest management and conservation practice.

1.7 Environmental endowments and entitlements

Environmental entitlements analysis is developed by Sen (1981) “to explain how it is that people can starve in the midst of food plenty as a result of a collapse in their means of command over food” (Leach, Mearns and Scoones, 1999 p.232). Endowments refer to “the rights and resources that social actors have” (Leach, Mearns and Scoones, 1999). For this thesis I use the definition of environmental entitlements given by Leach, Mearns and Scoones (1999): “Alternative sets of utilities derived from environmental goods and services over which social actors have legitimate effective command and which are instrumental in achieving well-being”. Please note that the term ‘legitimate’ includes customary rights of access, use or control over resources. For example, command over natural resources derived by rights over plants and trees gives the ability to cook, feed cattle and use or sell medicine. An extended entitlements approach sees entitlements as “the outcome of negotiations among social actors, involving power relationships and debates over meaning (Gore, 1993, p.452), rather than as simply the result of fixed moral rules encoded in law (Leach, Mearns and Scoones, 1999).

1.8 Non Timber Forest Products and Medicinal and Aromatic Plants

“The Nepal Environmental Policy and Action Plan advocate that forestry research should address the utilisation of lesser known forest species, which could include Non Timber Forest Products (NTFPs)” (NBS, 2002). Products that come from the forest can be divided into timber products and Non Timber Forest Products. With NTFPs I mean all biological materials derived from forest species other than timber or fodder, such as *Lokta* to make paper, Bamboo to make baskets or medicinal plants. “The National Conservation Strategy (HMGN/IUCN, 1998) highlighted the necessity of establishing appropriate policies, regulations and management approaches to ensure sustainable extraction of medicinal plants” (NBS, 2002).

MAPs are not only harvested from forests but also from pasturelands, grasslands and fallow ground. “For the marginalized farmer, the diversity of the non-farm environment has tremendous utility consisting of not only timber for building and bedding, and fodder for livestock, but also valuable, nutritional, medicinal, economic (subsistence and cash), religious and cultural recourses (Daniggelis, 1994). Exploitation of wild plants is therefore very high in areas of poor economic conditions to buffer periods of food scarcity” (NBS, 2002).

Many people in Nepal today still rely on plant resources for their medical needs. The Department of Forests tries to control illegal trade and allows sustainable harvesting of some species with special permits (NBS, 2002). But in practice illegal trade is very difficult to control. Many plants grow in very remote areas, where there are no roads. Sometimes you need to walk for more than a week to

arrive in a certain area and this makes monitoring of rules and regulations quite difficult. Various organisations promote capacity building through village institutions, trying to increase communities' abilities to negotiate and establish more equitable relationships with traders and the pharmaceutical sector (Torri, M. 2008). In Dolakha this is done through the establishment of Village District Committees and Forest User Groups, by which the villagers officially became the owners of the forest. However, in practise most local people are not able to control the illegal collection of medicinal plants as is confirmed by the following statement of a farmer in *Orang*, (see the documentary supporting this thesis). "We do not have the time to stop the stealing of our medicinal plants, cause we have to work in our field".

NBS states that in Nepal there is still a great lack of information, which hinders the development plans that integrate biodiversity conservation issues. "Recently there has been increasing awareness of the importance of NTFPs as a result of factors such as the dependence of rural communities on NTFPs, site quality, new market preferences for natural products, increasing concern about the conservation of forests and their biodiversity; and the occurrence of many non-wood products amongst the biological richness and ecological complexity of natural forests (FAO 1994; Grimes et al., 1994)" cited in NBS, 2002. "The value of these products can be far greater than that of timber harvests or the land converted to pasture or agriculture (Roque, 1992). In Southeast Asia, at least 29 million people depend on NTFPs for subsistence income" (NBS, 2002 p.13). "Sustainable management of NTFPs is important because of their value as a perennial source of subsistence income and as means of conserving biodiversity. Little attention, however, has been given to the biological, socio-economic and conservation importance of NTFP resources. A clear understanding of this resource is still lacking in Nepal" (NBS, 2002).

The World Health Organization (WHO) Traditional strategy paper 2002-2005 explains that traditional, complementary and alternative medicine attracts the full spectrum of reactions, ranging from uncritical enthusiasm to uninformed scepticism. Due to the affordability, availability and accessibility of medicinal plants for local people living in remote areas it has played an important role in meeting the demands of primary health care in many development countries. "70 to 80% of the population in India and Ethiopia still depend on traditional medicine and practitioners for primary health care" (www.who.int, 12 September, 2008). In many parts of the world, policy makers, health professionals and the public are wrestling with the question about safety, effectiveness, quality, availability, preservation and further development of this type of health care.

Scepticism does not only come from outside development countries. During the fieldwork in Nepal many local people told me they do not make use of locally available medicinal plants and prefer using allopath medicine. Meanwhile, in many developed countries, complementary and traditional medicine is becoming more and more popular. The use of medicinal plants has been expanded widely in many developed countries where it functions under the title of complementary and alternative medicine (CAM). For instance "70% of the populations in Canada and 80% in Germany have used traditional medicine as complementary and alternative medical treatment" (www.who.int, 12 September 2008). There is a growing demand for alternative medication in The Netherlands as well (CBS, 2008). In 2007, 7% of the Dutch visited a traditional medicine practitioner comparing to 1981, when only 4% of the Dutch visited a traditional medicine practitioner (see Appendix I).

"The term traditional medicine refers to a way of protecting and restoring health that existed before the arrival of modern allopathic medicine. As the term implies, these approaches to health belong to the traditions of each country, and have been handed down from generation to generation. Ayurveda, Amchi, Homeopathy associating with Unani and Naturopathy are the known important traditional health systems existing in Nepal. Traditional medicine include diverse health practices,

approaches, knowledge and believes incorporating plant, animal and/ or mineral based medicine, spiritual therapies, manual techniques and exercises, applied singularly or in combination to maintain well-being as well as to treat, diagnose or prevent illness (www.who.int, 12 September 2008). On purpose I do not use the term traditional medicine for this thesis because some of the plants that I have selected are used in allopath medication. Therefore my preference goes out to use the term: medicinal and aromatic plants (MAPs). With medicinal and aromatic plants I mean the plants and part of plants which can be used directly or indirectly after preparation, as a medicine to treat certain illnesses”.

1.9 Problem statement

The impact of commoditisation of medicinal and aromatic plants in Asia has lead in some areas to the expansion of unregulated trade and commercial use of medicinal plants, which poses a major threat to biodiversity (Source: ntfp.inbar.int, November 15, 2008). Local communities are asked by traders to collect medicinal and aromatic plants. People tend to collect the highest value or most popular plant species, leading to over-harvesting or species extinction. “Medicinal and aromatic plants are highly exploited in the mountains, and traders take advantage of the poverty of the local people” (NBS, 2002). There is a high demand for natural products as well as in developed countries as in developing countries. Pharmaceutical companies have made well use of this demand and earn quite a lot of money in comparisment with the local medicinal and aromatic plant collectors. This resulted in problem statement 1: The loss of medicinal & aromatic plant species and unequal distribution of resource wealth.

The levels of deforestation and ecosystem degradation in Asia are also contributing to a decline in medicinal plants (ntfp.inbar.int, November 15, 2008). These factors have severely reduced the availability of medicinal plant ingredients and the overall environmental sustainability in Asia. In Kathmandu I met with a doctor and a Botanist who are documenting on medicinal plants and publishing their findings on the Internet. Many medicinal plants are yet unknown and could have beneficial qualities to treat illnesses. Dr. Gurung expects that only about 50 to 60% of the medicinal plants in Nepal have been documented so far (see documentary supporting this thesis).

“Along with the deterioration of natural resources, the cultural heritage of medicinal plant use disappears as well. Much of the indigenous knowledge concerning Nepali’s plants is now dwindling and largely retained by village elders” (rbg-web2.rbge.org.uk/nepal, 15 November, 2008). During the interviews it became clear that elderly people in the selected villages knew more about medicinal plant uses than younger people. Many people are concerned that the knowledge on medicinal and aromatic plants will be lost to future generations. Ethno-botanists in Nepal are documenting the indigenous knowledge on medicinal and aromatic plants for future generations.

Besides the loss of indigenous knowledge, quite often indigenous knowledge is being ignored, or wrongly understood because scientists feel that their knowledge is superior to local knowledge (Bodeker, 2007; Sillitoe, 2009). Biodiversity conservation policies should be formulated in ways that relate to local concerns (Sillitoe, 2009). This resulted in problem statement 2: The loss and ignorance of indigenous knowledge on medicinal and aromatic plants.

1.10 Research Objectives

- To address local situations after the implementation of forest conservation policy & sustainable harvesting practices of medicinal and aromatic plants in Dolakha, Nepal.
- To find out if knowledge on medicinal and aromatic plants is decreasing and whether this could be a problem.
- To show that film is an interesting research methodology.
- To contribute to the awareness and coordination between the different actors active in the field of sustainable use of medicinal and aromatic plants through relating different spheres of knowledge.

1.11 Research Questions

Main research questions:

- “What are the local situations after the implementation of forest conservation policy of medicinal and aromatic plants in Dolakha, Nepal?”
- “How does forest conservation policy (NBS) affect the access to resources in Dolakha and what is its impact on community development?”
- “Is the knowledge on medicinal plant use decreasing? And if so, is the loss or ignorance of MAPs a problem and for whom?”
- “Could global and local science profitably inform each other in terms of sustainability?”

Sub questions:

- “What are the ideas, opinions, believes of FUG members on the sustainable use of medicinal plants?”
- “Do elderly people know more about medicinal plant use than the younger generations?”
- “What medicinal plants do people still use and what are its cures?”
- “Which plants did people used before and why did they stop or continue using these plants?”
- “To what extend are Forest User Groups in Dolakha able to enhance capabilities for managing local resources and dealing with outsiders?”
- “What is the impact on marginalized groups in relation to access to resources, social status, and levels of income and production?”

1.12 Research Methodology

This chapter describes the methods and tools used to carry out the research, the methods of data collection and data analysis. The region of Dolakha was selected, because of the working experience of the Nepal Swiss Community Forestry Project in that area. The region is divided in 3 different village areas: easy accessible, medium accessible and difficult to access. I took a random sample and selected 3 easy accessible Forest user Groups and 3 difficult FUGs to access.

The research was carried out in Dolakha district of Nepal and was done in a qualitative manner. The initial intention was to do a (quantitative) survey with structured interviews and to collect additional (qualitative) data by means of in-dept interviews, participatory observation and film material. However, the data on population was a bit dubious. It turned out that there were far more members of FUGs than the total population of Dolakha. This could be because some villagers were members of more than one Community Forest. Data was not recorded on who was a member of which community forest. Only lists of total numbers of members were available, this made it quite hard to do a good random sample. Nevertheless, the District Forest Office in Charikot provided a list of one remote village of which they were sure all villagers were members of the same and no other Community Forest. And also the employers of the Nepal Swiss Community Forestry Project did all they could to provide me with proper data. The results of the survey are shown in Chapter four.

Selected medicinal and aromatic plants³

Medicinal plants are not harvested only from forests, but also from pasturelands, grasslands and fallow ground. That is why I selected 5 different medicinal and/ or aromatic plants for the focus of the survey by which I could get a broad idea about medicinal plants in the mid-hills and mountain region of Dolakha.

First I selected the medicinal & aromatic plants on their location. I wanted to see people harvest the plants and in the higher areas everything was covered with snow, due to winter season. That is why I decided to go a bit lower than I planned originally; and conducted my fieldwork in the mid-hills and mountain area (between 2000-6000 meter high). After my literature research I selected *Sil Timur* (Nepal Pricky Ash) and *Chiraito* (Chiretta) as the first two plants for my survey. Both *Sil Timur* and *Chiraito* grow 'wildly' along the road and are commercially harvested from farmland. *Chiraito* is used against high fever and *Sil Timur* against stomach pain.

The Nepal Swiss Community Forestry Project asked me to document on *Dhasingare* (Wintergreen), because they were very interested whether this plant offers good economic possibilities for their project communities. In addition, *Dhasingare* offers a good example of recent change within the selected villages (e.g. recent opening of a local oil factory, local commercial harvesting practices) *Dhasingare* is collected since 3 years commercially as an aromatic plant. Before that *Dhasingare* was mainly used as food & fodder for animals.

After consultation with Dr. Gurung from Himalayan Bio Trade Pvt. Ltd. (HBTL) I became to know about more interesting medicinal plants such as *Loth salla* (Himalayan Yew) and *Satawari* (Wild Asparagus). *Loth Salla* grows in the forest and sometimes on private land of people not used as a medicine but is in comparison to other medicinal plants very expensive. Both *Loth salla* and *Satawari* are not allowed to be collected and it is forbidden to export the plants abroad. *Loth Salla*

³ Note: I on purpose do not use the term traditional medicine cause some of the plants that I have selected are used in allopath medication.

contains Paclitaxel, which is used for an ingredient in chemotherapy in the treatment for cancer. However local people in the selected villages use it against spinal pain, paralysis, fever, cough and muscle pain. *Satawari* was previously used as a stimulant to produce milk for women & cattle. But during the fieldwork it became clear that most of the local people in the selected villages do not use *Satawari* anymore.

I believe by picking these 5 different medicinal and aromatic plants it is possible to get a good idea about the uses of plants in the selected villages. Nevertheless, in order to get a broad idea about the use and knowledge of medicinal plants in the selected villages I left enough space for additional medicinal plants that people are using. And some villagers provided me with quite a long list.

The use of film

The documentary is made to support this thesis on the sustainable use of medicinal, aromatic plants and linked spheres of knowledge. The documentary gives an overview of local situations in the field of forest management and the use of medicinal plants. I intend to initiate discussion on the knowledge and development initiatives that are established to enhance the livelihoods of local people. The following questions were raised throughout the fieldwork and were an incentive to make this documentary. How do local people provide a biography for medicinal plants and deal with innovations from external institutions? And can local and global science profitably inform each other on sustainability and development issues? (Sillitoe, 2009).

I felt very intrigued by the lecture from Dr. Alberto Arce where he showed us some films from the Anaconda Film Festival (2004) that were made about and by local people themselves. In a previous lecture by Professor Leontine Visser I had seen a film from Fairhead & Leach (Second Nature, 1996) about forest degradation in West-African landscape and read articles from the same authors about how there remain contradicting perspectives between conservationists and the local population. Later on in a lecture by Dr. Dick Roth and Dr. Gemma van der Haar I saw another interesting film used in Anthropology and Disaster studies. Yet again during my internship at UNISDR I came to know about several films related to Disaster Risk Reduction, titled: "Local voices, Global choices". By reading the literature and watching these films I became conscious about that film could be an interesting tool to collect local perspectives. The images collected with the statements of local people can give a powerful overview of local situations. In addition video as a research tool could assist local people to attain more voice for their every day situations and struggles. These courses and experiences inspired me to try and make a film myself about the sustainable use of medicinal and aromatic plants and linked spheres of knowledge.

Nowadays the use of film material is not only used for fund raising but also in education, awareness sessions and in research analysis. "Research undertaken so far has not addressed how benefit sharing agreements affect access to resources inside the community and on community development in general" (Torri, 2008). To record the interviews with actors sharing their different points of view I aim to provide insight into how actors use a biography of medicinal and aromatic plants and how local people deal with innovations from external institutions. By conducting in-depth interviews with different key actors working in the field of Non Timber Forest Products and MAPs I aim at getting a clearer understanding what medicinal plants mean to different people.

Perhaps this could contribute to the understanding of Non Timber Forest Products and decrease the lack of information there is on NTFPs. Consciousness of the different perceptions of sustainable use, management and development of natural resources and knowing what different actors drive, could be useful for policy writers, programme implementers and local people. The final result will

be presented to all the participants of the in-depth interviews. In addition, with the documentary I hope to show that film is an interesting research methodology. I am convinced that images add something to the words of people and can give a powerful overview of local situations. A thesis or report is often only read by other researchers or people looking for literature on a specific topic. This documentary can be understood by a wide audience and is fun to watch. Video as a research tool could assist local people to attain more voice for their every day situations.

Survey

The survey was useful to document a diversity of medicinal plants and its uses by local people in the selected villages. The hypothesis tries to confirm a decrease of local knowledge on medicinal and aromatic plant uses (H0). It was expected that the knowledge on medicinal plants would be decreasing and mainly with the elderly people. However, my data is not sufficient to generalize for all members of the Forest User Groups in Dolakha district in Nepal. Nevertheless the survey results were used to say something about the selected villages. Third, the survey notes down local peoples' opinions on Community Forest conservation and Forest User Groups.

Semi-structured and in-depth interviews

Semi-structured interviews enabled the interpreters and me to focus on the topic of my interests, but also provided room for additional information and for the interviewee to respond in their own way. This method seemed very useful in interviewing members of the CFUGs. The in-depth interviews were conducted with key informants such as Ayurvedic and local doctors, botanists, farmers, village and FUG chiefs, a businessman, a schoolteacher and project leaders.

Participatory observation

This method allowed the interpreters, guide and me to participate without having to ask questions in a formal structured way. This method was useful when going for walks with enthusiastic farmers who were willing to show us where medicinal and aromatic plants grow and how they use them.

Literature review

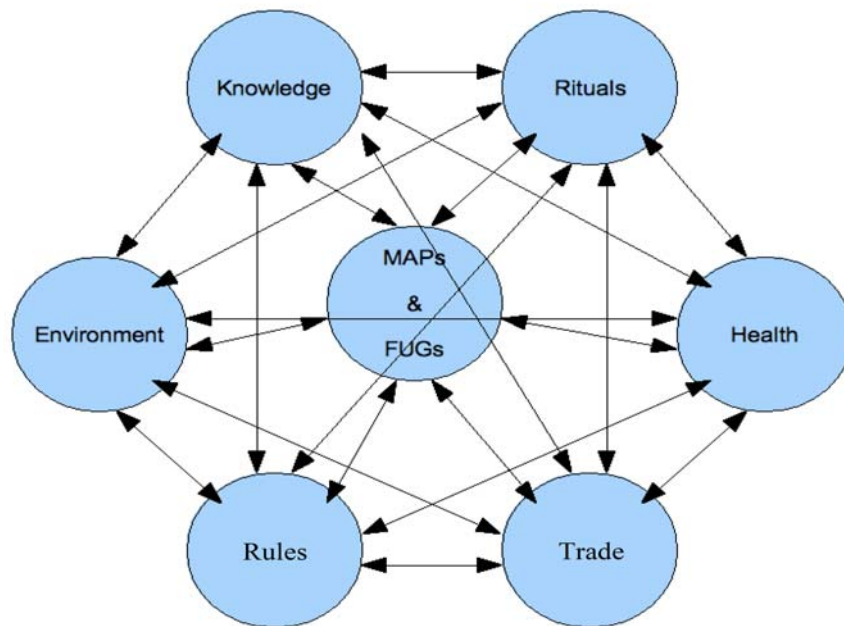
Literature on the work of other authors on the sustainability and use of natural resources has been taken into account in this thesis to back up an argument and to analyse the data. Additional literature was used to illustrate conflicting conservation principles, the use of Non-Timber forest Products with in particular Medicinal and Aromatic plants; and community based natural resource policy and implementation.

Many documents (WHO and NBS) were taken into account, which go in detail how regulations and programmes set out forest management. Literature from the Nepal Swiss Community Project came in handy in terms of economic development of NTFPs in Dolakha. Handbooks, such as "Finding the medicine Buddha" (Crow, 2000) came particularly in handy in supporting my understanding of the knowledge of medicinal plants and performed rituals to prepare medicine and treat patients. In addition the handbooks on actor perspectives (Long, 2001) and local science vs global science, approaches to indigenous knowledge in international development (Sillitoe, 2009) were useful for the data analysis and discussion on knowledge interfaces.

1.13 Data analysis

When possible, field notes were kept on a daily basis on the observations of behaviour, activities and the environment. Coding helped to categorize the data and identify the main topics of interest and focus in the field notes. Figure 4.2 gives an overview of a schematic representation of the areas of interest for the research.

Figure 1.2 **Discontinuities of social and environmental relations figure**



Forest User Groups (FUGs) and Medicinal and Aromatic plants (MAPs) bring together a complex setting of social life. Knowledge (local and global, scientific and non-scientific) and rituals are important in the analysis of sustainable use of medicinal and aromatic plants because people's beliefs and actions play a big role in shaping the environment (co-production). People make decisions on which plants to select and which not to support their livelihoods and health; and in this way transform the environment. Some plants are useful to breed while other plants are less beneficial to the use of people. Some plants and trees belong to Gods, spirits or are extinct and should be conserved, depending upon the actors social values and rationales, while other plants and trees can be consumed for every day use.

Knowledge on plants is an ongoing process, continuously transforming and directly related to plant use. However, many people are concerned that the knowledge about Nepali's plants will be lost to future generations, and ethno-botanists are documenting the wealth of indigenous knowledge for future generations. Local knowledge has helped Western researchers in the development of allopath medicine, such as in treatment against Malaria (Bodeker, 2007). Could local knowledge also profitably inform global science in terms of sustainability of medicinal and aromatic plants? And what about global science? Can global scientists profitably inform local people in terms of sustainability? (Sillitoe, 2009).

The forests have tremendous utility for people consisting of timber for building or fodder for livestock, but also valuable, medicinal and spiritual uses. "It can be said that forest plays a vital role to support food security situation of rural framers in Nepal. Aside from their values as source of energy, medicine and raw materials, plants are important to man in other ways. These are social, cultural and spiritual dimensions of forest uses, which have been less studied and documented in Nepal." (Acharya, 2003 <http://www.fao.org/DOCREP/ARTICLE/WFC/XII/0087-A1.HTM> visited on October 17, 2009). Plants are also used in rituals performed to cure people from illness. When a person gets sick some family members often request a "Dhami" or "Jhakri", a local spiritual healer to heal the patient. If this does not work they will visit an allopath or Ayurvedic doctor in a health clinic or hospital. Medicinal and aromatic plants have potent beneficial qualities, which vary from assuaging pain, to healing wounds, to complete recovery from disease. For a complete list of the uses of plants described by the people in the selected villages in Dolakha see the Survey in chapter 4.

At times in order to prepare medicine from plants, ancient rituals need to be carried out precisely according to traditions; written down in manuscripts over 5000 years old. (See documentary supporting this thesis and Crow, 2000). For over centuries plants are important in the daily life of Nepali people living in the mid-hills region. Perhaps we can learn something from the way Nepali people have lived with plants for centuries in terms of sustainability.

"All Hindu families in Nepal have to perform *pujas* (religious rituals) on certain occasions and is itself partially responsible for procuring the ritual objects necessary for them (Pohle, 1990). These could be daily *puja*, seasonal, monthly, annual, periodic and occasional. There is no religious ritual, which does not require plants and their products. Traditional Hindu Books such as *Ramayana*, *Mahabharata*, *Veds*, all put intention to preserve forest as a part of the cultural heritage. An attempt has been made to return to the sources of traditional cultural value in order to record and document the treasure of knowledge that still exists with different caste and ethnic community. Recently, few ethno-botanical studies on some caste or tribes have been conducted. However, these attempts have ignored detailed study on spiritual and cultural values of plants in heterogeneous Hindu dominated Nepalese society that gives higher social recognition on it. About 80 plant species are used in socio-cultural festivals. These plants are essential to start all religious festivals and one cannot imagine completing any religious rituals without them. It was observed that specific species are used for special purposes and festivals. The frequency of requirements varies from daily, seasonal, annual, and periodic to occasional. The nature of the plant species varies from annual herbs to big-sized trees. However, due to loss of species and migration to urban areas, some cultural changes have been occurred.

The practices of maintaining and managing religious forest and its potential to incorporate to community forestry have been seen as an important way to manage forest in Nepal. Ingles (1994) argued that religious beliefs and practices affect the way forests are perceived and managed in Nepal. Forests are also affected by activities such as tree worship; establishment and maintenance of scares sites in forests, religious festivals and rituals conducted within the forest. Moreover, religious forests provide refugia for species, which may otherwise have become locally extinct. Religious forests are not harvested and there is a belief that it is devoted in the name of the God. Nepalese society places a high value on *dharma*. Gyawali (1987) defined *dharma* as correct lifestyles of living in harmony with one's nature in a world of perpetual change, a lifestyle in harmony in three spheres; the philosophical, the social and the environmental. Various religious rituals and social activities are carried out to observe *dharma*. During the religious rituals and ceremonies, one or more deities are worshipped using actions, process and products prescribed by texts or priests or local tradition (Ingles 1994). The social activities includes the construction of temples, schools, rest houses for pilgrims, construction of drinking water taps, donating to charity, constructing bridges, roads, *chautara* (resting place). All these activities require use of plants or plants products.

In Hindu theology, specific plant and trees species are deemed to be incarnations, or symbols of deities and other supernatural forces and must be worshipped (Ingles 1994). Harvesting of worship tree was thought to be against worshipped god e.g. *F. religiosa* is not harvested easily and there is religious merit by planting such worshipped trees is still common. The trees and plants are regarded to be incarnations or symbols of the Gods or deities and therefore tree worship became more common. The increased realization of the importance of trees would be helpful to solve the problem of environmental imbalance. One of the approaches towards this direction could be tree worshipping in Nepal. The creation and maintenance of religious forest has positive impacts on ecological and biodiversity implications. The Nepal Biodiversity Action Plan (NBAP 2001) has emphasized to conduct biodiversity assessment in religious forest all over the country and has speculated that there could be few species, which are preserved only in such religious forest. There are 40 religious forests in Kathmandu valley only, (NBAP, 2001). The maintenance of religious forest especially in hilly regions has positive impacts on soil conservation and microclimate conservation.

Without completing rituals and cultural values life of a Hindu is not completed. Hence a significant number of plants and their products are essential to sustain life system of a Hindu. The detailed investigation covering heterogeneous society with diverse cultural ceremonies, geographical variation will enhance knowledge and understanding of importance of forest trees in Nepalese society" (Acharya, 2003
<http://www.fao.org/DOCREP/ARTICLE/WFC/XII/0087-A1.HTM> visited on October 17, 2009).

All over the world, control, management and exploitation of natural resources are subject to complex legal and other forms of regulation. In legally complex resource governance, state laws concerning management use of resources may interact in unpredictable ways with non-state laws and norms (e.g. customary) or supra-state norms (Roth, D., G. van der Haar, 2007). The Nepal Biodiversity Strategy (NBS) records the understanding reached between the government and the people of Nepal on the thrust and direction to be taken over the next twenty years to protect and manage Nepal's biodiversity. This Strategy is the result of extensive consultations with a variety of stakeholders over a considerable period of time (NBS, 2002). However, there remain contradicting perspectives between conservationists and the local population (Leach, Mearns and Scoones, 1999).

When medicines are made from natural products such as plants the environment in which these plants grow play a vital role. A global concern of a decrease in biodiversity supports Community Based Natural Resource Management (CBNRM) and Conservation programmes of forests and medicinal plants (Leach, Mearns and Scoones, 1999).

There is a high demand for natural products as well as in developed countries as in developing countries. Pharmaceutical companies have made well use of this demand. Local plant gatherers could see benefits from these extra income generating activities when given a 'fair' price. And health is directly related to medicinal plants when people become ill and use medicine for treatment.

1.14 Limitations of the research

There were a number of difficulties faced while carrying out the research. Understanding the local language is important and even though I was able to have a basic conversation I could not understand a lot of what was being said. I felt very lucky to have good relationships with 3 interpreters who seemed to feel quite comfortable during the fieldwork for most of the time. The remote, difficult to access areas in Dolakha were quite vast with many houses far apart. It was very time consuming to visit the selected households from the random sample. What complicated things in the beginning was that the number of members of Forest user Groups was higher than the total population of Dolakha. This made it difficult for me to calculate the sample size, and to carry out a correct random sample, where each household have a same chance of being selected for an interview. There were also time constraints; therefore I could not visit the selected households of Dolakha in Hava.

Sometimes it was difficult to disturb the villagers for an interview, cause they were working most of the time in their land during the daytime. In the evening it got dark quite early. This restricted our time to interview people in the early evening and the early morning. Additionally it was a challenge to get some of the people to respond to questions. Sometimes we had to pass through the village chief or the Community Forestry chief to get to respondents. At times this could also limit the research in a sense that some of the respondents were influenced by the presence of the chief. Therefore, I mentioned to my interpreters that it would be better if we could visit the people on our own, which in turn took longer time to find the randomly selected houses for the interviews.

Some of the villagers held prejudiced against us, because they associated us with the government, NGO's or other organisations. Doing research in Nepal was further complicated by the lack of electricity. Throughout the fieldwork, during the winter time, the city of Kathmandu had power cuts of more than 16 hours a day. This caused big problems for people, especially in hospitals. On top of that the electricity schedule was very irregularly.

No electricity also means no light and no water. I made most of my evening notes by romantic candlelight. There was no clean or hot water available for most of the time and during winter season it was very cold to wash myself. I had to filter water on the way before we could drink it. This experience thought me how spoiled and wasteful we are in The Netherlands with water. On the other hand it was also fun to wash myself in the river and to find new ways to refill my batteries for the camera. Sometimes there were villages that had some electricity from a hydrological power plant and we found ways to exchange things in order to refill the batteries. I am not used to carry a mobile phone, but I do see why many Nepali felt inseparable with their little machines. It saves a lot of time if you need to ask someone something or are in need of information from a neighbouring village. However in the higher remote areas it was not possible to use the mobile phones, this caused tremendous frustration for some of my interpreters.

When my spoiled body became ill on the way there was no access to health centres or hospitals. This made me realise how valuable the knowledge of farmers on local vegetation is. I became familiar with the plants such as *Sil Timur* (treatment for stomach problems) and *Chiriato*, (treatment for fever) which helped me back on my way. Being sick also helped me to understand that women are not without knowledge on medicinal plants and thus not completely without healthcare.

What was the most difficult for me was not the lack of toilets, hot water or other facilities. It was the shortage of fruits and vegetables. People eat twice a day (around 11.00 and 21.00) and I am used to eat small bits of food 3 or 4 times a day. I am a great fan of spicy food, but this food was beyond spicy to me and caused me to have severe diarrhoea. After some time I had to restrict myself to rice

(dinner) and popcorn (breakfast). After a few weeks living on rice and popcorn my face became a bit yellow and I was extremely happy with the bag of carrots that the guide left for me when he returned to his home. A carrot a day kept the doctor away! As well as the *boisy's* (buffalos') buttermilk, which helped me to regain my strength. One of the women called the beautiful *boisy* "our local doctors".

One of the biggest limitations to the research was that it took too much time and was quite expensive to carry out. The distance from one village to another took days of trekking through the mountains. Sometimes we also arrived in quite hostile environments and my interpreters and me felt unsafe. I was happy to have a trustable guide and interpreters with me. On the other hand I had to pay for a guide, sometimes a porter, my interpreters, some of the village chiefs, not to mention the film equipment. Nevertheless, all these limitations and constraints could not weigh up to the memorable experience I had in Nepal. Moreover, the warmth, help and hospitality of the many people we met on the way will never leave my mind.

To conclude Chapter one, the problem statements of the thesis has been introduced; and what questions and tools were used to carry out the fieldwork and the analysis of the data. The different concepts have been introduced and the limitations of the research were pointed out. In the following chapter the theoretical framework and literature analysis will be discussed.

Chapter 2 Theoretical Framework

When I came to Dolakha I did not encounter with full systems that correspond with one theory. Instead, I saw fragments of different systems, which relate to several aspects of different theories. For this thesis it seems useful to use a combination of an extended entitlements, a political ecology and an actor oriented approach as a framework to analyze how resources are used and how CBNRM has an effect on the local situations in the selected villages. I have chosen for a combination of these frameworks because I believe they together will outline the major elements in the research situation of inquiry and provoke analysis of relations among them. These frameworks lay out the collective actors, key nonhuman elements, and the arenas of commitment and discourse within which they are engaged in ongoing negotiations. In addition these frameworks show the major positions taken, and not taken, in the data vis-à-vis particular axes of difference, concern, and controversy around sustainability and conservation issues.

Narratives and natural resource use

Theories that have been said to suffer from ‘resource determinism’ have been criticized and challenged by perspectives that relate conflicts over resources to economic, political and social contextual factors. In this part I will explain my position in these debates and which, in my opinion, are particularly powerful and have promising insights provided by the different theories.

There is a strong interest from government agencies and NGO’s in community based and co-management approaches, involving local communities in forest management and conservation. A promising insight from Leach, Mearns and Scoones (1999) is that that there remain important questions “about the diversity of interests in and claims over forest resources, the institutions which underlie these claims, and the implications of different activities for forest cover and quality change” (Leach, Mearns and Scoones, 1999 p.227). They argue that oversimplification of narratives in Community Based Natural Resource Management (CBNRM) serve as a misleading guide for translation into operational strategies and programmes.

Earlier work from Leach and Fairhead (1998, 1996) has shown that narratives about forest degradation can be so powerful that in one particular case no one did proper research to see whether forests really did decrease or not with the result that organisations carried out forest conservation projects in an area where the forest had actually increased. People can assist forest formation, but “equally diverse practices in farming and Non Timber Forest Products collection have affected the quality of forest patches (Leach, Mearns and Scoones, 1999 p.227). The authors argue that it’s important to understand social differences, social and environmental dynamics and the institutions that underlie social practices in order to have a strong basis for effective interventions. Many authors emphasize on linking agency and structure to explain social change to see how rules and norms emerge as products of people’s practices and actions both intended and unintended (Arce, 2009; Long, 2001; van der Ploeg, 1999). Leach, Mearns and Scoones argue for an ecological view of “spatial and temporal variability, dynamic, nonequilibrium processes and histories of disturbance events”; and stress the need to ground institutional analysis in a theory of power. (Leach, Mearns and Scoones, 1999 p.230).

I strongly agree on this with Leach, Mearns and Scoones (1999) and believe their criticism is justified because some projects and programmes managers and directors are a times indeed little aware of the actual local dynamics in the field and therefore short sighted in their implementation of the projects. When I was actively engaged and working for two NGOs I recognised the frustration as mentioned in the article such as communities being portrayed as a homogeneous groups (Mosse,

1994), the “intended beneficiaries” to be treated as passive recipients of projects and “a lack of clear criteria by which to judge sustainability or success in meeting conservation or development goals” (Leach, Mearns and Scoones, 1999 p.226). These findings are important when trying to analyze the links between humans and the environment.

Even though I do believe that these insights could sometimes lead to capacity building practices as has been illustrated in the article (ibid.) by the story of NGO Seva Mandir. I do, however, have my doubts about whether the findings from Leach, Mearns and Scoones (1999) will be seriously considered and incorporated in the approach of many organisations active in the field. Seriously linking local negotiation capacity and the various power relations may be very time consuming for organisations with a 4-year plan. On top of that dynamic institutional arrangements “influenced by ongoing practices and agency in economy and society cannot assume predictable outcomes” (ibid. p.241); something which won't be an easy task for many project and programme policy designers to incorporate in their work.

2.1 Extended entitlements analysis

Leach, Mearns and Scoones (1999) extend Sen's environmental entitlements analysis (1981, 1984, 1985) into a useful framework for analyzing natural resource claims and studying local situations of the use and management of Non Timber Forest Products. Their critique on Community Based Natural Resource Management (CBNRM) focuses on the implications of intracommunity dynamics and ecological heterogeneity (Leach, Mearns and Scoones, 1999).

The framework explores the roles of institutions at different levels in society. “How differently positioned social actors command environmental goods and services that are instrumental to their well-being” (Leach, Mearns and Scoones, 1999). The figure above shows how an undifferentiated environment has been replaced by one that is disaggregated into particular environmental goods and services. The distribution, quality and quantity of these goods and services are influenced by ecological dynamics, which are in part shaped by human action. (Leach, Mearns and Scoones, 1999).

“The relationship between a given ‘community’ made up of differentiated social actors, and the changing ecological landscape, can be analyzed in terms of the ways different social actors gain capabilities, or a sense of well-being, by acquiring legitimate, effective command over resources through processes of endowment and entitlement mapping” (Leach, Mearns and Scoones, 1999). Note that with “legitimate” the authors refer not only to command sanctioned by a statutory system but also to command sanctioned by customary rights of access, use or control, and other social norms (Leach, Mearns and Scoones, 1999).

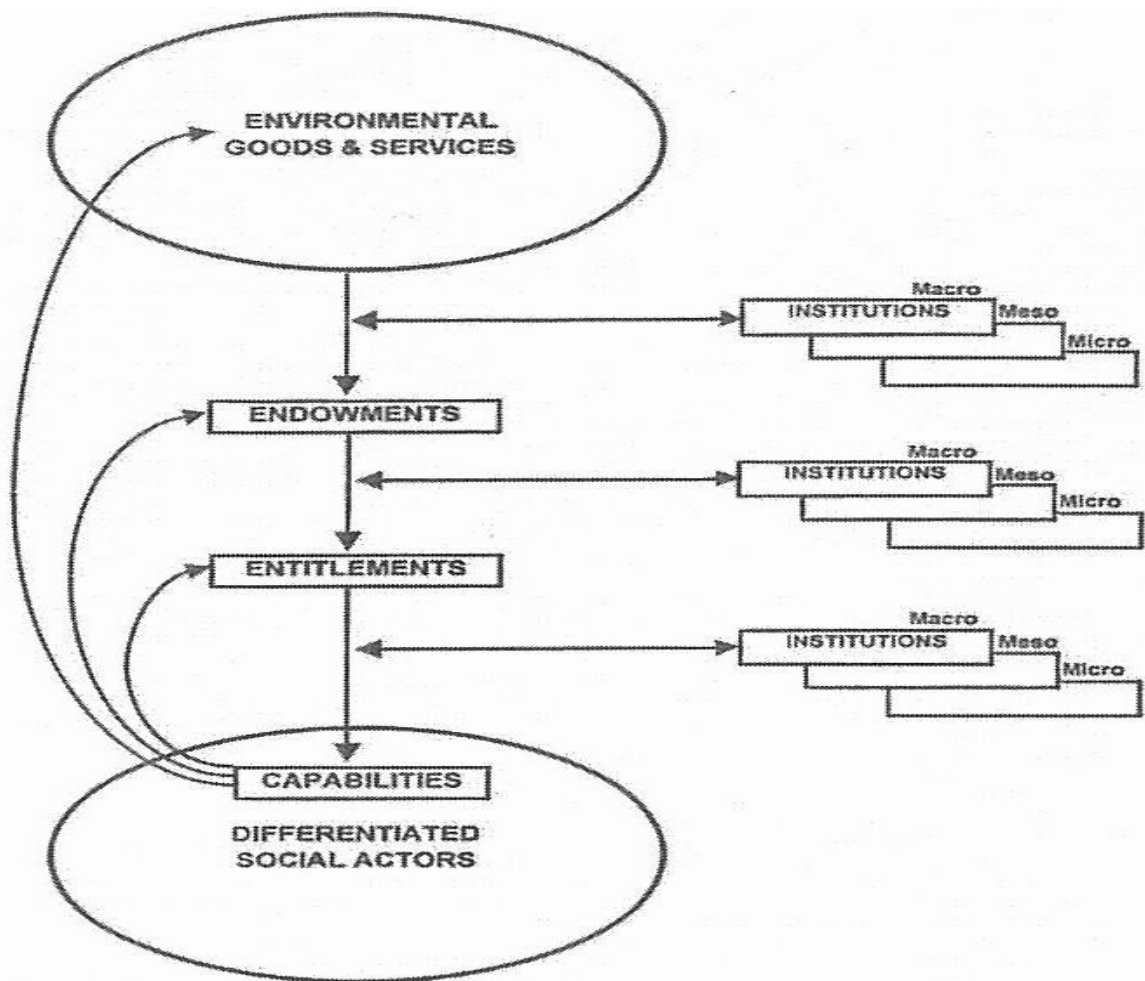


Figure 2.1 Environmental entitlements framework from Leach, Mearns and Scoones, 1999.

And this is the point where the limitation of this approach for my thesis becomes apparent. The approach ends with the capabilities and the sense of well-being and seems to ignore the political dimensions of natural resource use. Scientists need to become aware of how their findings are often repackaged within a policy arena in which environmental and political stabilization are strongly linked (Turner, 2004).

“Such repackaging leads not only to the reduction and simplification of the ecologies of resource use and the multi-stranded relations that exist between resource users but also requires ignoring the process that lead up to social conflict. When referring to “struggles over resource access”, political ecologists need to utilize their fuller understandings of resource-related conflict to explain the full material and non-material dimensions of these struggles. How resource-related conflict is understood plays a major role in policy formulation in these regions. Without providing a fuller explanation of these struggles, one’s work may be likely to be used to support policies that increase the vulnerability of one’s research subjects” (Turner, 2004 p. 884).

Natural resource conflicts in poorer countries are often portrayed as scarcity induced conflicts. “These perspectives, and their underlying conceptualization of “resource conflicts”, have strong influence in international environment and development circles” (Turner, 2004 p.885). Turners approach includes the political dimensions of resource related struggles and therefore seems very applicable for analysing natural resource related struggles in Dolakha, Nepal. In the next paragraph I shall explain how he used his political ecology approach for farmer-herder conflicts in the Sahel.

2.2 Political ecology approach

Turner (2004) has written a great critique on two policy driven perspectives: environmental security perspective and that of applied common-property theory with respect to natural resource management. These policy driven perspectives have had a great influence on international environmental and development policy agendas and are “less concerned with the interplay of local and extra-local social and ecological processes and more concerned with what they see as key driving factors” (Turner, 2004 p.865). As for example can be read through the NBS (2002). The authors of NBS touch upon some of these complex processes, but as these do not have a clear point of focus, thus resulting in an action plan that is based on what politicians see as the main driving factors. It is often believed that resources provoke conflicts within in a community (Collier, 2007), but resource related conflicts are not always driven by resource competition, resource degradation or institutional failure per se and there is no direct linkage between scarcity and conflict. Turner’s criticism is justified because the critiques in his study of the farmer-herder in the Sahel provides powerful insights, insights which are also useful for other resource related conflicts (and studies) in other parts of the world.

Turner’s case in the Sahel explains how cattle herders have strategies to maintain resource access over the longer term and how the struggles over resources should be put into a “broader moral narrative” in order to understand why and how conflict comes about. “The high spatiotemporal variability of productive resources leads to a situation in which there is little spatial fixity in the competition over land” (Turner, 2004 p.877). It is quite uncertain what crop is going to be productive or not, something which is highly dependant on the rainfall; thus herders must invent long-term strategies to protect their access to productive resources. Not all resources are of high importance (and worthy of conflict), not even when people are very poor. According to Turner it’s mostly the “more spatially-fixed resources such as access to paths to water points or around strategically-located and highly productive floodplain pastures” (Turner, 2004, p. 877). When conflicts erupts this is often carefully planned: “these are conflicts that are waged over the long term with the conflict’s history being invoked and reworked to make moral claims in the present” (Hobsbawn and Ranger, 1983 in Turner, 2004 p. 878).

The point is that “resource-related conflicts are not simply struggles over resources but reflect a broader set of tensions within agro-pastoral societies, many of which have moral dimensions and which cannot be seen as simply derivative of in-the-moment struggles to subsist” (Turner, 2004 p.885). Instead they are the result of ongoing political struggles to maintain control over fluctuating resources in the future (Pradhan 2000; Turner, 2004). Conflicts that seem to be “resource conflicts” are often conflicts about other things, things that are often more important than the actual resource, be it about local politics, a disagreement over a bride price or the control of the grazing taxes paid by outsiders. This is what Turner calls “the theatre of conflict”. Though not about natural resources, an example of such theatre is described in the following paragraph.

During the fieldwork I visited a local primary school. At a certain moment an angry man (a local farmer which commercially harvested *Sil Timur*) run up the schoolyard and attacked the headmaster with a chair. He ran up to him and threw the chair right in front of him. People were running towards them and were heavily involved in a discussion. I did not understood what was happening at the time and thought this man was insane. Later I asked who this man was and I was informed by different people that he was a good man” and “he was right because he worked hard and was never paid by the headmaster for his work”. It turned out he had done some repair on the headmasters house and worked in his field and repeatedly requested for the payment he was promised. After asking several times and still not getting any payment he decided to use some theatre. In this way

the whole village was involved in the conflict and aware of the situation. What happened was that the headmaster became terrified and ran away to the local chiefs house for shelter. The local chief negotiated between the two men and settled the payment. In this way people can also dramatise a recourse conflict in order to gain more political or financial support. As will become apparent in chapter 3, the case study of *Dhasingare*.

Another interesting insight from Turner (2004) is that researchers should be careful cause their work “may also produce less sophisticated portrayals of resource conflict that are more consistent with the diagnoses that support programs of political and environmental stabilization that work against the interests of the recourse-poor” (Turner, 2004 p.885). For example, technical construction and economic research is often used to design or support programmes and policies. When researchers solely focus on their own aspects of interests they perhaps miss out on other important social, environmental and political dynamics, which can result into policy implementation, which can “work against the interests of the resource-poor” (Turner, 2004).

Turners’ ideas are important for the focus of, as well as the tools used for, the fieldwork on Non-Timber Forest products in Dolakha and for the analysis of the data collected during the fieldwork. The struggle between fodder for cattle and conservation of the forest are fully engaged with both the material interests but also the moral claims and narratives that animate these conflicts. Collecting people’s views in this way (on paper and on camera) contributed to the understanding of local situations in terms of the sustainable use of medicinal and aromatic plants in Dolakha, Nepal. In the following paragraph an actor-oriented approach is introduced, as developed by Long, Arce and others. This approach is particularly useful in gaining insight in the multiple realities of the different life-words⁴ of actors.

2.3 An actor oriented approach

The actor-oriented approach (Long, 2001) is valuable to analyse different various complex situations. In the case of Dolakha it was particularly useful in making the social relations visible, the biography or life-worlds of commodities (medicinal plants). The actors involved are farmers, leaf gatherers, policy makers (government and non-governmental organisations), businessmen, schoolteachers and students, Ayurvedic doctors, allopath doctors, “*Dhami*” or “*Jhakri*” (local spiritual healers), botanists and medical and environmental researchers. Each situation is experienced in a different way by actors, and thus differently interpreted. Multiple definitions of the same situations become a reality. “We need to document the ways in which people steer or muddle their ways through difficult scenarios, turning ‘bad’ into ‘less bad’ circumstances” (Long, 2001 p.14). For example for some people conservation of the community forests led to new opportunities, enlarged networks and more income, while for others it meant that many of their cattle died of hunger. For some people the establishment of an oil factory meant new opportunities, while for others the conservation of Dhasingare leaves for oil meant longer walks to find fodder for their cattle. For some people the establishment of local health clinics meant easy access to medicine, while for others it meant that their expertise was no longer needed. Small policy changes can lead to a major shift in power relations.

⁴ “Life-words are “lived-in” and largely ‘taken for granted’ social worlds centring on particular individuals. Such worlds should not be viewed as ‘cultural backcloths’ that frame how individuals act, but instead as the product of an individual’s own constant self-assembling and re-evaluating of relationships and experiences. Life-words embrace actions, interactions and meanings, and are identified with specific social-geographical spaces and life histories” (Long, 2001).

“Macro sociological concepts must always be unpacked to as to identify their micro-foundations in everyday life settings; otherwise they are emptied of any significant meaning at the level of social practice. Foucault (1981:94) makes the same point when he argues that, although power may seem remote and tied up with juridical sovereignty and state institutions and thus beyond the arena of everyday social life, it is actually manifested and reproduced or transformed in the workplaces, families and other organisational settings of everyday life.” (Long, 2001 p.85)

And that is where an actor-oriented approach becomes valuable for the analysis, because it engages in a discussion on agency⁵, knowledge⁶ and power. Documentation upon the multiple realities of different actors, imply potentially conflicting social and normative interests and diverse discontinuous configurations of knowledge (Long, 2001). If so, “then we must look closely at the issue of just whose interpretations or models (e.g. agricultural and environmental scientists, politicians, doctors, businessmen, farmers or anthropologists) prevail over those of others and in what circumstances” (Long, 2001; Sillitoe, 2009). As many authors have argued Western science dominates over local knowledge (Bodeker, 2007; Arce and Fisher, 2007; Sillitoe, 2009), but could also be combined in ways to help solving problems together (Sable, Howell, Wilson and Penashue, 2007). Which made me wonder and led to the following discussion question for the documentary supporting this thesis: “Can local knowledge and global science profitably inform each other in terms of sustainability?” (Sillitoe, 2009).

“This brings an actor-oriented perspective on the interplay between contingencies, local situations and knowledge interfaces, helping us to reflect on the importance of understanding scientific procedures in relation to actors’ experiences, making associations between peoples everyday life and scientific knowledge. (Arce and Fisher, 2007).

The local character of much local knowledge is proving problematic in international development when development agencies seek generic solutions to problems of poverty and sustainability (Sillitoe, 2009). Medicinal and aromatic plant knowledge is so localised that only persons with kin and spirituality validated associations will profess to know about it and who not allow for general category divorced from place (Bodeker, 2007; Sillitoe, 2009). An actor-oriented approach can help to lay out the collective actors, key nonhuman elements, and the arenas of commitment and discourse within which they are engaged in ongoing negotiations.

The major argument against the use of an actor-oriented approach is that it dwells on individual agency, and overlooks the significance of the ways actions are embedded in wider social relations and structural settings (Long, 2001).

“Parallel to the way in which constructionalism has been misconstrued as privileging cultural representation and the power of language and discourse, so actor-oriented analysis has sometimes been reduced to rational choice theory or criticised for being ‘methodologically individualist’ (i.e., explaining social behaviour in terms of individual motivations, intentions and interests). This view seriously distorts the aims and methods of an actor perspective, since the world of social action is never made up of a series of detached individualists and atomised decision-makers. Persons and their environments (which include other people and institutional frames) are reciprocally constituted. Moreover, they do not simply respond to the imperatives of cultural norms and values, or to the dictates of dominant discourses” (Long, 2001 p. 4).

“Actors’ projects and practices are not simply embedded in structural settings defined by commodity circuits. Instead, it is through the ways in which they interlock that they create, reproduce and transform particular ‘structures’ (Long, 2001 p.63). Environmental, religious, market and medical relations are at least mediated, if not actively sought after and constructed by actors themselves (Long, 2001). An actor analysis indeed seems useful to explain the meanings, purposes and powers associated with different modes of human agency intersecting to shape the outcomes of

⁵ The notion of agency refers to the actors’ (individuals’ and organisations’) capacity to process social experience and to devise ways of coping with life, even under the most extreme forms of coercion (Long, 2001).

⁶ Knowledge, like power must be looked at relationally and not treated as it could be depleted and used up. Someone having power does not entail that others do not (Long, 2001).

emergent social forms, whereby agency itself is framed in by various cross-cutting discourses, institutional constraints and processes of objectification, through which these very same processes also permit or promote certain modes of social agency (Long, 2001). “Perhaps the biggest challenge for an actor-oriented approach to the study of development and social change concerns how to re-conceptualise the relations between knowledge, power and social agency within this global informational world” (Long, 2001 p.239).

Using a combination of the three above introduced theoretical frameworks, highlighting the major positions taken, and not taken, in the data vis-à-vis particular axes of difference, I aim to get more insight in controversy around sustainability and conservation struggles in Dolakha, Nepal.

2.4 Additional literature analysis

Rights and institutions

Approaches that focus too much on rights as the product of rules (‘institutions’) miss the important point of tension, contradiction and conflict that is inherent in definitions of rights to natural resources (Roth, 2007). One way of analytically coping with this is by paying attention to the plural character of definitions of rights, legal pluralism. Legal pluralism is used to gain a better understanding about what law means and how it operates (law and behaviour) and is used (law and agency) by individuals and groups of people in a community. It is not only about state law but also about other laws and rules established in society such as: religious law, project law, local law, hybrid forms of law, customary law and transnational law. It also allows for differences of interpretation within one system (Von Benda-Beckmann, 2006; Pradhan and Pradhan, 2000; Hellum and Derman, 2005). His approach can contribute to the extended entitlements approach by Leach, Mearns and Scoones (1999) but in my opinion focuses too much on the rules itself instead of the people accessing or not using, transforming and manipulating these rules.

Von Benda-Beckmann (2006) explains how many states have a plurality of property ideologies and legal institutions, and how these ‘new properties’ raise new political, legal and ethical questions and generate new conflicts. “Where former autocratic regimes in the Third World have been dismantled, meanwhile, a somewhat contradicting approach advocated decentralization and the devolving of responsibility to smaller geopolitical units, often by promoting community-based management” (Von Benda-Beckmann, 2006). For example, in Dolakha, I noticed how ‘Community Forests’ and ‘Non-Timber Forest Products were such a ‘new property’ after the establishment of the so called Community Forestry User Groups; and how the conservation of Non Timber Forest Products (and thus medicinal plants) resulted into conflict with people who collected these plants for fodder for their animals.

Property rights are created, defined and protected by organisations other than the nation state, both within the spatial boundaries of states and beyond (Von Benda-Beckmann, 2006) such as Forest District Offices, NGO’s and Forest User Groups in Nepal. The balance between rights and freedom for individual persons and the need of the collective of which they are a part of has proven another enduring question in political science, authors warn that porous barriers between the public and the private can lead to significant conflict between state and citizens (Von Benda-Beckmann, 2006; Norgrove and Hulme, 2006). For instance, public (conservation) and private (agricultural) values came into conflict in Dolakha when medicinal plants were conserved for sustainable harvesting and commercialization purposes. These plants were previously collected by farmers for fodder for their

animals and now it was forbidden for them to collect these plants. Farmers had to walk longer to find food for their cattle. Together with the newly established rule of not to let cattle enter the forest (for grazing) this resulted in conflict between farmers and Community Forestry User regulators.

The case of Pradhan and Pradhan (2000) more focused on *how people* make use of rules and regulations, illustrated how individuals have access to different legal orders such as state law and state courts, local law and local dispute processing mechanisms. In Nepal there was an increase of state interference, which brought about new laws and rules, which gave the state more control to regulate water use. But at the local level farmers continued to use their water resources quite independent of the state. Farmers in Nepal are using their social relations (good and bad relations, power, kinship, political) and legal resources (law, courts, District Administration Office, District Forest Office or village councils) to pursue their claims. “Stakeholders have the option of using different legal orders or normative repertoires to justify or legitimize their claims. The normative order they choose depends on which legal order they believe best suits their claim at that particular time” (Pradhan and Pradhan, 2000).

“Systemic interdependencies (embeddedness) have been pursued through empirical studies of how property systems work on the ground... deconstructing many Western assumptions” (Von Benda-Beckmann, 2006). The latter supports the arguments from Fairhead and Leach (1998; 1996) article and film about West Africa, the “myth” of deforestation. The idea of forest degradation was adopted by many organisations to protect the forest. However, the village elders were aware that there were actually more trees than before, which was later confirmed by satellite images. This indeed deconstructed many Western assumptions.

Here, the differences between a national (governmental) and a local (farmers) view on resources are important. In the article from Hellum and Derman (2005) it was shown how water was taking a different meaning in *Chegutu*, Zimbabwe at government level than at the local level. At the local level water cannot be owned, because it's a sacred common pool resource but the national government justifies government control over all water. “While justifying its claims the government is also making itself subject to the counter-hegemonic rights discourses of its contesters (Hellum and Derman, 2005)”. Water was indeed used to gain control over land and people by local chiefs. “With land and water becoming part of a patronage system or a political rewards system for those who support the party and state, the instruments of any government policy toward water and land are likely to be undermined by the powerful (Hellum and Derman, 2005)”.

The main advantage of legal pluralism is that it can be used as an analytical tool to analyze the legally complex character of claims, rules and legitimations of property (Roth, 2007). Legal plurality can be used to see law in a “broader context, including both legal and illegal uses of resources because the determination of what is legal is subject to changing politics, variable perspectives and shifting, though always unequal power relations” (Von Benda-Beckmann, 2006). It is looking at “how social processes continuously construct and reconstitute the meaning and the effect of legal” and illegal norms (Link, 2000). Legal pluralism also helped in understanding how important are the differences in categorical and concretized rights (Von Benda-Beckmann, 2006) such as: “water rights” and “water acquisition” (Pradhan and Pradhan, 2000).

Disadvantages of legal pluralism are that it focuses too much on the rules and regulations itself instead of the people using or not using these rules and regulations. Perhaps in combination with an actor perspective it could assist in understanding how law is used in particular situations of disagreement, competition of resources and even violent conflict; and how law is used to negotiate or legalize control of resources.

Even if legal pluralism could lend a hand to unravel the complexities of reality this does not automatically imply that legal pluralism assists all people with asserting their claims. In fact, in some situations it can make things even more complex. How to solve all these overlapping claims? Which claim is more powerful than the other? And do situations of legal pluralism hinder or enhance socially disadvantaged rural citizens securing participation and justice? Is legality actually possible where unequal power-relations are in existence? Some people speak up and cause countertendencies to legal procedures, while others stay silent. Legal pluralism entails opportunities for one, but constraints and uncertainties for others.

2.5 A disaggregated approach

Several case studies illustrate how local differences in access to resources, problems of exclusion and tensions around the management and control of resources may come to articulate with violence. In this part I discuss what I think is the relevance and what are the limitations of a disaggregated approach to the study of such conflict and the role of resources.

In the article by Andre and Platteau (1998) it became clear that people in Rwanda, who do not own any land; and who do not have access to any source of off farm income frequently indulge in acts of robbery in order to make ends meet (Andre and Platteau, 1998). The authors made a distinction between the “voleurs par faim” and “voleurs par default”, by which the latter have a far more violent character. The authors argue how disempowerment of vulnerable groups takes place by selling land through the market. They use the example of a divorced women returning to her village asking her brother for a piece of land, which he refuses. He made this refusal based on the claim that he bought this land through the market. When land however, is being handed down within the lineage of family, “customary obligations are attached to these lineage lands, in particular, obligations to redistribute land in favour of land-scarce kith and kin” (Andre and Platteau, 1998 p.31).

Another example is that a father can resist the use of a piece of land to his sons because he purchased his land through the market and no longer feels the customary obligation to share his land with his sons. Serious tension can arise in these situations for instance when children claim the land is too big for their father to manage by himself or when the father decides to rent the field to ‘strangers’ while the children do not have any land themselves. More tension arises between the generations when for example a father has to bail out his son from prison or has to ‘give’ land to someone who has been robbed by his children (Andre and Platteau, 1998). “Hostility from the sons is generally all the more violent as they are convinced that caring strangers are opportunists guided by the secret hope on inheriting their father’s land upon his death” (Andre and Platteau, 1998 p.36). Though the authors acknowledge that the reasons to the civil war were extremely complex they do argue “the prevailing state of extreme land hunger created a troubled environment which made the most desperate people ready to seize any opportunity to change their present predicament or reverse the present order of things” (Andre and Platteau, 1998 p.38). It could explain “why violence spread so quickly and so devastatingly throughout the countryside” (ibid.).

Norgrove and Hulme (2006) have written an interesting article about state management of a national park in Uganda through law enforcement and participatory strategies, which is characterized by conflict due to the incompatibility of development aspirations of local people and the preservationist objectives of park authorities, lacking supportive constituency for conservation by local inhabitants. However, policies of inclusion do not result in renegotiation of the

conservation agenda, with the result that “participatory park management strategies were unable to change the relationships that exists between managers and neighbours from conflict, to one characterized by acceptance, negotiation and compromise (Norgrove and Hulme, 2006 p.1095). The authors distinguish two different types of resistance: day-to-day resistance low profile cover struggles and hybrid forms of resistance, combining overt forms and weapons of the weak. “Strategies have included token negotiations and signing of agreements; non-cooperation, poor accessibility perhaps purposefully maintained and threat of violence against park staff; and the use of social and political relationships” (Norgrove and Hulme, 2006 p.1107).

For example, in 2000 it was decided that a neutral party should retrace the park boundary. The locals under pressure of the park managers and park neighbours marked a ‘mutual acceptable’ boundary. However, the park’s senior management did not agree with this negotiated boundary and cancelled the contract. The *Bamasobo* responded by further fabricating histories, challenging park records and throwing water on the road as park vehicles approached, which made it very hard or impossible for vehicles to pass by (Norgrove and Hulme (2006). The authors also address that the situation is not a clear-cut hegemonic/ counter-hegemonic struggle between park staff and park neighbours. Park staff sometimes used military force to pursue their goals, but at other times park staff collaborated with the park neighbours, breaking rules and deviating from official management objectives for their own benefit.

To conclude this part, I like to emphasise that struggles over resources are diverse and very complex. Actors make use of different networks and relations, which benefit their short-term and long-term needs. Actors have the option of using different (be it legal or illegal) means or normative repertoires to justify or legitimize their claims. Besides that, there might be much more at stake than the issue of the resource itself. Conflicts that seem to be conflicts on natural resources might actually have more to do with local politics (Turner, 2004).

The relevance of a disaggregated approach to the study of conflict and the role of resources is that for instance in the case of Rwanda we learned that how individualization of land rights, unassisted by any process of titling or registration at the state level, can result in extreme forms of violence and conflict (Andre and Platteau, 1998). However, some of the solutions (technical, institutional innovation and agricultural intensification) that Andre and Platteau (1998) conclude with do not seem very useful to me in order to solve these problems. In my opinion Turner (2004) offer a much better theoretical framework to tackle the violence and conflict that’s being associated with natural resource claims.

In my opinion the “idea of a disaggregated approach” could be very useful, nevertheless the implementation of such an approach in practice may result in diverse outcomes, based on after understanding of all claims; how far actors are willing to negotiate and compromise their claims. When actors have conflicting claims and are not able or willing to negotiate further as illustrated in the case by Norgrove and Hulme (2006) resistance and conflict is not likely to make place for acceptance and new compromised policies. “Park managers sought to use both old and new strategies to engineer coercion and consent and obstruct the efforts of local people to pursue their development initiatives. Park neighbours responded by continuing to practice both overt and covert resistance to the park” Norgrove and Hulme, 2006 p.1095). But, perhaps, if local peoples needs and ideas could be seriously taken into account (not only listened to and ignored when it comes to re-negotiation processes of the policy and practice of a national park) managers of national parks could be able to adjust the policies in a way that conservation of a park could go together with sustainable use of resources by local inhabitants of the area. However, if ideas remain too diverse and

development goals too wide apart, it is very unlikely for even with a disaggregated approach to come to a settlement which leads to complete acceptance by all actors involved in such a struggle.

As has been illustrated by other authors (e.g. Turner, 2004) struggles over resource conflicts might actually go over other struggles, (such as broader political resistance to the government parties or other power struggles) but even when such struggles are unravelled with a political ecology approach, it still depends on the actors willingness to negotiate their claims and the outcomes of such negotiation processes whether conflicts can be brought back to conflicts with a less violent character.

2.6 Indigenous knowledge and development projects

Many authors understand the terms indigenous knowledge (IK) and local knowledge (LK) as an essential ingredient in any sustainable development strategy, as well as having applications in industry and commerce. These terms are also used in Community Based Natural Resource Management (CBNRM) and Participatory Rural Appraisals (PRA). PRA is an approach used by many international and (non-) governmental organisations involved in development work. PRA aims to include the opinions, ideas and knowledge of local people in the managing of development projects. It is very difficult to make a distinction between information and knowledge, and between official 'community' knowledge and local knowledge. Knowledge is not something that's kept in a box, waiting to be opened whenever a project manager pays a visit. Most of the time one is not even aware of what exactly is your own, specific knowledge on things. It's so imbedded and common that it is hard to imagine someone else does not know about the same things as you do. While at other times you are very aware that people indeed have an interest in your specific knowledge, and you might feel you prefer to keep such things to yourself. Whatever the specific individuals feelings are: "Information does not just exist "out there" waiting to be collected or gathered, but it is constructed, or created, in specific social contexts for particular purposes" (Mosse, 1994). It is not easy to get insight into local knowledge from a locals' viewpoint, especially on a short-term basis. The question is whether project workers using PRA can collect this kind of knowledge.

Knowledge becomes information through 'official interaction'. Knowledge becomes information for the "official" collector, e.g. a civil servant or a NGO project manager, usually for documentation or project implementation. But knowledge is not accessible or understandable for everyone and quite often people only hear what they were looking for in the first place. "PRA are far from providing a neutral vehicle for local knowledge, they actually create a context in which the selective presentation of opinion is likely to be exaggerated" (Mosse, 1994). The people that are "heard" are the ones that provide the project managers with their local knowledge, thus becoming a source of information. This information might be used (and is often exaggerated) to attract donors for a particular project in the village. "PRA are contexts in which certain types of knowledge is generated but in which other types of knowledge are occluded" (Mosse, 1994). Indigenous knowledge cannot always easily be "collected and formalized" as intended by practices such as with PRA. There might be many reasons why local knowledge will not come to the ear of the project manager. People trying to set up PRA could be perceived as outsiders, not a member of the community. It might be that certain information is not spoken about out loud, for instance about the knowledge and problems of women within such a community or that the local government, chief or authority does not like to share this information.

“PRA can contain informal exercises which often involve setting up contexts which are in social terms highly formal” (Mosse, 1994). Even and perhaps especially when PRA make use of so called ‘community meetings’, which are perceived by practitioners of PRA as informal, might be perceived by villagers as something very formal instead. Not everyone might be used to have a say in making certain decisions or raising particular issues and questions in public. “Information for planning is shaped by relations of power and gender, and by the investigators themselves... women’s access to the ‘public’ of the PRA would vary with age, marital status, residence, religion and class” (Mosse, 1994). Once I was attending a ‘village meeting’ organised by an NGO in Thailand. The only woman from the village who attended the meeting was the wife of the chief. Quite often when such ‘incomplete information’ is collected this is used as ‘the community’s information’: “PRA tend to emphasize the general over the particular, tend towards the normative and towards a unitary view of interests which underplays difference” (Mosse, 1994). Thus much might depend on local authorities, still, usually community leaders know very well how to “trigger” the different interests: the interest of the villagers, the government, the “projects interest” and the interests of his own family.

PRA can be the source of many feelings of unease and awkwardness amongst villagers. Villagers might feel obliged to act in certain ways. In particular to speak up in public about issues they are not used to, and which might make them feel ashamed, disappointed or perhaps afraid to embarrass or insult other members of the community. Than the good intentions of ‘democratic’ PRA might not been perceived as such at all. This might lead to frustrations on both sides, of development workers and local villagers.

People who work with PRA often wonder about why so little members of a community have attended a meeting. While villagers might feel that it is not in their position to attend, they might not have the time, they do not feel a need or it might even be that no one has informed them about that such a meeting was held. Sometimes the people working with PRA for instance the interpreters have a different background than the villagers (e.g. they might come from a big city). Different social and cultural backgrounds might imply the use of a different language or a different way of the same language. Language barriers are often a big struggle during community meetings and interviews with local people. It also depends on the community’s or local authority’s recent experiences with “outsiders”. When people feel to be used, exploited or abandoned it is very unlikely one would feel comfortable to share ideas and opinions with such a ‘stranger’ once more. Quite often local people have been in contact before with other projects. Established relations between an organization and local people have an impact on future collaboration between villagers and researchers or project implementers.

The quality of local knowledge is important for rural development because according to Ellen and Harris (2000) it is good to use multiple sources of information in order to design a development strategy. They are using the example of Fairheid and Leach (1996) Scientific knowledge (SK) versus indigenous knowledge (IK), to explain that in some cases IK is being perceived as using resources in a wasteful and damaging way, while this does not necessarily have to be the case in the complex realities of every day life. Usually in an inhabited area nature is managed and reproduced by humans. They are changing nature in a way that it is best usable, beautiful and practical to them. Sometimes in a degrading, wasteful way, but at other times creating new and broader fields of vegetation.

Authors approach the term from different perspectives. Ellen and Harris (2000) concentrate on the transfers of ideas between different groups and context in developing countries. They focus on the meanings and made a list of 10 more commonly asserted characteristics of indigenous knowledge.

IK emphasizes the personal, the specific and the situational. They stress it could be in danger of becoming a depersonalized, objectified concept which, used as a top-down approach to development, may lose its agency and efficacy once a new trend is established. Ellen and Harris explain what role it plays in “green” arguments and scientific political discourse in general. They do not claim that SK and IK are equal, but that there will always be an interface between this kind of expert knowledge and real word situations. “A baseline for universal reason exists and that in all traditions it is driven by shared human economic needs and cognitive processes, also they are activated and expressed in different cultural contexts.” (Ellen and Harris, 2000).

It is important in which way local knowledge is being used. Local knowledge used by whose view, and in which context? Those who wish to document it are mostly from Western elites or other outsiders. States and NGOs have both sought to protect indigenous rights to such knowledge but have also used it to pursue their own wishes and interests. Some authors (Ray, 1999) explain how indigenous knowledge can be used for development project to secure funds. Generating local participation in the project in order to construct a territorial identity could meet some of the peoples needs in an area as well as those of policy makers, but might be a much more difficult process than how it is written down in Ray’s article which focuses on projects within Europe. It might face more and different obstacles with projects and programs in developing countries. During my practical in Thailand (2005) I have seen several times how projects were being forced upon people to secure funds, showing pictures of smiling children to donors in order to continue this money flow. I agree with Roy that sometimes this does not imply that people do not benefit at all, but the fact remains that it does disappoint many people’s expectations indeed.

The quality of local knowledge is important for rural development projects because it looks inwards to discover, recover or invent the identity of the territory (Ray, 1999). It looks inwards to find useable resources from that specific location from which define development can be generated. By bringing these potential resources into being and thus available for use, by focusing on what makes an area unique and of value to the local people and how this could contribute to peoples well-being, the development trajectory options available can be defined. Ray explains that the aim of territorial identity construction is to devise strategies and put in place structures that enable the locality to mediate more effectively exogenous forces that historically have undermined the socio-economic well-being of a community.

New units of socio-economic and cultural development intervention can be very interesting, but finding a market for these services and products is not always the easiest thing to establish. Infrastructure in developing countries is often not optimal for transporting goods or easily accessible for curious people that would like to visit such a place (see documentary supporting this thesis). The social changes that might take place in such ‘developed villages’ might not even been perceived as positive by the villagers themselves (e.g. disrespectful tourists). The new services and goods that have been developed should also be able to compete with other products in the area. When 10 communities in an area start ‘empowering women’ by starting a handicraft project it can be a very profitable product, but when 50 communities tend towards such a development it might be more difficult to find shops that want to sell these goods. Likewise, but in a more positive perspective, one company’s success can attract other business. For example when a region has a certain historical monument, special architecture or a beautiful landscape that people would like to see it could also use certain experts in that field such as tour guides. People might want to sit down for coffee (café/restaurant) or want to spend a few days in that area (camping/ hotel). Thus one specific, unique resource can attract several options for development.

2.7 Who will profit in either case from a localized focus?

Many authors who write on PRA see potential for everyone with an innovative mind. People can benefit from generating local participation in the project in order to construct a territorial identity that would meet peoples own needs as well as those of policy controllers, and the political agendas of any regional or national government. But usually not everyone has access to, or ownership of resources that enables participation in a development program. Some people involved in such practices will benefit more than others, and there are often some people that are worse off than before. All these issues depend on the many different voices that claim to have this specific local knowledge of that place and how villagers can claim their rights over this knowledge. Ellen and Harris (2000) alert it could be in danger of becoming a “depersonalized, objectified concept” that used as a top-down approach to development may lose its agency and efficacy once a new trend is created. When states, NGOs and other interest groups ‘help’ local people to set up their identity or businesses, they might become dependant upon their ‘help’ and thus not set up a self-sustained development, but rather one that continues to be dependant on outsiders help. In that case these specific development agencies will benefit more than the people itself, because by ‘helping’ local people they will stay active within that area.

Whether and how Indigenous knowledge and culture might differ is often ignored. More than often projects are designed in the “interest or benefit of the community” which is already conflicting in itself, since there exist multiple viewpoints within a community, within a family, and sometimes even within one single person. So how are “outsiders” to develop a project that will be in the interest and benefit of all? If you only record what you see what people do and not fully understand why people do it, it will most likely lead to wrong interpretations. If employers of development organizations not see the “interconnections and co-existence between empirically and symbolically motivated criteria, within any system of knowledge,” (Ellen and Harris, 2000) then how could they properly provide assistance to these local communities?

Also problems with corruption can constrain good initiatives and inventive ideas for local services and businesses from coming off the ground or for them to continue to move on in a more self-sustained way. It might be that in some ways (local) governments or other forms of authorities benefit more than the majority or the poorest of the villagers themselves.

PRA often faces problems getting hold of local, indigenous knowledge. “PRA are rather than informal exercises often involve setting up contexts which are in social terms highly formal and can be the source of much anxiety among villagers” (Mosse, 1994). Whether and how local knowledge and culture might differ is often ignored. How and who claim their rights over this specific local knowledge is another important point.

It is important to address in which way local knowledge is being used. Local knowledge documented by whose view, and in which context? And why should it have to be documented in the first place? Those who wish to document it are mostly from Western elites. States, global research institutes and NGOs have both sought to protect indigenous rights to such knowledge but have also used it to pursue their own wishes and interests. Often local knowledge is mistaken and incorrectly interpreted by global scientists. This is well illustrated by Bodeker (2007) who written on how the use of a Chinese traditional medicine to treat Malaria were mistakenly documented. The side effect from the Chinese anti-malarial was that it caused severe nausea, which lead to the resistance and disuse of the drug in the West. “However, at least three of the other ingredients in the classical formulation studied in China in the mid-twentieth century would seem to be candidates for offsetting the emetic properties of *changshan*” (Bodeker, 2007). All of the other missing ingredients were proven to be effective against nausea (e.g. ginger, liquorice and betel nut). “Bodeker argues

that medicinal researchers must accord equal status to traditional healers when working on herbal medicines, and not allow science to dominate, as such power differentials can fatally undermine research, as illustrated with *changshan*, the Chinese anti-malarial" (Sillitoe, 2009).

Other authors (Sable, Howell, Wilson and Penashue, 2007) argue that both the local people and global scientists can benefit from each other's knowledge. Generating local participation in the project (e.g. in order to construct a territorial identity) could meet some of the peoples needs in an area as well as those of policy makers and global scientists. Sable, Howell, Wilson and Penashue (2007) argue that local people can benefit when following six indicators. "Each of these questions could be developed into an indicator, or a measurable value.

1. Have all the people been engaged in defining the motivation to undertake the project?
2. Does the research serve the community as well as the investors? Who is the ultimate beneficiary of change?
3. Who is defining the knowledge that is being gathered and documented? Is it inclusive of all stakeholders?
4. Who is governing the decision-making process and to what ends?
5. To what extent have avenues of communication, e.g., different languages, been included and respected?
6. To what extent have cultural land use practices and values been included in co-management agreements?" (Sable, Howell, Wilson and Penashue (2007).

These six questions look quite interesting and could work for some specific cases. However, I remain quite skeptical about the implementations of such indicators and the actual benefits for local people in sharing their knowledge in general. Whether local science and global science can profitably inform each other in terms of sustainability and development issues is one of the main themes in the documentary supporting this thesis. Apart from whether or not this is possible, if improvements are to be made it should focus on how local knowledge is gathered. "PRA needs to be complemented by other methods of 'participation', which generate the changed awareness and new ways of knowing, which are necessary to locally-controlled innovation and change" (Mosse, 1994). This could perhaps be done by using informal ways of communicating knowledge such as making use of stories, poetry, sayings and music (songs). In this way people might not feel so obliged to speak directly about certain issues as they would in arranged local 'public meetings'.

Local knowledge can contribute to scientific knowledge, especially in the case of finding new medicine. The case of *changshan* also shows how local knowledge does not "allow for generic categories divorced from space" (Bodeker, 2007). And probably the preparation (environmentally, seasonally and perhaps spiritually) of other local medicines differs greatly from the chemical medicine preparation in the West. "It is not a case of being right or wrong, but of radically different world views and epistemologies" (Sillitoe, 2009). As Ellen suggests, "the real issue is dealing with the diversity and dynamism that characterises human understanding" (Sillitoe, 2009).

There is already so much confusion between people sharing similar life-worlds. But confusion at its best can lead to discussion with sharing different views from which both persons can learn. So, could local and global science profitably inform each other in terms of sustainability? I wonder, but definitely not in a short-term setting. Does this imply more work for anthropologists who prove to be considerate of diversity and dynamism? I am not so sure, after all researchers are often annoying

to local villagers and as long as locals did not ask for their help (as in the Innu case) I remain skeptic about how we can assure that sharing knowledge in terms of development and sustainability will bring benefit to local practice.

Chapter 3 Case study on Dhasingare in Dolakha, Nepal

Aromatic *Dhasingare* (Wintergreen, *Gaultheria fragrantissima*) oil is used as flavour in the confectionary industry, in soft drinks, in perfumery industry; and in aromatherapy as an antiseptic, anti-rheumatic medicine. The case study on *Dhasingare* has been carried out by means of participant observation and semi-structured in-depth interviews⁷ with key actors. During the fieldwork I note my observations and feelings down in a field diary. The in-depth interviews were recorded on camera from which I selected several opinions from different actors active in the field of the sustainable use of medicinal and aromatic plants in Dolakha, Nepal. Secondary data and literature has been taken into account to back up an argument and to analyse the data.

3.1 Case study analysis

As Leach et al stress, “dynamic views of communities and the environment have important implication for analyzing the links between people and the environment, raising a very different set of questions from those addressed by conventional narratives around CBNRM” (Leach, Mearns and Scoones, 1999). For the analysis of the case study it is important to question: “How does natural resource use by different social actors transform different components of the environment?” (Ibid, 1999). Other questions of my focus are: Which social actors see what components of variable and dynamic ecologies as resources at different times? How do different social actors gain access and control over such medicinal resources? And which roles do the “the theatre of conflict” entail for the actors involved in *Dhasingare* oil production in Bulung, Dolakha Nepal (Turner, 2004)?

3.2 Dhasingare leaf collection

In the village Bulung, in Dolakha Nepal, *Dhasingare* leaves are collected by villagers mainly by women and high school children and are used to produce *Dhasingare* oil. Most men were ploughing during the time of the fieldwork, which is strictly a men’s job. Not all villagers have the time to collect *Dhasingare* leaves; most of them are quite occupied with farming all day. The oil is fabricated in the recently newly established oil factory in the village. In this particular case the trader is a local villager, but there are many cases when the traders comes from outside the village. The factory is located outside the Community Forest; cause the trader could not get a permit to establish his factory inside the Community Forest. The trader has asked local villagers to collect the plants in return for money. At the moment the villagers were receiving 1.50 Nepali Rupees per kilo *Dhasingare* leaves and 2 Nepali Rupees per kilo for firewood. But these prices are fluctuating constantly. The trader did mention that he gives a higher price for *Dhasingare* leaves (2.00 Nepali Rupees) when villagers have to come from far away.

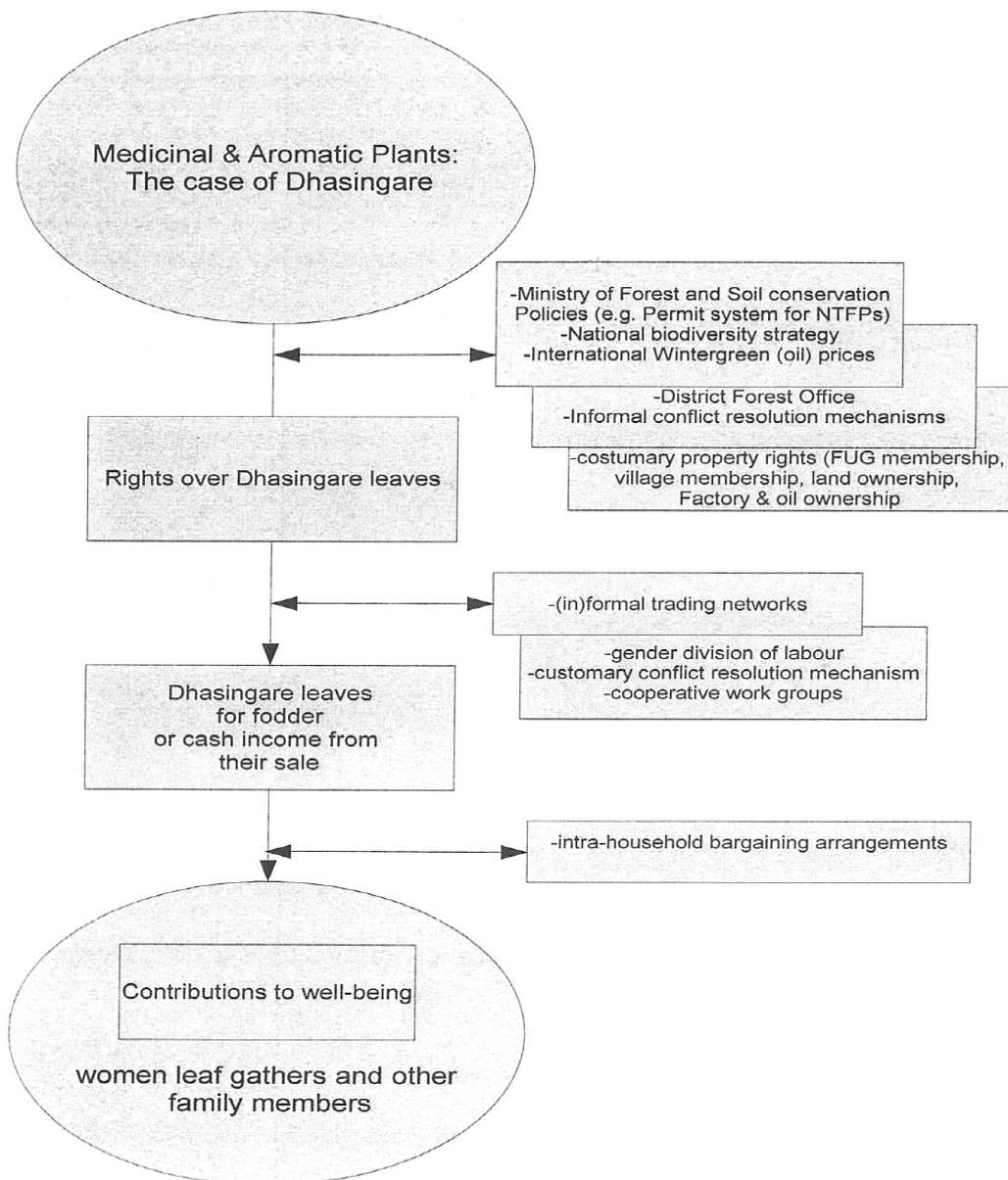
The collected leaves are being thrown in front of the factory and are being weighed. The leave collectors receive their money. After the gathering of leaves, the oil production process takes about 12 hours to complete. Two factory employers throw the leaves inside the vessel above a high fire. Water is added to the leaves. After some time, when all the leaves are inside the vessel, the vessel is closed. It needs to boil for about 10 hours. The vapour passes through a cooling chamber and is collected to filter the oil out of the water. Oil weighs heavier than water and after stirring, the oil sinks down and the water can be thrown out. In the early morning the trader comes back and

⁷ For a look at the interviews please see Appendix IV.

collects the oil from the basin. About 2,5 to 3 Litres of oil can be produced per day. The trader earns about NRs 850 per Litre of *Dhasingare* oil.

The leaves become endowments (people gain rights over them) in different ways. The leaves are usually the common property of a village, with an actor endowment mapping depending on village membership. Where they occur on farmland, collection rights are acquired through membership of, or negotiation with, the appropriate land-holding family.

Figure 3.1 Dhasingare leaf collection in Bulung, Nepal



For some endangered medicinal plant species, traders need a permit system to use them. For *Dhasingare* however the latter is not the case. Right now *Dhasingare* can be found anywhere along side the road, on fields and in forests. The particular sets of endowments, entitlements and capabilities discussed, and the relevant institutions, are summarized in Figure 3.1.

In my opinion the extended entitlements framework analysis by Leach, Mearns and Scoones (1999) is too simplistic. It was clear that the “contributions to well-being for women leaf gatherers and other family members” could not be a clear-cut end of the analysis for the *Dhasingare* case in *Bulung*.

3.3 Which social actors see what components of variable and dynamic ecologies as resources at different times?

The set of entitlements derived from *Dhasingare* leaves may include the direct use of the leaves as fodder for cattle or cash income from their sale to a trader to make aromatic oil. Most villagers involved in the gathering of *Dhasingare* leaves, collected them only after a trader asked them for these plants. Locals sell them as an important source of seasonal income. “In entitlements mapping, both labour and marketing issues are important. Women may have to negotiate with their husbands and co-wives, in relation to other farm work and domestic duties, for labour time to collect the leaves” (Leach, Mearns and Scoones, 1999). During the interviews we also talked with many farmers who did not find the time to collect *Dhasingare* leaves as an extra source of income. Though, some of the high school children were collecting leaves on Saturdays.

Previously, before the establishment of the *Dhasingare* oil factory the *Dhasingare* leaves were fed to cattle (goats). Especially the landless villagers depend on collecting these leaves to feed to their goats. Since the establishment of the CFUGs the CFUG made a rule that it is forbidden to let cattle graze in the forests and thus villagers have been to collecting leaves to feed to their cattle themselves. Some villagers mentioned that now they have to search longer to find fodder for their goats, while others said the exact opposite. For some people the conservation of *Dhasingare* leaves for aromatic oil production may mean that they have to collect other kind of leaves for their goats. Some villagers told me they could not collect enough fodder for their goats and that some of their cattle died due to starvation. This is a very sad reality, but could also be seen as an example of Turner’s “theatre of conflict”. In order to dramatise the outcome of the shift in power, this could be a way to gain support for their interests to access the forest whenever they want and with their cattle.

3.4 How does natural resource use by different social actors transform different components of the environment?

The various elements in the extended entitlements framework are continuously changing over time. Therefore, Leach, Mearns and Scoones (1999) introduce a ‘dynamic, historical perspective’ over different time scales. “In the process of actors gaining legitimate, effective command over a resource bundle, negotiations over labour or land may take place which in turn transform the nature of certain actors’ land or labour rights. Over longer time frames, a process of commoditization of certain resources might serve to increase the role of the market as a key institution in endowment and entitlement mapping” (Leach, Mearns and Scoones, 1999).

One might think that the group of landless people with goats could collect *Dhasingare* for oil and with the money they receive buy food for their goats. On the contrary, most of the farmers told me that they do not have enough time to collect the leaves as an extra source of income because they are too busy with farming. The landless quite often work on the fields of others. The village chief told me that they have special rules and regulations for the 'poorer group' of their community. The rule today is that once a day one member of the family can gather as much fodder and firewood as he or she can carry out of the Community Forest. When 'poorer villagers' ask him for permission to get extra fodder out of the forest they will make special arrangements. The chief also informed me they have special 'loans' for the people in need. This also implies that the new rules on community forest conservation made landless people more dependant upon local elites.

Commercial harvesting of some medicinal plants in Nepal (e.g. *Loth salla* (*Taxus wallichiana*) and *Chiraito* (Chiretta)) led to over-collection for the export trade (Source: <http://rbg-web2.rbge.org.uk/nepal/> visited on June 12, 2009). "Marketing effectively depends on establishing a regular relationship with village based or visiting traders who will guarantee a 'reasonable' price even at times of year when the market is flooded" (Leach, Mearns and Scoones, 1999). During the fieldwork villagers often mentioned that they have no idea about what traders do with the medicinal plants they collect and what are 'reasonable' prices for the collection of medicinal plants. Some villagers also mentioned that they would like to learn more about the uses of medicinal plants so that they could use it for themselves. It seems there is a need for more transparency about the trading process of medicinal plants in Bulung.

3.5 How do different social actors gain access and control over medicinal plants?

Policy makers are trying to control the forest by law and manage the forest scientifically. Though, at the local level, different 'laws' may be applied to the control and use of medicinal plants. Villagers collect plants for their own use. And during different seasons, depending on when the plants are ready to harvest, traders ask villagers to collect plants for them in return for money. A shift in legislation in Kathmandu may not immediately be applied at the local level. Even when actors become aware of that certain things became 'illegal', it is extremely difficult to control illegal trade of endangered plant and animal species at a high altitude. If a trader would offer the local farmers money (which in his or her case may seem a lot of money) to collect a medicinal plant from the village this may be a very interesting offer for local farmers. At some times traders also come to the village and collect plants themselves, with or without permission or payment to the local villagers. In this case, the first situation (to receive some money) seems a much better situation for the local farmer than the latter.

Access and control over medicinal plants have got much to do with knowledge on plants (on which I will elaborate more in the discussion, chapter 5). For instance: the knowledge about the location of plants, the use of plants, the preparation of medicine from plants and the market. Besides botanists and other scientists; Hindu priests, Ayurvedic doctors or local spiritual healers such as "*Dhami*" or "*Jhakri*" would know a lot about the use of medicinal plants. But also farmers, male and female, have particular knowledge about medicinal plant species to treat their illnesses. Being a member of a village community gives one user right to access the Community Forest and to harvest plants. When a farmer owns land it is possible to grow medicinal plants on his own field for sale and for own consumption.

The paradox of illegal trade

To forbid the collection of a certain good creates, as long as there is a demand for the good, illegal trade and thus feeds crime. As we say in Dutch: “*Verbod schept handel*”. This goes for many goods such as the illegal logging of wood, drugs, endangered animals- and plant species. As long as people become ill there will be a demand for drugs and medicinal plant species, endangered or not.

3.6 What roles do the “the theatre of conflict” entail for the actors involved in *Dhasingare* oil production in Bulung?

At certain times, some actors have more control over resources than others. Every person has his or her own agenda and power struggles are changing constantly. Actors have social relations with other actors through family bounds (by birth or by marriage), through friendship, village area or work. Farmers in Nepal are using their social relations (good and bad relations, power, kinship, political) and legal resources (law, courts, District Administration Office, District Forest Office or village councils) to pursue their claims. Actors have the option of using different ‘legal’ orders or normative repertoires to justify or legitimize their claims. “The normative order they choose depends on which legal order they believe best suits their claim at that particular time” (Pradhan and Pradhan, 2000). This can be seen through the different opinions and statements actors made during informal conversations and the in-depth interviews that were recorded by video. For instance a government representative will emphasis the need of funding new projects, a business men will emphasis on the laws that need to be revised related to better market conditions and an NGO employer will stress on the importance of the support of the ‘rural poor’.

Environmentalists and botanist base their arguments on the protection of biodiversity, the lack of documentation and conservation of medicinal plants. “All plants have their uses and we have to identify those uses. Researchers and institutions have documented about 50 to 60% of the medicinal plants in Nepal. But still, there is a lot to be done” (Botanist Kathmandu, 2009). A primary schoolteacher stressed on the level of illiteracy in her village and argued for the improvement of the educational system and on incorporating awareness on medicinal plants in local schools. “Approximately 80% of the people in this area do not get any education. It would be good if they could increase education here. Public awareness is most important for them I think “ (schoolteacher Bulung, 2009). Local villagers and members of the Community Forestry User Groups argued for more transparency about the use and trade of medicinal and aromatic plants. “We feel sad when people come and take away our medicinal plants. If we could use it for ourselves it would be better. We want to know which plants are used for which purpose. We do not know how to stop the stealing of our medicinal plants. We do not have the time to stop the thieves because we have to work in our field” (local farmers Orang, documentary supporting this thesis).

A Community Forestry User Group chief will emphasis the growth of the forest after conservation, the easy access to fire wood and fodder for cattle for local villagers. “Nowadays people have sufficient fodder for cattle and firewood and we get medicinal herbs from our forest” (CFUG chief Bulung, 2009). While the landless farmers stress the importance of the lack of food and fodder of their cattle after the conservation of the forest. “After the conservation of the forest more than one third of my cattle starved to death, because I could not let them graze inside the forest anymore” (local landless farmer in Bulung, 2009).

Conflicts that seem to be “resource conflicts” are often conflicts about other things, things that are often more important than the actual resource, be it about local politics, a disagreement over a bride

price, the ‘forgotten’ payment of an farm employer, the need for funding or the control of the grazing taxes paid by outsiders. Some of the landless people were angry not just because some of their cattle died of starvation, but also because they feel they have lost the power to access the forest with cattle whenever they feel like it. If one does not own land and animal husbandry is the only source of income, a simple change of rules have a big impact on ones personal life. Now the landless need to establish ‘good relations’ with community leaders or other landowners to rent land from the Community Forest or one needs to search for other ways of extra income.

Thus, there is a shift in power relations, a stronger dependence on other actors with previously established, already existing relationships (some good and some bad). For instance one can imagine that certain actors (e.g. local priests’ or village chiefs’ relatives) have a higher income (or status) and own a plot of land. If a farmer did not make use of his ‘good relations’ with the family members that own land, because they previously could find enough fodder for their cattle in the forest; it might be harder or entail a higher price to rent land from them. “Resource-related conflicts are not simply struggles over resources but reflect a broader set of tensions within agro-pastoral societies, many of which have moral dimensions and which cannot be seen as simply derivative of in-the-moment struggles to subsist” (Turner, 2004 p.885). Instead they are the result of ongoing power struggles to maintain control over resources in the future (Pradhan 2000; Turner, 2004).

3.7 Women and healthcare

Many in-depth interviews confirmed that men ‘ought to know more’ about medicinal plants cause it are the men who are mostly involved in the trade of medicinal plants and other goods. Men exchange goods such as potatoes in Tibet for salt or medicinal plants and there they learned more about the traditional healing system. Very little is known about specific females’ knowledge on medicinal and aromatic plants. Although early Ayurvedic gynaecology was male-dominated, academic and oriented to the continuation of monarchies, women in traditional societies were not without health care (Crow, 2000).

“Folk medicine, which is the basis of much of Ayurveda’s herbal knowledge, has always been primarily in the hands of women. The knowledge of how to treat women’s health problems was passed on from mother and grandmother to daughters in an experiential tradition, requiring no academic education or formal medical knowledge. These traditions of home health care continue into the present day in almost every household in Nepal society; in many parts of the Himalayas, it is the only form of medicine available to women. In spite of Ayurveda’s patriarchal orientation, it is women who continue to provide the primary form of medicine within the family structure.

Over time I learned that religious dogma, derived originally from Vedic philosophy, is the root cause of the perpetuation of much of the suffering and sickness of women in Nepal and India. This is not the fault of the Vedas, but of their interpretation and application by men, for men. During my years of studying in Nepal, I had ten teachers; nine of them were men. The views of these highly educated individuals concerning women were naturally more informed than those of the average Nepalese farmer or Tibetan nomad. Nonetheless, their sentiments ranged from socially conservative and religiously orthodox to radically unconventional. Their comments were often permeated, either subtly or overtly, with the chauvinistic views of their culture-views that, when put into daily practice, affect the health and happiness of millions of women, children, and men alike, as well as the environment.

The failure of family planning programmes is one of the best examples of how the imposition of religious orthodoxy causes health problems for women. Birth control is rejected, especially in the Brahmin and Chettri castes in the villages, where cultural interpretation of Vedic philosophy dictates early marriage, desire for male children, multiple marriages if male children are not produced, and law against abortion. Religious beliefs also contribute to malnutrition by teaching women that they are not good wives unless they feed the husband and children before themselves. In the conditions of poverty which prevail in rural areas, this practice leads to widespread illness” (Crow, 2000).

“Asian medicines offer great hope for healing of individuals, society, and the natural environment, yet ironically their philosophies are embedded within religious and cultural sentiments that contribute to sickness and suffering” (Crow, 2000). Throughout the fieldwork I have not met with many women who were involved in healing rituals as medicine women. It could be that the absence of my female interpreter in the second stage of the fieldwork prevented me from talking more in-depth about female health care and healing rituals in the remote rural areas. My male interpreter informed me that knowledge on female health care has to be taught by another women, for instance the grandmother of the family. He also mentioned that there are separate rituals for male and female involved in healthcare and that it would be inappropriate for him to discuss the male healthcare rituals with a woman. However, some elderly male farmers did mention the medicinal plant *Satawari* or *Kurilo* (*Asparagus racemosus*), which was previously used to treat low milk production of women and cows after delivery.

“Deeply ingrained and infrequently questioned attitudes about the female body have serious negative impacts on women’s health. Women are taught to repress their emotions, deny the needs of the body, and avoid communication about their desires. Most women in Nepal are shy and inhibited about their bodies, many will simply run away from physical examination by doctors or wait until a disease becomes acute for seeking help. As a result, many women suffer unnecessarily with health problems that can be easily prevented and treated” (Crow, 2000 p.199).

Yet there is a lot to learn from ancient medicinal practices such as Ayurveda. “While the Hindu interpretation of Vedic philosophy has had unhealthy effects on women, Ayurvedic philosophy supports women’s health and wellbeing” (Crow, 2000 p.200). Hindu culture encourages marriages of girls at a young age. When girls are married they are expected to carry out heavy household responsibilities. Besides that “Pregnancy in girls whose bodies are not fully developed can lead to genealogical, obstetric, and paediatric problems, as well as deprive girls opportunities for education, thus perpetuating the cycle of illiteracy and suppression” (Crow, 2000, p.200). However, Ayurveda put forward that 22 is the optimum age for marriage for women.

And “Vedic philosophy as practiced in everyday life encourages women to accept frequent pregnancies as the gift of God... However, Ayurveda recommends that women conceive not more than once every three to seven years” (Crow, 2000 p.200). As Crow (2000) argues, observance of these Ayurvedic principles could reduce the suffering of mothers from too much child delivery, decrease infant mortality rates and stabilize Nepal’s population level.

In the rural areas women continue to be active in the preparation and collection of medicinal plants. In the rural areas of the selected villages in Dolakha it is mostly a women’s job to collect medicinal and aromatic plants. In Bulung and Orang it was mostly the women and children who collect *Dhasingare* to make oil. We were there during the time that farmers are ploughing and since it are only men who are allowed to do the ploughing, some of the women and children were involved in the collection of *Dhasingare* leaves as an additional source of income.

“As I became more aware of the medical and social problems affecting Himalayan women, I could understand why they would often agree that having a female body was an unpleasant experience. There was certainly truth in Amchi-la’s observation about women suffering, but his comments were inherently dangerous in their applications: the belief that women are “defective” and inferior is what ultimately causes the most detrimental impact on their health” (Crow, 2000 p. 203).

During the in-depth interviews it became clear that villagers spoke about ‘medicine men’ to us. We did not meet with a lot of women who knew a lot about medicine preparation from plants. However the women we met and who did know about it were very enthusiastic to talk about it (e.g. one of these women worked for an NGO and was involved in ‘women emancipation projects’). Another women, a female primary school teacher, taught me how to prepare and apply *Titopathi* (*Artemisia vulgaris*), which is used as a treatment against skin irritations and pimples. In Kathmandu we also

met with a few female students, doctors and nurses at the Ayurvedic hospital. “There are many traditional practitioners of Ayurvedic and Tibetan medicine in Nepal, fewer than one hundred are registered and licensed as doctors, and only four of them are women... Ayurvedic education in Nepal is still in an age in which “religious” men quit school in protest of attendance by female students, university deans discourage girls from pursuing careers, and teachers are grossly abusive” (Crow, 2000 p.208). As we have seen most rural women in the remote areas of Nepal are not without healthcare but could not properly carry out their needs through social repression. On the other hand it became clear that women are not without agency and are learning about medicine preparation from plants as well as attending a medical programme at a College or University.

“Has it always been like that in this society? “It has been like this in most societies. Don’t you think that in the bible women are taken as a commodity? It is only different in the most primitive societies. There the women have better rights and a better position. Rape is a disease of civilized society. There is nothing like rape in primitive society” (Crow, 2000 p.224).

Even in rural areas of The Netherlands today not all women have the same access to education as men do. One of my female friends was not allowed to study, unlike her brother, who got full financial support from their parents to finish his degree. No more than quite recently people perceive it as ‘normal’ for women to finalize their academic studies and pursue their careers. And even in this society men still earn more money for the same job than women do.

When we interviewed an Ayurvedic doctor in the Ayurvedic hospital of Kathmandu he mentioned: “Some patients arrive here without being able to pay for medical treatment. If we know which medicinal plant is useful to the patient and also if we know that the patient does not have money to buy medicine and if medicinal plants can be found near the patients home. We usually recommend to these patients with a low income that they use the medicinal plants near their home and we give them instructions on how to do this. If a patient has more money we recommend they buy manufactured Ayurvedic medicine” (Ayurvedic doctor, in documentary supporting this thesis). When people are able to make use of the medicinal plants near their homes they do not have to pay for more expensive healthcare in the hospitals.

3.8 Conclusions

It seems that the production for *Dhasingare* oil has some advantages and disadvantages for the villagers in Bulung. Some people can earn extra income during the winter season (from February) by collecting *Dhasingare* leaves. When traders give a ‘fair’ price this can be a good source of an extra income generating activity. However, for some villagers it seemed to be a burden since they needed these leaves to feed their goats. In theory all people can engage in the gathering of *Dhasingare* leaves for oil production. However in practice not all people have the time or the means to engage in this activity. Furthermore, on the international market, traders earn a much higher price for their product, in comparison with the local villagers who gather the leaves and are willing to sell their plants. Perhaps if local villagers would receive more information about the process of herbal medicine-, aromatic oil preparation and the international market prices they could acquire more voice and agency to negotiate about their resources in the future.

A parallel discussion goes for the conservation of medicinal and aromatic plants and the Community Forest. A shift in national rules and local regulation of the forests entail a broader set of tensions within Bulung, many of which have moral dimensions and which cannot be seen as simply unrelated contemporary struggles, instead they are the result of ongoing power struggles to remain control over resources in the future.

If local people themselves make use of MAPs it could support self-sufficiency of people living in rural areas, and a decrease of dependence on extern (allopath, often expensive) medicine and (Western) healthcare systems. Perhaps the collection of these plants could also benefit rural populations as an extra income generation activity. And the incorporation of ‘traditional’ Ayurvedic philosophy could support women’s health and wellbeing in Nepal.

Chapter 4 Survey

The survey documents a diversity of medicinal plants and its uses by local people in the selected villages. Second, it tries to confirm a decrease of local knowledge on medicinal and aromatic plant uses (H0). However, my data is not sufficient to generalize for all members of the Forest User Groups in Dolakha district in Nepal. Nevertheless it could be used to say something about the selected villages. Third, this survey notes down local peoples' opinions on Community Forest conservation and Forest User Groups.

4.1 Methods

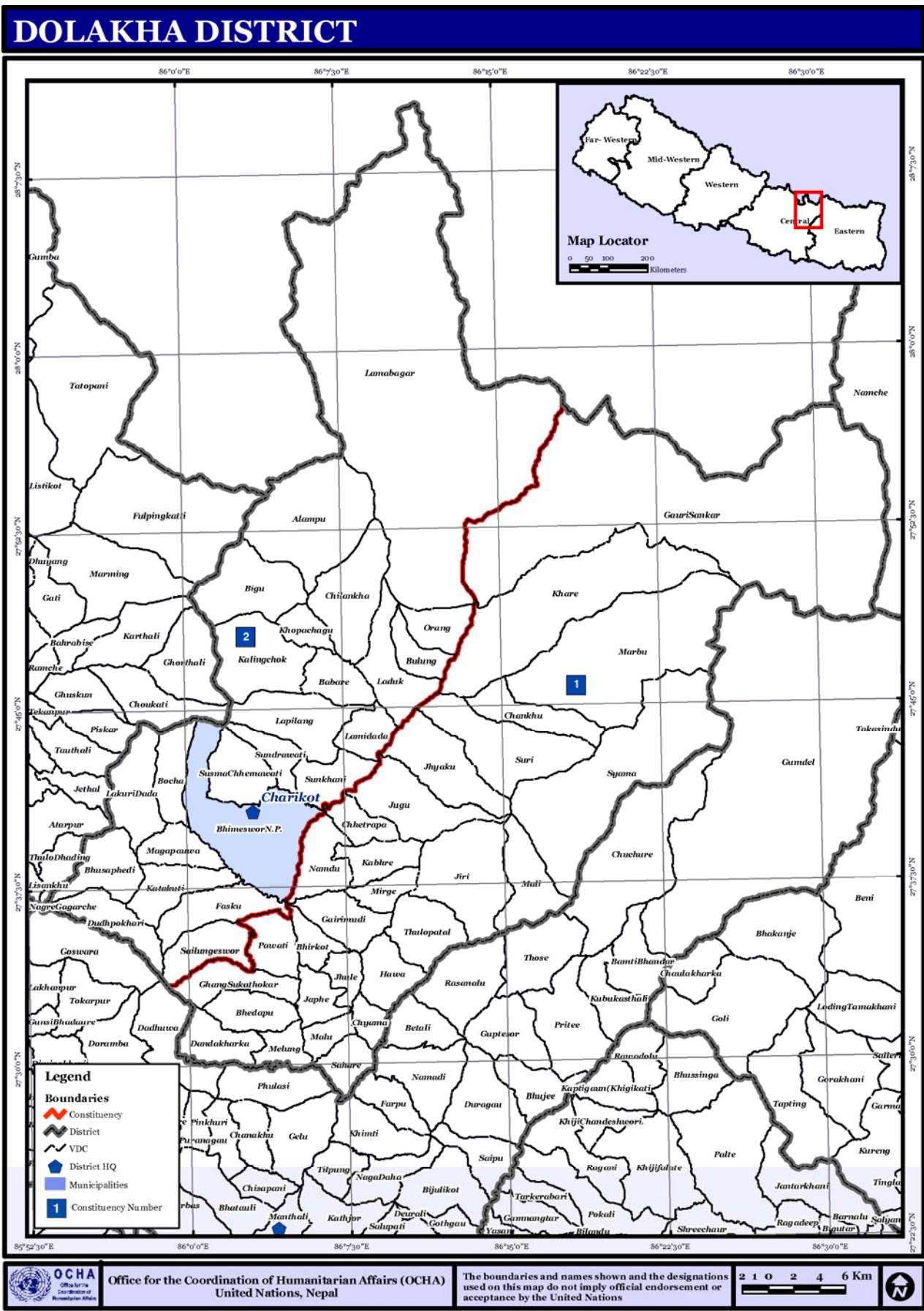
First I designed the survey questionnaire with seven questions related to Forestry User Groups, medicinal and aromatic plant use and collection. To see a copy of the survey questionnaire please see appendix IV. The first question collects general information of the interviewee, like, age, sex and occupation. The second question collects data on medicinal and aromatic plants (MAPs) and its uses. Question 3 inquires about changes in collection of MAPs since childhood. Question 4 inquires about changes in collection of MAPs since the establishment of the Forest User Groups (in the last 6-7 years). The last 3 questions are control questions and check whether the first questions were understood and answered correctly. The control questions ask the interviewee to agree or disagree with certain statements and to elaborate on their opinions.

Before the fieldwork I prepared a two-days training course⁸ for my interpreters on ways of interviewing, sampling, probing and the use of camera. We discussed about the survey questionnaire and tested it out in Kathmandu. I selected one male and one female interpreter as I imagined it would be easier to interview the men and women separately. After a 2-days practise we left to the field. First we went to Lakhuri Danda to carry out the survey and returned back to Kathmandu. My interpreter went for his studies to Australia and could not come along the second time. I had to find 2 new interpreters. Unfortunately after training the 2 new interpreters I got Cholera and we had to postpone our trip. One of the interpreters could not make it after I postponed the fieldwork so I left with one interpreter to the field. We visited a *Dhasingare* (Wintergreen) oil factory in Bulung. There we witnessed how oil was made from Wintergreen and who collected the leaves. Besides interviewing villagers we also carried out in-depth interviews with medicinal plant traders, a schoolteacher, leave collectors, a botanist, a landless farmer, an Ayurvedic doctor, Community Forestry User group chiefs and village chiefs.

In Kathmandu I went to the CBS to search data on village names and household numbers in Dolakha. But I could only find data on the total number of the population in Dolakha and the data was quite old. I became familiar with the FUG names in Dolakha through the Nepal Swiss Community Forestry Project. It was a bit frustrating when it turned out that there were more Forest User Group households in Lakhuri Danda than the total number of the households in Lakhuri. This hindered me in calculating the sample size for my survey questionnaire. Some households were members of more than one Forest User Group. It could also be that some of the numbers were put higher in order to receive more support for conservation of the Community Forest.

⁸ To read a copy the training manual please see Appendix VII

Figure 4.1 Map of Dolakha district, Nepal (Source: wikimedia.org)



When I went to visit the DFO and mentioned this problem to one of the employers who was very helpful; he assured me that in the selected villages that were difficult to access I would not find any 'double membership'. Thus, we made copies of the household lists from Bulung and Orang, made a sample and went on our way.

The fieldwork was carried out with the help of a guide from FECOFUN, and 2 interpreters from Tribhuvan University. On our way we met with a porter, who carried our bag on the way down when I fell ill. We also rent a horse for one day to carry some of our equipment.

4.2 Hypothesis

After consulting various literature on Forest User Groups and sustainable harvesting practises in Nepal it became clear that authors argue that many medicinal plants and its indigenous knowledge on plant use was vanishing and that these plants and its knowledge should be documented and protected. "Along with the deterioration of natural resources, the cultural heritage of medicinal plant use disappears as well. Much of the indigenous knowledge concerning Nepali's plants is now dwindling and largely only retained by village elders" (rbg-web2.rbge.org.uk/nepal, visited on 15 November, 2008).

One of my research questions for this thesis is "Is the knowledge on medicinal plant use decreasing? And if so, is it a problem and for whom"? In order to answer the research question it was necessary to find out whether knowledge on MAPs is decreasing or not. Therefore the following hypothesis is tested: "Local knowledge on medicinal and aromatic plant use in Dolakha is decreasing" (H0).

My initial plan was to see whether the younger generation of the selected villages have less knowledge on medicinal plants than their parents and grandparents. But by doing this a decrease in knowledge cannot be confirmed, because for example it could be possible that people learn about medicinal plants at a higher age. In order to find out whether knowledge on medicinal plants is decreasing a survey must be carried out at two different points of time so the data can be compared.

The hypothesis was tested by asking villagers if they know any medicinal and aromatic plants and if so, what are the uses of the MAPs (question 1 of the survey). The number of plants mentioned by the interviewee was counted and noted down in Excel with the rest of the survey questions. With Excel I made a few figures that point out the results. But before we could actually start the survey we needed to know how many households we had to interview. Therefore a sample size was calculated.

4.3 Sampling

A stratified random sample was used among Forest User Groups in Dolakha. The sample was stratified on Forest User Groups in Dolakha who are known to use medicinal plants. This information was collected with the help of different organizations, which include: the Forest District Office, the Nepal Swiss Community Forestry Project (NSCFP) and FECOFUN all established in Charikot. The sample was also stratified between villages who were easy accessible, moderate and difficult to access. The sample selected households in Lakhuri danda (easy accessible), Bulung (difficult to access), Orang (difficult to access) and Hawa (moderate accessible). Due to illness and the lack of time it was not possible to carry out the survey in Hawa.

Probability%		
2-tailed	1-tailed	z
68	84	1.00
75	87,5	1.15
80	90	1.28
85	92,5	1.44
90	95	1.64
95	97,5	1.96
99	99,5	2.58

Table 4.1 Selected probabilities and z values for one-tailed an two-tailed situations (Poate and Daplyn, 1993)

The following formula is used when it is necessary to find out whether there is a significant difference between the values of a variable for two different populations, or for the same population at two different points of time (Poate and Daplyn, 1993).

$$n = 2 * (z^2 c / d^2)$$

$$2 * (1.64^2 * 80 / 15^2) = 153 \text{ households that need to be interviewed}$$

n represents the sample size, the number of households that need to be interviewed. z is the confidence level at which precision is calculated (95%). I was aware that knowledge on medicinal and aromatic plants is very variable in the study area so a coefficient of variation (c) of 80% is assumed. $d\%$ is the difference between mean values of a variable from the population at two different points of time.

In this case $d\%$ depends on what difference the researcher finds high enough in order to state what % knowledge difference could become a problem or not. One could argue that a decrease of knowledge on medicinal plants in the study area of 5 or 10% would already be worrisome. I choose a d of 15% because in my opinion it represents a clear difference between one or two generations. A decrease of 15% implies that if for example during the first survey people on average name 10 medicinal plants and its uses, that in order to confirm the hypothesis, a decrease in knowledge is taking place when people will name 8,5 or less plants and its uses on average during the second survey.

However, in order to confirm a decrease of knowledge on medicinal and aromatic plants in Dolakha it is necessary that a second survey is carried out at another point of time. It would be interesting to do the second survey in 50 years from now, in order to compare the survey result of one generation with the next. In total we made a sample selection of 200 households, keeping in mind that not all interviewees would be available for an interview. Unfortunately due to illness and a lack of time we did not manage to interview 153 households. In total we interviewed 129 households.

During the first field visit in Lakhuri we did not have a list of household names from the DFO yet. In order to make a sample from the households we needed a village map. We went to the villages and asked a group of high school children to draw their village for us. We then asked them to add the names of every household. We made a list of all the names and took our sample and carried out the survey. An example of such a village map is shown in figure 4.1 Lakhuri Dharedhunga Village Map.

[illegible]

4.4 Medicinal and aromatic plants

Table 4.1 and figure 4.2 below show the result for question 1: “Which medicinal plants do you use and what for”? For a precise overview on the survey results in Excel see Appendix VI. A variety of local medicinal plants are used to treat several ailments. Many medicinal and aromatic plants are given different names to the same plants, which make it a bit more difficult to document them. Figure 4.2 implies that the knowledge on medicinal plants lies mainly with the elderly village men. However, more men were interviewed than women and there have not been enough interviews with younger people to statistically confirm this outcome. Nevertheless, women did mention more than once that “I think my husband knows more about medicinal plants than me” and “When I am sick my husband finds medication for me”. In contrary to men who talked more than once about their “grandmother” who taught them how to use certain plants.

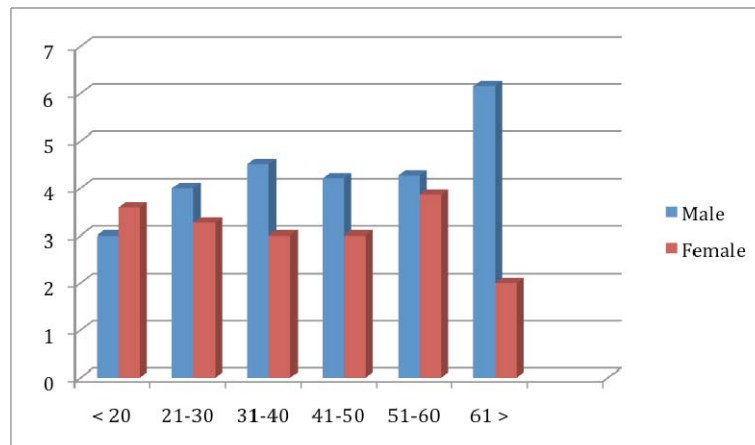


Figure 4.2 Known medicinal plant uses according to age and sex (Source: own data)

Figure 4.3 shows the percentage of medicinal plants that are common to villagers in Lakhuri, Bulung and Orang. Almost 90% of the people who use medicinal plants were familiar with *Chiraito*, *Sil Timur* and *Banmara* and its uses. Medicinal and aromatic plants that were less common were *Simrik jhar*, *Swotta* and *Aisebe*.

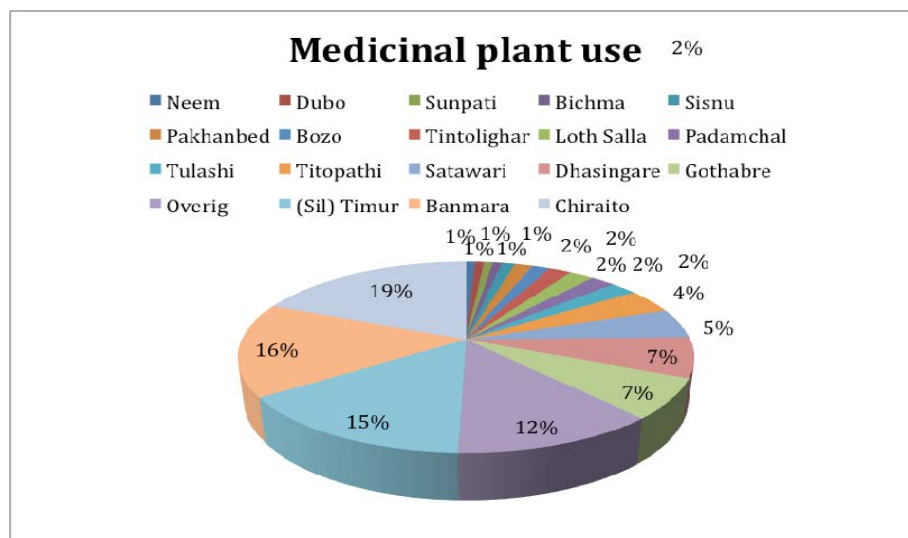


Figure 4.3 question 1: medicinal plant use

No.	Local Name	Scientific Name	Part used	Uses
1	Aisebe		Root	Sore throat
2	Aiselu	<i>Rubus ellipticus</i>	Juvenile stem	[Peel stem and eat] fever, pneumonia
3	Akash belly	<i>Cuscuta refelexa</i>	Tendrils, Plant extract	Jaundice, insecticide
4	Bamboo	<i>Dendrocalamus strictus/ Dendrocalamus hamiltonii</i>	Bark	Lower abdominal pain due to carrying heavy load
5	Banjh	<i>Quercus lanata</i>		Broken bones
6	Banmara	<i>Eupatorium adenophorum</i>	Leaf extract	[Smash or boil plant in water and apply liquid] cuts & general wounds, snake bites and to stop the bleeding
7	Bansuntala			Together used with Sisnu and Chamlaya to heal broken bones cook together and tie around fracture
8	Bansup			Spiritual medicine against the evil eye (ex. when someone sees you eating: jealousy)
9	Bespetch/ Bisfez	<i>Polypodium vulgare</i>		Marasmus, kwashiorkor, lack of nutrients
10 ⁹	Bhajardante	<i>Potentilla fulgens</i>	Bark, root	Worms, stomach pain, gastric, gum problem (as toothpaste)
11	Bikhma/ Bichma	<i>Aconitum bisma</i>	Root	Stomach pain, fever, snake bite, heart disease, cuts
12	Bojho	<i>Acorus calamus</i>	Root, Stem	Sore throat, bronchitis, cough, cold, insecticide, scabies
13	Budoghar			
14	Chamlaya / Chamlia	<i>Skimmia laureola</i>		Cough, used with Sisnu and Simrik jhar to heal a fracture

⁹ No⁹ = medicinal plants threatened through over-collection for the export trade (Source: <http://rbg-web2.rbge.org.uk/nepal/> visited on June 12, 2009)

15	Chiraito	<i>Swertia chirayita</i>	Whole plant	[Boil plant in water and drink liquid] fever, stomach pain, headache, cough, cold, worms
16	Chutro	<i>Berberis aristata</i> / <i>Berberis asiatica</i>	Bark	Low abdominal pain due to lifting heavy load
17	Dhasingare / Machino / Charchare/ Patpate	<i>Gaultheria fragrantissima</i>	Leaf, root	[Oil] Swelling, broken bones, strike of joints, steam (also for cattle) [root] pneumonia, pain
18	Dhursho / Dhursito	<i>Colebrookea oppositifolia</i>	Sinusitis Sinusitis	
19	Dubo	<i>Cynodon dactylon</i>	Whole plant	Pneumonia, fever, lot of blood loss during menstruation
20	Gaitihare	<i>Inula cappa</i>	Root	Sore throat
21	Ghantaghar			Wounds
22	Ginger	<i>Zingiber officinale</i>	Root	Cold
23	Gothabre	<i>Centella asiatica</i>	Whole plant	[Smash root] sore throat, chest pain, tonsils/ [smash leaves & stem] fever / [wash leaves and eat] to increase apatite, stomach ache, headache, pneumonia, bladder infection, jaundice, diarrhea, gastric
24	Jai / Jai phul	<i>Jasminum humile</i>		High fever
25	Kaphal tree	<i>Myrica esculenta</i>	Bark	[Smash bark & apply on skin] skin diseases [smash bark & smell] sinusitis
26	Kakregher			Wounds
27	Kaijal			To stop bleeding, for women when great loss of blood after child birth,
28	Jhyau		Whole plant	Wounds, cut, joint disorder
29	Kudki	<i>Parmelia sp/Ramalina sp</i>		
30	Kuku paile	<i>Neopicrorhiza scrophulariiflora</i>	Root	Stomach pain (due to overweight), fever, gastric, high blood pressure
		<i>Houttuynia cordata</i>		Cough

31	Kukurpaleghar	<i>Hydrocotyle nepalensis</i>		Cold
32	Kurkurejhar	<i>Equisetum diffusum</i>		Jaundice
33	Kulkulihara			
34	Kyamuno	<i>Cleistocalyx operculatus</i>		Sinusitis
35	Loth salla / Dangre salla	<i>Taxus wallichiana</i>	Leaf	Paralysis, spinal pain, breast cancer, fever, cough, muscle ache
36	Mahabikhma			Worms, stomach pain (due to overweight)
37	Majitho	<i>Rubia manjith</i>	Whole plant	Dyeing
38	Malayagiri	<i>Cinnamomum glaucescens</i>		Fever, pain due to carrying heavy load, worms
39	Napke			
40	Neem	<i>Azadirachta indica</i>	Leaf, stem	Fever, throat pain, cough, cold, stomach ache, wounds, scabies, antipyretic
41	Padamchal	<i>Rheum australe</i>	Root	[Prepare as tea] bruises, swelling, muscle ache, gastric, cough, broken bones, fracture (also used for animals), spinal pain, bad blood circulation, general weakness
42	Pakhambad	<i>Bergenia ciliata</i>	Stem	Loose teeth, stomach pain, menstruation excessive blood loss, delivery
43	Panch aunle	<i>Dactylorhiza hatagirea</i>	Root	Burned skin, cuts, stomach ache, eye pain, nerve system problems
44	Pinashe laharo/ Piere laharo		Stem, Leaves	[Smash plant & smell] sinusitis
45	Sarmaguru	<i>Swertia multicaulis</i>		Cuts, swelling
46	Satawari / Kurilo		Root	
47	Satuwa	<i>Asparagus racemosus</i>		Low milk production, delivery, diarrhoea, cholera, muscle pain, high blood pressure, lack of energy, unknown diseases
48	Sayapatri	<i>Paris polyphylla</i>	Root	Jaundice
		<i>Tagetes minuta</i>		Soar throat

49	Sil Timur		Seed	
		<i>Litsea cubeba/</i> <i>Lindera neesiana</i>		[Eat seed] cholera, stomach pain, gastritis [make tea or alcohol from seed] muscle ache, back pain, bloated belly, nausea, chest pain, heart diseases, worms, headache, snake bite, cough, fever (also for cattle), diarrhoea, cold, swollen stomach
50	Silajit / Bhir khoto	<i>Rock exudates</i>	Rock extract	Used to purify blood and in combination with Sisnu and Simrik jhar used as a plaster to heal broken bones
51	Simok			
52	Simrik jhar			Broken bones, strike joints
53			Leaf, root, juvenile stem	
	Sisnu	<i>Urtica dioica</i>		Used in combination with Simrik jhar and Silajit or Bansuntala and Chamlaya as a plaster to heal broken bones, jaundice
54	Sungaauri			Sore throat
55	Sungrikande			Broken bones
56	Sunpati		Leaf	Fever, shivering fever, pain
		<i>Rhododendron anthopogon</i>		
57	Swotta			Lack of vitamins, drunkenness
58	Thulo okhti	<i>Astilbe rivularis</i>		Pain, pregnancy, during labour, menstruation blood loss, pain, it relaxes the body during pain
59	Tintolighar			Bleeding, wounds
60	Titopathi	<i>Artemisia vulgaris</i>	Leaf, Stem	[Smash leaves & drink liquid] fever, headache / [smash leaves & apply on skin] To heal wounds, allergies that affect the skin, acne, pimples, cold, insecticide, stomach pain, cold, bad smell, cuts
61	Totallo	<i>Oroxylum indicum</i>	Bark of root	Deep cut in vein or nerves
62	Tulashi / Tulsi	<i>Ocimum sanctum</i>	Leaf	High fever, pneumonia, cough, sore throat, skin diseases, snake bites
63	Tulotijhar			Wounds

Table 4.2 Survey question 2, 63 different medicinal plants (Source: own data)

4.5 Opinions on MAPs collection and the establishment of FUGs

Question 2 asked “Was there any change in the collection of medicinal plants since you were a child?” Which was a very confusing question, because a lot of villagers had moved since their childhood and thus could not properly compare the new environment with the old one. In general most of the villagers felt that some medicinal plants were more difficult to find (over exploitation) because a lot of villagers started to collect them for traders, while other MAPs have grown in amount due to commercialisation or conservation of the specific plants or conservation.

The following survey question was “Has there been any change since you became a member of the Forest User Group?” Some villagers first answered that nothing had changed, but after test statement 6 do you agree or disagree: “Nothing changed for collecting medicinal plants in the last 6 to 7 years” they told something more. For an overview of the villagers attitude towards the change since the establishment of the FUGs please see figure 4.4. and 4.5. Every positive point of change was given a plus 1, and every negative attitude towards changes a minus 1.

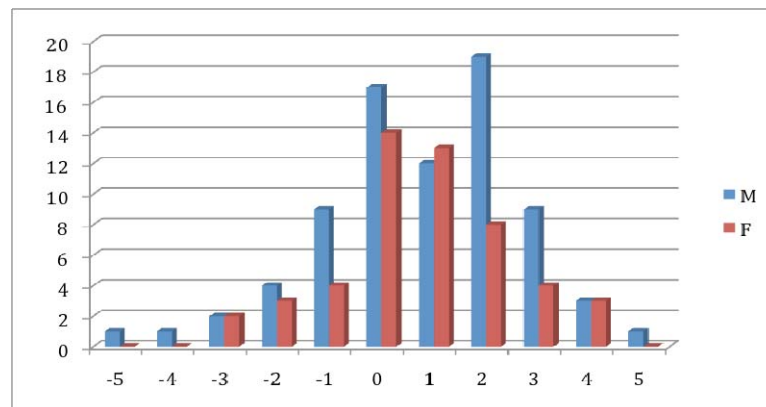


Figure 4.4 Question 3: Attitude towards change since the establishment of the FUG A

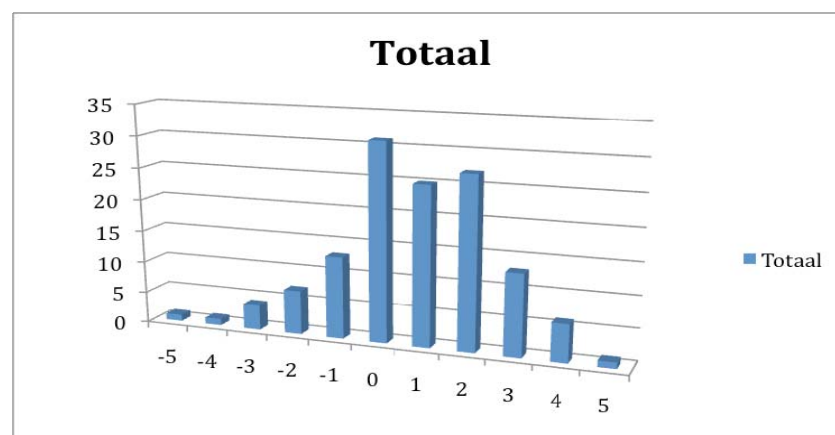


Figure 4.5 Question 3: Total attitude towards change since the establishment of the FUG B

Figure 4.4 and 4.5 show the total attitude towards the establishment of the Forest User Groups in the selected villages. Most of the villagers were quite positive with the changes since the establishment of the FUGs. For example the interviewees mentioned that it took less time to collect firewood and fodder for animals.

However, there were also some people who found that there were a lot of negative changes, such as the conservations of the forest, which implied that the forest was no longer open to everyone at any given time. Those villagers felt deprived of their freedom to enter the forest whenever they wanted to.

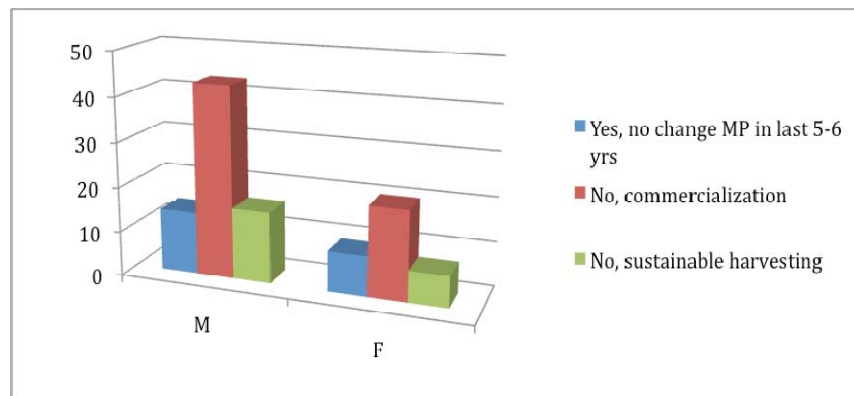


Figure 4.6 Test statement 6: Nothing changed for collecting MAPs in the last 6-7 years

Figure 4.6 shows the total result for test statement 6 which stated “Nothing changed for collecting MAP in the last 6-7 years”. Most people answered “No, there have been changes”, especially related to the commercialisation of medicinal and aromatic plants. This also shows that local villagers were indeed involved in the establishment of the FUGs and became familiar with concepts such as the ‘conservation of the forest’.

Figure 4.7 shows that the opinions on the changes since the establishment of the FUG are very diverse between the different villagers. For some it meant advantages, while for others disadvantages; and for some the establishment of the FUG meant no difference at all.

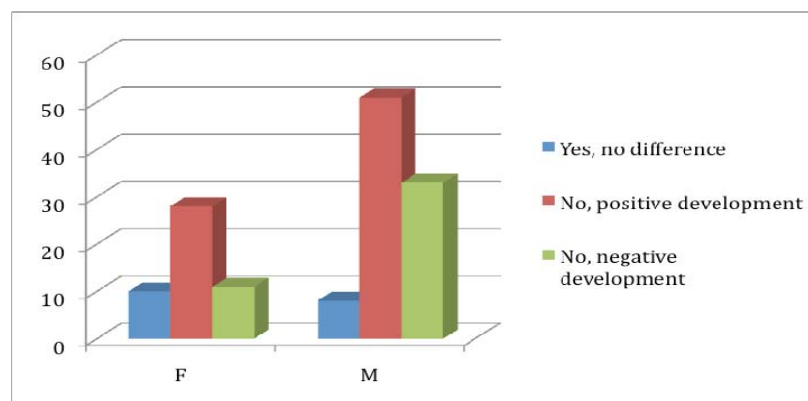


Figure 4.7 Test statement 7: I did not notice any difference since our village established a CFUG

4.6 Conclusions

The survey did succeed to document on a diversity of medicinal plants and its uses by local people in the selected villages. 63 local medicinal and aromatic plant names and its uses have been listed. I asked a Nepali botanist to comment on my list and to add any scientific names that were still missing. We did however not succeed to find all scientific names for the local plant names that were found by means of the survey questionnaire. It could be that some of the local names were misspelled or that some of the MAPs are still unknown to scientists.

Second, the survey tried to confirm a decrease of local knowledge on medicinal and aromatic plant uses (H0). However, in order to confirm a decrease of knowledge on medicinal and aromatic plants in Dolakha it is necessary that a second survey is carried out at another point of time. Therefore the survey did not answer the question whether knowledge on MAPs is disappearing. It would be interesting to do the second survey in 50 years from now, in order to compare the survey result of one generation with the next.

Unfortunately, due to illness and the lack of time we could not carry out the survey in Hawa. Therefore my data is not sufficient to generalize for all members of the Forest User Groups in Dolakha district in Nepal. Nevertheless it could be used to say something about the selected villages.

It was expected that the knowledge on medicinal plants would be mainly with the elderly people. The survey did show that the knowledge on MAPs was mainly with the elderly people in Lakhuri, Bulung and Orang. However, not enough young people have been interviewed to statistically confirm the data.

Third, this survey notes down local peoples' opinions on change and the establishment of the Community Forest. It showed that CFUG should not be seen as a homogenous group of people who all share the same beliefs and opinions. Local villagers have quite different ideas about the establishment of the Forest User Groups and the Community Forest.

Most villagers perceived it as a positive development. For that group it meant less walking to find firewood and fodder for their cattle. Some people also mentioned that they enjoyed watching the forest expand. While for other villagers the establishment of the Community Forest and the additional new rules that accompany local community forest management were perceived as a heavy burden. Villagers could not enter the forest whenever they felt like it as before. And for some this implied they could not collect enough fodder to feed their cattle.

Chapter 5 Discussion

Besides the loss of plants and the biodiversity of species it is assumed that there is also a loss of knowledge on how to use these plants. Along with the deterioration of natural resources, the “cultural heritage of medicinal plant use disappears as well” (ntfp.inbar.int, visited on November 15, 2008). The discussion tries to answer the following question: “Is the loss or ignorance of knowledge on medicinal plants a problem and if so, for whom?” I argue for more research on how global science could profitably inform local knowledge instead of solely focussing upon how indigenous knowledge could profitably inform global science. With this discussion I argue for a need to transform the knowledge of medicinal and aromatic plants in a way that local knowledge and scientific knowledge can profitably inform each other in terms of sustainability (Sillitoe, 2009).

Natural resource conflicts in developing countries are often portrayed as scarcity induced conflicts. “These perspectives, and their underlying conceptualization of ‘resource conflicts’, have strong influence in international environment and development circles” (Turner, 2004 p.885). Many organisations in Nepal put emphasis on awareness sessions of biodiversity and forest management. The DFID Research into Use programme is working with two local agencies in Nepal's mid-hills: the International Development Enterprises (IDE) and Forest Action. These organisations are sharing information from research with local communities. The article in *The New Agriculturist* below highlights a few examples of these practices.

Farmers discuss marketing, forest rights, increasing income and protecting the environment. Information about rights, policy and forest management is giving local people knowledge of how to sustain the forest and the confidence to speak out. In Nepal, the poorest people depend on the forest the most, but have no title deeds and can be forced from the land by the more powerful. Many people now recognise the need for forest planning to prevent deforestation. Facilitated by Forest Action, forest users are sharing scientific and local knowledge about which trees to cut down and which to preserve. There are regular community meetings to discuss how they can use the forest to their best advantage without abusing it. From a low caste, Surbana Ale Magar has fought long and hard for her rights, though her struggle has often been in vain. But information about rights, policy and forest management has given her knowledge of how to sustain the forest and the confidence to speak out.
[*The New Agriculturist*, 13/07/09]. (www.fao.org/countryprofiles visited on June 19, 2009)

Other organisations like the Ethno-botanical Society Of Nepal (ESON) are actively engaged in documenting on well-known and unknown medicinal plants. ESON aims to enhance documentation and sustainable utilisation of plant resources through co-ordination, promotion and research activities and published a database with Nepali medicinal and aromatic plants on the Internet. In this way many people have access to the documentation of medicinal and aromatic plants in Nepal. But what about the people without Internet? Many organisations link ethno-biology and plant conservation with community development. But to what extent can local communities actively engage and benefit from such documentation and knowledge transformation processes? Many policy makers, researchers, economists and development workers reinvent the need of their profession under the label of ‘supporting the poor people’ (Ferguson, 2005). Too much of scientific research is based on how local knowledge could benefit global scientific knowledge. But can global scientific knowledge profitably inform local science? (Bodeker, 2007; Sable, Howell, Wilson and Penashue, 2007; Sillitoe, 2009).

Most of the organisations involved in the production of NTFPs have been focussing on the economic benefits for the rural population (e.g. such as the production of *Dhasingare* oil). However, an emphasis on the market and quality production is not a simple thing to establish. Quality production demands skilled labour input and most local households are not able to mobilise this labour (Arce, 2009). In addition, “We cannot assume that all aspects of ... quality networks are positive because they can also create exclusion and market limitations for some producers” (Arce, 2009).

Organisations that assist with education and awareness programmes are confronted with many challenges in the documentation on the use of medicinal and aromatic plants. “Information about plants and animals is passed from one generation to the next through folklore and is often kept secret. Sometimes it is very difficult to extract information from local people, even with some form of payment (Rao, 1991; Shengji, 1996)” (NBS, 2002). But knowledge is not a given thing out there, waiting to be collected and documented.

“The basis for actors ‘truth claims’ and ‘authority’ will vary, this applies to ‘scientific’ as well as to ‘non-scientific’, ‘everyday’ forms of knowledge. Knowledge construction is, at one and the same time, ‘constructive’ in the sense that it is the outcome of many decisions and selective incorporations of previous ideas, beliefs and values, and ‘destructive’ in the sense of transforming, dissembling or ignoring other existing frames of conceptualisation and understanding, and ‘localised’ in specific institutional domains and arenas whether of global or local scope” (Long, 2001).

Therefore generating new bases for understanding, knowledge construction is not an easy task. Medicinal and aromatic plant knowledge is so localised that only persons with kin and spirituality validated associations will profess to know about it, who do not allow for general category divorced from place (Bodeker, 2007; Sillitoe, 2009). Also local people who are interested in learning more about medicinal plants do not always have easy access to teachers and study materials. “We feel sad when people come and take away our medicinal plants. If we could use it for ourselves it would be better. We want to know which plants are used for which purpose. We do not know how to stop the stealing of our medicinal plants. We do not have the time to stop the thieves because we have to work in our field” (local farmers in Orang, documentary supporting this thesis). I kept on wondering why the transformation of local knowledge should be ‘assisted’ by awareness sessions from ‘outside’ organisations. When I asked if local healers teach other people, one of my interpreters answered that the few people left with knowledge on medicinal plants are not always willing to transfer their knowledge to others in the village. These power dynamics are as well at the global as at the local level. There is competition between local spiritual healers and global health systems. The grandfather of my interpreter informed us that if someone else has greater healing ‘powers’ it is sometimes believed that the ‘weaker’ healer and the patient will get sick. My interpreter also informed me that in his village it is believed when a spiritual healer teaches another person about his healing techniques the healer would lose some of his or her healing ability. There are special days for teaching people on the use of MAPs and spiritual healings. One is not assumed to teach others on any given day. The grandfather of my interpreter told me that such teachings are usually done on the day of an eclipse. In addition to that, women ought to be taught by a female teacher and men taught by a male teacher. Therefore it is not so strange that many local people feel reluctant to share their knowledge with others.

As stressed before in Chapter 2, the implementation of good intentions usually have several side effects that eventually can turn out in a negative way for the rural poor (Turner, 2004). Most people in the selected villages for the fieldwork agreed that the forest had grown since the establishment of the FUGs. However, the implementation of Forestry User Groups increased the power of the local elite such as village and FUG chiefs. It resulted in less freedom for farmers to enter the forest whenever they felt like it. It had negative effects on the landless people rearing goats (i.e. by implementing a rule that cattle could no longer graze inside the Community Forest that had). “Resource-related conflicts are not simply struggles over resources but reflect a broader set of tensions within agro-pastoral societies, many of which have moral dimensions and which cannot be seen as simply derivative of in-the-moment struggles to subsist” (Turner, 2004 p.885). Instead they are the result of ongoing political struggles to maintain control over fluctuating resources in the future (Pradhan 2000; Turner, 2004).

Knowledge on the sustainable use of plants has always been there as long as people have made use of the forest. “Traditional Hindu books such as *Ramayana*, *Mahabharata*, *Veds*, put intention to preserve forest as a part of the cultural heritage” (Acharya, 2003). In everyday practice people depend on sustainable use of the forest in order to be able to continuously collect firewood to cook, fodder for cattle and medicine to treat illnesses. As I understood from the studied literature and the in-depth interviews throughout the fieldwork, conflicts on the use of natural resources is no issue of rational communication or transfer of knowledge but one of creativity (Joas, 1996). Actors invent ways of using resources be it through building good relationships with other actors, inventing new claims and narratives on the rights to use such natural resources or violence. Quite often local people have their own ways and ideas about managing forests in a sustainable manner. Scientific, environmental and development organisations should be very precise and careful in carrying out research and implementing their programmes, policies and awareness sessions. Besides scientists, local farmers, Ayurvedic doctors and spiritual healers could perhaps play an interesting role with the implementation of sustainable forest use practises.

A loss or ignorance of local knowledge on the use of medicinal plants can have several consequences, and not only for Nepal but also for people living in Europe and the USA. Local medicinal plant species have had several advantages and opportunities for the West. Many medicinal plants that can be found in the hills of Nepal are used to make allopath medication as well. An example is *Loth Salla*, which contains Paclitaxel that is used as an ingredient in allopath treatment of cancer. It is very difficult to make a clear distinction between ‘traditional’ and ‘allopath’ medicine. Local knowledge has helped Western researchers in the development of allopath medicine, such as in treatment against Malaria. Often local knowledge is mistaken and incorrectly interpreted by global scientists. This is well illustrated by Bodeker (2007) who written on how the use of a Chinese traditional medicine to treat Malaria were mistakenly documented. The side effect from the Chinese anti-malarial was that it caused severe nausea, which lead to the resistance and disuse of the drug in the West. “However, at least three of the other ingredients in the classical formulation studied in China in the mid-twentieth century would seem to be candidates for offsetting the emetic properties of *changshan*” (Bodeker, 2007). All of the other missing ingredients were proven to be effective against nausea (e.g. ginger, liquorice and betel nut). “Medicinal researchers must accord equal status to traditional healers when working on herbal medicines, and

not allow science to dominate, as such power differentials can fatally undermine research, as illustrated with *changshan*, the Chinese anti-malarial” (Sillitoe, 2009).

Nowadays many scientists and doctors face problems with the increase of immunity cases against certain antibiotics. “Some of the most worrying microbes around, the drug-resistant bacteria known as MRSA (methicillin-resistant *Staphylococcus aureus*) have been discovered in heavily disinfected hospital locations such as catheters and on the disinfectant soap dispensers used in wards” (<http://www.news-medical.net/news/2004/09/08/4581.aspx> visited on November 2, 2009). To add to that the use of antibiotics can have unwanted side effects. Some ‘traditional’ herbal products might offer good alternatives for allopath antibiotics.

“Gold is considered as excellent antiseptic and has got '*Rasayana*' properties also. *Suvarna Bhasma* (Gold Calx) is effectively used in cases of pulmonary tuberculosis. '*Mahasudarshan Choorna*' has been found very effective in cases of Malaria and other P.U.O. cases without any unwanted side effects. *Panchvalkala choorna* has been proved very effective in surgical profilexis and it shows good antibacterial and wound healing properties. *Triphala guggul* is also seen to be effective in surgical prophylaxis. '*Sukshma Triphala*' and '*Gandhak Rasayan*' are the Ayurvedic preparations routinely used by Ayurvedic practitioners to treat wound infections and infected skin conditions. '*Kutaj*' is a herb which has got excellent anti-amoebic properties and is very effective in treating amoebic dysentery and diarrhoea cases. *Babool*, *Termeric Triphala* are useful when its paste is applied over the infected gums and in cases of pyorrhea. '*Chandraprabha*', '*Vangabhasma*' are effective in the treatment of urinary tract infections. Thus ideas similar to today's antibiotics do exist in Ayurveda.”(<http://www.dreddyclinic.com/forum> visited on November 2, 2009).

In some cases people might not feel interested in learning more about local medicinal plants. This can be because local people have increasingly more easy access to allopath medication, are fully engaged in other activities such as farming or simply see no use in spending time on something that does not seem to add much to their already low income or that is perceived as ‘old-fashioned’. “If the people get benefits from the resources, they themselves can manage the forest, no doubt. But if they do not get any benefit, why to manage? There is no meaning.” (Botanist, documentary supporting this thesis). Sable, Howell, Wilson and Penashue, 2007 argue that both the local people and global scientists can benefit from each other’s knowledge. Generating local participation in the project (e.g. in order to construct a territorial identity) could meet some of the peoples needs in an area as well as those of policy makers and global scientists. This is well illustrated by the Innu case where the research served the local community as well as the investors, sharing beneficiary of change.

Nevertheless, there is an increasing demand for natural products in the West and thus, NTFPs and MAPs. And some pharmaceutical companies are making a lot of money out of trading these products; the local people however do usually not get a fair share of the deal. In the Netherlands most of the herbal or homeopathic medication contains a message, which says that the effects of the medication is not scientifically proved. However, more and more herbal medication is scientifically proved to work well (e.g. *Echinea*). Sceptics however remain reluctant to the effects of herbal medication such as homeopathy on the ground of how such a small amount of plant extract; diluted in such a big amount of water could possibly have any effect on human health. On the other hand there could be thought of many pros of such herbal products. Local knowledge could be used to develop medicine for the treatment of many ‘modern’ diseases (e.g. *Loth salla*, Paclitaxel for the treatment of cancer). If used by local people

themselves it could support self-sufficiency of people living in rural areas, and a decrease of dependence on external allopath medicine.

There is a lot to learn from non-Western medicine in terms of sustainability, but we should not over romanticise the implementations of such 'ancient' teachings. The implementations of such teachings have had serious impact on people in Nepal.

"Classical Asian medicines offer great hope for healing of individuals, society and the natural environment, yet ironically their philosophies are embedded within religious and cultural sentiments that contribute to sickness and suffering. They are rich within inherent truth, but their interpretation can also perpetuate injustice, social malaise and spiritual confusion. Nowhere is this more evident than in the deeply ingrained attitudes about women that pervade Hindu and Buddhist cultures" (Crow, 2000).

Yet there is a lot to learn from ancient medicinal practices such as Ayurveda. "While the Hindu interpretation of Vedic philosophy has had unhealthy effects on women, Ayurvedic philosophy supports women's health and wellbeing" (Crow, 2000 p.200). Hindu culture encourages marriages of girls at a young age. When girls are married they are expected to carry out heavy household responsibilities. Besides that "Pregnancy in girls whose bodies are not fully developed can lead to genealogical, obstetric, and paediatric problems, as well as deprive girls opportunities for education, thus perpetuating the cycle of illiteracy and suppression" (Crow, 2000, p.200). However, Ayurveda put forward that 22 is the optimum age for marriage for women. And "Vedic philosophy as practiced in everyday life encourages women to accept frequent pregnancies as the gift of God... However, Ayurveda recommends that women conceive not more than once every three to seven years" (Crow, 2000 p.200). As Crow (2000) argues, observance of these Ayurvedic principles could reduce the suffering of mothers from too much child delivery, decrease infant mortality rates and stabilize Nepal's population level. The incorporation of 'traditional' Ayurvedic philosophy could support women's health and wellbeing in Nepal.

It seems that the loss or ignorance of local 'traditional' knowledge on MAPs cause different problems as well as for local people as for the West. There are so many plants unknown to the West, which possibly can be used to treat 'modern' diseases. If local people themselves make use of MAPs it could support self-sufficiency of people living in rural areas, and a decrease of dependence on external (allopath, often expensive) medicine and (Western) healthcare systems. "Some patients arrive here (Ayurvedic hospital in Kathmandu) without being able to pay for medical treatment. If we know which medicinal plant is useful to the patient and also if we know that the patient does not have money to buy medicine and if medicinal plants can be found near the patients home. We usually recommend to these patients with a low income that they use the medicinal plants near their home and we give them instructions on how to do this. If a patient has more money we recommend they buy manufactured Ayurvedic medicine" (Ayurvedic doctor, in documentary supporting this thesis). Perhaps the collection of these plants could benefit rural populations as an extra income generation activity, but a focus upon quality production might also result in exclusion and market limitations for other producers (Arce, 2009).

Therefore, I argue for more research on how global science and local knowledge could profitably inform each other in terms of sustainability instead of focussing upon how indigenous knowledge could profitably inform people in terms of economic profits.

Chapter 6 Final Conclusions

The documentary made to support this thesis gives an overview of local situations in the field of forest management and the use of medicinal plants. By doing so I initiated discussion on the knowledge and development initiatives that are established to enhance the livelihoods of local people. This contributed to the understanding of Non-Timber Forest Products and medicinal and aromatic plants in selected villages. Consciousness of the different perceptions of sustainable use, management and development of natural resources and knowing what different actors drive, could be useful for policy writers, programme implementers and local people in order to see things from a different point of view.

In addition, with the documentary I hope to show that film is an interesting research methodology. I am convinced that images add something to the words of people and can give a powerful overview of local situations. A thesis or report is often read by other researchers or people looking for literature on a specific topic. This documentary can be understood by a wide audience and is fun to watch. To conclude, video as a research tool could assist local people to attain more voice on their every day situations.

The first two research questions: “What are the local situations after the implementation of forest conservation policy of medicinal and aromatic plants in Dolakha, Nepal?” and “How does forest conservation policy affect the access to resources in Dolakha and what is its impact on community development?” are answered by means of the in-depth interviews with forest user group members and collection of personal opinions, ideas and feelings on paper and video. The case study in chapter 3, the survey in chapter 4 as well as the discussion in chapter 5 took these first two questions into account. The thesis and documentary and the survey showed that local situations are diverse and that the implementation of forest and conservation policies can have many different outcomes in terms of situations for local people.

The case study in *Bulung* showed that after the implementation of conservation policies a local shift in power relations took place, which resulted in negative situations for the landless cattle herders. The cattle herders could no longer enter the forest with their goats. Furthermore they were no longer free to enter the forest themselves whenever they felt like it. Some herders mentioned that because of these new rules many of their cattle died of starvation. In addition the conservation of *Dhasingare* was less beneficial to cattle herders, because goats previously ate these plants as well. However, “Resource-related conflicts are not simply struggles over resources but reflect a broader set of tensions within agro-pastoral societies, many of which have moral dimensions and which cannot be seen as simply derivative of in-the-moment struggles to subsist” (Turner, 2004 p.885). Instead they are the result of ongoing political struggles to maintain control over fluctuating resources in the future (Pradhan 2000; Turner, 2004).

While for other people forest conservation implied less long walks to gather firewood or fodder for cattle. For some women the collection of *Dhasingare* leaves were a good source of an extra income generating activity. Some people also mentioned that they enjoyed the sight of more greenery close to the village.

The third research question: “Is the knowledge on medicinal and aromatic plant use decreasing in Dolakha?” has not been answered. The survey tried to confirm a decrease of local knowledge on medicinal and aromatic plant uses (H0). However, in order to confirm a decrease of knowledge on medicinal and aromatic plants in Dolakha it is necessary that a second survey is carried out at another point of time. It would be interesting to do the second survey in 50 years from now, in order to compare the survey result of one generation with the next. The survey did succeed to document on a diversity of medicinal plants and its uses by local people in the selected villages. 63 local medicinal and aromatic plant names and its uses have been listed.

Unfortunately, due to illness and the lack of time we could not carry out the survey in Hawa. Therefore my data is not sufficient to generalize for all members of the Forest User Groups in Dolakha district in Nepal. Nevertheless it could be used to say something about the selected villages. The survey did show that the knowledge on MAPs was mainly with the elderly people in Lakhuri, Bulung and Orang. However, not enough young people have been interviewed to statistically confirm the data.

The fourth question: “Is the loss or ignorance of MAPs a problem and if so, for whom?” was answered in chapter 5 the discussion. In the discussion I argued that the loss or ignorance of local ‘traditional’ knowledge on MAPs cause different problems as well as for local people in Nepal as for people the West.

The case study showed that the incorporation of ‘traditional’ Ayurvedic philosophy could support women’s health and wellbeing in Nepal. If local people themselves make use of MAPs it could support self-sufficiency of people living in rural areas, and a decrease of dependence on extern medicine and healthcare systems. In the discussion I used the case of *changshan* (Bodeker, 2007) to show how the ignorance of local knowledge by Western scientists resulted in the misuse of a good medicine for the West.

The last research question: “Could global and local science profitably inform each other in terms of sustainability?” (Sillitoe, 2009) was a question throughout the thesis and one of the main questions for the documentary supporting this thesis. It is clear that local knowledge can contribute to scientific knowledge, especially in the case of finding new medicine. Medicinal and aromatic plants could be studied and used to treat ‘modern’ diseases today. Apart from whether or not it is possible for local knowledge and global science to profitably inform each other, if improvements are to be made it should focus on how local knowledge is valued and perceived. “Medicinal researchers must accord equal status to traditional healers when working on herbal medicines, and not allow science to dominate, as such power differentials can fatally undermine research” (Sillitoe, 2009).

Sable, Howell, Wilson and Penashue, 2007) argue that both the local people and global scientists can benefit from each other’s knowledge. Generating local participation in the project (e.g. in order to construct a territorial identity) could meet some of the peoples needs in an area as well as those of policy makers and global scientists. The six indicators designed by the authors (ibid.) look interesting and could work for some specific cases.

However, I remain quite skeptical about the implementations of such indicators and the actual benefits for local people in sharing their knowledge in general. I think that such 'projects' cannot be done in a short-term setting. Does this imply more work for anthropologists who prove to be considerate of diversity and dynamism? I am not so sure, after all researchers are often annoying to local villagers and as long as locals did not ask for their help (as in the Innu case) I remain skeptic about how we can assure that sharing knowledge will bring benefit to local practice. However, if local and scientific knowledge in terms of sustainability is shared and put into action everyone could benefit from it.

I therefore argue for more research on how global science and local knowledge could profitably inform each other in terms of sustainability instead of focussing upon how indigenous knowledge could profitably inform people in terms of economic profits.

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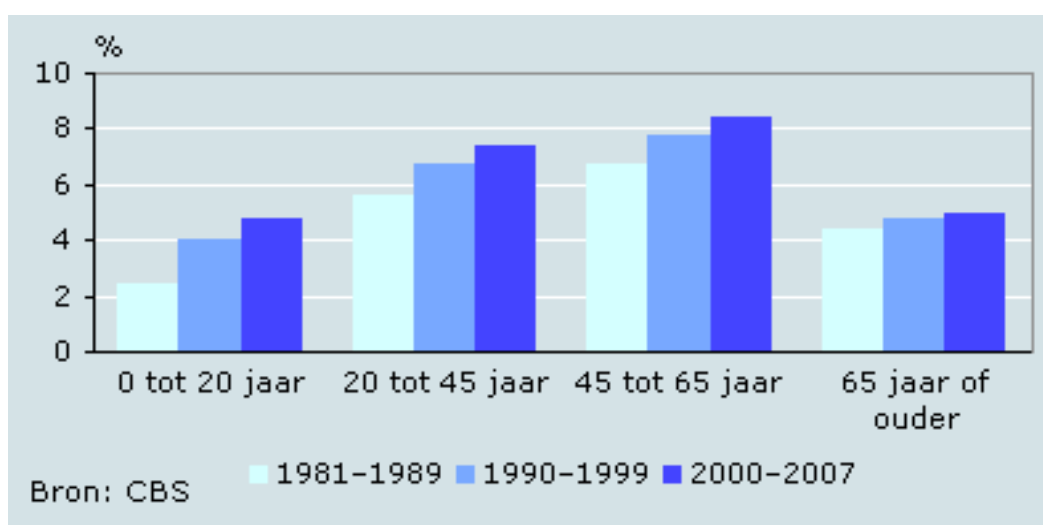
Appendix I

Source: Webmagazine 2 June, 2008

Meer Nederlanders naar alternatieve genezer

In 2007 bezocht 7 procent van de Nederlanders een alternatieve genezer, zoals een homeopaat, acupuncturist, natuurgeneeskundige, magnetiseur of paranormaal genezer. Inclusief de eigen huisarts die alternatieve geneeswijzen toepast, is dit percentage zelfs 11. Ter vergelijking: in 1981 bezocht nog maar 4 procent van de Nederlanders een alternatieve genezer.

Vooral personen van middelbare leeftijd (45–65 jaar) bezoeken de alternatieve genezer, jongeren en 65-plussers doen dit minder vaak. Vrouwen gaan vaker dan mannen: het afgelopen jaar (2007?) bezocht 5 procent van de mannen en 9 procent van de vrouwen de alternatieve genezer.



Source: StatLine, [Gebruik medische voorzieningen](http://www.cbs.nl/nl-NL/menu/themas/gezondheid-welzijn/publicaties/artikelen/archief/2008/2008-90130-wk.htm)
<http://www.cbs.nl/nl-NL/menu/themas/gezondheid-welzijn/publicaties/artikelen/archief/2008/2008-90130-wk.htm>

1) Always be curious to learn more!

Probing:

transitive verb 1 : to search into and explore very thoroughly : subject to a penetrating investigation 2 : to examine with a probe

intransitive verb : to make a searching exploratory investigation

Note: Probing can be done by asking another question (e.g. why or how?) or simply by nodding your head or being silent and in this way encourage the other person to tell more.

2) Do not put words into someone's mouth!

Note: Even if you think you already know the answer(s) ask the question in such a way like it is NEW to you! Try not to have a preference in answers → to only hear what you wish to hear. There are no good or bad answers. We would like to learn more about the person's personal knowledge, opinions, experiences, wishes and believes.

3) Interview one person at a time!

Please try to interview one person at a time and ask others (husband, wife, parents, friends) to be silent and listen, they can give their personal opinion after the interview.

Note: In practice this might be very difficult, because people usually come in groups and are very willing to engage in the conversation. During our test face we experienced quite often when interviewing a woman her husband will take over in answering the questions for her. We will try to avoid this problem by separating the women from the men during the interviews. (e.g. Shiva will interview the men, Gita will interview the women). However, because we have to interview more women than men (stratified sample) Shiva will also have to interview some women.

4) Stratified random sample!

Note: The sample should represent the population of Dolakha in Nepal. Stratification will be done for the following subjects: age, sex (and perhaps profession/income/education).

In statistics, **stratified sampling** is a method of sampling from a population. When sub-populations vary considerably, it is advantageous to sample each subpopulation (stratum) independently. **Stratification** is the process of grouping members of the population into relatively homogeneous subgroups before sampling. The strata should be mutually exclusive: every element in the population must be assigned to only one stratum. The strata should also be collectively exhaustive: no population element can be excluded. Then random or systematic sampling is applied within each stratum. This often improves the **representativeness** of the sample by reducing sampling error. It

can produce a weighted mean that has less variability than the arithmetic mean of a simple random sample of the population.

5) Random Sample

A sample is a subject chosen from a population for investigation. A **random sample** is one chosen by a method involving an unpredictable component. All members of the population have an equal chance of being selected as part of the sample.

Note: You might think this means just standing in the street and asking passers-by to answer your questions. However, there would be many members of the population who would not be in the street at the time you are there, therefore, they do not stand any chance of being part of your sample. To pick a random sample, it is necessary to take all the names on the electoral register (list of all the people who are a member of the FUG) and pick out, for example, every fifth name. This particular person needs to be interviewed to make the sample truly random. Random sampling is very expensive and time consuming, but gives a true sample of the population. We will visit CBS (Central Bureau of Statistics) to get the most accurate info on the number of households in Lakhuri, Bulung and Orang as possible. However, please do keep in mind that in practice statistics might not represent the numbers of households in real life as we experienced during our test face in Lakhuri danda.

Needs before interviews:

- List of FUG, village names.
- Create a village map or list of household names.
- List with random numbers.

6) Some tips

- Bring warm clothes it will be very cold!
- Be prepared not to be able to shower, use electricity and your mobile phone for several days!
- Bring good walking shoes, as we will walk at least 2 to 12 hours a day!
- We will stay in the villages for about 3-8 days per FUG.
- Do not take things too lightly. This mission is not going to be easy, but we will have a wonderful new experience, learn a lot and have lots of fun!!!
- Be patient and polite and do not leave any rubbish behind (e.g. plastic, paper).
- Try some test interviews before going to the field!~

Appendix III: The history of forest governance in the hills and the Terai during the Ranas regime

In the hills, the Talukdari¹⁰ system and Kipat system in the Eastern Nepal were employed by the Ranas in conjunction with the Birta systems for controlling and regulating the land tenure and collecting the tax from people (Fisher 1989; Barlett & Malla 1992). The Talukdari system was used for the management of communally used forests through the chief, called Talukdars. The forests under the charge of the Talukdars were used only for fuelwood, small timber, grazing, collection of leaf litter and other such activities without paying any fees. However some sort of gift (Theki) in return to the functionary had become customary (Mahat et al. 1986a). For the first time in 1907, an official document lalmohar was issued to provide guidelines for the local use and management of forests through the Talukdars (Hobley 1996). The special decrees called Sanads were issued to particular landlords whose responsibility was to manage the forests and organize their protection. Chitadars, forest watchers were appointed and paid through mana-pathi system in kind by villagers across Nepal (Fisher 1989; Barlett & Malla 1992; Adhikari 1990).

In the Kipat system, Jimmawals, the village headmen who were recognised as the tax collectors and a de facto owners of forest lands (Loughhead et al. 1994), had significant control over resources and local people. The role of Jimmawals continued until the early 1970s and still they have a large amount of influence over local matters (Hobley 1996). Apart from the above systems, there was a Rakam system in which the tenants were obliged to supply forest products to landowners free of charge (Hobley 1996).

These systems controlled resources and oppressed local people. Despite various oppressive systems employed, there were signs that people resisted the feudal systems. A significant resistance emerged in terms of the religious belief of the local people in which many local communities controlled forests around temples through religious institutions, called Guthi (Regmi 1984). The strong resistant was expressed through the practice of Khorias or shifting cultivation, in which people were involved in cultivation of subsistence agricultural products in temporary plots within forests. Since the Khorias did not attract any rents and taxations and peasant farmers did not have choice to manage their livelihoods, it became popular to resist the Ranas forest ownership.

In Terai, the forest was managed for commercial purposes. Since most of the forests and lands of Terai were owned by three Rana Families (English 1985), apart from Birta and Jagir, they established Banjanch Goswara⁴ (Forest survey office) to oversee the commercially valuable forest exploitation during the second half of the nineteenth century (Mahat et al. 1986a, Bajracharya 1983). This system generated a significant amount of money for the Ranas. However there was a dilemma for the Ranas whether to maintain the forest or to exploit it. With a constant fear of invasion from the colonial power, the government of Nepal in one hand, had to maintain the border line forest as a physical barrier against possible invasion from the south by the British empire, on the other had to exploit the forest to generate income (Regmi 1984).

Although Nepal was never colonised, the presence of the British-East India Company influenced the forest use and management in Nepal. British occupation in India created a conflict over the use of commercially valuable forest bordering to India. The forests of Nepal played a central role in providing raw materials for infrastructure development within India (Guha 1989). According to Regmi (1978a), in the first half of the twentieth century, Rana rulers employed British forestry experts, J. V. Collier (1925 to 1930) from the Indian Forest Service to supervise felling and export of timber for the construction of

¹⁰ 1 Talukdar is a generic name for the local officials or functionary employed by the Ranas at the local level. This term is also used interchangeably with the term Mukhiya.

2 In Mana-pathi system, users of the forest decide to appoint forest watchers and each household contributes a certain amount of grain to pay the watcher as Salary (Mana and Pathi are Nepali traditional unit of volume in which 1 mana equals 0.31 to .44 kilogram and one Pathi equals 2.5 to 3.5 kilogram depending on the nature of the grains).

3 Rakam system is a compulsory labor obligation, which a farmer rendered to government and later to the Birta owners on a regular and inheritable basis (Regmi 1978) and revenue collection tactics. Although this practice led to the eventual degradation of large areas of forests (Hobley 1996), it was ultimately the Ranas forest policy that forced people adopt this practice.

Indian Railway. The Nepalese government supplied timbers to British India free of charge as part of Nepal's contribution to the First World War (Collier 1976). In 1942, a forest service was created within Nepal structured in line with that of India by British Advisor, E. A. Symthies for exploitation of forest in the Terai (ibid). Many Nepalese were sent to Oxford Imperial (Indian) Forestry School in Dehra Dun to study forest management (Hobley 1996). The newly graduated foresters became either commercially oriented foresters or total custodians of the forest. Since the needs of the primary users were largely disregarded (Roche 1990), this led to further marginalisation of the forest dependent people in accessing and using the forest resources. The feudal system under the Ranas regime oppressed Nepalese people. The Ranas used the free labour and tax accrued from the peasant farmers to build palaces and maintain luxury of the ruling families (Regmi 1978b). The local functionaries fully supported and implemented Ranas' policies so that they could receive as much as land and forest as possible through Jagir and Birta. They became local landlords and used local peasants as tenants to cultivate their land and extract rents (Malla 1999). As a few people captured almost all the land, there was increasing competition for the land to cultivate. The local landlords later introduced kut (contract) systems, in which the opportunity to cultivate the land went to the highest bidders (ibid). In this system, whatever the harvest, the tenants were forced to return the bid quantity. There was a strained relationships developed between the local functionaries and the peasant farmers. This transformed the peasant farmers into slave labourers for the Jagir and Birta holders (Stiller 1975; Regmi 1978b). Some oppressed farmers engaged in illicit cutting and shifting cultivation. The forests under these arrangements subsequently declined (English 1982). (Source Dr. Gurung, 2006)

Appendix IV Request for interview contacts

We are currently looking to invite people for a short interview about Non Timber Forest Products and medicinal plants. Our primary purpose is to facilitate an understanding of the subject of Non Timber Forest Products and the work of professionals in this area by providing current news and information on the topic and tools for exchange and collaboration. Our audience includes specialists working at local, country and regional levels, as well as non-specialists, public citizens, teachers and students. The interviews will last approximately 20 to 30 minutes. Below you can find an example of the interview questions. If you have any further questions please do not hesitate to contact me.

Warm regards,

Jeltje Alexa Roetink
jaroetink@gmail.com
+9779849059479

Interview questions

Introduction

Please tell us something about yourself and the work that you do.
(e.g. Name, occupation, professional interests and activities).

Non Timber Forest Products

Could you explain how your work relates to the use and management of Non Timber Forest Products in (Dolakha) Nepal?

Medicinal Plants

Could you tell us something about the use of medicinal plants in Nepal?
(e.g. History, present situation, challenges and future perspectives).

Example

Could you give us an example about which medicinal plants are used in (Dolakha) Nepal and what for? Do you use any medicinal or aromatic plants yourself?

Appendix V Survey Questionnaire

	Question	MP1	MP2	MP3	MP4	MP5	MP6
		Dhasingare	Chiraito	Loth salla	Timur	Satawari	Other *****
	Survey no:						
	Date:						
	VDC / village:						
	Age:						
*	Sex: m (male) f (female)						
	Profession:						
	FUG member since:						
1*	Does your family use ... (MP) ...?	Y N D	Y N D	Y N D	Y N D	Y N D	Y N D
2*	Was there anything different in the collection of M.P. when you were a child?	Y N D	Y N D	Y N D	Y N D	Y N D	Y N D
3*	Has there been any change since you became a member of the FUG? 	Y N D	Y N D	Y N D	Y N D	Y N D	Y N D
4*	Who buys the plants from your village?	L P T D E	L P T D E	L P T D E	L P T D E	L P T D E	L P T D E
5*	Do you agree or disagree with the following statements for ...MP:						
	-MP are a good source of extra income	Y N D E	Y N D E	Y N D E	Y N D E	Y N D E	Y N D E
6*	-Nothing changed for collecting MP in the last 5 to 6 years	Y N D E	Y N D E	Y N D E	Y N D E	Y N D E	Y N D E
7*	-I do not notice any difference since our village established an FUG	Y N D E	Y N D E	Y N D E	Y N D E	Y N D E	Y N D E

*Info: Please circle around correct answer(s) in the front & note down probing at the backside!

MP=medicinal plants, F=frequency, Q=quantity, T=time of the year/ season, O=other, Y=yes, N=no, L=locals, P=Pharmaceutical c, T=trader/export, E=else, D=don't know

Question	Probing/ extra info:
Q1	Why? (Loth salla/Dangre salla, Dhasingare/Machino, Satawari/Kurilo) Why? What do they use MP for? Examples?
Q2	Change in the collection/ harvesting of M.P. since childhood (F=frequency, Q=quantity, T=time of the year/ season, O=other)
Q3 Q4 Q5/6	

Survey no	Age	Sex	SUM MP	MP1 Dhasingare	MP2 Chiraito	MP3 Loth Salla	MP4 (Sil) Timur	MP5 Satawari	MP Titu
1	28	M	6	1	1	0	0	0	
2	31	M	8	0	1	0	1	1	
3	27	F	5	0	1	0	1	1	
4	22	M	2	0	1	0	1	0	
5	54	M	6	0	1	0	1	0	
6	46	M	3	0	1	0	1	0	
7	29	F	4	0	1	0	1	0	
8	46	M	5	0	1	0	1	0	
9	50	M	4	0	1	0	1	0	
10	70	M	14	1	1	0	1	1	
11	61	M	5	0	1	0	1	1	
12	40	M	9	1	1	0	1	1	
13	47	M	5	0	1	0	1	1	
14	60	F	5	0	1	0	1	1	
15	75	F	2	1	0	0	1	0	
16	21	F	3	0	1	0	1	0	
17	30	M	5	0	1	0	1	1	
18	15	M	5	0	1	0	1	1	
19	27	F	3	0	1	0	1	0	
20	30	F	2	0	1	0	1	0	
21	44	F	3	0	1	0	1	0	
22	65	F	1	0	0	0	1	0	
23	29	F	4	0	1	0	1	0	
24	72	F	2	0	1	0	1	0	
25	37	F	2	0	1	0	1	0	
26	65	M	2	0	1	0	1	0	
27	55	M	5	0	1	0	1	0	
28	28	M	2	0	1	0	1	0	
29	40	F	1	0	0	0	1	0	
30	50	F	2	0	0	0	1	0	
31	44	F	8	1	1	0	1	1	
32	28	M	5	0	1	0	1	0	
33	36	F	6	0	1	0	1	0	

Appendix VI Survey Question 1-6

Survey Dolakha 2009 - Question 1 Medicinal Plant use

34	50 F	5	0	1	0	1	0
35	48 M	5	0	1	0	1	0
36	49 M	6	0	1	0	1	0
37	78 F	3	0	1	0	1	0
38	66 M	4	0	1	0	1	1
39	66 M	3	0	1	0	1	0
40	70 M	5	0	1	0	1	1
41	35 M	6	0	1	0	1	1
42	55 M	6	1	1	1	1	1
43	59 M	4	0	1	1	1	0
44	65 M	4	0	1	1	1	0
45	16 M	4	0	1	0	1	0
46	30 M	6	1	1	0	1	1
47	79 M	7	0	1	0	1	0
48	56 F	4	0	1	0	1	0
49	37 F	9	0	1	0	1	1
50	49 M	5	0	1	0	1	0
51	66 F	4	0	1	0	1	0
52	79 M	8	1	1	0	1	1
53 ?	F	4	0	1	0	1	1
54	38 F	3	0	0	0	1	0
55	37 M	4	0	1	0	1	0
56	24 M	4	0	1	0	1	0
57	42 M	4	0	0	0	1	0
58	48 M	4	0	1	0	1	0
59	19 F	6	0	1	0	1	1
60	61 M	7	0	1	0	1	1
61	42 M	7	0	1	0	1	1
62	55 M	3	0	0	0	1	0
63	56 M	5	0	1	0	1	1
64	50 M	5	0	1	0	1	1
65	67 M	10	1	1	0	1	1
66 ?	F	5	0	1	1	1	0
67	60 F	3	0	1	0	1	0
68	58 M	6	0	1	0	1	1

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Survey Dolakha 2009 - Question 1 Medicinal Plant use

69	26 F	6	0	1	0	1	nnnnnnn	nnnnnnr
70	50 M	5	0	0	0	1		0
71	70 M	2	0	0	0	1		0
72	58 F	4	0	1	0	1		0
73	60 F	5	0	1	1	1		0
74	58 M	4	0	0	0	1		0
75	68 M	10	0	1	0	1		1
76	67 M	4	1	1	0 x			0
77	78 F	2	0	0	0 x			0
78	13 F	3	1	1	0 x			0
79	60 F	2	1	1	0 x			0
80	50 F	1	1	0	0 x			0
81	61 M	2	0	0	0 x			0
82	32 F	3	1	0	0 x			0
83	35 F	3	1	0	0 x			0
84	16 M	3	1	1	0 x			0
85	58 M	3	1	1	0 x			0
86	32 M	7	1	1	1 x			0
87	21 F	2	1	0	0 x			0
88	18 F	3	0	1	0 x			0
89	18 F	3	1	1	0 x			0
90	40 F	4	1	1	0 x			0
91	45 F	1	0	0	0 x			0
92	17 F	3	1	1	0 x			0
93	42 M	4	1	1	1 x			0
94	60 M	5	1	1	1 x			0
95	50 M	3	1	1	1 x			0
96	35 M	4	1	1	0 x			0
97	20 M	1	0	1	0 x			0
98	40 M	1	0	1	0 x			0
99	22 F	2	0	0	0 x			0
100	32 M	5	1	1	1 x			0
101	45 M	3	1	1	0 x			0
102	48 M	3	0	1	0 x			0
103	23 M	1	0	1	0 x			0

Appendix VI Survey Question 1-6

Survey Dolakha 2009 - Question 1 Medicinal Plant use

104	40 M	1	0	0	0 x		0
105	38 M	7	1	1	1 x		0
106	31 M	5	1	1	0 x		0
107	73 M	4	1	1	0 x		0
108	70 M	4	0	1	0 x		0
109	15 M	4	1	1	x		0
110	22 F	4	1	1	0	1	0
111	50 M	3	1	1	0 x		0
112	45 F	4	1	1	0	1	0
113	32 F	0	0	0	0 x		0
114	32 M	3	0	1	0 x		0
115	50 M	3	0	1	0 x		0
116	40 M	2	0	1	0 x		0
117	35 M	1	0	0	0 x		0
118	45 M	3	0	1	0 x		0
119	55 M	0	0	0	0 x		0
120	72 M	3	0	1	0 x		0
121	31 F	1	0	0	0 x		0
122	67 F	0	0	0	0 x		0
123	34 F	1	0	0	0 x		0
124	42 F	0	0	0	0 x		0
125	30 M	0	0	0	0 x		0
126	24 F	1	0	0	0 x		0
127	73 M	19	0	0	0	1	0
128	30 M	9	1	1	0	1	0
129	56 F	4	0	0	0	1	0
SUM			36	99	11	79	26

Appendix VI Survey Question 1-6

Survey Dolakha 2009 - Question 1 Medicinal Plant use

MP7 Banmara	MP8 Gothabre	MP9 Pineshe Lahale	MP10 Kafal tree	MP11 Simrik Thar	MP12 Swatta	MP13 Padamchal	MP14 Pakhanbed	MP Toe
	1	2						
	1	1	1	1				
	1							
	1	1			1	1		
	1							
	1	1						
	1	1					1	
	1	1						
	1	1	1					1
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Survey Dolakha 2009 - Question 1 Medicinal Plant use

Survey Dolakha 2009 - Question 1 Medicinal Plant use

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1							1	
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1	1							
1							1	
1							1	
84	36	2	1	1	1		11	8

Appendix VI Survey Question 1-6

Survey Dolakha 2009 - Question 1 Medicinal Plant use

MP16 Dhursho	MP17 Kyamuno	MP18 Neem	MP19 100 Petal Flower	MP20 Aisebe	MP21 Gaitihere	MP22 Ginger	MP23 Thurookthi	Mp. Tul
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2

1

MP25	MP26	MP27	MP28	MP29	MP30	MP31	MP32	MP33
Bozo	Sunguri	Djai	Dubo	Sunpati	Panchaunle	Algae	Bajo	Sisnu

1

1

1

1

			1	1		1	1
8	1	1	4	4	2	3	2

Appendix VI Survey Question 1-6

Survey Dolakha 2009 - Question 1 Medicinal Plant use

MP34	MP35	MP36	MP37	MP38	MP39	MP40	MP41	MP42
Simok	Bir Khato	Sila Jit	Patsole	Kurki	Mahabakhma	Chomlay	Banch	Bichm

1

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1

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1

1

1

1 1 1 2 1 1 0 0

Appendix VI Survey Question 1-6

Survey Dolakha 2009 - Question 1 Medicinal Plant use

MP43	MP44	MP45	MP46	MP47	MP48	MP49	MP50	MP51
Paash Only	Akash belly	Kulkulihara	Tulochato	Kutki	Totallo	Tintolighar	Budoghar	Ghant

1

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Appendix VI Survey Question 1-6

Survey Dolakha 2009 - Question 1 Medicinal Plant use

MP52	MP53	MP54	MP55	MP56	MP57	MP58	MP59	MP60
Ghau	Bhajardante	Bespetch	Satuwa	Sungrikande	Kakreghe	Kukurpaleghar	Kukupale	Maje

1

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Appendix VI Survey Question 1-6

Survey Dolakha 2009 - Question 1 Medicinal Plant use

MP61	MP62	MP63	MP64	MP65	MP66	MP67	MP68	MP69
Malayagin	Napke	Bansup	Kafal	Bamboo	Chitoo	Bansuntala	Chamlaya	Kulku

MP70	MP71	MP72	MP73
Kaijal	Thulo Okhto	Sarmaguru	Aiselu

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Survey Dolakha 2009 - Question 2 Change in MP collection since childhood

Survey no	Age	Sex	MP1 Dhasingare	MP2 Chiraito	MP3 Loth Salla	MP4 (Sil) Timur	MP5 Satawari	
1	28	M	x	x	x	x	x	
2	31	M	x	x	x	x		1
3	27	F	x		1 x	x	x	
4	22	M	x	x	x		1 x	
5	54	M		1 x	x	x	x	
6	46	M	x		1 x	x	x	
7	29	F	x		1 x	x	x	
8	46	M		1	1 x	x	x	
9	50	M	x		1 x	x	x	
10	70	M		1	1 x		1	1
11	61	M	x		1	1 x	x	
12	40	M		1	1 x	x		1
13	47	M		1 x	x	x	x	
14	60	F		1 x	x	x	x	
15	75	F		1 x	x		1 x	
16	21	F	x		1 x	x	x	
17	30	M		1 x	x	x	x	
18	15	M		1 x	x	x	x	
19	27	F		1	1 x		1 x	
20	30	F		1	1 x		1 x	
21	44	F		1	1 x		1 x	
22	65	F	x	x	x	x	x	
23	29	F	x		1 x		1 x	
24	72	F	x		1 x		1 x	
25	37	F	x		1 x	x	x	
26	65	M	x		1 x		1 x	
27	55	M	x	x	x	x	x	
28	28	M	x	x	x		1 x	
29	40	F	x	x	x	x	x	
30	50	F	x	x	x	x	x	
31	44	F		1	1	1 x	x	
32	28	M	x		1 x	x	x	
33	36	F		1	1 x		1 x	

Survey Dolakha 2009 - Question 2 Change in MP collection since childhood

34	50 F	x		1 x	x	x	
35	48 M		1	1	1	1 x	
36	49 M		1	1 x		1 x	
37	78 F		1	1 x		1 x	
38	66 M		1	1 x		1	1
39	66 M		1	1 x		1 x	
40	70 M		1	1 x		1	1
41	35 M		1	1 x		1	1
42	55 M		1	1	1	1 x	
43	59 M		1	1	1	1 x	
44	65 M		1	1 x		1 x	
45	16 M	x	x	x	x	x	
46	30 M		1	1 x		1 x	
47	79 M		1	1	1	1	1
48	56 F	x		1 x	x	x	
49	37 F	x		1 x	x	x	
50	49 M	x		1 x	x	x	
51	66 F	x	x	x		1 x	
52	79 M		1	1 x		1 x	
53 ?	F	x		1 x	x	x	
54	38 F	x	x	x		1 x	
55	37 M	x		1 x		1 x	
56	24 M	x		1 x	x	x	
57	42 M	x	x	x		1 x	
58	48 M	x		1 x		1 x	
59	19 F	x	x	x	x	x	
60	61 M	x		1 x		1 x	
61	42 M	x		1 x		1 x	
62	55 M	x	x	x		1 x	
63	56 M	x		1 x	x	x	
64	50 M	x		1 x	x	x	
65	67 M		1	1 x		1	1
66 ?	F	x		1 x		1 x	
67	60 F	x		1 x		1 x	
68	58 M	x		1 x		1	1

Survey Dolakha 2009 - Question 2 Change in MP collection since childhood

69	26 F	x		1 x		1 x	
70	50 M	x	x	x		1 x	
71	70 M	x	x	x		1 x	
72	58 F	x		1 x		1 x	
73	60 F	x	x	x		1 x	
74	58 M	x	x	x		1 x	
75	68 M	x		1 x		1	1
76	67 M	x	x	x	x	x	
77	78 F	x	x	x	x	x	
78	13 F	x	x	x	x	x	
79	60 F	x	x	x	x	x	
80	50 F		1 x	x	x	x	
81	61 M	x	x	x	x	x	
82	32 F		1 x	x	x	x	
83	35 F		1 x	x	x	x	
84	16 M	x	x	x	x	x	
85	58 M		1	1 x	x	x	
86	32 M		1	1	1 x	x	
87	21 F		1 x	x	x	x	
88	18 F		1	1 x	x	x	
89	18 F		1	1	1 x		1
90	40 F		1	1 x	x	x	
91	45 F		1	1	1 x		1
92	17 F		1	1 x	x	x	
93	42 M	x	x	x	x	x	
94	60 M		1	1	1 x		1
95	50 M		1	1	1 x	x	
96	35 M		1	1	1 x	x	
97	20 M		1	1	1 x	x	
98	40 M		1	1	1 x	x	
99	22 F	x	x	x	x	x	
100	32 M	x	x	x	x	x	
101	45 M		1	1	1 x		1
102	48 M		1	1	1 x		1
103	23 M		1	1	1 x		1

Survey Dolakha 2009 - Question 2 Change in MP collection since childhood

104	40 M		1	1	1 x		1
105	38 M		1	1	1 x		1
106	31 M		1	1 x	x	x	
107	73 M	x	x	x	x	x	
108	70 M		1	1 x	x	x	
109	15 M		1	1 x	x	x	
110	22 F	x		1 x	x	x	
111	50 M		1	1 x	x		1
112	45 F		1	1 x	x	x	
113	32 F		1 x	x	x	x	
114	32 M	x		1 x	x	x	
115	50 M	x	x	x	x	x	
116	40 M	x	x	x	x	x	
117	35 M		1	1	1 x		1
118	45 M	x	x	x	x	x	
119	55 M	x	x	x	x	x	
120	72 M	x	x	x	x	x	
121	31 F	x	x	x	x	x	
122	67 F	x	x	x	x	x	
123	34 F	x	x	x	x	x	
124	42 F	x	x	x	x	x	
125	30 M	x	x	x	x	x	
126	24 F	x	x	x	x	x	
127	73 M		1	1 x		1	1
128	30 M	x	x	x	x	x	
129	56 F	x	x	x	x	x	

Survey Dolakha 2009 - Question 3 Change since the establishment of Community Forestry User Groups (7 yrs)

Survey no	Age	Sex	MP collection	Food & fodder	Firewood	Access	Finance	Forest conservatio	No change
1	28	M				1	-1	-1	2
2	31	M					-1		
3	27	F		-1	-1		-1		
4	22	M					-1		2
5	54	M					1		2
6	46	M							x
7	29	F		-1			-1		x
8	46	M							1 x
9	50	M	0				-1		1
10	70	M	0		-1		-1		1
11	61	M	0				-1		1
12	40	M	0				-1		1
13	47	M	0				-1		1
14	60	F	0						2
15	75	F	DK						
16	21	F	0						1
17	30	M	0				-1		1
18	15	M	0				-1		1
19	27	F	0	-1					2
20	30	F	0	-1					2
21	44	F	0				-1		2
22	65	F	0						x
23	29	F	0						
24	72	F	0				-1	-1	
25	37	F	0	-1	-1		-1		1
26	65	M	0				-1		2
27	55	M	0	-1	-1		-1		2
28	28	M	0	-1	-1		-1	-1	
29	40	F	0					-2	1
30	50	F	0	-1	-1			-1	
31	44	F	0						2
32	28	M	0	1			-1		2
33	36	F	0				-1		2

Survey Dolakha 2009 - Question 3 Change since the establishment of Community Forestry User Groups (7 yrs)

34	50 F	0					
35	48 M	0					1
36	49 M	0		1			1
37	78 F	0					
38	66 M	0	-1		-1	-2	-1
39	66 M	0				-2	1
40	70 M	0			-1		2
41	35 M	0			-1	1	
42	55 M	0		1		1	1
43	59 M	0			-2		
44	65 M	0			-1	-2	
45	16 M	0	-1			-1	
46	30 M	0	1	1			1
47	79 M	0				-1	1
48	56 F	0					1
49	37 F	0	0	0			1
50	49 M	0	-1	-1			1
51	66 F	0				-1	
52	79 M	0					-1
53 ?	F	0					1
54	38 F	0	1				1
55	37 M	0					2
56	24 M	0					1
57	42 M	0					x
58	48 M	0					1
59	19 F	0					1
60	61 M	0					2
61	42 M	0					2
62	55 M	0	-1	-1		-1	2
63	56 M	0		1			1
64	50 M	0		1	-1		
65	67 M	0					2
66 ?	F	0			-1		1 x
67	60 F	0					1
68	58 M	0					1

Survey Dolakha 2009 - Question 3 Change since the establishment of Community Forestry User Groups (7 yrs)

69	26 F	0						2
70	50 M	0	1	1				
71	70 M	0						2
72	58 F	0			-1			1
73	60 F	0	1	1				1
74	58 M	0	-1	-1	-1			
75	68 M	0				-1		1
76	67 M	0						x
77	78 F	0						x
78	13 F	0						x
79	60 F	0						1 x
80	50 F	0						
81	61 M	0						
82	32 F	0						
83	35 F	1						
84	16 M	0	-1					2
85	58 M	0		-2				
86	32 M	-1				1		
87	21 F	0			-1	1		
88	18 F	0				1		2
89	18 F	0				1		2
90	40 F	1		-1	-1			
91	45 F	0						x
92	17 F	0		-1				2
93	42 M	0						2 x
94	60 M	0			-1			1
95	50 M	0			-2			2
96	35 M	0				1		2
97	20 M	0						2
98	40 M			-1		-2		2
99	22 F	0						x
100	32 M	1	-1					2
101	45 M	1				1		
102	48 M	1						1
103	23 M	1						2

Survey Dolakha 2009 - Question 3 Change since the establishment of Community Forestry User Groups (7 yrs)

104	40 M	0	1	1		1	2	
105	38 M	-1			1	2	1	
106	31 M	0			-1	1	2	
107	73 M	1			-1		1	
108	70 M	0	1	1			2	
109	15 M	1		1			1	
110	22 F	1	1	1				
111	50 M	0	1	2	-1			
112	45 F	0	1	1			2	
113	32 F	0	1	1			2	
114	32 M	1				1		
115	50 M	0	1	1			2	
116	40 M	0	1	1	1			
117	35 M	0	1	1			2	
118	45 M	0	1	1				
119	55 M	0		1				
120	72 M	0	1	1	1			
121	31 F	0	1	1				
122	67 F	0	1	1				
123	34 F	0	1	1			2	
124	42 F	0	1	1				
125	30 M	1			-1	-1		
126	24 F	0	1	1				
127	73 M	0				-1	-1 x	
128	30 M	0					2	
129	56 F	0			-1			
SUM		9	6	13	-35	-9	115	14

*
Question 3 is turned around. Its not difficult to collect MP for own use, instead it is difficult for some pec

Survey Dolakha 2009 - Question 3 Change since the establishment of Community Forestry User Groups (7 yrs)

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Survey Dolakha 2009 - Question 3 Change since the establishment of Community Forestry User Groups (7 yrs)

Survey Dolakha 2009 - Question 3 Change since the establishment of Community Forestry User Groups (7 yrs)

Survey Dolakha 2009 - Question 3 Change since the establishment of Community Forestry User Groups (7 yrs)

ome plants have turned into MP and cannot be collected anymore for cattle fodder!

Survey Dolakha 2009 - Question 4 Why buys the plants

Survey no	Age	Sex	MP1 Dhasingare	MP2 Chiraito	MP3 Loth Salla	MP4 (Sil) Timur	MP5 Satawari
1	28	M	L/T	T	T	T	T
2	31	M		T	T	L	L/T
3	27	F		T	T	T	T
4	22	M		T		L	
5	54	M	T	T		L	
6	46	M		T		L	
7	29	F		T		L	
8	46	M		L/T		L	
9	50	M		L/T		L	
10	70	M	L/T	L/T		L	T
11	61	M	L/T	T	T	L	L
12	40	M	L/T	T			T
13	47	M	T	T			
14	60	F	T	T			
15	75	F					
16	21	F	T	T			
17	30	M					
18	15	M					
19	27	F					
20	30	F					
21	44	F					
22	65	F					
23	29	F		L/T			
24	72	F	L/T	L/T	L/T	L/T	
25	37	F					
26	65	M	L/T	L/T	T	L/T	L/T
27	55	M				L	
28	28	M		L/T		L	
29	40	F				L	
30	50	F				L	
31	44	F	L/T	L/T		L	L
32	28	M	T	T		L	
33	36	F	L/T	T		L	

Survey Dolakha 2009 - Question 4 Why buys the plants

34	50 F					
35	48 M	L/T	T			
36	49 M	L/T	L/T		L	
37	78 F	L/T	L/T	T	L	
38	66 M	L/T	L/T			
39	66 M	L/T	L/T		L	
40	70 M	L/T	L/T		L/T	L
41	35 M	L/T	L/T		L	L
42	55 M	L/T	L/T	L/T	L/T	L/T
43	59 M	L	L	L	L	
44	65 M	L	L/T	L	L	
45	16 M					
46	30 M	L/T	L/T	L/T	L	
47	79 M	L/T	L/T	T	L	L/T
48	56 F		L/T		L	
49	37 F		L/T		L	
50	49 M		L/T		L	L/T
51	66 F					
52	79 M					
53 ?	F					
54	38 F					
55	37 M		L/T		L	
56	24 M		L/T		L	
57	42 M		T		L	
58	48 M		L/T		L	
59	19 F					
60	61 M		L/T			
61	42 M		L/T		L	L/T
62	55 M				L	
63	56 M		L/T			
64	50 M					
65	67 M					
66 ?	F					
67	60 F					
68	58 M					

Survey Dolakha 2009 - Question 4 Why buys the plants

69	26 F			
70	50 M			
71	70 M			
72	58 F		L/T	L
73	60 F			
74	58 M			
75	68 M		L/T	
76	67 M	T/P	T	
77	78 F			
78	13 F	L/T	L/T	
79	60 F	T	T	
80	50 F	T		
81	61 M			
82	32 F	T		
83	35 F	T		
84	16 M	T	T	
85	58 M	T	T	
86	32 M			
87	21 F			
88	18 F	T	T	
89	18 F	T	T	
90	40 F	T	T	
91	45 F	T	T	
92	17 F	T	T	
93	42 M	T	T	T
94	60 M	T	T	T
95	50 M	T	T	T
96	35 M	T	T	T
97	20 M	T	T	T
98	40 M	T	T	T
99	22 F	T	T	T
100	32 M	T	T	T
101	45 M	P/L/T	P/L/T	
102	48 M	T	T	
103	23 M	T	T	

Survey Dolakha 2009 - Question 4 Why buys the plants

104	40 M	T	T			
105	38 M	T	T	T		
106	31 M	T	T	T		
107	73 M	T	T			
108	70 M	T	T			
109	15 M					
110	22 F					
111	50 M	T	T	T		
112	45 F	T	T	T		
113	32 F					
114	32 M	T	T	T		
115	50 M	T	T	T		
116	40 M	T	T	T		T
117	35 M	T	T	T		
118	45 M	T	T	T		T
119	55 M					
120	72 M	T	T	T		
121	31 F	T	T	T		T
122	67 F	T	T	T		
123	34 F	T	T	T		
124	42 F					
125	30 M	T	T	T		
126	24 F	T	T	T		
127	73 M	L/T	L/T	T	L	L/T
128	30 M					
129	56 F					

Survey Dolakha 2009 - Question 5 Do you agree or disagree with the following statement:
MP are a good source of extra income

Survey no	Age	Sex	Yes, good source of extra income	Yes, if more plants	No time	More study	N
1	28	M		1			1
2	31	M		1			1
3	27	F					
4	22	M		1			
5	54	M					
6	46	M			1		
7	29	F			1		
8	46	M			1		
9	50	M		1			
10	70	M		1			
11	61	M		1			
12	40	M		1			
13	47	M		1			
14	60	F		1			
15	75	F		1			
16	21	F					
17	30	M		1			
18	15	M		1			
19	27	F		1			
20	30	F		1			
21	44	F				1	
22	65	F					
23	29	F					
24	72	F					
25	37	F	no				
26	65	M					
27	55	M		1			
28	28	M					
29	40	F					
30	50	F					
31	44	F				1	
32	28	M		1			
33	36	F		1			

Survey Dolakha 2009 - Question 5 Do you agree or disagree with the following statement:
MP are a good source of extra income

34	50 F				
35	48 M		1		
36	49 M		1		
37	78 F				
38	66 M				
39	66 M	no			
40	70 M			1	1
41	35 M			1	
42	55 M			1	
43	59 M			1	
44	65 M			1	
45	16 M		1		
46	30 M			1	
47	79 M				1
48	56 F			1	
49	37 F			1	
50	49 M		1		
51	66 F		1		
52	79 M			1	
53 ?	F			1	
54	38 F			1	1
55	37 M			1	
56	24 M	no			
57	42 M			1	
58	48 M				
59	19 F				
60	61 M			1	
61	42 M		1		
62	55 M		1		
63	56 M		1		
64	50 M		1		
65	67 M			1	
66 ?	F		1		
67	60 F		1		
68	58 M		1		

Survey Dolakha 2009 - Question 5 Do you agree or disagree with the following statement:
MP are a good source of extra income

69	26 F		1		
70	50 M			1	
71	70 M		1		
72	58 F		1		
73	60 F				
74	58 M			1	
75	68 M			1	
76	67 M	no			
77	78 F	no			
78	13 F		1		
79	60 F			1	1
80	50 F		1		
81	61 M	no			
82	32 F		1		1
83	35 F		1		
84	16 M		1		
85	58 M		1		
86	32 M		1		
87	21 F		1		
88	18 F		1		
89	18 F		1		
90	40 F		1		
91	45 F		1		1
92	17 F		1		
93	42 M		1		
94	60 M		1		
95	50 M		1		
96	35 M		1		
97	20 M		1		
98	40 M		1		
99	22 F		1		
100	32 M		1		
101	45 M		1		
102	48 M		1		
103	23 M		1		

Survey Dolakha 2009 - Question 5 Do you agree or disagree with the following statement:
MP are a good source of extra income

104	40 M	1			
105	38 M	1			
106	31 M	1			
107	73 M	1			
108	70 M			1	
109	15 M	1		1	
110	22 F	1			
111	50 M	1			
112	45 F	1			
113	32 F			1	
114	32 M	1			
115	50 M	1			
116	40 M	1		1	
117	35 M	1			
118	45 M	1			
119	55 M				
120	72 M	1			
121	31 F	1			
122	67 F	1		1	
123	34 F				
124	42 F				
125	30 M	1			
126	24 F				
127	73 M		1		
128	30 M	1			
129	56 F				
SUM		74	24	10	4

Survey Dolakha 2009 - Question 5 Do you agree or disagree with the following statement:
MP are a good source of extra income

"loose" managemer yes, but no market

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Survey Dolakha 2009 - Question 5 Do you agree or disagree with the following statement:
MP are a good source of extra income

1	1
	1

Survey Dolakha 2009 - Question 5 Do you agree or disagree with the following statement:
MP are a good source of extra income

Survey Dolakha 2009 - Question 5 Do you agree or disagree with the following statement:
MP are a good source of extra income

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4

Survey Dolakha 2009 - Question 6 Do you agree or disagree with the following statement:
Nothing changed for collecting MP in the last 5 to 6 years

Survey no	Age	Sex	Yes, no change MP in last 5-6 yr	No, commercialization	No, sustainable harvest
1	28	M			1
2	31	M			
3	27	F	1		
4	22	M			
5	54	M			1
6	46	M	1		
7	29	F	1		
8	46	M			1
9	50	M			1
10	70	M			
11	61	M			1
12	40	M			
13	47	M			1
14	60	F			1
15	75	F			
16	21	F			
17	30	M			1
18	15	M			1
19	27	F			
20	30	F			
21	44	F			
22	65	F			
23	29	F			
24	72	F			
25	37	F			
26	65	M			
27	55	M			1
28	28	M			1
29	40	F			
30	50	F			
31	44	F			
32	28	M			1
33	36	F			

Survey Dolakha 2009 - Question 6 Do you agree or disagree with the following statement:
Nothing changed for collecting MP in the last 5 to 6 years

34	50 F		1
35	48 M		
36	49 M		1
37	78 F		1
38	66 M		1
39	66 M		1
40	70 M		1
41	35 M		1
42	55 M		
43	59 M		
44	65 M		1
45	16 M		
46	30 M		1
47	79 M		1
48	56 F		
49	37 F		1
50	49 M		
51	66 F		
52	79 M		1
53 ?	F		1
54	38 F		1
55	37 M		1
56	24 M		1
57	42 M		1
58	48 M	1	
59	19 F		1
60	61 M		
61	42 M	1	
62	55 M		
63	56 M		1
64	50 M		1
65	67 M		1
66 ?	F		1
67	60 F		
68	58 M	1	

Survey Dolakha 2009 - Question 6 Do you agree or disagree with the following statement:
Nothing changed for collecting MP in the last 5 to 6 years

69	26 F		
70	50 M	1	
71	70 M		
72	58 F		1
73	60 F	1	
74	58 M	1	
75	68 M		1
76	67 M	1	
77	78 F	1	
78	13 F	1	
79	60 F		1
80	50 F	1	
81	61 M		1
82	32 F		1
83	35 F		1
84	16 M	1	
85	58 M		1
86	32 M		1
87	21 F		1
88	18 F		1
89	18 F	1	
90	40 F		1
91	45 F		1
92	17 F		1
93	42 M	1	
94	60 M	1	
95	50 M		1
96	35 M		1
97	20 M	1	
98	40 M		1
99	22 F	1	
100	32 M		
101	45 M		1
102	48 M	1	
103	23 M		1

Survey Dolakha 2009 - Question 6 Do you agree or disagree with the following statement:
Nothing changed for collecting MP in the last 5 to 6 years

104	40 M		
105	38 M		
106	31 M		
107	73 M	1	
108	70 M		1
109	15 M		1
110	22 F		
111	50 M	1	
112	45 F		1
113	32 F		1
114	32 M		1
115	50 M	1	
116	40 M		1
117	35 M		
118	45 M		1
119	55 M		
120	72 M	1	
121	31 F	1	
122	67 F		1
123	34 F		
124	42 F		
125	30 M		1
126	24 F		
127	73 M		1
128	30 M		1
129	56 F		
SUM		25	63

Survey Dolakha 2009 - Question 7 Do you agree or disagree with the following statement:
I did not notice any difference since our village established an CFUG

Survey no	Age	Sex	No difference since CFUG	No, positive developmen	No, negative developmen
1	28	M		1	
2	31	M			1
3	27	F			1
4	22	M	1		
5	54	M	1		
6	46	M	1		
7	29	F			1
8	46	M		1	
9	50	M		1	
10	70	M			1
11	61	M		1	
12	40	M		1	
13	47	M		1	
14	60	F		1	
15	75	F	1		
16	21	F			
17	30	M			1
18	15	M			1
19	27	F		1	
20	30	F		1	
21	44	F		1	
22	65	F	1		
23	29	F			
24	72	F			1
25	37	F			1
26	65	M		1	
27	55	M		1	1
28	28	M			1
29	40	F			1
30	50	F			1
31	44	F		1	
32	28	M		1	
33	36	F		1	

Survey Dolakha 2009 - Question 7 Do you agree or disagree with the following statement:
I did not notice any difference since our village established an CFUG

34	50 F			
35	48 M		1	
36	49 M		1	
37	78 F		1	
38	66 M			1
39	66 M			1
40	70 M		1	1
41	35 M	1		
42	55 M		1	
43	59 M			1
44	65 M			1
45	16 M			1
46	30 M		1	
47	79 M		1	
48	56 F		1	
49	37 F		1	
50	49 M		1	1
51	66 F		1	1
52	79 M	1		
53 ?	F		1	
54	38 F		1	
55	37 M		1	
56	24 M		1	
57	42 M	1		
58	48 M		1	1
59	19 F		1	
60	61 M		1	
61	42 M		1	
62	55 M			1
63	56 M		1	
64	50 M		1	1
65	67 M		1	
66 ?	F	1		1
67	60 F	1		
68	58 M	1		

Survey Dolakha 2009 - Question 7 Do you agree or disagree with the following statement:
I did not notice any difference since our village established an CFUG

69	26 F		1	
70	50 M		1	
71	70 M		1	
72	58 F		1	
73	60 F		1	
74	58 M			1
75	68 M			1
76	67 M			
77	78 F	1		
78	13 F	1		
79	60 F	1		
80	50 F			
81	61 M	1		
82	32 F	1		
83	35 F			1
84	16 M		1	1
85	58 M			1
86	32 M		1	
87	21 F		1	
88	18 F		1	
89	18 F		1	
90	40 F			1
91	45 F	1		
92	17 F		1	
93	42 M		1	
94	60 M		1	
95	50 M			1
96	35 M		1	
97	20 M		1	
98	40 M			1
99	22 F	1		
100	32 M		1	
101	45 M		1	
102	48 M		1	
103	23 M		1	

Survey Dolakha 2009 - Question 7 Do you agree or disagree with the following statement:
I did not notice any difference since our village established an CFUG

104	40 M	1	
105	38 M	1	
106	31 M	1	
107	73 M	1	
108	70 M	1	
109	15 M	1	
110	22 F	1	
111	50 M	1	
112	45 F	1	
113	32 F	1	
114	32 M	1	
115	50 M	1	
116	40 M	1	
117	35 M	1	
118	45 M	1	
119	55 M	1	
120	72 M	1	
121	31 F	1	
122	67 F	1	
123	34 F	1	
124	42 F	1	
125	30 M		1
126	24 F	1	
127	73 M		1
128	30 M	1	
129	56 F		1
SUM		18	79
			34