Social Production of Ecosystem Services in the Tinau Watershed, Nepal

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Abstract

The concept of 'ecosystem services' has drawn considerable attention of people engaged in environmental, forestry and natural resource policy and management. There are two broad perspectives regarding the concept. The first emphasises the advantage of using pricing mechanisms to value the different components of ecosystems that operate in the form of 'services' for keeping the environment healthy and functional for people. It argues that by allocating monetary values to these ecosystem services, people who are involved in protecting them can receive proper compensation for their actions by others who derive benefits from such efforts. Payment for ecosystem services is thus viewed as an economically rational, market-based approach that incentivises people to protect the environment in return for monetary profit, which can be used to further invest in enhancing environmental benefits.   The second perspective is critical of the concept of ecosystem services, arguing that it is yet another neoliberal strategy aimed at commoditizing and privatizing nature in new ways and creating a market for such services that benefits a few and excludes the majority of people who do not have the financial capacity to pay for them. However, neither of these perspectives considers how the meaning and materiality of ecosystems are produced as socio-natural entities, and how they are imbued with a wide range of values associated with people's livelihoods, traditions and cultural practices. This alternative perspective provides a more grounded and nuanced understanding of how these diverse values can be used to understand and manage ecosystems in ways that improve and strengthen their meaningfulness for the communities and groups involved.

This thesis aims to analyse how the material and meaning of ecosystem services are socially produced in the context of the Tinau watershed in Western Nepal. This watershed encompasses the Siwalik Hills of the outer Himalayas and the sub-Himalayan lowlands

known as the Terai. The watershed has been targeted by the government and international agencies for piloting a 'Payment for Ecosystem Services' project, where communities living in the hill areas are to be compensated by downstream communities for their efforts in protecting and increasing forests in the watershed. By adopting Henri Lefebvre's framework of 'the production of space', the thesis examines how the relationship between the highlands and lowlands has been established over time, and how this relationship shapes the Tinau watershed and ecosystems in terms of the interaction of spatial processes and their socio-natural outcomes. Lefebvre's framework holds that space is a dynamic and living entity produced from the interaction of three interrelated components: spatial practice, representations of space, and representational spaces. I examine these three components of production by drawing on theoretical work on commons and common property, epistemic communities, and political ecology.

The thesis traces the political-economic and attendant social and ecological changes in the Siwalik and the Terai through different historical phases of Nepal's emergence and identity as a Himalayan nation state to provide the context for the Tinau watershed case study. The historical review shows the development of a conceptual and material division between the hills and the plains in terms of unequal access to natural resources, economic benefits and political power that has consistently favoured the political interests of the hill elites. This unequal relationship has been politically reproduced at the regional scale in terms of conceptualising the Siwalik and Terai as two separate physical entities. The thesis shows how these concepts of the Siwalik and Terai have in turn influenced the delineation of theTinau watershed in terms of 'upstream' and 'downstream' for 'payment for ecosystem services'.
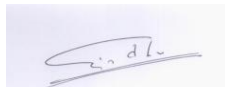
The thesis illustrates that the spatial practice at different locations along the Tinau watershed are connected by the multi-directional flows of people and resources through their everyday practices. These spatial practices produce the watershed as a complex set of socio-natural ecosystems interlinking villages and towns in the Siwalik and the Terai. In contrast, political authorities and dominant players such as the government agencies and international NGOs represented the Tinau watershed entirely within the Siwalik area and defined it as the 'upstream' source of ecosystem services that provided benefits to the 'downstream' Terai area. The thesis then explores the concerns and values of people living in the Siwalik and Terai areas of the Tinau watershed to examine their interpretations of the watershed, forest ecosystems, and management of watershed resources. It shows that the representational space emerging from their concerns and values interprets the Tinau watershed as a commons space with a shared sense of belonging and the need for collective action for its management. The thesis concludes by reflecting on these findings from the Tinau watershed, arguing that they provide radical ways of thinking about valuing ecosystems and managing them without relying on the concept of 'payment for services'. It shows how the study offers alternative ways of overcoming the conceptual and politicised divisions between mountain and plains that have persisted in policy and state-making in Nepal, and argues that these alternatives can produce a sustainable common future for the nation's Terai and Himalayan regions.

Declaration

In accordance with Monash University Doctorate Regulation 17.2 Doctor of Philosophy and Research Master's regulations the following declarations are made:

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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The research for this project received the Human Ethics Certificate of Approval of the Monash University Human Research Ethics Committee (Project Number: CF11/2449 - 2011001415)

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List of Acronyms

CAPS   Chure Area Programme Strategy

CARE   Cooperative for Assistance and Relief Everywhere

DDC   District Development Committee

ES   Ecosystem Services

FECOFUN   Federation of Community Forestry Users, Nepal

GON   Government of Nepal

GPS   Global Positioning System

ICIMOD   International Centre for Integrated Mountain Development

INGO   International Non-Government Organization

IUCN   International Union for Conservation of Nature

MJF   Madhesi Janadhikar Forum

CPN (Maoist)   Communist Party of Nepal (Maoist)

CPN (UML)   Communist Party of Nepal (Unified Marxist Leninist)

NGO   Non-Government Organization

PES   Payment for Ecosystem Services

PSCP   President Siwalik Conservation Programme

REDD   Reduce Emissions from Deforestation and Forest Degradation

UDMF   United Democratic Madhesi Forum

UNDP   United Nations Development Programme

USAID   United States Agency for International Development

VDC   Village Development Committee

WTLCP   Western Terai Landscape Complex Project

WWF   Worldwide Fund for Nature

Chapter 1: Introduction

When I was growing up, I heard a story about a merchant and a poet sharing a house and living in adjacent rooms. The life of the poet was impoverished, while the merchant was better-off. The merchant used to cook a fragrant and delicious curry every day for his lunch. When he cooked the curry, its spicy aroma would diffuse through the wall into the poet's room. As the poet lived simply from hand-to-mouth, he could manage only rice, but no curry. Every day he cooked rice early in the morning and waited until the merchant cooked his curry. Once the poet noticed the spicy aroma spreading in his room, he would gobble his rice as quickly as possible before the aroma subsided. It was a daily routine.

One day the poet kept waiting with his rice for the merchant to cook his curry. The afternoon passed by but he did not notice any aroma at all. He was so hungry that he could not help knocking on the merchant's door. He asked the merchant if he had cooked his curry that day. To the disappointment of the poet, the merchant replied that he was fasting that day. The merchant was very surprised and wondered why the neighbour asked him about his lunch. Very reluctantly the poet explained how he used to have his rice with the spicy aroma. Accustomed to measuring everything for a price, the merchant raised a serious issue about the poet's use of his curry's spicy aroma. He argued that he bore all the cost of the curry but the poet enjoyed the aroma without spending a penny on it. To the merchant, it was unfair to use anything owned by someone else without paying for it unless the owner offered it freely. Finally, the merchant asked the poet to pay him for the total of the utility of the aroma that he had enjoyed in the past. Unaware of any economic trick in such matters, the poet did not agree at all with the merchant. He argued that even if he did not enjoy the aroma, the

merchant could not help spreading it from his curry. They quarrelled fiercely until a village headman intervened to settle the problem.

I had a similar experience in my career as a forester. I decided to be a professional forester after finishing high school. During my early forestry training, I was taught, besides other things, how forests could be managed using a variety of silvicultural systems irrespective of the types of ownership or institutional mechanisms. What forestry meant to me basically was the knowledge and skills of 'silviculture', which Bebarta (2011:391) defines as the 'art and science of cultivating forest crops'.

The silvicultural systems would follow a series of cultural practices including weeding, cleaning, pruning, thinning and final harvest to name a few in the old growth or newly planted forests. It was through these silvicultural practices that the owner of the forest would produce tangible products such as timber, fuel-wood, fodder and leaf litter. We were taught that as far as the other benefits of the forests such as aesthetic beauty or conservation were concerned, the owner would not know who might benefit from them. The flow of such benefits, if any, was beyond the control of the owner, just as the curry aroma was not controlled by the merchant.

As my training and later career as a government forester unfolded, the dominant discourse of forestry gradually changed from forest as a crop to forest as an institutional landscape. The focus of discussions shifted, for example, from pruning to participation and from silviculture to social institutions. A number of new ideas such as community-based forestry, community-based forest enterprises, pro-poor forestry, community-based watershed management and locally-managed conservation areas emerged, emphasizing the role of local collective actions in resource management. Nonetheless, the focus of forestry still revolved around how to increase timber, fuel wood, fodder, leaf-litter and varieties of non-timber

forest products with more participation by the people and improved management practices. Timber and non-timber forest products were the main 'benefits' that people aimed for in managing forest resources. However, they were also aware that protecting forests could have other effects including direct and indirect support to farming, livestock rearing and greenery followed by an increased number and species of wild animals in their forests.

In the first decade of the third millennium, I started hearing that the benefits of forests could be priced and sold without felling any trees or shrubs. In other words, forests could be managed without applying any conventional silvicultural techniques that required weeding, cleaning, cutting branches and harvesting trees, among other activities. Both the earlier concepts of silvicultural and institutional landscapes were taken over by completely new concepts. An owner could simply preserve the forests and other 'non-owners' would pay for its benefits such as landscape beauty, soil conservation, biodiversity and carbon sequestration that would spread across space like the spicy aroma in the merchant-poet story. The tangible and intangible benefits of forests (and other ecological resources) were lumped together into a very mercantile term 'ecosystem service', a more abstract idea than forest products and functions. The payment for ecosystem services was supposed to be on a 'user pays'basis and the 'free lunch no more' (Joppa, 2012:656).

Interestingly, the concept of payment for ecosystem services was also expanded to include the context of community forests in that the forest user groups, who conserve the community forests, would be paid for their contribution toward producing the 'ecosystem services' that could benefit people beyond their user groups. Experts imagined a scenario between an uphill area with forests managed by local user groups (community forests) and the immediate downhill area without forests. The experts injected the idea of an 'upstream-downstream' linkage of ecosystem services whereby upland user groups were presented as

potential service providers to the people living in the plains. This kind of scenario has been portrayed in several landscapes, but most notably between the Himalayan foothills or the Siwalik (representing the upstream) and the plain immediately to the south or the Terai (representing the downstream). At a broader scale, entire community forests in Nepal were proposed as a single landscape that would produce 'ecosystem services' mainly in the form of carbon sequestration and conservation to be sold in the global market through a scheme called 'Reduce Emissions from Deforestation and Forest Degradation plus' (REDD+). 'Ecosystem services' and payment for these services were new concepts that challenged not only my silvicultural mindset developed through my academic training but also my growing awareness of local people's rights to decide on the ways in which the forest commons could be managed and used.

I return to the merchant-poet dilemma. Why does the merchant think the poet should pay for the aroma? Why does the poet think he does not need to pay for it? 'Ecosystem services' are part of a living space that produces numerous tangible and intangible things that are used in different ways like the aroma, which is conceived by the merchant in one way in terms of economic utility but perceived differently by the poet based on his material circumstances, experiences and imaginations in his everyday life.

My curiosity revolves around discovering the details of how the concept of 'ecosystem services' is socially produced and how the idea of 'upstream-downstream' linkage is used with reference to forests. A number of questions also arise. How do different social groups in a particular place or region value and use forest ecosystems? Are ecosystem services a commodity or commons? Can all aspects of forest ecosystems be priced in monetary terms? There are many different ways of valuing and managing forests, but why is it that payment for ecosystem services became the dominant concept for forestry? These are

some of the questions that call for an in-depth inquiry into the prevailing practices, concepts and institutions related to forests, ecosystems, ecosystem services and common resources in a case study context. Therefore, through the remainder of this dissertation I attempt to discover and address the complexities of these questions on empirical grounds.

1.1 Background, aim and objectives

The term 'ecosystem services' has drawn considerable attention from a wide spectrum of researchers and commentators interested in environmental changes that include climate change, ecological degradation, resource distribution conflicts and natural resource management. Although the knowledge that human livelihoods are founded on ecological production and transformation is not something new in human cognisance, the concept of ecological systems as stocks supplying 'services' to society is a relatively recent construct. In everyday language, 'ecosystem services' are understood as the products and processes in ecological features such as forests, grasslands, and wetlands that are regarded as critical for supporting the biological diversity and livelihoods of people in their local environments. In recent policy and academic discourse, the term is defined as the 'benefits people obtain from ecosystems' (Millennium Ecosystem Assessment, 2005:3), or more recently as 'the direct and indirect contributions of ecosystems to human well-being' (de Groot et al., 2010:25) at scales ranging from local to global environments.

The Millennium Ecosystem Assessment, which is a set of landmark reports published in 2005 with contributions by over 1400 scientists and experts from around the world highlighted the values attached to ecosystems that are important for human wellbeing. The documents broadly classify ecosystem services into provisioning, regulating, cultural and supporting services, all of which are crucial for human life and biodiversity (Millennium Ecosystem Assessment, 2005). In this classification, the provisioning services include the

tangible products of ecosystems, such as wood, food and fresh water, and regulating services include physical processes such as climate regulation and water purification. Cultural services include ecological values such as aesthetics, recreation and education perceived or enjoyed by human beings, while supporting services are the biogeochemical processes such as photosynthesis, soil formation and nutrient cycling that maintain the former three types of services. The supporting services have been rephrased as 'habitat services' by some authors (e.g. de Groot & Hein, 2007). The importance of ecosystem services has been increasingly emphasised in various global environmental agendas as a critical issue for human survival, biodiversity conservation and for mitigating the effects of global climate change (Daily, 1997; Kumar, 2010).

Despite emphasising the diverse socio-cultural, economic and ecological values accorded to ecosystem services around the world, most studies tend to describe or debate the value of ecosystem services primarily in economic or monetary terms. For example, Costanza et al. (1997a) estimate the value of 17 types of different ecosystem services across 16 biomes around the world (which, according to the authors, represent the entire biosphere) as ranging between US$16 to US$54 trillion annually. They claim that the upper limit of this range is almost three times that of the total Gross Domestic Product of all nations of the world in the study year. Balmford et al. (2002) value ecosystem services in terms of financial profitability, indicating a 100:1 benefit-cost ratio derived from managing ecosystem landscapes. Many more scholars have followed this trend by valuing ecosystem services in monetary terms at regional, national or local levels (Liu & Costanza, 2010; Wilson & Hoehn, 2006; Zhongxin & Xinshi, 2000). A recent study undertaken by 'The Economics of Ecosystems and Biodiversity Foundations' (TEEB Foundations) using a sample of 10 major biomes (open oceans, coral reefs, coastal systems, coastal wetlands, inland wetlands, rivers

and lakes, tropical forests, temperate forests, wetlands and grasslands) estimates the monetary

values of global ecosystems in striking figures (de Groot et al., 2012). The study claims that

the total monetary value of the bundle of ecosystem services per hectare of coral reefs can be

estimated as high as US$ 2.1 million per year, whereas the open ocean, which provides the

least amount of ecosystem services, is valued at US$ 1664 per hectare annually (de Groot et

al., 2012). The prices of other biomes, such as forests, rivers and lakes fall on a continuum

between those of the open ocean (the least) and the coral reef (the most).

The authors who emphasize the monetary values of ecosystem services maintain that

this approach highlights an understanding of user preference and the importance of ecosystem

services for future generations. They argue that this can be helpful in drawing the attention of

decision makers to allocating resources to ecosystem conservation and enable the

achievement of better policy making in the environmental sector with power (de Groot et al.,

2012; Wildavsky, 1979). However, there is a fundamental contradiction in emphasising the

importance of ecosystem services by assigning monetary values to them. On the one hand,

monetary estimates can be seen as a way of drawing public attention to the enormity of forest

conservation or watershed management, using the language of economic rationalism to

persuade policy makers to act on these issues (Costanza et al., 1997b; de Groot et al., 2010).

On the other hand, any monetary estimate of ecosystems at any scale is likely to be a crude –

and most likely inaccurate and inadequate – approximation of value because of the inherent

complexity of ecological processes as well as the multiple social and cultural meanings

ascribed to various components of local and regional landscapes (Hajkowicz, 2007). This

contradiction is often the source of many social conflicts regarding forest or watershed

management. The policy makers use economic rationality to define elements of ecosystems

as fungible resources or services that can be valued, regulated and traded in monetary terms,

but regional or local communities often disagree with the pricing of their environments (Beymer-Farris & Bassett, 2012). These disagreements over the values of ecosystems raise two key questions. First, how are ecosystem services understood in complex or locally contextualized ways where multiple actors are involved in using and managing a shared landscape or ecosystem? Second, how can the values attributed to ecosystems be assessed in ways that do not solely represent them as tradable commodities or economic goods and services?

This research attempts to address both questions by focusing on the watershed of the Tinau river in Western Nepal where different social groups actively explore, debate and challenge the problems of valuing forest ecosystems. This region has experienced opposition to and disagreement over the economic valuation of forests, particularly over questions such as who should be involved in defining their value, and who has the right or ability to access these 'ecosystem services' for livelihood or other purposes.

The Tinau watershed serves as an appropriate case study for three reasons. First, the Nepalese government has paid special attention to the area's Siwalik ecosystems for the supposed betterment of both the Siwalik and the plains. The government's recent declaration of the whole Siwalik range as a 'protection zone' has been contested by various groups. The Tinau watershed being a part of the Siwalik and the Terai provides an excellent context for understanding the competing perspectives on how to value ecosystems in this mountain-plain zone. Second, Nepalese government and donor-funded projects have conceptualized an upstream-downstream linkage between the Siwalik hills and the plains associated with the Tinau watershed for more than two decades. This conceptualization of upstream-downstream has been employed by various INGOs to devise 'Payment for Ecosystem Services' (PES) mechanisms particularly between the Siwalik and the Terai. However, the arguments over

what constitutes the upstream-downstream relationship have also been reflected in the opposition to the concept of PES. Third, because of the institutional interventions and involvement of NGOs and communities in these ongoing arguments, the Tinau watershed provides a unique opportunity to examine how questions about the valuation and the values of forest ecosystems are currently being negotiated.

The aim of my study is to engage in a critical analysis of how the material and meaning of watershed and ecosystem services are socially produced in the context of the Tinau watershed in Western Nepal. The objectives of the project are to:

1. historicise the growth and importance of the Siwalik and the Terai around political, cultural, economic and ecological processes;
2. understand how local communities perceive ecosystem services in connection with their everyday practices related to their livelihoods, collective actions and traditions;
3. assess how watershed and ecosystem services are represented in policies, projects and dominant discourses of environmental changes; and
4. examine how different social groups work together to redefine the watershed and ecosystems in local and regional contexts.

1.2 Approach

My approach to analysing the concept of watershed ecosystems is the 'production of space', which holds that a space is produced in a triadic form of perceived, conceived and lived spatial elements (Lefebvre, 1991). I examine these three spatial elements through the lens of common property theory, epistemic communities and political ecology, respectively. I elaborate on these theoretical frameworks in Chapter 3.

The research was undertaken using qualitative methods. The whole landscape in the Tinau watershed was conceptually divided into upland (Siwalik), midland (Butwal municipality) and lowland (Bhairahawa municipality). Members of the community forestry user groups were the main respondents among the upland communities, whereas the research participants from Butwal comprised NGO representatives, journalists, municipality officers, businesspersons and industrialists. The respondents from Bhairahawa included political party representatives, members of public land forestry groups, farmers and government officers. Key informant interviews from across the watershed, focus group discussions in each geographic location (upland, midland and lowland) and a watershed-level workshop provided the primary methods for collecting information for this enquiry. The research methods are elaborated in Chapter 3.

1.3 Outline of the thesis

The thesis is organized into nine chapters. In Chapter 2, I critically evaluate various approaches to understanding the natural world and associated ideas in order to shed light on the theoretical contexts of my research. I specifically trace the evolution of the ecosystem concept, and examine the various disciplinary explanations of ecosystems and related theories. In Chapter 3, I discuss the conceptual framework, presenting the highlights of Henri Lefebvre's approach to the 'Production of Space' (Lefebvre, 1991) and its link to the theories of the commons, epistemic communities and political ecology. I also present the research design and the data collection methods in this chapter. In Chapter 4, I provide a historical context of how the Siwalik and the Terai were produced as a regional space in Nepal, from the time of its unification to 1990. Chapter 5 discusses the development of the Siwalik and the Terai from 1990 to the present. These two chapters elaborate how the

Government of Nepal produced over time the Siwalik-Terai as a separate ecological and political region.

In Chapter 6, I analyse the material and conceptual production of the watershed from the perspectives of 'spatial practice' following Lefebvre's theory of space. I critically discuss how various socio-natural ecosystems are spatially connected and how different social groups are engaged in everyday social practices in the Tinau watershed. The discourses emerging from interviews and group discussions are mainly analysed in this chapter. In Chapter 7, different forms of 'representations' of the Tinau watershed conceptualized by dominant players, particularly government agencies, international NGOs and local NGOs are discussed. I elaborate on how these three representations play dominant roles in defining watershed, ecosystem services and Payment for Ecosystem Services.

In Chapter 8, I examine how different social groups can work together to redefine the boundary of the watershed as an alternative space that challenges the dominant representations that divide the watershed into upstream, midstream and downstream areas. This chapter also puts forward alternative ideas, symbolisms and values articulated by local people against official versions of watershed management, values of forest ecosystems, stakeholders of community forests and 'Payment for Ecosystem Services' (PES). Chapter 9 provides the conclusion in which the problems of mountain-plain divide are argued in the shadows of upstream-downstream and PES. Alternative spaces envisioned by the local social groups for valuing and managing watershed as a whole by the sense of commons, collective actions and belonging are discussed and finally, I show how these spaces transcend PES.

Chapter 2: A Historical Journey from the 'Natural World' to 'Ecosystem Services'

> [T]he nature that preceded human history…today no longer exists anywhere (Marx & Engels, 1970:63).

2.1 Introduction

Two distinct perspectives have been proposed in relation to the concept of 'ecosystem services'. The first perspective, which relies on the assessment of various use and non-use values of ecology in economic terms, vindicates it as a tool to persuade policy makers to invest resources in environmental sectors. This approach proposes the trading of 'ecosystem services' as a panacea to conserve the values of nature sustainably by creating financial incentives to do so. The alternative perspective simply problematizes the concept as a ploy or pitfall, and views it as imposing a neoliberal hegemony on nature or ecology that has never been privatized or that could not be commoditised in material or social reality.

However, both perspectives are problematic. First, both viewpoints lack historical insights into how the natural world that is considered so important for life on earth was reduced to be merely 'ecosystem services'. Second, neither viewpoint offers a satisfactory explanation about why there is a mismatch between the various conceptions of ecosystems and the practices of managing natural resources, such as forests, watersheds and wetlands, that are considered ecosystems or parts of ecosystems. Finally, both viewpoints value the natural world or the ecosystems, albeit in different ways, but fail to explain how the material and conceptual values of ecosystems are produced differently in different contextual settings.

In declaring the end of pre-human nature in contemporary society, as expressed in the opening epigram of this chapter, Marx and Engels (1970) allude to two things. First, the

'natural world' in biophysical reality has been significantly transformed by human labour under different production relations in a way that the so-called pure or pristine nature does not exist at all anywhere. Second, and more importantly, the natural world predated human society but its value or meaning has been reduced to almost nothing through various social abstractions that manipulate the representation of nature in many different ways to suit different interests. Robertson (2012:394) corroborates the second argument by saying that nature's 'commodification has come with a redefinition of natural world' through 'social abstractions that circulates in capitalist accumulation'. Thus the materiality and abstractions of 'natural world' constantly reshape each other towards newer and newer forms. I take this reciprocal relationship between the biophysical reality and the meaning or conceptualization of the natural world as a crucial starting point for understanding and describing how a myriad of associated terms such as 'natural world', 'nature', 'environment', 'ecology' and 'ecosystem' have been produced or constructed to arrive at 'ecosystem services' in environmental knowledge over time.

Post-structuralist genres suggest that the 'natural world' or 'nature' are ideas that are socially produced or constructed (Ekers & Loftus, 2013; Smith, 1984). How is the meaning of nature produced? Botkin (2012) maintains that over time, the meaning of nature has been produced or seen through three dominant metaphorical lenses, namely a divine, a creature and a machine. Each of these images, however, constructs or represents the natural world or nature in a specific way that serves the interests of particular groups, especially the politically powerful, in particular historical contexts (Ellen, 1996; Rangan, 2000a). In this connection, a reductionist philosophy, among others, has played a substantial role in shaping the concept of nature in various forms including creating the term ecosystems (Dubos, 1964; Ninan & Inoue, 2013). I argue that the very concept of 'ecosystem services' is a recent product of a

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longstanding reductionist approach to abstracting the 'natural world' over time in history. The reductionist approach, however, does not follow a specific image of nature in a certain order as explained by Botkin (2012) but at times any of the images may be used. In addition, other ways of describing nature have been used to justify or legitimize the abstraction of nature in a certain way.

In this chapter, I make a brief survey of how the meaning of 'natural world' which was later abstracted to simply 'nature' and then finally to 'ecosystem services' in recent time has travelled a long journey from pre-history to the present. Along with the review, I also analyse why a variance exists between various conceptions of ecosystems and everyday practices of managing natural resources. I conclude that the economic approach to interpreting the values of ecosystems is questionable and hence the study of ecosystem commons should replace the reductionist approach.

2.2 From natural world to nature

Society and the human mind had to exist before the social idea of 'nature' could be constructed. The 'natural world' or 'material world', later variously described as 'nature' for lack of a better term, had obviously existed long before human society emerged (Simmons, 1993; Thomas, 1983). The abstraction of nature began with human society that dialectically led to the social production of both material or biophysical (concrete) and conceptual (abstract) forms of nature (Coates, 1998). In that sense, as Dwyer (1996) maintains, both material and conceptual 'nature'[1] are products of human invention. The abstraction of nature,

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[1] While discussing 'nature' and related terms, I should clarify here that the term 'nature' conveys the Western conceptualization of the natural world and, hence, an exact equivalence of the meanings of the term across cultures and civilizations is unlikely or highly debatable (Coates, 1998; Weller, 2006). It is highly contested whether the Sanskrit derivative word '*prakriti*'(Shiva, 1989) in Hindi, Nepali or other related dialects or the Chinese word '*ziran*' (Weller, 2006) that is considered the direct dictionary equivalent of the English word 'nature' conveys the same meaning or not. Similar difficulties arise when considering whether other terms such

however, was never politically neutral (Latour, 2004; Robertson, 2012) but it transmitted 'a narrative of political and social control' in relation to the natural world (Peet et al. 2010: 37).

There are nuanced explanations about what led to the abstraction of the natural world to simply 'nature'. One of the most powerful explanations is found in the conceptualization of nature in connection with religion. Some scholars argue that the social construction of nature in both Eastern and Western societies arose in tandem with religions, albeit in different ways (Gottlierb, 1996; Rønnow, 2006; Tucker & Grim, 1994). The Eastern religions, especially Hinduism and Buddhism revered nature and its parts as a form of the God or spirituality which implied that nature was insurmountable and that living in harmony with nature was necessary for humans to survive (Brown, 1994; Chapple, 1994; Horn, 2006). The concept of '*Pancha mahabhuta*' (five major materials) in Vedic scriptures explains that both the universe (cosmos) and the human body (living being) are composed of five physical ingredients, namely the earth (soil), water, fire, air and space (Chapple, 1994). When an individual dies, according to this explanation, each of these five ingredients of the human corpse returns to its respective original source in the universe or natural world. This was probably the first attempt to describe the human-nature relationship in terms of material exchange between the two.

The earliest form of religion in the West is said to have been pagan animism which, like the Hindu tradition set down in the Vedic literature, connected natural objects with deities or gods. However, Judeo-Christianity replaced pagan animism with a materialistic view of nature. Western religions, especially Judeo-Christianity acknowledged nature for

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as 'environment' and 'ecology', that have been translated into other languages mostly in the 20th century, carry the same meaning in other cultural or linguistic contexts as they do in English. In this review, therefore, I have compromised in these linguistic variations and have surveyed the English-language literature on the conceptualizations of nature and related terms.

human society to conquer or exploit (White, 1967). In other words, nature would 'serve' humanity if it were subjugated. White argues:

> Christianity in absolute contrast to ancient paganism and Asia's religions not only established a dualism of man and nature but also insisted that it is God's will that man exploit nature for his proper ends… In Antiquity every tree, every spring, every stream, every hill had its own *genius loci*, its guardian spirit. These spirits were accessible to men, but were very unlike men; centaurs, fauns, and mermaids show their ambivalence. Before one cut a tree, mined a mountain, or dammed a brook, it was important to placate the spirit in charge of that particular situation, and to keep it placated. By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects (White, 1967:1205).

These religious explanations about nature were dominant during their conceptualizations but have been overshadowed by modern environmental discourses that revolve around more recent global ecological agendas, such as climate change and ecosystem services.

In line with the Christian explanation but within an historical approach, Thomas (1983) emphasises that the abstraction of nature began with the 'subjugation of the natural world' by humans. Other scholars argue that the abstraction of the natural world into nature began with the construction of the values the natural world offered to society. Nature was a source of aesthetic appreciation and utilities (including traditional medicines), besides the values of nature in itself (Soper, 1995). This utilitarian view of nature, however, contradicts the broad picture of nature as everything in the world. Chew (2001) maintains that the concept of nature evolved as early as third millennium BC in the form of ecological consciousness, environmental movements and conservation practices in human society in different civilizations although these terminologies were coined much later.

Despite being abstracted, 'nature' did not carry a single meaning. Lovejoy and Boas (1973) identify at least sixty-six different meanings of the term 'nature', most of them already prevalent in ancient Greek and Roman societies. Coates suggests:

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[F]orty-four of the sixty-six meanings of nature listed by Arthur Lovejoy and George Boas were already current in classical times. Greek thinking about nature was inseparable from scientific, philosophical and religious speculation -themselves thoroughly intertwined. Aristotle (384-322 BC), from his premise that nature (*physis*) is everything outside culture (*nomos*), characterised nature in his Metaphysics variously as the origin of living things … the immanent part of a growing thing; the principle of life: and the source, constituent material or essence of something (Coates, 1998:23).

It is in this sense that nature was first conceptualized as a valuable world both outside and across culture with nuanced meanings contributing to sustaining life forms including human. The conceptualization of nature was a first step to explain the nature-society relationship through the binary lenses of 'nature and culture' (Schmidt, 1971).

The nature-society relationship was explained in a variety of ways in both Eastern and Western cultures. The ancient Vedic literature of India produced during the second millennium B.C. emphasized the power of forests to provide a profusion of benefits for humans and animals, and to replenish rivers with water (Shiva, 1989). The *aranyani* chapter in the Rigveda, which is believed to be the earliest form of the Vedas , described beautiful hymns dedicated to the 'goddess of forests', wildlife and wilderness for their values to human society (Chaitanya, 2000). The term '*aranyani*' in Sanskrit means 'goddess and animals living in wilderness'. Besides the Vedic or Aryan civilizations, aboriginal cultures of the Indian subcontinent and many other parts of the world alluded to the complex connections between forests, soil health, water availability and climate in their myths and stories (Shah, 2010).

Early Greek philosophers such as Plato described how forest resources contribute to water recharge in streams and rivers (Daily, 1997; Glacken, 1976). These early conceptions reduced the meaning of the natural world to nature as a category, but at the same time the

relationship between nature and culture was produced or reconstructed. This mutual relationship of nature and society is still a dominant aspect of environmental history. Nonetheless, while the natural world was abstracted to 'nature', those early scholars or worldviews did not reduce the values of the natural world in terms of simply economic utilities or benefits as it is now in the majority of literature highlighting the concept of 'ecosystem services'. To borrow the metaphor from Botkin (2012), the earliest form of the abstraction of the natural world was of nature as a kind of divine object created by the God to maintain the matter and life on earth.

2.3 From 'nature' to 'environment'

Nature was a 'grand word' (Rolston III, 1997:41). It encompassed everything on and around earth. In other words, nature was a conceptual representation of 'natural world' through various lenses (Botkin, 2012). A word with a smaller scope than 'nature' gained currency in the first half of the 19th century AD 'the environment'-to denote a 'sense of nature, conditions in which a person or thing lives' (Online Etymology Dictionary, 2014). The term originated from Middle French '*environnement'* (meaning the action of surrounding something) during 12th century AD (OED, 2013). It was later used in English in the current form of 'environment' in circa 16th century AD to mean the 'state of being environed'. Nonetheless, it was only in 1827 that the term 'environment' was first used by the Scottish essayist Thomas Carlyle in connection with the 'natural world' (Online Etymology Dictionary). In the beginning, the word 'environment' conveyed the same meaning as 'nature' but the conundrum of whether this 'nature' included 'environment' or vice versa continued for some time. To escape the problem, it was safe for some authors to use 'nature as a synonym for environment' (Simmons, 1993: 11). However, the term 'environment' did not exactly mean

nature, but was rather closer to 'ecology' indicating a narrower scope than the nature itself (Rolston III, 1997).

The Merriam Webster dictionary defines 'environment' as the 'complex of physical, chemical, and biotic factors (as climate, soil, and living things) that act upon an organism or an ecological community and ultimately determine its form and survival' (MWD, 2013). With this dictionary meaning, what can be argued is that nature was converted to 'environment' to be explained as a proximate determinant of organisms and communities. Thereby the use of the word 'environment' further reduced the meaning of nature from its original conception. Environment was not nature but something else, which was explained in a way that 'environment is not nature, for nature is all there is anywhere anything is' (Rolston III, 1997:43)

One of the differences between the conceptualization of nature and that of environment was that nature was regarded as pristine or unspoiled, while environment was connoted as being trampled or polluted by human society. The conceptualization of nature into environment instigated the interest of natural scientists in exploring the biophysical realities and meaning of the natural world across the globe. The interest in understanding the role of forests and watersheds in sustaining life and the economy was heightened during the 18th and 19th century AD as European naturalists travelled the world and sought to explain the relationships between geographical features, forests, and climate and their roles in creating rich or poor environments for humans and animals (von Humboldt, 1997). Scientists employed by European colonial governments in India and elsewhere debated the importance of forests as parts of environments in maintaining watersheds and preventing desertification (Grove, 1997; Rangan, 2000a). The notion these scientists described was more akin to the idea of environment rather than that of nature *per se* in a sense that they were concerned as

early as the 1830s about the destruction of forests and watersheds (instead of grand nature) by the colonial power (Rangarajan, 1996).

Although the scope of the term 'environment' was narrower than that of 'nature' itself, the expression of nature in the form of 'environment' did not reduce the meaning of nature in 'exchange value'. Nor did it allude to bringing nature in the form of 'private property' that could be owned by an individual. The term 'environment' was conceived as a combined form of a common resource, a bio-physical reality, and a perceived meaning of that bio-physical reality. Rolston III observes:

> [M]y environment, though it is a perspective that is true in shortest scope, is rather too private a term. My environment when encountered as a landscape is a commons shared, your environment too, *our* environment. That fosters social solidarity, fortunately. It also demands another, fuller sense in which *the* environment is objectively out there, and this is not only our social world, but the natural world that we move through, there before we arrive, and there after we are gone… We have our environments, plural, because there is a world out there, *the* environment, in which all these horizons are sustained …Environment is *the* ground of my being, and we can remove the 'my' because 'the' environment is the common ground of all being (Rolston III, 1997:44).

At a time when the natural world could be expressed as 'nature', why was it further abstracted or conceived as 'environment', either replacing or supplementing the idea of 'nature' in the first half of the 19th century? The reasons for this could be several, out of which two are prominent. First, the term 'nature' was too vague to capture precisely the logic of bio-physical reality in connection with human perception since the term 'nature' had already had more than five dozen varied meanings (Lovejoy & Boas, 1973). This explanation is academically too naive and, to some extent, apolitical. Second, 'nature' alluded to universal phenomena but the word 'environment' meant a more localized or contextualized form of nature in terms of common pool natural resources intermingled with human society (Rolston III, 1997). If the term 'environment' is linked with imperialism, the second explanation could be strategically

used by a colonial power through various narratives of environmental destruction to exercise control over local natural resources such as forests by restricting or regulating the access of local people to these resources (Gadgil & Guha, 1992; Rangan, 2000a; Robbins, 2012).

2.4 From 'environment' to 'ecology'

The term 'ecology' is derived from the Greek '*oikos*' and meaning 'household' or 'place to live' (Odum, 1993:23). The big environment that included everything on earth in relation to living things was reduced to simply ecology as an aggregate of populations, communities,and ecosystems (Odum, 1959). Odum clarifies that although the term ecology was much later coined, various Greek philosophers such as Hippocrates and Aristotle also wrote about concepts which were similar to that of ecology. Mooney and Ehrlich (1997) note that the publication of 'Man and Nature' by George Perkin Marsh, an American geographer and naturalist, in 1864 transmitted awareness of the relationships between and among plants, animals, micro-organisms and non-living components. It laid the foundation for the concept of ecology. Eventually, it was Ernst Haeckel, a German biologist who introduced the term 'ecology' for the first time in 1869 (Odum, 1959). To some authors the ecology and environment both embodied the same idea of 'home'. Rolston III (1997:43) argues that 'an environment must surround someone, in that sense environment is quite similar to ecology, the logic of a home'. However, to some other authors, ecology was different from environment. Odum (1993) precisely categorizes all environments into fabricated (developed), domesticated (cultivated) and natural environments and hence differentiates the concept of environment from that of ecology.

The relationship of plants, animals (non-human species) and their surrounding physical environment was conceptualized as an ecology in its original form. However, the term is often used or misused as the study of only plant communities and their successions

at various time scales and the part of animals is often overlooked, not to mention the role of human beings in ecology (Vogt et al., 1996). Although a further abstraction or reduction from 'environment', the values of ecology to humanity were still not reduced in economic or monetary terms during the conceptualization of ecology. To borrow a metaphor from Botkin (2012), it can be argued that ecology still bore an 'organic view' of nature in a way that ecology as a whole and the relationship between the living and non-living things therein would change in tandem.

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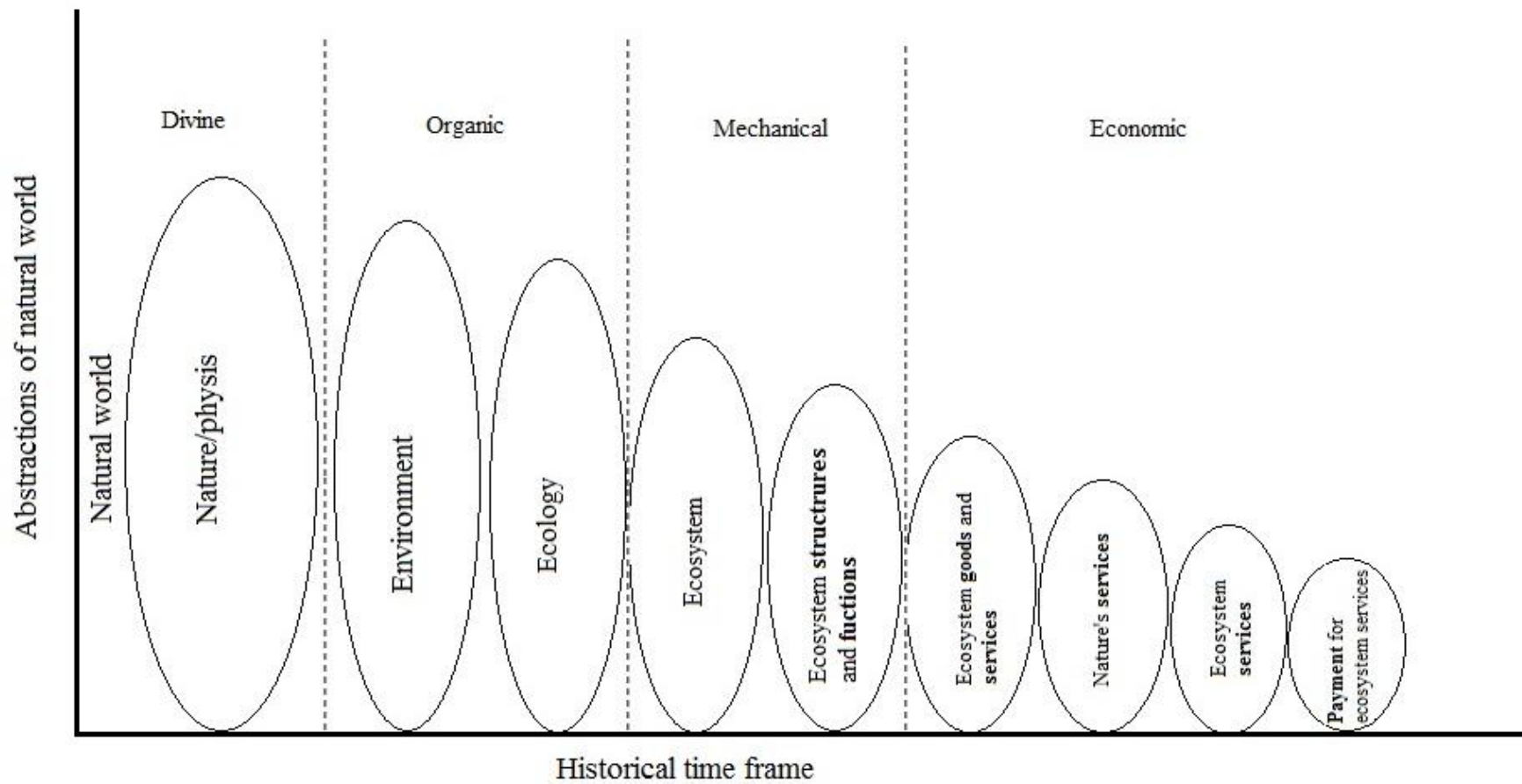
Figure 2.1 : Conceptual overview of how the meaning of natural world reduced to 'Payment for Ecosystem Services'

2.5 From 'ecology' to 'ecosystem'

Haeckel's conception of ecology took into account living things in relation to their surrounding environments. The ecology was considered a 'household' for the living things (Odum, 1993). The term 'ecology' exhibited two meanings: 1) a relationship within and between living and non-living things; and 2) a scientific discipline dealing with that relationship. Leaving aside the term 'ecology' as a discipline, the relationship between and within living species and nonliving things was gradually called an 'ecological system' or 'ecosystem' later in the first half of the 20th century AD. Sir Arthur George Tansley, an English botanist, for the first time introduced the term 'ecosystem' in the journal 'Ecology' in 1935. Tansley described:

> It is the systems so formed which, from the point of view of the ecologist, are the basic units of nature on the face of the earth. Our natural human prejudices force us to consider the organisms (in the sense of the biologist) as the most important parts of these systems, but certainly the inorganic "factors" are also parts- there could be no systems without them, and there is constant interchange of the most various kinds within each system, not only between the organisms, but between the organic and the inorganic. These ecosystems, as we may call them, are of the most various kinds and sizes. They form one category of the multitudinous physical systems of the universe, which range from the universe as a whole down to the atom (Tansley, 1935:299).

Since Tansley's conceptualisation was published, a variety of approaches have been developed to study ecosystems. At least three streams of disciplines offer rich understandings in the theory of ecosystems and provide a variety of models. The major theoretical models or approaches include the 'cybernetic system approach', 'hierarchical approach' and 'thermodynamics approach', under three major disciplines, namely mechanics, biology/ecology and ecological economics, respectively. These three models are not exhaustive, but represent the mainstream theoretical explanations of ecosystems.

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One approach to ecosystems is represented in the work of Margalee (1968). He bases his approach on a cybernetic model borrowed from physics, particularly from mechanics. He assumes that in a controlled physical system in space and time with various interconnected parts or units where a communication mechanism plays a significant role in sustaining the system as a whole. According to Margalee, 'cybernetics' refers to a 'system', which is 'a set of different elements or compartments or units, any of which can exist in many different states, such that the selection of a state is influenced by the states of other components of the system' (Margalee, 1968:2). These components are constantly interacting with one another to provide a stable form of the system as a whole. There always exists a mechanism of 'feedback', which is called 'communication' or 'information'. This feedback helps the system to remain in a self-contained stabilized form until some external forces are applied to disrupt the stabilization. The self-stabilization concept of ecosystem corroborates Newton's first law of motion or the 'Law of Inertia' which holds that anything tends to stay in a state of rest or motion until acted upon by some external force big enough to change its state. How can this cybernetics approach be applied to ecosystem?

The cybernetic system is based on five concepts. First, there are many parts or components in the structures of the system. Second, these parts are interconnected and interdependent and influence one another to form the whole system as a larger unit. Third, a self-regulating mechanism of 'feedback' or a 'communication' loop is present within the system. Fourth, the feedback mechanism helps the system to balance its stability or equilibrium. Finally, the system with its structures and functions remains in equilibrium or tends to remain in equilibrium if left in its own state.

Margalee (1968) applies these mechanical concepts to explain how the structures and functions of an ecosystem operate. Taking the analogy further, first of all, individuals or

communities of living things (non-human) and their surrounding physical factors work as the various components of the structures of the ecosystem (producers, primary consumers, secondary consumers, decomposers and the physical factors). Second, these non-human species are connected or interdependent on one another for food and other life-support systems (food chains and food webs). Third, feedback or communication or information is expressed in a way that the present states of equilibrium set the limits or patterns for future states of the system. Finally, the ecosystem remains or tends to remain in its state of equilibrium or restores itself through natural selection processes if the system is not impacted upon from outside.

The cybernetic approach provides a very convincing systematic explanation about ecosystems. However, this approach is based on a hypothetical mechanical system which is free of human impact or any other external phenomena that can disrupt the self-regulating mechanism of the system. In reality, a system which is beyond the influence of human beings is almost non-existent. The most striking paradox inherent in this explanation is that the ecosystem is, on the one hand, considered a closed and static mechanism, while on the other hand, the changing mode of an ecosystem is also discussed through the concept of information flow and the feedback loop. The stability hypothesis is also problematic because the continuous effects and impacts of climatic, human and geologic processes are acting on ecosystems. Ecosystems are not closed systems, but open systems exchanging energy, matter and information with their surroundings (Müller, 1992). Different horizontal and vertical levels of components make up an ecosystem. Various levels of ecosystems make up higher and higher levels, ultimately covering the whole biosphere. This multi-level concept reflects a different approach to studying ecosystems, that is, under the hierarchical theory (Luan et al., 1996; Müller, 1992).

The hierarchical model of ecosystems holds that all living systems are organized hierarchically at different levels. These hierarchies are explained in two ways, either based on 'ecosystem-function hierarchy' or 'population-structure hierarchy' (O'Neill et al., 1986). Simply put, various dimensions of ecosystems are understood in a continuum of lower to higher levels, and each ecosystem is seen as a 'middle' system nested within a larger or higher system. One type of vertical hierarchy, for example in a forest ecosystem, can be seen as a continuum of individual trees, a population of tree species and as communities of forest trees in which each later component represents the higher level of the system (Luan et al., 1996). In terms of systems, a small ecosystem in a niche is attached to a broader (higher) ecosystem that encompasses the niche. The broader ecosystem is, in turn, included within another broader level ecosystem. This process continues further to make a series of ecosystem levels in hierarchies.

Müller (1992:221) identifies at least four characteristics of hierarchical theory in ecosystems. First, the spatial extent or scale of a higher level is broader than that of lower levels. Second, it takes significantly longer for the higher level to change than the lower level. Third, the higher levels control the lower levels rather than *vice versa*. Finally, the higher levels contain the lower levels, which is called a 'nested hierarchy'.

Vogt et al.(1996) present hierarchical studies of ecosystems in a modified way in terms of a 'population-community' approach and a 'process-functional' approach. The population-community approach emphasises living things as the major component and the physical environment as an externality to the system, while the 'process-functional' approach considers the biotic community as an externality to the system. It is, therefore, necessary to combine the two approaches if interactions between the living and non-living components.are considered important in ecosystems.

The hierarchical concept, like the cybernetic concept, does not take into account the human aspect in ecosystems. It hypothesizes that ecosystems are 'out there' and their study excludes human society and human interferences. But in reality, ecosystems are not something that is 'out there' without the human component. In the words of Major (1969:13) '[m]an is part of the ecosystem, even economic man' . The impact of bio-physical components on socio-economy and vice versa requires that ecosystems be studied through integrating the socio-economic component into ecosystems.

Ecological economics attempts to bridge the gap between the ecosystems and economic components using thermodynamics approach to ecosystems. It employs the energy laws to establish the linkage between the ecology and economics (Glucina & Mayumi, 2010). Following the first and second laws of thermodynamics, ecosystems are described in relation to the energy that passes through different levels of ecosystem components. The first law of thermodynamics holds that energy transforms from one form to another but it can neither be created nor destroyed. For example, solar energy enters ecosystems through photosynthesis and is converted to other forms, such as the chemical energy in food which passes through different trophic levels (producers, consumers, and decomposers). The second law of thermodynamics states that when the transformation of energy takes place, not all energy is transformed because some of the energy degrades or dissipates during transformation. Although energy is neither created nor destroyed during transformation, some of it dissipates and is unavailable or less available for further use (Odum, 1993).

The thermodynamic model focuses on the use, transformation and dissipation of energy in ecosystems, instead of focusing on structures and other non-energy functions. In line with this, the second law is understood as the 'entropy law' in which the entropy refers to the state of ecosystems in terms of the quality of energy to transfer. 'High entropy' means

the state of low quality energy or the energy that does not transfer easily, whereas in 'low entropy', the energy transfers easily across the system (Glucina & Mayumi, 2010). This concept of entropy helps explain why an ecosystem tends to remain in a stabilized form. When an ecosystem is disturbed, it enters a low entropy state and the transfer of energy takes place in a more efficient way to bring the ecosystem back to its level of equilibrium.

The thermodynamics model is applicable in ecosystem management/conservation through the combined lenses of ecology and economics. Glucina and Mayumi (2010) identify at least five implications of the laws of thermodynamics in an economy. First, the stocks of energy on the earth, such as minerals and fossil fuels are not created but once they are used, they change to forms that cannot be easily utilised again (energy is not created but gradually dissipates during transformation). Second, as matter-energy cannot be destroyed, any unwanted waste of production cannot be destroyed but is dumped somewhere in the biosphere. Third, any unit of energy from a stock such as oil and wood fuel can only be used once and they are not available for further use once they are used up. Fourth, the maximum energy that any technological advancement can produce is the level that is equal to the energy created due to the difference between a system and its surroundings, implying that technology has limitations. Finally, there is a limit on economic growth because the growth depends on the use of energy, which is limited.

The thermodynamic model offers insights into the concept of ecosystems from both qualitative and quantitative perspectives. It describes not only the structures, functions and different levels of ecosystems, but also acknowledges the ecological systems as the foundation of an economy. One of the most significant contributions the ecological economic model has made to ecosystem theory is that it highlighted the values of ecosystems in terms of energy units, as opposed to neoclassical economics which measures it in only monetary

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terms. Despite these contributions, this model also suffers from theoretical and practical difficulties. Although it departs from neoclassical economics (which will be discussed later), which considers the market as the only solution to fix ecological problems, ecological economics heavily relies on the quantitative aspect of ecosystems making it analogous to neoclassical economics to much extent (Price, 2003).

Thermodynamics model is also criticised for being overly pessimistic in its highlighting of the 'limitation' of both economic growth and technology. Despite the very convincing narrative of the linkage between ecology and economy for 'sustainability', the thermodynamics model does not deal with the political aspect of ecological conservation or degradation, that is, the distributional equity dimension of ecosystems (Norgaard, 2010). Finally, the approach has been more 'academic' or theoretical, whereas the practical aspects of ecosystem management/conservation in landscapes at present are underpinned by something other than these different models of ecosystems.

Why are there mismatches between the theoretical models of ecosystems and real life practices of managing ecosystems such as forests, wetlands or grasslands? The current meaning of ecosystem has been strongly motivated by the logic of neoclassical economics, resulting in the reduction of the ecosystem concept into exchange or monetary values that can be used for certain political missions such as the 'neoliberalization of nature' through its privatization and valuation (Heynen & Robbins, 2005). Thus, a conceptual shift has occurred, from 'ecosystem' in an ecological sense to 'ecosystem services' in purely economic language.

2.6 From 'ecosystem' to 'ecosystem services'

The concept of 'ecosystem services' emerged in the 1970s and was underpinned by neoclassical economics revolving around the market-based valuation of the benefits

ecosystems could provide to human society (Gómez-Baggethun et al., 2010). Neoclassical economics, in relation to ecosystem resources or anything else, recognizes private ownership, buying and selling as the three economic acts applicable to all individuals, who are considered rational beings, to maximize their benefits or utilities (Wolff & Resnick, 1987). Neoclassical economics has contributed to the understanding of ecosystems by offering several techniques of assessing ecological processes in terms of exchange value or money. It also provides an ex-ante or ex-poste benefit-cost analysis of environmental decisions based on whether the monetary values of ecosystems are reduced or augmented.

The supporters of monetary valuation of ecosystems argue that the importance of the processes, such as, climate regulation and photosynthesis, which ultimately contribute to human well-being, would remain largely unnoticed by policy makers if they were not valued as 'services' in some market price (Kumar, 2010). The valuation is largely based on the preference of the individuals who use or enjoy the benefits of the ecosystem. The overall benefit that an ecosystem can offer to society, according to neoclassical economics, is the aggregate monetary value of all the individuals' willingness to pay for that benefit. A variety of techniques have been developed, the most notable being the contingent valuation method, travel cost method and hedonic pricing method, to put values on the benefits of ecosystems to humans (Hajkowicz, 2007).

The use of the neoclassical economic logic to justify the values of natural resources in terms of ecosystem services has passed through various stages over the last four decades or so.This approach can be traced back to Vogt (1948), who introduced the idea of conceptualising natural resources as capital to emphasise the role of soil as the basic resource to support human life. However, the contemporary economic conceptualisation of ecosystem services explicitly emerged in the early 1970s. It has passed through three main phases,

beginning with the gestation of the concept (1970 - late 1980s), followed by a period of extended economic and scientific discourse (late 1980s early 2000), to the recent phase of introducing the concept into policy making (early 2000 onwards) (Gómez-Baggethun et al., 2010).

The concept of ecosystem functions was introduced as various forms of 'services' to human society in a report published in 1970 on the 'Study of Critical Environmental Problems'(MIT, 1970). This term was later rephrased in 1977 as 'public services of global ecosystems', 'nature's services', and finally 'ecosystem services' in 1981 (Mooney & Ehrlich, 1997:14-15). In the first phase, 'gestation of concept', from the (1970s to the late 1980s, the idea of ecosystem structures/products and functions was reduced to the idea of 'goods and services' in terms of purely economic logic (Peterson et al., 2010). This conversion of the concept of ecosystems to economic terms was justified to bring neglected non-marketed ecosystem functions into economic decision making (Gómez-Baggethun et al., 2010; Kumar, 2010). This phase introduced 'money' as a sole metric of values attributed to ecosystem processes through preference-based techniques such as contingent valuation method, paradoxically in the name of objective assessment (Price, 2003).

The second phase brought ecosystem services into public discourse by commoditising, that is, by quantifying the valuation of these services in monetary terms. The monetary valuation of global and national ecosystem services (Costanza et al., 1997a; Zhongxin & Xinshi, 2000) was a key agenda in this phase followed by the piloting of various 'Payment for Ecosystem Services' schemes in France, USA and some South American countries (Wunder et al., 2008). The scholarly journal Ecological Economics highlighted the concept of ecosystem services, allocating a special section on the topic in 2002 for the first time (Farley & Costanza, 2010). The reward or compensation mechanisms in various natural

resource management projects were interpreted as 'Payment for Ecosystem Services' (PES) either setting up new mechanisms or redefining some already established environmental schemes as 'PES' or 'PES-like' (e.g. Wunder, 2008; Wunder et al., 2008), although they were not previously called PES.

2.7 From 'ecosystem services' to 'payment for ecosystem services'

The third phase of the economic interpretation of ecosystems developed with the publication of the final Millennium Ecosystem Assessment reports in 2005, resulting in the agenda being brought into various policy decisions (Gómez-Baggethun et al., 2010). This phase refers to ecosystem services primarily by promoting the strategy of Payment for Ecosystem Services (PES) in the context of managing environmental resources for augmenting economic benefits and mitigating ecological crises such as climate change (Kumar, 2010). This strategy included reducing carbon emissions through the Clean Development Mechanism (CDM) and Reduced Emissions from Deforestation and Forest Degradation (REDD+); protecting watersheds for water quantity and quality; conservation of biodiversity; and protection of aesthetic landscapes for eco-tourism (Wunder et al., 2008). In policy terms, the PES discourse effectively advocates the privatisation of the commons through globally determined pricing and market mechanisms; it also claims that it can foster economic development and poverty reduction in poor countries (Sjostedt, 2012). This latest phase culminated in the Rio+ 20 United Nations Conference on Sustainable Development held in June 2012, which focused on several thematic areas linked to a 'green economy' based on natural and built ecosystems for the sustainable future of the planet (Barbier, 2012).

The evolution of the ecosystem services discourse raises a number of questions regarding the assumptions and methods used for economic valuation. First, how does the economic approach to valuing nature make decisions to include some ecosystem components

in 'goods and services' (Farley & Costanza, 2010) while excluding many others that are part of the same complex ecological system? Second, how does this approach theoretically and practically fix the prices of specific ecosystem 'services' for commons such as forests? Third, how does this approach take into account the components of nature which are 'directly enjoyed, consumed or used to yield human well-being' (Boyd & Banzhaf, 2007:619) and that are part of ecosystem processes not directly quantifiable in terms of price (Turner et al., 2008)? These questions point to the limitations of viewing ecosystem commons as a kind of commodity that can be reduced to a few parts and produce ecological benefits from trading these in monetary terms. Even a veteran ecologist, Odum stood against the total monetization of ecosystems and commented:

> The trouble is that money tracks human-made goods and services but not equally important natural goods and services …At the ecosystem level …money enters …only when [a] natural resource is converted into marketable goods and services, leaving unpriced (and therefore not appreciated) all the work of the natural system that sustains this resource …Only the harvest and seafood processing part of the production chain is valued in terms of money; all the energy and work performed by the estuary to sustain the crop and to provide other valuable services such as recycling of air and water are entirely external to the monetary system. Accordingly the estuary is worth a great deal more to society as a whole than is indicated by the economic value of its products. It is worth a lot even if no products are harvested (Odum, 1993:105-6).

The main problems of using neoclassical economics as the basis for managing ecosystems arise from: a) overlooking community actions involving multiple actors that involve non-monetary transactions and collaboration to create and maintain common pool resources; and b) ignoring the discursive and qualitative ways in which various actors and social groups value their ecosystem commons (Randhir & Shriver, 2009). Both of these problems illustrate the need to focus on ecosystems as dynamic spatial commons produced from the interaction of ecological, social, political, economic and cultural processes.

2.8 Natural resource management and ecosystem services

While ecology or ecological economics describe various models of ecosystems, this theoretical knowledge is rarely considered when some ecosystem landscapes such as forests are conserved, managed or used. The landscapes are simply assumed as 'ecosystems' but how the materials and meaning of those landscapes are used is guided by other disciplines or practices. Although various steps are recommended for the valuation of ecosystem 'services' (identification, quantification, valuation and 'benefit-transfer' or 'payment' (Turner et al., 2008)), some of the steps are skipped, mostly the 'quantification' step for establishing PES. Neoclassical economics in these endeavours follows a reductionist approach to valuing ecosystems, ultimately reducing them to a dollar price through 'contingent valuation', despite the claim of 'objective' quantification of these services. The method provides an inadequate, approximate valuation of those services from an individual utility perspective and does not consider the complex socio-cultural, economic, ecological and institutional contexts that are connected to ecosystems. It is therefore questionable to assert that the neoclassical economics approach to ecosystems has contributed to conserving them. But it can be argued that neoclassical economics has provided a ground for the process of neoliberalizing nature (Büscher, 2012; McCarthy & Prudham, 2004). ,

Nowhere is there a more apparent anomaly between the theories and practices related to ecosystems than when it comes to natural resource management. All the theoretical conceptualizations such as cybernetic, hierarchical or thermodynamic approaches have rarely been considered while devising management regimes for ecosystems such as forests, wetlands and watersheds. These are managed as commons or common resources rather than as ecosystems. Even in areas where a 'Payment for Ecosystem Services' scheme has been set up, people conserve or protect landscapes as a whole as commons rather than as ecosystems

having different components, hierarchies or levels. Robertson (2012) notes that wetlands are managed as a whole as ecosystems without segregating them into components, but they are only abstracted in ecosystem markets through classification, categorization, unbundling and stacking of ecosystem services, in order to fit them into payment mechanisms. Neither the traditional managers of ecosystem landscapes nor the advocates of ecosystem services have followed any particular model of ecosystems while dealing with or managing them. PES proponents have been emphasizing the financial values of services, while traditional managers take into account the landscape as a whole without paying attention to parts and parcels of components, structures, functions or processes.

Actually, the conceptualization of ecosystem services and PES has brought ecosystems into simply a 'service model'. The opponents of the service model of ecosystems argue that it is a way to neoliberalize nature using a market logic rather than conserving nature in an ecosystemic way (Heynen & Robbins, 2005; McAfee & Shapiro, 2010; McCarthy & Prudham, 2004). The proponents of neoliberal conservation also openly accept that the concept of ecosystem services is intended to expand capitalism but in a 'desirable sense' (Brockington & Duffy, 2010; Corson, 2010). While both opponents and proponents of the neoliberal approach to conservation argue that the motive of the ecosystem services model is political rather than ecological, how can the practices of managing natural resources be argued to be managing 'ecosystems'?

Thus it can be argued that the current trend of managing or conserving ecosystems through PES is guided by both neoclassical economics and neoliberal politics. While neoclassical economics in connection with ecosystems deals with the valuation and monetization of ecosystems using the economic terminology of 'goods and services', the neoliberal agenda includes various premises such as governance, privatization, enclosure and

valuation of ecosystem commons (Heynen & Robbins, 2005). This agenda, however, is best seen not as a consequence but as a process. The four neoliberal premises argued by Heynen and Robbins (2005) have a special connotation for managing ecosystem landscapes. The 'governance' in this respect is the institutional arrangements for private firms to enter and trade ecosystems globally through various 'payment mechanisms' to earn profits. In the same vein, 'privatization' becomes a pre-requisite to bringing ecosystem services into the market in the name of rewarding the owners of the ecosystems. While ecosystems as stocks, such as forests and watersheds, are largely common resources managed or conserved mostly by the states or communities (Agrawal et al., 2008) , neoliberal capitalism has entered the hypothetical market that can privatize these resources through commodification and monetization (Robertson, 2012). The 'enclosure' of the ecosystem is realised when traditional users of the resources are denied access to these resources by criminalizing them as destroyers of the ecosystems and by offering so-called monetary incentives in lieu of access (Beymer-Farris & Bassett, 2012). At least one buyer and at least one seller would be sufficient to represent communities or states for PES to perform (Wunder, 2008), which means that the complexities of common property institutions are not entertained in neoliberal conservation (Büscher, 2012; McAfee & Shapiro, 2010). The 'valuation' here does not mean putting values on or giving importance to ecosystems, but putting price tags on nature (Hajkowicz, 2007; Hanley & Barbier, 2009).

The neoliberal approach to ecosystems is therefore problematic due to its contradictory position between 'ecosystem conservation' and 'selling out on nature' (McCauley, 2006), which is severely criticized for being an 'unnatural process' (Heynen & Robbins, 2005:6). As the ecosystems, such as forests, wetlands and watersheds, are regarded more as local and regional commons than something to be 'privatized' or 'globalized' for

trade, another pressing issue arises for local communities who live in and immediately around these commons. This issue has been debated in terms of the 'upstream-downstream' linkage of ecosystems. In this linkage some communities live in the upland closer to the commons such as forests and some communities live relatively further away from the commons but think that they are directly affected by the management practices on the commons.

The concept of upstream-downstream generally implies watershed geography in which a water body, specifically a stream or river, flows from the upland to the lowland. In this concept, the upland is considered the major source of water feeding into a river. A recent development in this concept accounts not only for water flow, but for a range of ecosystem structures, processes and products existing in the upland and their flow to the lowland (Sherer, 1990). Thus the health of the upland ecosystems in this explanation is considered crucial for the health of the river and its affected area in the lowland. Alternatively, the degradation of upland ecosystems is assumed to generate adverse effects in the lowlands. Although the notion of an upland-lowland linkage has a long history, it has recently been utilized in terms of upstream-downstream to establish PES mechanisms.

In areas where PES has been practiced especially for water resources, the users of ecosystem benefits pay the upland communities for their contribution to managing managing ecological resources. Wunder et al. (2008) have listed a number of cases around the world where the upland communities have been paid for their watershed conservation (Wunder et al., 2008). One of the 'perfect' cases of PES, for example, can be taken from north-eastern France, where Vittel, a mineral water company (a brand of Nestlé Waters) has established a PES scheme to pay for the local farmers practising agriculture on the upland watersheds of springs from which Vittel collects mineral water (Perrot-Maître, 2006). Such PES schemes

have been practised in many other countries including USA, Costa Rica, Mexico, Bolivia, Ecuador and China (Wunder et al., 2008).

The study of ecosystems from the perspective of an upstream-downstream linkage has been largely linked with PES. However, the universal idea of upstream ecosystems and their effect on downstream locations is not free of controversy especially considering the spatial scale and geographic contexts in which such linkages are taken into account. In some contexts, such as the case of the Rhine and the Elbe river systems, the upstream-downstream linkage has been recognized across at least five European countries covering large areas for integrated watershed ecosystem management (Moellenkamp, 2007). In other cases, such as in Northern Thailand, upland farming was found not to be significant in affecting the downstream within a narrow area in the same country (Forsyth & Walker, 2008). The spatial scale of the effects of upland anthropogenic conservation or degradation with the lowland is therefore uncertain to be established, and wherever established, these schemes are highly context-specific (Blaikie & Muldavin, 2004).

However, the upland-lowland linkage if taken on a small scale especially where the lowland communities perceive the values of upland ecosystems for their livelihoods provides better scope for valuing ecosystems. In that sense a collective management of a watershed can be understood as the management of an ecosystem. Major maintained:

> A watershed is an ecosystem subject to multiple use. The geomorphologist, the hydrologist, and the climatologist can all contribute to a watershed study, but their results are so bound up with other aspects of the ecosystem, such as soils and vegetation, that it might be wise to start with an integrated approach (Major, 1969:18).

How the upland and lowland people conceptualize the watershed on a local scale in ecosytemic terms and how they negotiate the overall well-being of both communities are largely unexplored in ecosystem literatures.

In practice, what people have been doing for the management of 'ecosystems' is the management of communal landscapes such as forests, pastures or watersheds. These landscapes are collectively managed and used mostly either by local communities or states (Agrawal et al., 2008; RRI, 2009) in contrast to neoliberal approaches to dealing with ecosystems through private property and market logics. The trend of communal management of these resources is increasing globally and posing a challenge to their privatization or neoliberalization (Agrawal et al., 2008; Persha et al., 2011). After the complete failure of the Kyoto Protocol to promote forestry PES, global financial institutions such as the World Bank are making efforts to bring forest ecosystems under their domain with the help of REDD+ as a global PES mechanism (Phelps et al., 2010).

Nonetheless, REDD+ is already facing right from the beginning a number of theoretical and practical challenges, such as overlooking non-carbon benefits including biodiversity, contradictory notion of market environmentalism, lack of environmental justice to marginalized social groups and increasing protests of local communities (Beymer-Farris & Bassett, 2012). Forests and other ecosystems have been well managed as common pool resources around the world. Wherever ecosystems have been destroyed (or restored) cannot be simply linked with the lack (or presence) of market or economic incentives or monetary valuation of ecosystem benefits. It depends more on the national, regional or local contexts which shape the ecological processes and outcomes in the light of who loses and who wins under certain policies and institutions (Kull et al., 2007).

2.9 Conclusion

In this chapter, I argued that a vast body of knowledge has been produced in studying the natural world over the past six thousand years or so in human history. The conceptualization of nature through the lenses of mythologies, bio-physical sciences or very recently economics

is not apolitical, but demands critical scrutiny from the perspectives of the nature-society relationship. I mentioned in the beginning that reductionist philosophy is in play in abstracting the natural world into its various forms. Some ecologists maintain that the reduction of nature within itself into its various parts was desirable and, to some extent, necessary for the sake of understanding complex biophysical processes in the world (Peters, 1992). It could be logical as long as nature was reduced to its inherent parts for the sake of understanding it. However, the reduction of nature to something else, such as dollar or exchange value, is theoretically flawed, empirically unrealistic and ethically questionable. On the one hand, the economic construct (monetary construct actually) is being misused by neoliberal capitalism to further destroy the nature for profit maximization (Peet et al., 2011). On the other, the local communities who manage ecosystems such as forests and watersheds have their own ways of maintaining ecological processes as common resources beyond ecological modelling or economic rationalism.

The reduction of nature or ecosystems into dollar value is a paradox. This is a new version of the 'Lauderdale Paradox', which holds that private affluence in terms of exchange value increases at the expense of public wealth or the use value/intrinsic value of nature (Clark & Foster, 2010). One of the motives behind 'ecosystem services' or 'PES' is to make a profit from trading nature according to market logic. The interpretation of the natural world in terms of ecosystem services or PES under neoliberal capitalism has not guaranteed the protection or sustainability of natural resources, not to mention its distributional justice. Capitalism has rather contributed to the destruction of nature through overemphasis on profit making or private property accumulation at an expense of local, regional and global commons (Peet et al., 2011).

Some ecologists, such as Botkin (2012), are in search of a new worldview through which to look at nature or ecosystems in order to solve pressing environmental problems. Various abstractions of nature in mechanical, organic or economic constructs do not offer convincing explanations for everyone when the values, sustainability and equity of ecological resources are considered important in environmental problems. Botkin's frustrations are expressed in his recent book about nature. He desperately urges:

> I wrote in 1989 that solving our environmental problems requires a new perspective that goes beyond science and has to do with the way everyone perceives the world. That is still lacking- that new perspective has not taken hold (Botkin, 2012:6).

Botkin's anxiety is understandable in the shadows of the dominant ecological modelling and economic interpretations of ecosystems. However, his argument is over pessimistic: at the same time he calls for some charismatic emergence of a new worldview in an ahistorical way. A sudden emergence of the 'most' appropriate worldview as a panacea to solve all global environmental problems is unrealistic and over-idealistic.

Nevertheless, some alternative perspectives are already in place that can be understood in everyday life and that transcend scientific abstractions or reductions of nature in order to better explain how the material and meaning of ecosystems are socially produced. The task at hand is to combine some perspectives that have evolved in environmental studies and tested against the empirical evidence of natural resource management. The following chapter discusses these perspectives as a conceptual framework that can be adopted to study how the values of ecosystems are socially produced in both geography and language.

Chapter 3: Conceptual Framework and Research Methodology

3.1 Introduction

There are different ways of perceiving the natural world. Ecology, for instance, is often seen as a biophysical relationship between forest, soil, air and water in a landscape context. The concept of ecosystems is a more abstract representation of the interactions and exchanges between these biogeochemical components. The natural world can also be perceived in terms of landscapes and resources that are governed by traditions, customs, and other institutional forms of collective and individual use. It can be further conceived as a resource-extractive landscape where different social classes and groups conceptualize these resources in a variety of ways. These various ways of using, understanding and conceptualizing the natural world contribute to the social production of ecosystem services as a biophysical, conceptual and institutional entity.

In order to understand how different social groups or epistemic communities perceive, conceive and use a watershed and socially produce 'ecosystem services', I draw on Lefebvre's conceptualization of space in 'The Production of Space ' (Lefebvre, 1991). This concept explains a space such as ecosystems in terms of both causes and effects of three interacting spatial elements:the perceived, conceived and lived spaces. In this chapter, first I introduce the Lefebvrian concept of the production of space and then examine three other theoretical premises, related to the about commons, epistemic communities and political ecology, to explain the perceived, conceived, and lived spaces respectively. Finally, I specify my research design and fieldwork methodology.

3.2 Production of space

Henri Lefebvre's 'theory of space' (Merrifield, 2006:104) outlined in his philosophical publication, The Production of Space *(La production de l'espace* in the original French) describes three spatial elements or 'three spaces', which he calls a 'triad' (Lefebvre, 1991:39). Lefebvre's theory of space begins with the argument that space is not some neutral geographic backdrop or container of populations or other objects, but something produced and reproduced by the triadic interaction between 'physical space (nature), mental space (formal abstractions about space) and social space (space of human interaction)' ultimately producing the same space that people notice or understand (Merrifield, 2006:104). This three-space concept is helpful in explaining how the production and reproduction of an ecosystem or ecosystem services take place materially, conceptually and socially in a particular geographic and institutional context.

In order to describe the perceived, conceived and lived spaces, Lefebvre discusses three elements or 'moments' about space, namely 'spatial practice', 'representations of space' and 'representational spaces', respectively, at the focal point of his concept in space (Figure 3.1). These three elements produce space, while at the same time they are produced in space in a way that 'space is at once result and cause, product and producer' (Lefebvre, 1991:142). More understandably, social groups first produce the three spaces or spatial elements (physical, mental, social), which in turn, make up the space in totality, while at the same time, the space also reproduces the three spatial elements in a continuous way (Elden, 2004; Milgram, 2008; Rogers, 2002). Understanding the three spatial elements is crucial to understanding the production of space as a whole

Spatial practice

Spatial practice is tightly linked to *'espace perçu'*, or 'perceived space' (Rogers, 2002:29). Social actions give rise to spatial practice (Buser, 2012). It is 'materialized, socially-produced space that exists empirically...directly sensible or perceivable…open to measurement and description' (Rogers, 2002:29). Spatial practice embraces specific locations, physical activities and patterns of interaction that are directly perceived by people as a result of everyday life (Rangan & Kull, 2009; Unwin, 2000).

Rogers (2002:29) calls the spatial practice a 'First Space' and gives an example of a 'barbed wire fence' erected in a field in order to clarify all the three elements including spatial practices. According to Roger, what Lefebvre meant by spatial practice is how the fence has constructed a pathway or route parallel to it where people walk. The fence produces and reproduces various social relations/practices (processes) and outcomes/things (objects) such as ownership of land, the characteristics of the landscapes built as a result of the fence, how the farmers construct and repair the fence and how the fence creates facilities (to land owners) and prohibitions (to trespassers). Rogers elaborates that when people walk along the side the fence and notice it with their eyes and feel it with their hands, it gives a sense of the 'spatial practice' component of the 'space'. Therefore it can also be called a 'perceived space' or the 'empirical space' (Lefebvre, 1991).
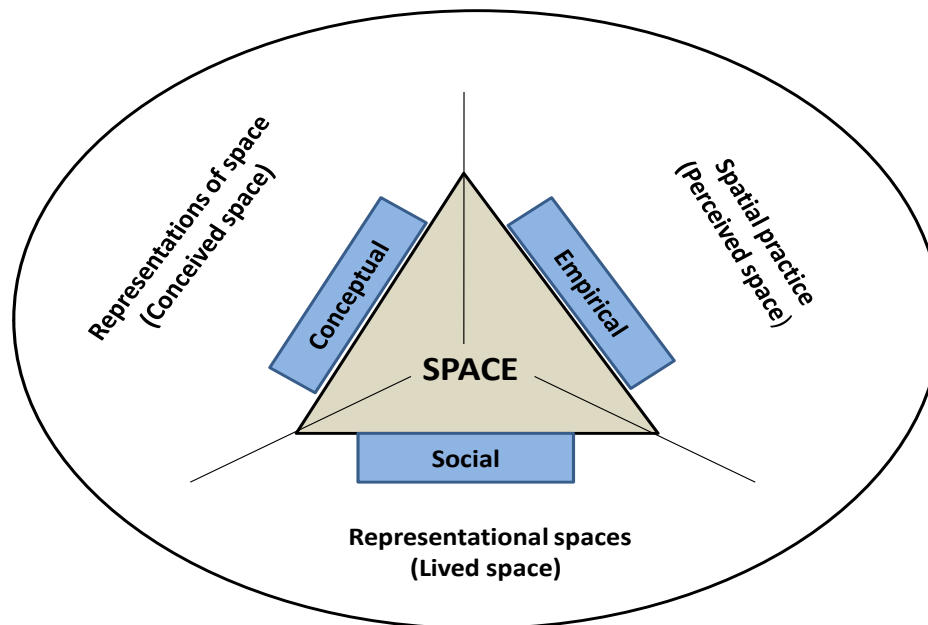
Figure 3.1 The Lefebvrian triad of the production of space (Source: Based on Elden, 2004; Lefebvre, 1991; Merrifield, 2006; Milgram, 2008)

Representations of space

Representations of space is linked to the *'espace conçu'* or 'conceived space' (Rogers, 2002:32). It is a mental space conceptualized in various textual forms or models, such as figures, codes, signs, alphabets and maps. It is the 'conceptualized space, the space of scientists, planners, urbanists, technocratic subdividers and social engineers...all of whom identify what is lived and what is perceived with what is conceived' (Lefebvre, 1991:38). This space is associated with ideology, power and knowledge (Merrifield, 2006) and therefore Lefebvre (1991:39) considers it as a 'dominant space' in any society or mode of production. It is the 'space of *savoir* (knowledge) and logic', which is a 'mental construct' or

'imagined space' (Elden, 2004:190) This is a space designed or created by technocrats for the politically powerful to exercise their control over people and resources.

Rogers (2002:25) calls the conceived space a 'Second Space'. It includes various 'arcane signs and jargon, objectified plans and paradigms' used by professionals, technocrats and their institutions, while at the same time it is 'the space of capital, state and bourgeoisie' (Merrifield, 2006:109). The barbed wire fence in the above examples 'represents' various ideas, such as production, ownership, control and access. The fence brings to mind a set of texts, such as the deed (title) of ownership and property laws, which are represented here by the 'fence'. Rogers (2002) distinguishes between *espace perçu* and *espace conçu* with a compact example of the same fence. If someone talks about the physical aspect of the fence, such as whether the fence is running on the boundary of the property, he/she will be talking about *espace perçu* (spatial practice). If someone considers the 'fence' as a representation of ownership and control and express it in the forms of 'the words, the ideas, and the understandings' which are 'used to try and make sense of it' (Rogers, 2002:32), it will be *espace conçu* (representations of space). In the latter case, it does not matter whether or not the fence is running on the boundary of the land property.

Representational spaces

Representational space is closely linked to the *'espace vécu'* or 'lived space' (Rogers, 2002:33). This is the space directly lived in by inhabitants and users through the 'associated images and symbols' (Lefebvre, 1991:39). Rogers (2002:33) calls the concept of 'representational spaces' the 'Third Space' in Lefebvre's triad. Unlike the formal or powerful conceived space, the lived space is articulated in the forms of poetry, lyrics, folklore, myths, and other less formalized but popular expressions. Lived space is 'everyday art, the poetry of daily life, the art of life' (Schmidt, 2008:33). It is in a sense, an alternative space dreamt by

those communities or social groups, who are suppressed by the politically powerful. At times, this space refers to 'utopian dreams' of the dominated social groups, who imagine that 'another world is possible' (Harvey, 2006:243).

The 'representational spaces' dissolve the binary concept into the third idea making everything 'triadic' instead of binary. Through the lens of representational spaces, a space is seen as 'produced and modified over time and through its use, spaces invested with symbolism and meaning', which is the 'space of *connaissance* (less formal or more local forms of knowledge') (Elden, 2004:190). It becomes a combination of both physical and mental space or in other words 'real-and-imagined' (Elden, 2004:190). Rogers elaborates on the contradictory nature of lived space as an interface of perceived and conceived spacesas follows:

This domain of lived experience is, I believe, full of contradictions and seeming opposites. Indeed, this is one of its most endearing properties, making lived space mysterious, secretive — indeed extraordinary. If we try to conceive of it or translate it into discourse by mapping it into *espace conçu* we change it. If we try to perceptualize lived experience by bringing it into *espace perçu* we change it as well. It can only be understood on its own plane of lived experience in the here and now. It then becomes both/and as opposed to either/or (Rogers, 2002:37).

Rogers (2002) returns to the example of the barbed-wire fence to describe the lived space or the representational spaces. When people walk and talk along the fence (lived experience), they are at the margins or boundary of the farm which is fenced. The sense of boundary refers to the power of the fence or the conceived space. But when they walk and talk along the fence, they are also in the centre of the farm and are participating in social practices that articulate the essence of the fence and farm. This second part is the spatial

practice or perceived space. Thus the 'lived space' is neither the perceived nor conceived, but at the same time, both. However, when the two ideas are combined, it becomes a third idea or the third space, that is, the 'lived space'. It is neither as empirical or measurable as the spatial practice component of the fence, nor as abstract as its representations in ownership and other conceptual ideas. Therefore, it is both 'real-and-imagined', 'perceptual-and-conceptual' which makes up a third form of spatial components. It is neither physical (natural) nor mental (conceptualized), but a social space, which bears an informal or local form of knowledge about any space such as the fence in the example. The lived space thus becomes an alternative space.

The triadic concept of space is useful in understanding how people perceive and conceive a landscape such as ecosystems where they directly live or which they use directly or indirectly. It helps understand the ways in which ecosystems are produced, used, conceptualized and governed. Focusing on the concept of the production of space, I employ three related research approaches in order to understand and discuss the three spatial elements in the context of ecosystems. Specifically I use the theory of the commons, the concept of epistemic communities and political ecology to discuss spatial practice, representations of space and representational spaces, respectively.

3.3 Theory of the commons

The central argument of common property theory holds that communities develop institutional arrangements through collective action to manage common pool resources, to address 'free-rider' problems, overuse or distributional conflicts (Ciriacy-Wantrup & Bishop, 1975; Dietz et al., 2001; Ostrom, 1990). The focus on common property and common resource management emerged around the same time as neoclassical economic approaches were beginning to be applied to ecosystems during the 1970s (Gómez-Baggethun et al.,

2010). This body of research challenged the view that environmental degradation was the result of the 'tragedy of the commons' (everyone has an incentive to use the common resources but no one is responsible for conserving them), which could only be remedied by privatising or nationalising common resources (Hardin, 1968). Initially, common property theory focused primarily on defining common resources in terms of communal or group ownership of property (Bromley & Cernea, 1989). But over the past two decades or so, this idea of common property has been critiqued and expanded to include other aspects of ownership such as control of access to and use of resources, and collective action in the management of resources (Agrawal, 2001; Larson et al., 2010; Rangan, 1997). Like any other commons, the management of forests or watershed as ecosystems requires a in-depth understanding of local knowledge, community needs, differences in access to and control over resources between social groups within communities (Dressler et al., 2010).

Although the concept of space production is broadly employed to understand how ecosystems are socially produced, the theory of commons is highly relevant to understanding the spatial practice within the broader analytical framework (Figure 3.2). It is more relevant when there is a debate over whether ecosystems are private property or communal resources or more specifically whether market or collective actions work better in managing ecological resources. Spatial practice in a watershed ecosystem, for my purpose, includes, but is not limited to, the management of community forests, the interaction of local people among themselves and with other stakeholders such as forestry officers, the boundaries between communal and private lands, the routes through the settlements, forests and farmlands, and the movements of people and livestock that are empirically perceived.
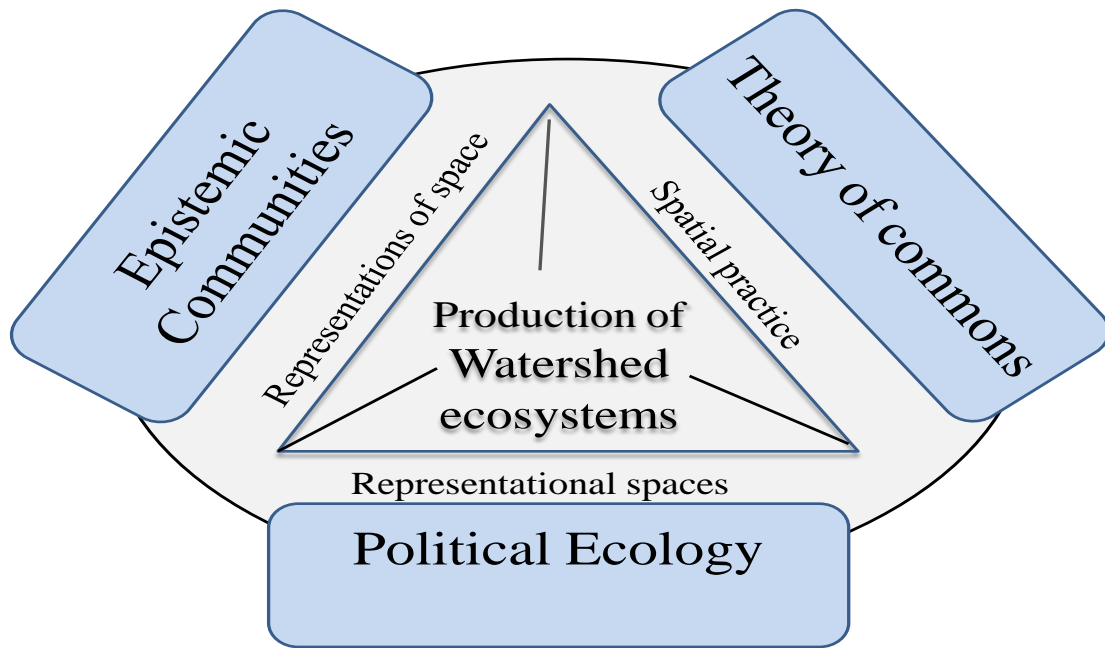
Figure 3.2: Conceptual framework for the research

3.4 Concept of epistemic communities

In order to address the question of 'representations of space', I rely on the analysis of 'epistemic communities'. This approach holds that the meaning or representation of any concept or idea is constructed differently by different social groups. In that sense, these social groups represent certain epistemic communities in understanding, reproducing and debating certain knowledge, narrative or discourse. Each of these social groups has particular beliefs and interests based on the particular forms of knowledge which they share. Their shared beliefs, interests and knowledge make up the social groups as 'epistemic communities'. In understanding the concept of an epistemic community, I follow Haas (1992) who defines it as a group of people having common conviction in the use of certain forms of knowledge . While some researchers such as Forsyth (2003) suggest the view that

an epistemic community is a group of like-minded international 'professionals' or a group of 'scientists' or 'experts', this is not the case in all contexts. Haas affirms:

> [T]he term "epistemic communities" has been defined or used in a variety of ways, most frequently to refer to scientific communities….We stress that epistemic communities need not be made up of natural scientists or of professionals applying the same methodology that natural scientists do…By our definition, what bonds members of an epistemic community is their shared belief or faith in the verity and the applicability of particular forms of knowledge or specific truths (Haas, 1992:3).

This definition of epistemic communities can be used to describe any group of people having similar beliefs in a policy agenda, such as suggesting how the meaning and values of ecosystems are produced. However, while employing this term, it is not suggested that such groups are formally constituted and permanent. Such a coalition may be formed formally or informally for a specific issue at a given time.

Sebenius (1992:325) considers an epistemic community not only as a coalition of people but as an 'approach' or 'framework' to analyse how negotiation takes place among these coalitions to influence policy making and suggests that 'the members of epistemic communities translate their beliefs and preferences into influence over policy outcomes'. While Haas (1992) qualifies his definition of epistemic communities for a variety of missions, such as shared normative beliefs, shared casual beliefs, shared notion of validity and common policy, Sebenius (1992) particularly underscores policy relevance and negotiation-analytic. Sebenius further argues:

> [A]n epistemic community can be understood as a special kind of *de facto* natural coalition of "believers" whose main interest lies not in the material sphere but instead in fostering the adoption of the community's policy project. Initially, an epistemic community faces the problem of how to expand from a typically small, *de facto* natural coalition into a meaningful "winning coalition" (Sebenius, 1992:325).

This definition is especially noteworthy for its emphasis on 'negotiation' between the communities to coalesce to form a bigger coalition powerful enough to exert pressure to effect policy change. This notion provides an additional way to frame my research to describe communities or social groups such as government, local governments, environmental NGOs, press media and local communities, located in different parts of a watershed, as 'epistemic communities' who not only contest the issue of ecosystem valuation but also at some points negotiate among themselves about such issues to draw the attention of policy makers. The epistemic communities, to some extent, are analogous to 'discourse-coalitions' in which actors team up together to address certain environmental story-lines or narratives which they believe to be biophysical and social realities (Hajer, 1995; Whittaker & Mercer, 2004).

The concept of epistemic communities is employed in this research to explain the 'representations of space' component of the production of watershed ecosystem space. The representations of space include, *inter alia*, the definition of watershed provided by experts, forestry related laws and directives guiding the conduct of community forestry user groups, watershed or forest management plans endorsed by forestry departments, the notion of 'upstream and downstream', the notion of 'user group', definition of watershed degradation in government circulars or expert opinion and so on. Conceived space refers not only to the dominant power instruments, such as project documents, laws, government circulars and expert reports in relation to watershed and ecosystems, but also to the 'material manifestations' of the landscapes shaped and reshaped by the influence of these power instruments (Milgram, 2008:269). The epistemic communities conceive, negotiate and conceive again the meaning and values of watershed ecosystems which are the material manifestations being produced by and producing the conceived space.

3.5 Political ecology

I employ the field of political ecology to explain the representational space in the triad of the production of watershed ecosystems. Political ecology emerged as a perspective or mode of inquiry during the 1970s and evolved into a more established field of research by the early 1990s (Watts & Peet, 1996). Blaikie and Brookfield (1987) defined political ecology as an approach integrating ecological issues within a 'broadly defined political economy 'Unlike the neoclassical economic approach of segregating and monetizing components of ecosystems as goods and services, Blaikie and Brookfield focused on a 'chain of explanation' that linked environmental change with social structure (relationships between classes and groups), institutional factors (government policies and regulations, community rules and custom), and broader market pressures to the actions of land managers.

Over the last three decades or so, political ecology has been enriched with a number of critical tools including common property theory, Marxist political economy, peasant studies, feminist development studies, postcolonial studies, environmental history, govermentality, post-structuralism, critical theory and actor networks theory (Forsyth, 2003; Robbins, 2012). Political ecology is, hence, interchangeably called 'critical political ecology' as well (Forsyth, 2003; Peet et al., 2011). The various tools and conceptual building blocks make up political ecology as one of the most generous 'analytical approaches that explains the biogeographical outcomes of social relations in the context of particular spatial and political configurations' (Rangan, 2000a:63). The mismatch between various theoretical modelling of ecosystems and the everyday practices of managing common pool resources can be coherently problematized or understood by situating the inquiry within the framework of political ecology. Rangan remarks:

> The theoretical coherence of political ecology lies in its ability to recognize the dynamism of ecological processes and social life from a geographical-historical perspective. It is by far the most useful and comprehensive analytical approach that exists at the moment for understanding the processes of ecological and social change through the shifting patterns of human values, economic activity and natural-resource use, related institutional practices and their contestation, and ensuing distributional outcomes for populations, places, and regions (Rangan, 2000a:65).

The scope of political ecology has broadened with the emergence of new issues in environmental problems. While political ecology during the late 1980s or early 1990s was confined within local or regional contexts (Blaikie & Brookfield, 1987; Bryant, 1992), it has recently been elaborated to encompass human-ecology interaction on scales ranging from local to global (Peet et al., 2011; Springate-Baginski & Blaikie, 2007). This enhanced scope of political ecology helps to understand how various local, national and global environmental contexts, policies and practices such as neoliberalization of ecosystems shape the shifting dynamics of institutional landscapes, socio-economic marginalization, ecological outcomes and contest over the interpretation of ecosystems (Springate-Baginski & Blaikie, 2007).

To a large extent, common property theory and political ecology have enriched each other. Robbins (2012) notes that while common property theory has contributed to political ecology through its emphasis on the institutional dimensions of collective action and management of natural resources, political ecology has contributed to common property theory by offering a more nuanced understanding of social power and conflicts over land use and consequent ecological outcomes in the context of a broader political economy. Both common property theory and political ecology challenge the neoclassical approach of viewing ecosystem commons such as forests and watersheds only from the logics of market and private property (Agrawal, 2001; Robbins, 2012). The concept of 'ecosystem services' has been criticised by political ecologists as a social construction and a neoliberal approach to

commodifying and monetizing nature (Heynen & Robbins, 2005; McAfee & Shapiro, 2010; McCarthy & Prudham, 2004; Muradian et al., 2010; Okereke, 2008; Robertson, 2004). These scholars argue that ecosystems are common pool resources that cannot be divided into discrete 'services'.

Political ecology provides an analytical premise to explain the 'respresentational spaces' in the production of ecosystems in my study. Representational spaces refer to the symbolic values of an ecosystem landscape, which are, for my purpose, produced by marginalized local people to counter the dominant conception of the landscape such as ecosystem services, upstream-downstream linkage, conservation or degradation of environments.

The Lefebvrian approach to the the social production of space relies on three spatial components, namely 'spatial practice', 'representations of space' and 'representational spaces'. While a 'space' is contextual, these three components should also be understood in certain contexts. I situate a watershed ecosystem as a space in the Lefebvrian framework. In order to understand the three elements in this watershed context, I employ three more analytical approaches -- commons, epistemic communities and political ecology. However, different ways of understanding the three spatial components in a watershed might be presented in other studies. Each of the three approaches could also stand alone in other investigations. All four theoretical premises (space, commons, epistemic communities and political ecology) are used independently in some contexts, while in others some of them have been integrated. For example, political ecologists have frankly admitted the use of 'common property theory' (Robbins, 2012:51) and 'epistemic communities'(Forsyth, 2003:183) in their studies. In that sense, researchers have already integrated the theory of commons, epistemic communities and political ecology into one another. I use these three interrelated approaches to understand

the three interconnected spatial dimensions of the production of space. This is the main contribution of this study to research methodology. The research methodology is designed accordingly.

3.6 Research design

The aim of my study is to engage in a critical analysis of how the material and meaning of watershed and ecosystem services are socially produced in the context of the Tinau watershed in Western Nepal. I have conceptualized my study around four specific objectives associated with the spatial production process of the watershed. These objectives are to:

1. historicise the growth and importance of the Siwalik and the Terai around political, cultural, economic and ecological processes;

2. understand how local communities perceive ecosystem services in connection with their everyday practices related to their livelihoods, collective actions and traditions;

3. assess how watershed and ecosystem services are represented in policies, projects and dominant discourses of environmental changes; and

4. examine how different social groups work together to redefine the watershed and ecosystems in local and regional contexts.

I developed a series of open ended guiding questions to collect, analyse and explain information for my study. These questions led all the findings towards the three broader spatial elements that make up the biophysical realities and meaning of ecosystems through the lenses of Lefebvrian social production processes. I used mostly secondary sources of information for the objective 1 and 3 substantiated by the information derived from interviews and focus group discussions. I used interviews and focus group discussions as the main sources of information to achieve objective 2. For objective 4, a watershed level

interaction workshop provided the main data and information. I describe in detail how the data and information were gathered for each of the objective.

Objective 1: To historicise the growth and importance of the Siwalik and the Terai around political, cultural, economic and ecological processes

I attempted to achieve this objective through the historical analysis of the development of the Siwalik and the Terai particularly since the mid 17th century. I mainly reviewed literature to address this objective. I collected information from books, government reports, newspapers, magazines and other documents that provide descriptions of political, economic and environmental changes in the Siwalik and the Terai within the broader context of Kathmandu-centric politics, contemporary British colonial influences and in the later phases the international aid industries. I mainly focused on the analysis of various images or representations of the Siwalik and the Terai in different historical periods.

For the descriptions of the Terai during the unification of Nepalese Kingdom, I mainly drew on material in books written by British authors who visited Nepal before or after the Anglo-Nepal war of 1814-15. The remaining phases up until 1990 were studied from materials such as books and journal articles written mostly in the second half of the 20th century. Newspapers, magazines, journal articles and policy documents provided information for the most recent phases in the history of the Siwalik and the Terai. Documents related to environmental projects in Nepal were also employed to understand how the concept of upstream-downstream and ecosystem services have been imposed in the Siwalik and the Terai context. These literature sources were also enriched by key informant interviews in the case study sites in Palpa and Rupandehi districts.

Objective 2. To understand how local communities perceive ecosystem services in connection with their everyday practices related to their livelihoods, collective actions and traditions

The secondary information used to achieve this objective was derived from forestry project documents, forest management plans, publications of NGOs, records of village development committees and municipalities in Palpa and Rupandehi districts. The primary information was collected from individual interviews and focus group discussions. Altogether 76 key informants were interviewed and audio-recorded. The interviews were transcribed and thematically categorized in order to synthesize the information. A focus group discussion was undertaken in Dobhan village of Palpa, Butwal municipality and Bhairahawa municipality each.

In the Dobhan area, the key informants who took part in interviews and in focus group discussions were mainly community forestry users, other village leaders and school teachers. I asked questions about the extent to which the community forests served as larger commons for people living in different parts of the watershed and in what ways. I also asked how they saw the different functions of forests as ecosystems, and in what ways they value them, individually or as a whole. In the Butwal area, I particularly interviewed NGO activists, officials from Butwal municipality, school teachers, irrigation water users, political party cadres, businesspersons and industrialists. In the Bhairahawa area, NGO activists, officials from the District Forest Office, officials from District Soil Conservation Office, employees of the District Development Committee, Madhes-based political party leaders and members of public land management groups .. In these three areas, participatory mapping was also undertaken to understand how the local communities perceive and delineate the extent of the area of the Tinau watershed.

Objective 3: To assess how watershed and ecosystem services are represented in policies, projects and dominant discourses of environmental changes

In order to address this objective, I relied mostly on secondary sources of information. The key documents I analysed were the project reports of the Tinau Watershed Project that operated during the late 1980s and early 1990s, reports and publications of government offices, journal articles, records of donor-funded projects and NGOs. Some articles from local and national newspapers were also employed. Information from district profiles and district forest management plans was also used. In order to substantiate the secondary data, the interviews with forest officers, engineers and soil conservation officers were used. A sketch map was produced with the help of these officials to delineate the Tinau watershed, which is represented for government planning.

Objective 4: To examine how different social groups work together to redefine the watershed and ecosystems in local and regional contexts

To understand the collective views of different social groups, a one day workshop was organized in Butwal. The participants of the workshop were individuals who had earlier taken part in key informant interviews and focus group discussions. Those taking part from Dobhan and upper Butwal area were community forestry users and school teachers. NGO activists, local government officials, irrigation water users, journalists, businesspersons and industrialists were among the participants from the Butwal area. Forest officials, Soil Conservation Officials, NGO activists, political party leaders, public land management users and farmers from Bhairahawa participated in the workshop.

The participants prepared a single participatory map of the Tinau watershed. While preparing the map, they negotiated with one another collectively and individually to delineate

the boundary of the Tinau watershed. The concept of upstream-downstream, ecosystem services, valuation of ecosystem services, roles of different ecosystems such as forests, river, rural agro-ecosystems and urban ecosystems in watershed management were debated. The problem faced by the lowland people in accessing to community forests in the Siwalik was also discussed. The roles of District Forest Coordination Committee, District Development Council, government agencies, NGOs, forestry user groups and other local actors in managing the Tinau watershed were identified and discussion. The information was helpful in understanding the lived space or alternative space of the watershed ecosystem.

3.7 Fieldwork methodology

I undertook my major fieldwork from September to December 2011. My first step was to make contact with the district forest offices of Palpa and Rupandehi districts in order to collect basic information about community forests, Tinau river management, and about the various actors and institutions involved in forest and watershed management or conservation. The district chapters of the Federation of Community Forestry Users Nepal (FECOFUN) in Palpa and Rupandehi districts were consulted in the second stage for more information. In the third round, I consulted some local journalists and NGOs working in the environmental sector. In the fourth stage, I made a spatial observation of the Tinau river and the surrounding forests and settlements in Palpa and Rupandehi, driving along the highway that runs almost along the bank of the Tinau from Palpa to Butwal, then driving along the banks of the Tinau from Butwal to the Nepal-India border in the south.

After consultations with the major stakeholders and field visits, I selected my sample groups in the upland Siwalik (Palpa district), midland Butwal and the lowland Bhairahawa. From the upland area, I selected four community forestry user groups, two from Palpa and

two from Rupandehi. For the midland area, I selected Butwal municipality. Key informants were selected in consultation with local journalists and NGOs working in Butwal. For the lowland Terai, respondents were selected from Bhairahwa muncipality. The key participants were were political party leaders, NGO activists, journalists, public land agro-forestry managers, forest officers, local government employees and soil conservation officer. Advertisement flyers had been distributed to different organizations including political parties, community forestry user groups, media offices, NGOs, schools and government offices in these three locations. The researcher made a contact with participants after receiving their interests to participate.

Key informant interviews

I used in-depth interviews to gather primary information. I developed some guiding questions for the interview, but basically interviews were informal and open-ended questions were asked. This kind of informal interview was appropriate in my study; it allowed me to gain insights into the views of respondents from diverse backgrounds. According to Punch (2005:172), such informal and open-ended interviews are useful for 'understanding the complex behaviour of people without imposing any *a priori* categorization which might limit the field of inquiry'. In community forestry user groups, I individually interviewed executive committee members, previous chair persons, school teachers, local facilitators and village committee leaders. In Butwal municipality, I mainly interviewed environmental NGO activists, journalists, municipality officials, school teachers, business persons, industrialists and farmers. Similarly, in Bhairahawa, I interviewed political party leaders, public land management group leaders, soil conservation officers, forest rangers, environmental NGO activists, journalists and farmers.

According to the convenience of the respondents I undertook the interviews wherever the respondents chose. Most of the respondents preferred a public place such as the building of community forestry office, while some participants preferred their own homes for the interview. Each interview was audio-recorded in the Nepali language. I later transcribed the records first in Nepali and then translated them into English. The list of interviewees is presented in Table 3.1.

Table 3.1: List of interviewees

Location	Representative social group	Number of participants
Dobhan village in Palpa district	Community forestry user group members	25
	School teachers	5
	Village leaders	3
Butwal municipality in Rupandehi district	NGO activists	5
	Community forestry user group members	11
	Journalists	4
	Municipality employees	1
	Irrigation water users	2
	Businesspersons	2
	Industrialist	1
Bhairahawa municipality in Rupandehi district	Political party leaders	7
	Forest officer/rangers	2
	Soil Conservation Officer	1
	NGO activists	5
	Donor funded project employees	2
	Total	**76**

Focus group discussions

After the individual key informant interviews, I organized a focus group discussion in each of the three locations: Dobhan, Butwal and Bhairahawa.   This was a kind of group interview, but the questions were more general than the specific questions asked in the individual interviews. The whole group would try to answer a question or topic raised by the researcher. I played the role of facilitator in the focus group discussions. Instead of asking questions repeatedly, I facilitated and moderated the interactions among the participants. The office building of Arghachhap Community Forestry User Group was used to carry out the focus group discussion with community forestry user groups. The midland focus group discussion was held in the office building of Laxmi Adarsha Community Forestry User Group in Butwal. The focus group discussion for lowland Bhairahawa was held in the office of the Livelihood and Forestry Programme. The discussions were audio-recorded and key points noted down. The participatory map of the watershed was also drawn in the group discussion.

Watershed actors negotiation workshop

Following the focus group discussions, I invited the key informants from each focus group to attend a big gathering, which I previously called the 'watershed actors negotiation workshop'. The main key informants, who also took part in the interviews and group discussions, participated in the workshop which was held in a community training centre in Butwal. I hired a professional facilitator to conduct the workshop so that I could observe and note the key points raised in the discussion and how they were discussed. The objective of the workshop was to provide a common space for people from different areas of the watershed in which they could discuss and negotiate the meanings and values of the watershed ecosystems associated with their livelihoods, their economy and beliefs.

In the beginning of the workshop, the participants were asked to produce a single map that would delineate the watershed boundary. The participants had very aggressive discussions over this but finally they negotiated a common boundary that met their interests. Similarly, they negotiated a common understanding of concepts such as ownership, values, management, use and actors in forests and watersheds. The questions of whether ecosystems are private or common resources and which of the values of ecosystems can be traded were also debated. The full details of how the discussions took place are described in Chapter 8. This workshop addressed the fourth objective of the research: to examine how different social groups work together to redefine the watershed and ecosystems in local and regional contexts. The discussions were audio-taped, and the participatory map and group presentations were also collected for analysis. The maps are presented in Chapter 8.

Chapter 4: Historical Making of the Siwalik and the Terai

> If Nepal's borders ended at the base of the Himalayan foothills, the country would by now be in the throes of a total economic and ecological collapse. Luckily, the borders extend farther south to include a strip of ...plains known as the Terai, an extension of the vast Indo-Gangetic Plain of northern India, one of the world's most productive areas (Eckholm, 1976:78).

Nepal is often presented as a 'Himalayan' nation (Hagen, 1971; Karan & Ishii, 1996; Rose & Scholz, 1980). Several high altitude valleys, such as Kathmandu and Pokhara, are also counted within the folds of lofty mountains rather than plain terrains. This geographically mountainous image of the country, however, overshadows a reality that nearly one sixth of the country's total area of 147,181 km^2 lies in the Terai, a part of the extension of the Indo-Gangetic plains. This region is immediately south of the Himalayan foothills or the Siwalik. Despite its size, it holds strategic importance for the whole country. The latest census reports that 50.3 percent of the total population of the country inhabits the region (CBS, 2012a), which has also been characterised as the 'granary', 'bread basket' and 'economic backbone' of the whole nation (Gaige, 1975). The Siwalik range forms an ecological transition zone or 'ecotone' between the Terai and the higher Himalayan ranges further north.

The linkage between the Siwalik range and the southern plains Terai is not simply topographical, but also culturally constructed. Discourses of environmental change have played a substantial role in shaping, and being shaped by ,the cultural significance of the connection.. The latest narratives of upstream-downstream connections and ecosystem services (GON, 2008; ICIMOD, 2012) emphasise the need to understand the production and discursive power of the spaces associated with these narratives.

Nowhere have environmental narratives of the mountain-plain linkage been so profoundly conceived than in the Himalayan region since the second half of the 20th century (Blaikie & Muldavin, 2004; Eckholm, 1976; Forsyth & Walker, 2008; Guthman, 1997; ICIMOD, 2012; Ives & Messerli, 1989). Whilethe spatial scale of the connection is contested, the linkage has been recounted in one way or another in human geography over time. For example, human migration from the hills to the plains or vice versa, seasonal pastoral movements, mountain trade routes, livelihood interdependence, patterns of rainfall, downhill flows of the river and spatial ecological transitions have all been conceptualized as mountain-plain interactions (ICIMOD, 2012). At the largest scale, the whole Himalayan ranges are presented as the sources of 'benefits' (resource conservation) or 'costs' (resource degradation) for South Asia (e.g. Eckholm, 1976). At a finer scale, the linkages are presented in a similar manner between the Siwalik and the Terai (GON, 2008; Laubmeier & Warth, 2004; Paudel et al., 2011; Singh, 2010). This raises some prominent questions: Are these mountain-plains linkages politically neutral? Are these linkages always gravity-driven or in other words 'unidirectional', flowing downhill? Does the concept of upstream-downstream linkage in terms of ecosystem services 'bond' or 'divide' the two connected ecological regions?

The linkage of the Siwalik and the Terai particularly from pre-unified Nepal to 1990 is the major focus of this chapter. Its main objective is to shed light on the broader geographic and historical setting of the case study area in order to contextualize the detailed insights derived from the particular localities. Against the backdrop of the country's geographic and historical position, I first describe the topographic features of the Siwalik and the Terai followed by their historical development in terms of political, social, economic and ecological changes. I argue that human-induced changes in the Siwalik and the Terai landscapes are not new phenomena, but can be traced back at least 3000 years. That is to say,

there is a long history of human settlement and activities linking these two regions. I discuss the making of the Siwalik and the Terai by focusing on particularly the political-economic and attendant ecological changes in five major historical phases: 1) pre-unification of Nepal; 2) from a unified Nepal to the Anglo-Nepal treaty of 1916; 3) from the treaty to the rise of the Rana oligarchy in the 1840s; 4) from the 1840s to the overthrow of the Rana regime in the 1950s; and finally, 5) from the 1950s to 1990 under the re-empowerment of the Shah monarchy. The latest phase, from 1990 to the present, forms the focus of the following Chapter.

4.1 Geo-political position of Nepal

Nepal is a landlocked country lying between China to the north and India to the east, south and west (Map 4.1). The shape of the country on the map is roughly rectangular with an average length of 885 km stretching east-west and an average width of 193 km running north-south (CBS, 2012c). The country is divided into four distinct, almost parallel, topographical or physiographical zones across its width from the north to the south (in roughly descending altitude). These zones are the inner Himalayas (permanent snow-capped mountains), the middle Himalayas (high mountains), the Siwalik (the Himalayan foothills) and the Terai (the southern plain). The topographical differences are based mainly on elevation but are also differentiated by

Map 4.1: Nepal in South Asia

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other factors such as geology, climate, rainfall, moisture regime, vegetation, soils and agricultural crops (FAO, 1999). The four topographies are generally presented as three distinct ecological zones: the Himalayas, the mountains and the Terai (Himal, Pahad, and Terai respectively, in vernacular Nepali), collapsing the Siwalik either into the Middle Mountains, collectively 'the mountains' or into the Terai (CBS, 2012c; Shrestha, 2002) (Map 4.2). Altitude varies remarkably in the country ranging from 70m above mean sea level in the southern Terai to the world's highest peak, 'Sagarmatha' or Mount Everest (8848 m) in the north (CBS, 2012c). Hydrologically, the whole land is divided into three major river basins, the Koshi, the Narayani and the Karnali, covering nine major Himalayan river systems and around 6000 rivers originating in different parts of the Himalayas, the mountains and the Siwalik (Shrestha, 2002). All three major river systems ultimately drain into two mega rivers of South Asia: the Ganges and the Brahmaputra (Map 4.1).
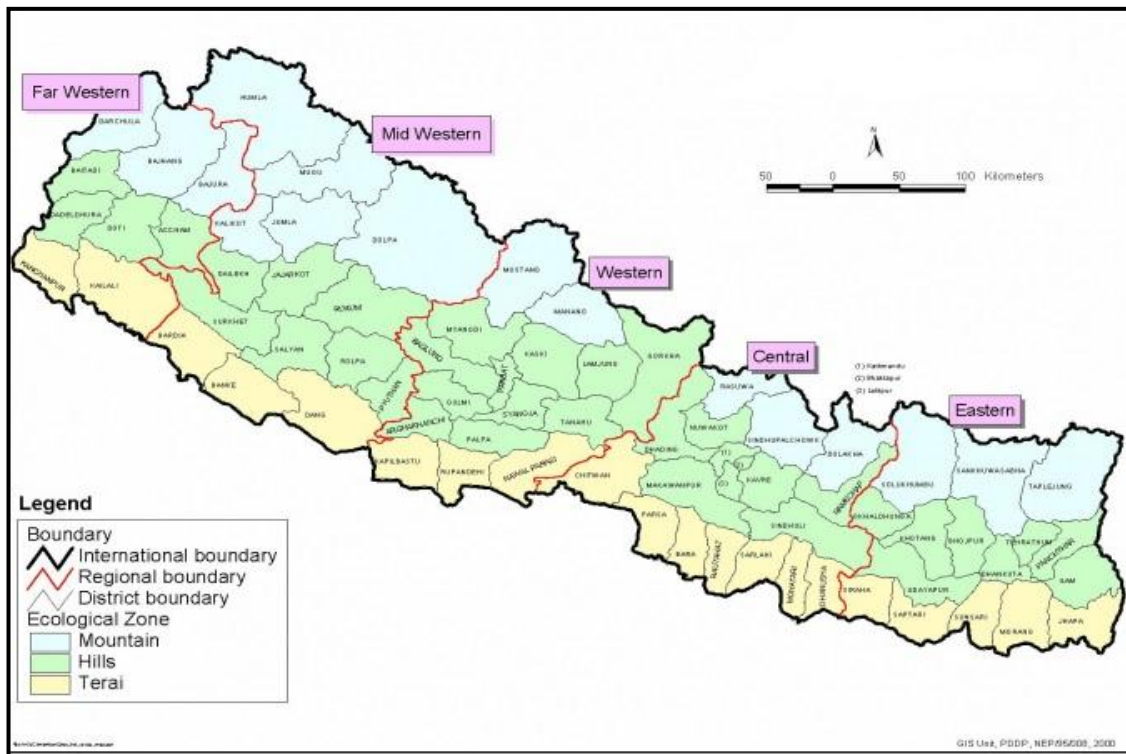
Map 4.2: Ecological zones of Nepal

Altitudinal gradient has a significant effect on climatic variation, ranging from tropical in the Terai to alpine in the High Himalayas. This climatic variation, in turn, has contributed substantially to a wide range of vegetation types and the biogeographic variation. Despite being a tiny country by area in comparison with its giant neighbours, Nepal reflects a unique biodiversity position due to the transitioning of the eastern and western Himalayas along the north-south axis in the middle of the country (GON, 2002). Forests and shrub-lands make up 29 and 10.6 percent, respectively, of the total area of the country (DFRS, 1999). Stainton (1972) classifies 35 forests types and 75 vegetation types characterized by detailed floristic features. The ecosystems are also described as immensely diverse, with 118 types identified across the country (GON, 2002).

The political geography of Nepal, however, was not fixed until one and a half centuries ago. It was only in the middle of the 19th century that the political-geographic

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borders of Nepal were fixed in their present form. The country arrived at this stage through the making and breaking up of several principalities and nation states over time. In the section below I describe how present-day Nepal was historically formed.

4.2 Historical formation of present day Nepal

Karan and Jenkins (1960:4) persuasively argue that the ancient history of Nepal is a mixture of 'myth and fact' resulting in great difficulty in establishing a chronological time line. The names of some prominent figures, such as kings and sages in history, are also found in the Vedic and Epic scriptures, which further complicates the task of separating historical facts from mythical stories (Sanwal, 1965). The history of human settlement in present day Nepal is supported by material evidence which can be traced back only to around 1000 B.C. (Heitzman, 1993; Whelpton, 2005). Historians have divided Nepal's chronology into three major temporal phases, namely ancient, medieval and modern periods.

The ancient period begins in time immemorial and lasts until 879 A.D., according to some scholars (Whelpton, 2005) or until 1200 A.D. according to others (Shrestha & Singh, 1972). The year 879 A.D. marks the beginning of the Nepal Era, while the year 1200 marks the beginning of the Malla dynasty's rule in the Kathmandu valley. Shaha (1992) reconciles the academic conflict by calling the period from 879 to 1200 the 'transition' between Ancient and Medieval Nepal. It is believed that several tribal confederacies existed in the territory until the beginning of the Christian Era. These confederacies, mostly in the Terai were subdued by monarchs from Magadha, present day Bihar, in India. These monarchs extracted taxes from this region from petty rulers on a regular basis in order to strengthen their states (Whelpton, 2005).

Like in many parts of Asia, the making and breaking of the political frontiers of several tiny chiefdoms or larger confederacies within this land was part of a common process until the beginning of the nineteenth century. The land which is now called Nepal started breaking up into several tiny kingdoms from the late ancient era and this accelerated in the medieval stage (Shrestha & Singh, 1972). It is debated among historians how the name 'Nepal' was derived. Many believe the term is derived from the name of a sage called 'Ne' who instructed the cultivators of the present day Kathmandu valley in religion during the early first millennium B.C[2](Sanwal, 1965). Nonetheless, Hagen (1971) assumes the Kathmandu valley was named 'Nepal' only in 879 A.D., which marks the beginning of the 'Nepal Era'.

Until the first half of the 18th century, the land called 'Nepal' today was divided into more than 50 tiny kingdoms or principalities ruled by Rajputs from north-western India and some autonomous tribal chiefdoms (Rose & Scholz, 1980). One such kingdom was Gorkha in the mid-hill area ruled by the Shah Dynasty under an inherited ruling system. King Prithvi Narayan Shah of Gorkha launched a military mission from 1743, subjugating or annexing the principalities or chiefdoms into the territory of the Gorkha kingdom. Only those principalities which peacefully accepted the Gorkha suzerainty were subjugated and taken into the nation, retaining some authority still vested in them as vassal status, while those which resisted were forcibly annexed (Regmi, 1972). Many principalities including three in the Kathmandu valley came under Gorkha dominion by 1769 followed by a shift of the state capital from Gorkha to Kathmandu. Prithvi Narayan gave the name 'Nepal' (after the then official name of

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[2] By this interpretation, 'Nepal' literally meant a territory protected or ruled by 'Ne'. According to this story, 'Ne' was a religious sage who ruled Kathmandu valley and preached to the people about religion. It is believed he instated a cowherd man, Bhuktaman, as ruler in his place and left the country.

Kathmandu) to all the territory under his rule including Gorkha. The year 1769 marks a milestone separating 'Modern Nepal' from the medieval age (Regmi, 1961).

The Gorkha King's mission of expanding the frontiers of Nepal and the colonial expansion of the British in India began at almost the same time. Prithvi Narayan launched his mission from 1743, while British East India Company officially started business in 1757 from Bengal. Prithvi Narayan was aware of the presence of the Company which was expanding its dominion not only across southern and western India but also into the Indo-Gangetic plains. This is the reason why Prithvi Narayan first brought the small principalities of the central and eastern Terai under his control before launching an attack on the Kathmandu valley (Regmi, 1972). The then king of Kathmandu, Jayaprakash Malla, had invited the Company to assist him against the Gorkhali aggression. The Company in response dispatched an army of nearly 2,500 soldiers under the command of British Captain Kinloch in 1767 from Patna via Janakpur. Gorkhali soldiers, however, ambushed them in the Siwalik hills near Sindhuli, resulting in heavy losses on the British side. Captain Kinloch was unable to move towards Kathmandu, and returned defeated to Patna directly from Sindhuli (Raj, 2012). Previously, the Gorkhali armies had also defeated a battalion of the Nawab of Bengal, who had assisted the Makawanpur principality in its resistance against the Gorkhalis during 1762 (Regmi, 1972). All these successes encouraged the Gorkha military to expand Nepal's territory further.

Prithvi Narayan died in 1775 but the Gorkhali mission, which is also called the 'unification of Nepal's mission' (Ojha, 1983:22) was continued by his successors, spreading east and west across the mountain region. Consequently, the frontier of the country was extended from the Tista River in the east and the Sutlej river in the west, and was nearly 2,100 km in length by the end of 1808 (Regmi, 1961). However, the Nepalese Kingdom

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collided with the East India Company again over a disputed territory in the Terai near present-day Butwal and Kapilvastu (Sanwal, 1965). Nepal also had to fight against the Company in western Himalaya when the deposed King of Garhwal sought assistance from the Company and made a retaliatory attack against the Gorkhas. Nepal faced defeat in the battle against the British from 1814 to 1815. It ended with the Anglo-Nepal Treaty that required Nepal to cede significant territory to the Company (including Sikkim to the east, Kumaon, and Garwal to the west and most of the Terai in the south). Following the Treaty, the Company did not intrude into Nepalese territory but appointed a permanent British envoy in Kathmandu (Whelpton, 2005) . Later, in 1860, the British also returned a tract of Terai land to Nepal as a reward to the Nepalese rulers for supporting them in suppressing the Indian Rebellion of 1857, popularly known as the Sipoy Mutiny (Karan & Ishii, 1996). Hence, the geographic frontiers of present day Nepal were ultimately fixed only in 1860 (Heitzman, 1993). In the following section, I elaborate on the making of the Siwalik and the Terai given the importance of the region for the country.

4.3 Making of the Siwalik and the Terai

As discussed in the previous section, Nepal can be broadly divided into three ecological zones: the Himalayas, the mountains and the Terai. The Siwalik holds an ambivalent position in terms of political-topographic meaning. Some authors include the Siwalik in the mountains, while others include it in the Terai. The compromise of the political division and topographic features into 'Himalayan districts', 'mountain districts' and 'Terai districts' also adds difficulty in determining whether the Siwalik should be referred to as belonging in the Terai or the Hills. Nepal is politically divided into 75 districts, of which 20 are counted as 'Terai districts', and each of which contains both the southern plain as well as a part of the Siwalik (Fig 3.2). The Siwalik geographically refers to the hills, but it has been presented or

used politically sometimes as a part of the hills or part of the Terai at various phases of history.

The Siwalik (which is also called the Churiya, Churia, Chure, Siwalik hills, outer Himalayas, Himalayan foothill, Shiwalik or Shivalik) is comprised of the outer Himalayan foothills stretching about 1,600 km from the Tista river in north-eastern India through Nepal and north-western India to northern Pakistan (Sahni & Mathur, 1964). In Nepal, the Siwalik runs about 800 km along the east-west length. Its average width is only 16 km, while its elevation ranges from 300 to 2,100 meters (GON, 2008). The region, which is also called the 'youngest mountain range' or the 'most fragile mountain' in the Himalayas, is believed to have been formed during the geological time between the middle Palaeocene epoch (circa 60 million years ago) and the early Quaternary period (circa 2.5 million years ago) (FAO, 1999). This zone is geologically composed of mainly sedimentary rocks and boulders including shale, sandstone and conglomerates. The Siwalik has been inhabited by human beings for a very long time. Fossils of human-like apes such as *Sivapithecus* or *Ramapithecus* found in South Asia were recovered from the Siwalik hills (Kennedy, 2000). The Soanian culture, one of the earliest human cultures, that existed between 500,000 and 125,000 years ago is also believed to have developed in the Siwalik hills (Lycett, 2007).

The Terai refers to the part of Indo-Gangetic plains immediately south of the Siwalik. The word 'Terai' means a 'swamp or marshy land' in Farsi, the Persian language (Shrestha, 2001). Its geography was formed by the uplifting of the Himalayan mountain ranges coupled with the alluvial actions of the hundreds of rivers that originate from the high Himalayas, middle mountains and the Siwalik which washed the debris and silt southwards (Gaige, 1975; Karan & Jenkins, 1960).The term Terai has two political meanings: one in general referring to the Indo-Gangetic plains overlapping the Nepal-India border; and the other referring

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particularly to to the southern plain within Nepal's frontiers. Gaige   sees the difference in definition as:

> The first and more general definition includes the long and narrow strip of plains abutting the Himalayan foothills all the way from Uttar Pradesh through Nepal, West Bengal, and Bhutan and into India's North East Frontier Agency, now called Arunachal Pradesh. The second definition...includes only the plains region adjacent to the foothills within Nepal's national boundaries (Gaige, 1975:3).

Throughout this study, I use the second definition, that is, the southern plain adjoining the Siwalik range within Nepal's boundaries, to refer to the Terai.

The altitude of the Terai ranges from 70m to 300m and has the hottest climate in the country. North to the Siwalik and the south to the Middle Mountains mostly lies a narrow strip of flat land, but in some portions, it expands to a substantial area, called the dunes or the Inner Terai. Udaypur, Sindhuli, Makawanpur, Dang and Surkhet are the major Inner Terai districts lying north of the Siwalik. These inner Terai districts are not referred to as the Terai proper, which lies in the south of the Siwalik. The history of the formation of the Terai, which is more fluid than that of the Siwalik, can be divided into five major eras aligning with key political changes in the country: before the unification of 1769; from unification to the Anglo-Nepal treaty in 1816; from the treaty to the political change that occured in 1951; and finally, from this point to another major political change in 1990.

Before 12th century : Terai-Siwalik as a part of Indo-Gangetic Himalayan system

The record of human settlement in the Terai dates back to as early as 900 B.C. when Indo-Aryan tribes entered the region from the north-west (Whelpton, 2005). The 'Ahirs' or 'Yadavs' are believed to have been the earliest arrivals in the Terai (Gaige, 1975). They were cow-herding tribes who moved from place to place in the Indo-Gangetic plains in search of greener pastures for their herds. It has been argued that they carried out some seasonal movements, such as grazing, around the foothills during the summer and in the plain in the south during the winter. Some of the earliest kings in the Kathmandu valley were 'Gopal Vamsi' (descendants of Lord Krishna, by definition), who are also called Ahirs or Yadavs (Sanwal, 1965). This suggestion alludes to the possibility that Ahirs ruled the present-day Terai from the Kathmandu valley around the first millennium B.C.

From circa 6th century B.C. to the 4th century A.D., the Terai was a part of the Vrijji confederacy, whose capital was at Vaishali, in present-day Bihar in India. Several *janapads* (a kind of semi-autonomous city state) of clans or groups had been organized into the confederacy (Gaige, 1975). The chiefs of the *janapads* were called *rajas* or kings although it is argued that they were elected rather than hereditary, alluding to the republican nature of the government. The Vrijji confederacy covered numerous *janapads* in the Indo-Gangetic plains in modern day Bihar, Uttar Pradesh and Nepal's Terai. There were several *janapads* in the present day Nepal's Terai of which the Kapilvastu and Videha were the most notable. Lord Buddha was born to a Shakya King Suddhodhana in 563 B.C. in Lumbini, which was part of the then Kapilvastu *janapad* in the western Terai. The Videha *janapad* spread across the middle and eastern Terai and some northern parts of Bihar. Its capital city was Mithila, the

modern-day Janakapur in the eastern Terai. Janaka, the legendary king whose reference is found in the Epic Ramayana, is believed to have ruled Videha at some point in its pre-history.

Historically the Terai has been an important setting for human-environment interaction. The clearing of forests in the Terai for pastures, forest products, cultivation or settlements is not a relatively recent manifestation but a part of social evolution in the territory. All the historical and archaeological traces allude to the existence of human societies in the Terai at least from 3000 years ago. However, as Gaige (1975) maintains, the density of human settlements and their activities might have waxed during favourable conditions and waned due to natural calamities, wars or epidemic diseases. This might be a reason why there is very little reference in written history about any significant human activities in the Terai particularly within present-day Nepal's territory from the fourth to the 11th century A.D. This could have been the period when the southern plains were reclaimed by forests and savannas before new arrivals of humans occurred. The domination of the settlements over forests or *vice versa* tended to ebb and flow at several points in the history of the Terai. As Gaige puts it:

> The ancient and medieval history of the region is a cyclical one in which men and forest have dominated in turns. From time to time, people from more settled parts of the Gangetic plain pushed back the forest, cleared the land and established settlements that grew into kingdoms. When the kingdoms withered away because of natural calamities or war, the forest reclaimed the land (Gaige, 1975:59).

To borrow a concept from modern land-use change modelling, the Terai witnessed a series of 'forest transitions' at several intervals in the early and medieval history of Nepal. Several principalities thrived and then faded away before they were reclaimed by secondary forests at intervals.

During the 11th century A.D., a powerful state called *Tirhut* emerged in the central Terai, whose capital city was located in Simroun Garh in the present-day Bara district near Birgunj. Tirhut extended to a large area including the present-day central Terai and Bihar north of the Ganges. It is believed this state was established and ruled by the kings of the Karnataka dynasty, who fled from Oudh in India after being hard pressed by Muslim invaders (Wright, 1877). King Nanya Deva, the founder of this state in the 11th century, was the most famous among those kings in Simroun Garh. During the reign of King Hari Singh Deva (the sixth descendant in the line of Nanya Deva), the Muslim king of Delhi attacked Simroun Garh in 1324. Hari Singh fled to the Kathmandu valley with his royal court and later on became the king of the valley which was by then called 'Nepal' (Shrestha & Singh, 1972).

From the 13th Century to 1769: Siwalik as shelter and Terai as a defence barrier

The Muslim invasions continued in the Indo-Gangetic plains. These invasions from the 11th to the 17th century A.D. had massive impacts on the migration of the non-Muslim population from west to the east and from the south to the north (Rose & Scholz, 1980). The Muslim kings, particularly in Delhi, Oudh and Bengal repeatedly attacked non-Muslim kingdoms which followed Hinduism (Regmi, 1972). Sultan Ala-ud-din Khilji, the then Muslim king of Delhi attacked Chittaur, now in Rajasthan in India in the first decade of the 14th century A.D. (Hamilton, 1819). This attack had far reaching consequences in Nepal. The Shah monarchs who ruled Nepal from 1769 until 2007 from Kathmandu are believed to have been descendants of the Rajput caste who fled from Chittaur during this invasion (Rose & Scholz, 1980).

All these attacks created havoc among the non-Muslim populations, who fled northwards seeking refuge in the Terai first and then further north into the hilly region. Some

of these fugitives became rulers of several parts in the hills and the Terai removing the local chieftains. Those who fled to the hills were relatively safer, but those occupying the Terai were more vulnerable to the Muslim attacks. During the 16th and 17th century A.D., the rulers of the Terai negotiated with the Muslim kings, resulting in the former paying tribute to the latter and enjoy other autonomy in their principalities (Regmi, 1972). The rulers nonetheless preferred the Siwalik for their capital mainly due to fear of the potential Muslim assaults any time. They conserved sufficient area of forests between their palaces in the Siwalik foothills and southern plain as far as they could as natural defence barriers. Some of the Hindu populations who were the cultivators or tenants in the Terai agreed to convert to Islam for their survival (Whelpton, 2005). Whelpton further maintains that the migrationnorthwards first to the Terai and then upwards to the Siwalik and higher mountains was not only due to the Muslim invasions, but also partly due to the agrarian expansion throughout South Asia during this period. This process of northward movement, whether to take refuge or expand farms, had impacts on the forests, farms and settlements.. The landscape of the Terai became a mosaic of human settlements each surrounded by forests. Later on, several settlements federated to develop into tiny chiefdoms ruled by chieftains or 'petty kings'.

The records of the historical formation of the Terai before 1769 are very scanty. It is however confirmed that there were several tiny kingdoms in the Terai before Prithvi Narayan and his succeeding rulers annexed those territories within the borders of Nepal. Many of the kingdoms or principalities had their capitals in the foothills but their territories spread across the southern plains. At least three principalities were prominent in the Terai immediately before they were annexed to Nepal under the Gorkha rulers. In the western Terai, chieftains of the Sen dynasty ruled from Butwal. This principality spread across the Terai west of the

Narayani River and occupied most of present-day Nawalparasi, Rupandehi, Kapilvastu districts and some parts of India north to Gorakhpur. The Terai east to the Narayani River was under another Sen ruler, who reigned from Makawapur, present day Hetauda municipality. In the far east was the Vijaypur principality, spreading across the Terai east to the Sapta Koshi River. All these petty rulers were Rajputs or Thakurs, whose ancestors had fled from the southern plains or western Himalayas during the Muslim invasions (Whelpton, 2005).

The rulers of the Terai preferred the Siwalik foothills for their residence, while their lands and the majority of their subjects occupied the Terai. This land-use arrangement was strategically important for the rulers both to generate revenue and to protect themselves from invading enemies. The rulers felt relatively safer in the Siwalik than in the Terai, partly because it was located at higher altitude and partly because it was surrounded by thick forests to the south. Their subjects, however, were settled in the Terai as cultivators. Thus those kings who ruled over land in the Terai claimed themselves as 'Pahadis' (hill inhabitants) as opposed to their majority 'subjects' who were either thee indigenous people of the Terai, such as Tharus, or migrants from India, who are now called 'Madhesi' (the plain inhabitants).

The chieftains in the Terai preserved the forests around their settlements as both barriers against invading enemies and sources of revenue. Instead of converting forests to cultivation, the economy was mostly based on forest products. Trade in timber, wildlife products and other non-timber forest products was the main economic activity. In some parts, mostly in the eastern Terai the economy was a kind of '*adivasi* (indigenous) mode of production', characterised by slash-and-burn agriculture accompanied by the use of the forests under communal ownership (Sugden, 2013:526). The land use pattern, thereby,

comprised mostly the forest cover accompanied by only small patches of settlements and cultivated lands. On the forest-based economy of the Terai, Hamilton observes:

> Before the conquest by the Nepalese, the petty Rajas, who governed its different portions, were so much afraid of their neighbours, that they did not promote the cultivation of this low land. They rather encouraged extensive woods, and contented themselves, in a great measure, with the produce of the forests in timber, elephants, and pasture; even then, however, many rich spots were occupied, and very productive; but they were so buried in the forests as to be little observable. The Gorkhalese, being more confident, have cleared much of the country, although still a great deal remains to be done. Even now they export a considerable quantity of grain; and, were property somewhat more secure, this territory is capable of yielding considerable resources. Its tobacco is said to be uncommonly good, and the reddish cotton wool is said to be very thriving (Hamilton, 1819:64).

From 1769 onwards the Siwalik and the Terai automatically came under government by Kathmandu after its conquest by Prithvi Narayan. The Terai west of the Narayani River, however was annexed into Nepalese territory only two decades later. This process of including the Terai under the emerging Nepalese regime especially from 1769 onwards had substantial effects on the social, economic and ecological conditions of the region.

From 1769 to 1816: Siwalik as a defence barrier, Terai as a forest resource and battleground

The period between 1769 and 1816 was crucial in shifting the political, economic and ecological landscapes of the Terai. It witnessed a turbulent time when kingdom of Nepal expanded its frontiers in the Terai but within three decades or so the country faced a massive loss of territory following its defeat in a battle with the British East India Company (hereafter the Company). The expansion mission of the Gorkhas and the wars with the Company both had serious impacts, significantly changing the spatial dynamics of the

lowland. The Terai was obviously valuable economically for both the newly expanding

Nepalese Kingdom and the Company. Although the Company had been defeated by the

Gorkhalis in the Sindhuli war in 1767, Captain Kinloch brought a message to the Governor

General that the Terai region under Gorkhali rule was full of valuable timber resources that

could meet the demands of the whole of India under the Company (Raj, 2012). Kinloch's

estimate was overstated, but it provided enough impetus for the Company to develop

strategies to gain control over the forest resources. The Company offered a commercial

treaty with Kathmandu which was signed in 1791. Following this treaty, the Company

dispatched a special exploration team led by Colonel Kirkpatrick in early 1792 in order to

gather detailed information about the social, economic, political and ecological aspects of the

newly expanding Nepalese territory (Wright, 1877).

Kirkpatrick's team entered Nepal from the Terai near Birgunj and made a long

journey via Hetauda, Chitlang, the Kathmandu valley, Nuwakot, finally reaching the Nepal-

Tibet border. Kirkpatrick documented minute details of the resources, societies, the life of the

people, languages, cultures, governance and military status that he encountered on his route.

He also recorded some of the historical background of the country gained from the available

records and discussions with the local people. Kirkpatrick substantiated the earlier claim of

Captain Kinloch that the Terai was a massive source of valuable timber, wildlife and other

forest products that could be supplied to meet the ever-increasing demand of British India. As

Kirkpatrick put it:

> I might venture to form a judgement from the superficial view I had of West Terrye[3](Terai), I
> should be inclined to pronounce that it is capable of being rendered highly productive to the

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[3] Kirkpatrick (1991:40) spelled the Terai as 'Terrye' or sometimes 'Turry' or 'Turryani'. Later on Hamilton (1819:62) spelled it 'Tarai', 'Tariyani', 'Ketoni'. Kirkpatrick spelled Nepal as 'Nepaul' , while Hamilton spelled 'Nepal' as it is now.

Nepaul (Nepal) government; its extensive forests alone contain an almost inexhaustible source of riches, since they might be made to supply with valuable timber, not only the countries washed by the Ganges, but even our other settlements in India. The pines of the Bechiacori, and the Saul-trees, both of that and the Jhurjoory forest, are not perhaps surpassed in any other part of the world, either for straightness or dimensions, or probably for strength and durability. The Bechiacori pines, nevertheless, seem to have never had an exe applied to them, though they grow in prodigious numbers, are very superior to what we generally met with in Nepaul proper[4], and, considering the vicinity of the Boora-Gunduck, might be conveyed to us both with little trouble, and at little expense, compared to the channel by which we are at present supplied with this useful article, and the cost at which it is produced. Besides timber for masts and yards, we could draw from hence whatever supplies of pitch, tar, and turpentine we required (Kirkpatrick, 1811:42-43).

Kirkpatrick justified his argument for seizing these products of the rich forests by pointing to the mismanagement of the forest resources in terms of government intervention, techniques of extraction and local ignorance of some forest products, such as resin and turpentine. The rates of taxes on timber trade were excessively high. The Gorkhali rulers were keen to extract as much money as they could squeeze from the Terai to meet their expanding military expenses. On the one hand, they encouraged the clearing of the forests to convert to agriculture. On the other hand, they also imposed heavy taxes on forest products. This provided rich opportunities for them to raise revenue from both felled timber and cleared lands.

The Nepalese government extracted revenues from three main sources in the Terai forests. First, it was timber. Elephants provided the second source. While these resources could not be fully consumed internally, both timber and elephants were sold in the neighbouring Indian territory. The third was the fees imposed on grazing. Herders from

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[4] By 'Nepaul proper' Kirkpatrick meant the Kathmandu valley, not the whole of Nepal. Up to the 1960s the Nepalese people still used 'Nepal' to mean only the Kathmandu valley (Gaige, 1975), although officially the whole country has been called 'Nepal' since 1769.

northern India used to bring cattle to graze in Nepalese territory during the winter every year and they would pay taxes to the Nepalese government for these rights. Thus the income from forests and grazing lands mostly depended on the demand from the Indian side. However, this forest trade was not well organized or sufficient to extract the full potential of the resources given the size of the human population, transport facilities and harvesting techniques, among others. Kirkpatrick notes:

> Besides valuable timber, this forest affords another source of profit to the Nepaul government in its numerous elephants; but this, like the timber, is not improved so much as it might be…there were caught annually between two and three hundred elephants…(due to) the imperfect mode of catching these animals…very few of this great number sold for the benefit of the government, who claim an exclusive right of the whole…A third branch of revenue arising from this forest consists in a duty levied upon the cattle of Chemparun and other districts[5], bordering on the Nepaul territories, which graze here annually about four months, the pasturage between October and January being deemed excellent…but its amount cannot be very considerable(Kirkpatrick, 1811:17-18).

The implicit (or explicit) message of the Kirkpatrick team could be interpreted in a way that the vast resources could be properly utilized by the Company given their more advanced economic, technological and market opportunities in comparison with the Gorkhali rulers confined within the territory under their traditional mode of economy and limited exposure to technology and the outside world. Thus the Terai had great strategic significance for the interests of both the Nepalese rulers and the British Company. The Nepalese were aware that the Terai could work as a natural defence barrier to prevent British invasion and also as a source of revenue, while the Company was aware that the Terai could provide valuable resources for them to meet the ever-increasing demands of the vast Indian territory. While the Company was tempted by the resources of the Terai, it was also baffled by the Gorkhalis'

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[5] These districts are located in present day Bihar state of India.

domination over Kumaon, Garhwal and other western Himalayan regions, through which had passed trans-Himalayan trade routes between India and China for centuries (Rangan, 2000b). Ultimately, the Company raised the issue of a part of the Terai region near Lumbini overr which both the Nepalese government and the Company claimed ownership. For the Nepalese, the Terai was 'much too important economically and strategically to be either ignored or allowed to secede' (Rose & Scholz, 1980:21).

While there was already tension between the Company and the Nepalese government, the deposed king of Garhwal invited the Company to assist him against Nepalese possessions in the western Himalayan region. The Company saw a double advantage in establishing control over both the Terai and the Tibetan trade-route if the Nepalese succumbed to them. The dispute was minor but provided sufficient 'pretext' for the Company to launch a war against Nepal which lasted from 1814 to 1816 (Rose & Scholz, 1980:37). Despite several setbacks initially on the British side, the war exacted a heavy toll on the Nepalese side. Finally, a treaty was drawn up between the two sides in March, 1816 in which Nepal agreed to cede its control over all the lands east to the Mechi river that included Sikkim and to west of the Mahakali river that included Kumaon, Garhwal and Kangra. The Company also occupied most of the Terai land in the south, except around Morang and Jhapa. It seems that the Company itself was also seeking a solution to end the war after realising the capabilities of the Gorkha fighting force as well as the importance of the country as a buffer zone between China and India. Rose and Scholz note:

> [T]he war had…been a lesson for the British, who discovered how difficult it was to contend with the militant Nepalis on their own terrain. They concluded that Nepal would be even more difficult to govern and from that time on dispensed with any serious notion of bringing the mountain kingdom within their Indian empire. Instead, Nepal became a valued part of the buffer area between British India and China. British-Nepali relations were not always

harmonious, but each treated the other with respect and circumspection (Rose & Scholz, 1980:37).

After the treaty, the Company started recruiting Nepalese soldiers for the British Indian army. The Company also established an office for a permanent resident in Kathmandu and a consular relationship with the Nepalese government. In 1817, the Company returned the part of the Terai which makes up present-day Saptari, Siraha, Dhanusha, Mahottari, Sarlahi, Rautahat, Bara, Parsa, Nawalparasi, Rupandehi and Kapilvastu districts (Regmi, 1972). The last re-inclusion of the Terai portion within Nepal was in 1860 when the British returned present-day Banke, Bardiya, Kailali and Kanchanpur districts in the western Terai.

During this time, the Siwalik was represented as the 'defence barrier', while the Terai was represented as a forest resource. The defence barrier shifted from the Terai forests to the Siwalik since the capital city of the unified Nepalese Kingdom was established in the Kathmandu valley as opposed to the earlier Terai chiefdoms whose palaces were located in the Siwalik. The representation of the Terai as a forest resource made it a battle ground for both the unified Nepalese kingdom and the Company.

From 1816 to 1840s: the Siwalik as a neglected region, the Terai as an agrarian resource

The effect of the Anglo-Nepal treaty of 1816 was the most intense on the Terai in comparison with the rest of the territory. Obviously, the land was significantly reduced, but the treaty also provided opportunities for the Nepalese rulers to expand economic activities in the remaining Terai lands. As a result, the Terai underwent a series of landscape changes in feudal agrarian relations coupled with the influence of the British Indian economy. The communal lands and forest resources gradually became the properties of landlords, political elites and government

employees. The earlier mode of production under communal slash-and-burn agriculture shifted to a feudal agrarian economy due to the changing policies of the rulers, particularly their aim of earning more revenue from the lands and distributing large areas of land and forest to aristocratic families and government employees (Sugden, 2013). The landowners had tenants cultivate their lands and also collected revenues for the public treasury. Different land tenure systems emerged and exerted effects on the changing political economy of the country in general and in the Terai in particular.

Complex land tenure systems had prevailed in Nepal even before the Gorkha expansion. By and large, all the land was first divided into two categories- *raikar* and *kipat* (Regmi, 1976).. The *raikar* land belonged to the state, while the *kipat* belonged to certain ethnic communities. Any land that was not assigned as *kipat* was automatically considered *raikar* or the land of the king or the state. Individuals had only a kind of 'use right' or the right to cultivate and appropriate a portion of produce from the *raikar* land by paying rent to the state usually in the form of kind or grain. This land could be inherited and subdivided for family members, but it would still be considered 'state land'. Under the *kipat* system, which was prevalent in the higher hills, a particular clan in a community had rights over the land while the cultivators did not have to pay rent to the state, in contrast to the *raikar* land. Thus the *raikar* system was a kind of 'state landlordism', while *kipat* was a communal land tenure (Regmi, 1976).

After unification, the Gorkhali rulers did not radically change the land tenure systems in the hills. The *kipat* system remained almost the same. However, a more robust feudal ownership emerged in *raikar* land in a way that individual ownership could be established over the land in order to collect rents more systematically through large landholders. The most prominent forms of this feudal ownership were the '*birta*' and '*guthi*' systems which

were found across the country. Under '*birta*' tenure, the state would grant a large chunk of *raikar* land to members of royal families, military officers or civil servants. Under the *guthi* system, the *raikar* lands were allotted to institutions such as temples, monasteries, shrines and charitable organizations. Under both these systems, the upper class/caste land owners would have the lands cultivated by tenants. The *birta* holders collected rent from tenants and channelled a portion of it to the state, keeping the remaining share for themselves. The *guthi* owners also collected rent from tenants, but they did not have to contribute a portion to the state treasury. The *guthi* rent would be spent on rituals and religious activities, to repair shrines and pay the salaries of the priests and monks. The *birta* and *guthi* systems gave rise to the division between the landlord and peasant classes resulting in the feudal agrarian relationships which characterised the next phase of Nepal's land tenure history .

More and more *birta* and *guthi* lands were formed as more lands became available from the clearing of forest lands in the Terai after unification. Another system of land grant in the form of *jagir* was introduced after unification, mostly in the Terai. *Jagir* was a form of '*birta*' land assigned to the nobility, military officials and civil servants as emoluments for their services to the state (Regmi, 1976). During their service tenure the *jagir* holders could obtain the *jagir* lands cultivated by tenants and pay taxes to the government for the use of the lands. Following the treaty of 1816, *birta* and *jagi*r lands became rapidly distributed across the Terai.

The land-use systems of the Terai were primarily occupied by forests followed by cultivated lands and settlement areas. The government was interested in increasing revenus and the spread of cultivated lands, although border protection was also one of the top priorities in the Terai. The small scale logging and export of timber was not sufficient to increase revenues and extend the area under cultivation. Contracts were made between the

Kathmandu government and the Company for the logging and export of timber to British India. The first ever law concerning forests/timber was issued by King Rajendra entitled 'Sawal (Rule) on Forest Conservation and Border Management' in 1828; this applied only to the Terai. The document set down 16 rules concerning the assessment of forest conditions and for the regulation of timber harvesting in the Terai. The rulers were designed for selling timber from the Terai forests in a regulated way; strongest emphasis was placed on exporting timber to British India through contractual agreements. For example, Sawal (Rule) 2 and 3 noted:

> Second Sawal: We have issued a Royal seal in the name of Captain Musli Sahib to cut the timber at Tappa Bahadura Pragannna Koradi Mahottari District upon fixing the boundary (Simana) in those areas in the forest of Banigama Patti Madhuwar; allow only his vehicles (Gadi) to collect the timber from there, and never allow any other Hindustani to cut the timber.

> Third Sawal: In case Captain Musli Sahib tries to cut the timbers beyond the boundary line which has been set in the Royal seal; tell him we have not ordered to cut timber in other areas, and stop him from collecting timber; if he does not follow as per your request report us and follow our command (quoted in Nepal Law Commission, 2014:1)

The government had a monopoly over the commercial use of timber. However, the local people were allowed to collect some forest products including timber, poles, fuel wood and agricultural implements free of cost for their household use. They were strictly prohibited from any engagement in any commercial use of these products. The revenues earned from selling timber would go to the government exchequer and *birta* holders. Rule 5 of the same document read:

> Allow our rural house owners to collect timber necessary for *Khamba (wooden posts and pillars), Khari (*beams*) , Thuni (*doors/gates*), Badera* (fences), *Kora (support to roofs), Bati (*wooden strips*), Halo* (ploughs) etc. for domestic use; never allow them to cut timber for trade

(commercial) purpose, if you try to allow anybody to cut timber for commercial purpose you may suffer physical and financial penalties (quoted in Nepal Law Commission, 2014:2).

After the Anglo-Nepal treaty, the rulers in Kathmandu wanted to reconfigure the social, economic and ecological landscapes in the Terai for several reasons. First, following the treaty, the Nepalese state obtained an assurance that the Company would not further invade any remaining territory. This meant that Nepalese rulers did not have to protect the remaining Terai forests as 'natural defence barriers' anymore. Before this treaty, the *birta* and *jagir* holders were required to protect the forests and cultivate only barren lands under their disposal (Regmi, 1976). Second, both the cultivated and cultivable lands were so productive that substantial amounts of revenue could be raised for government expenditure. Third, the lands would be reclaimed for cultivation without any extra expenditure by the government, while the revenue from forest products could itself cover the cost of the reclamation. Fourth, the state could maintain the salaries of the military and bureaucratic personnel without drawing funds from the central treasury, and so this money could be spent elsewhere. Last but most important during that time, the rulers wanted to expand their *de facto* control over the Terai, which was both geographically and culturally 'alien' to the Kathmandu elites despite its political subjugation (Gaige, 1975:42; Whelpton, 2005:54). The Gorkha government in Kathmandu had easily expanded its control over the hill principalities partly due to their linguistic and other cultural ties with the Gorkha rulers and partly due to their isolation from powerful neighbours such as British India (Regmi, 1972). The government tried to control the Terai through hill elites through using members of the royal families, army personnel and civil employees as landlords. During this phase, the Siwalik was a neglected region, but the Terai was represented as a forest and agrarian resource.

The Terai was the region most resistant against integration into the mainstream Nepalese polity which was, and to a large extent still is, dominated by the culture of the hill people. The rulers feared that the region would not be 'Nepalized'[6] if they could not establish stringent control over it by administrative, military, economic or any other means. Rose and Scholtz maintain:

> Since the 1860s the Terai has constituted one of the most difficult regions for the Nepali political system. It is the most valuable area of the country economically, but the most resistant to integration into the rest of the system because of its extensive and deep ties with neighbouring areas of India. Located on the Indian border, most of its local landed elite (some of whom were established during the British period of control from 1816-1860) are of plains Indian origin, as are most of the cultivators. Nepal followed its usual policy of establishing an indirect rule system - contracting out revenue collection, the maintenance of order, and the other such administrative functions to local *zamindars* of primarily Indian origin (Rose & Scholz, 1980:20).

The Kathmandu-centric state made several efforts to integrate the region socially and culturally, but always wanting to expand control over it and reap the benefits of the economic potential of the productive land. The allocation of large tracts of lands as *birta* or *jagir* to hill elites such as royal family members, high ranking civil servants and military officials was itself a part of the efforts to this end (Regmi, 1976).

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[6] Gaige (1975:216) coined a term 'Nepalization' to describe the process by which the Kathmandu government politically enforced the Madhesi people to adopt the Nepali language, dress, food and manners of the hill people as a symbolic standard of national unity. This sentiment of 'Nepalization' in the Terai gradually intensified, culminating in the reign of King Mahendra in the second half of the twentieth century.

From 1840s to 1950s: Siwalik as an ignored region, Terai as a frontier for industrial growth

After the Anglo-Nepal treaty of 1816, the courtiers of the Kathmandu Palace became divided into two rival groups. Conflicts within the royal family also surfaced many times in connection with making heirs. The chaos heighted in 1837 when Bhimsen Thapa, who was the Prime Ministers for 25 years was imprisoned followed by his alleged suicide in 1839. Three premiers appointed after him were assassinated after falling into conspiracies of different factions among the courtiers. King Rajendra Shah was placed under house arrest and his son Surendra Shah was made the king by the courtiers. Thus three key factions emerged among the aristocracy and courtiers, each supporting Rajendra, Surendra and one of Rajendra's queens. In the midst of this chaos, a military person, Jung Bahadur Rana, in cooperation with his six brothers and some military officials organized a plot at a night in 1846 and killed most of the powerful elites of the palace except for members of the the royal families. He then declared himself the Prime Minister of the country and appointed his brothers as his successors. The Ranas held the executive power and the Shah monarchs became virtually ceremonial figureheads. The lineage of the Rana premiership continued through the following generations for more than a century. .

The land allocation system was more rapidly expedited after the 1840s under the Ranas. The introduction of the hill elites as the *birta* or *jagir* holders in the Terai shifted the 'patron-client' relationships significantly in the *zamindari* system, a form of feudal agrarian system (Rose & Scholz, 1980:77). Previously, both the *zamindars* and cultivators had been invited to the Teri from the neighbouring Indian states. However, with the rise to power of the Ranas, members of their families became giant landlords, followed by high ranking military and civil officials all of whom were from the hill elites.

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The Ranas also encouraged the hill farmers to migrate to the Terai to take up land for cultivation, but the latter were reluctant due to socio-cultural differences between the hill and the Terai and also becauuse of fear of a virulent form of malaria prevalent in the plain during that time. The hill farmers called the Terai *'kala pani'* (death valley) due to this malaria (Dahal, 1983:1). This refusal forced the *birta* and *jagir* holders to invite cultivators from India to farm their lands. These hill-based giant elites were not able to attend the land in person over the year and hence needed 'revenue collectors 'or *patwaris*[7] as well from the Indian states to bring with them and oversee the cultivators. The *birta* and *jagir* holders were placed under pressure to cultivate the lands at any cost. For example, clauses of the*Zamindar-Patwari Sawal* (Landlord-Record Keeper Regulation) of 1836 stated, as quoted in Dahal:

> If you (*zamindar)* cannot find *raitis* (tenants), you have to cultivate the land yourselves and have to pay the land revenue. If you cannot do this, you have to assess the revenue from your parental possessions and resign from the post of *zamindar* because the land is under your disposal…If there is barren land under your disposal, and someone comes to cultivate it, you cannot sue the cultivator because the land is already cultivated (Dahal, 1983:5).

Several other legal instruments, such as *'Madhes Malko Sawal'* (Revenue Regulations for the Terai Districts) and *Muluki Sawal* (Civil Code) were promulgated to regulate the *raikar, birta, jagir* and *guthi* lands including the forests therein and their revenues especially in the Terai (Dahal, 1983). Later on after the 1860s, most Rana Prime Ministers kept sizeable areas of lands in the Terai under their own possession.

The British regime in India came directly under the Crown from 1858. The Anglo-Nepal relationship had been amicable since the Ranas' rise in power as hereditary prime

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[7] The *'patwaris'* worked as accountants and record keepers. They would collect and keep records of land revenues. Since they were also paid by a *jagir* land grant, they themselves were a kind of 'petty *zamindar*'.

ministers since the 1840s. The relationship was strengthened by several events, such as establishment of a permanent British resident in Kathmandu, the annual recruitment of *Gorkha* soldiers from Nepal into British Indian regiments, the first-ever visit ofa Nepalese Prime Minister, Jung Bahadur Rana, to England in 1850-1851, and through military cooperation and the return of lands (Wright, 1877). In this period the Terai was transformed economically via internal policies as well as as a result of the direct and indirect impacts of the imperial presence of the British in India. Vast tracts of forests were cut down in the Terai under the 'technical advice' of Collier, a British forester, who was deputed in Nepal upon the request of the Ranas in the 1840s (Guthman, 1997). For the first time, four 'working plans' were prepared by British advisors to harvest Sal (*Shorea robusta*) forests in the central Terai (Tiwari, 1990). The timber was sold to British India for railway sleepers (Gaige, 1975; Regmi, 1972; Soussan et al., 1995). Railheads were extended to northern India, mostly close to the Nepal-India border, such as Galgalia, Jogbani, Jaynagar, Raxaul, Nautanwa, Rupeidiha and Gauripanta from east to west. The railheads contributed to transforming the Terai economically in several ways. Close to these railheads developed towns in Bhadrapur, Biratnagar, Janakpur, Birgunj, Bhairahawa, Nepalgunj and Dhangadhi, respectively, in Nepal's Terai (Dahal, 1983). The surplus produce from the Terai was exported to India, while other necessary items such as salt and petroleum products that could not be produced in Nepal were imported from India. Small-scale trans-border trade also flourished through these Terai towns both formally and informally (Gaige, 1975).

Indian farmers were encouraged to migrate to the Terai since the land was still sparsely populated. For the Indian farmers, the Terai was favourable for two major reasons. First, the climate was similar to their Indian villages while cultivable land was more abundant in the Terai. Second and more importantly, the administrative *modus operandi* was more

lenient in Nepalese Terai than in the neighbouring Indian states under the colonial administration which would seek excessive voluntary labour for infrastructures and other public developmental activities (Dahal, 1983). In addition to landlords, *patwaris* and cultivators, a number of business persons, especially the Marwadi community of Rajasthan came to the Terai from the 1930s and started up several industries. Following Marwadis, other business castes of northern India, such as *Baniya, Haluwai, Rouniyar, Kalwar* and *Teli* also set up businesses in the newly-developing towns in the Terai. These business communities came with capital to the Terai where labour was available. Since the Pahadi merchant communities, such as *Newars, Thakali* or *Sherpas* were reluctant to start businesses in the Terai, the Kathmandu government offered incentives to the Indian merchants and industrialists with up to three hectares of land per family free of cost to start up their businesses in these newly developed border towns (Dahal, 1983). An industrial corridor developed between Biratnagar and Itahari in eastern Nepal, between Birgunj and Pathlaiya in central Nepal and between Bhairahawa and Butwal in western Nepal. The Indian railheads up to Jogbani, Raxaul and Nautanwa played a significant role in these industrial estates flourishing in the Terai.

While the Terai was developing at apace, the central government controlled by the Rana oligarchy suffered a severe political crisis. Following the independence of India in 1947, the Ranas became vulnerable to resistance from newly emerging political forces such as the liberal Nepali Congress Party (formed in 1948) and the Nepal Communist Party (formed in 1949). The Nepali Congress, which was ideologically close to the Indian National Congress, took the lead in nationwide protests in collusion with the Shah King. Predictably, most of the mass protests spread outwards from the Terai. Both the Nepali Congress and Communist Party had strongholds in the Terai for several reasons (Gaige, 1975). First, some

prominent leaders of the Nepali Congress, including its president B.P. Koiral belonged to middle class farmer families who had been residing in the Terai for some years. Second, the agitating forces could easily launch protests from the borders of the Terai taking advantage of cross-border movements since the post-Independent government in India took a lenient view of these political activities against the Ranas. The Indian leadership of the Independence cause was unhappy with the Ranas for their alliance with the British to suppress Indian rebellions. Third and most importantly, the people in the Terai were more exploited by the Ranas under the *birta* and *jagir* land tenure systems than those in the hills. The Ranas were removed from the premiership in 1950 with Nepal's adoption of a multiparty system under the Shah monarchy.

From 1950 to 1990: the Siwalik as a crisis zone, the Terai as a resettled and nationalized frontier

From 1950 to 1990, the configurations of the ecological and attendant socio-economic landscapes in the Terai were heavily reengineered in line with the changing centralized state and expanded foreign aid programmes. The emergence of a powerful monarchy, the nationalization of privately owned forest lands, a highly centralized government, land reform efforts, land resettlement projects, the influx of foreign aid agencies and a quest for modernization can all be drawn on to explain the shifting landscapes of the Terai during this period (Bhattarai et al., 2002; Ghimire, 1992; Guthman, 1997; Karan & Ishii, 1996; Shrestha, 2001).

A multiparty democracy system was adopted in theory, but the country underwent a transition phase with several *ad hoc* governments until 1958. A nationwide parliamentary election was held in 1959 out of which Nepali Congress party secured an overwhelming two-thirds majority in the Parliament. This was followed by the formation of the first popularly

elected government under B.P. Koirala, the leader of the Nepali Congress. However, within two years, King Mahendra, who held the supreme authority by constitution, dissolved the parliament, ousted the Nepali Congress government and banned all political parties in 1960. This non-partisan regime under an absolute monarchy ruled Nepal until 1990. Although the hereditary system of the Ranas' premiership had been abrogated and the parliamentary system was initiated, the latter was dismantled under the absolute authority of the king. Paradigmatically, the 1950 revolution ultimately proved to be a means of shifting the bipolar Shah-Rana power sharing to a uni-polar Shah monarchy instead of transforming the political economy towards democratic freedom and economic prosperity.

The importance of the land and forest resources in the Terai was highlighted through several political and development projects. In the beginning of 1950s, some policy interventions occurred to transform the land and forest resources in line with the new sentiments guided by the political parties (Whelpton, 2005). The three major legal reforms during the 1950s were the 'Private Forest Nationalization Act' of 1957, the 'Land Act' of 1958 and the 'Birta Abolition Act' of 1959, all of which had impacts on reengineering forest and land ownership and conditions in the Terai. Under the Private Forest Nationalization Act, all the forests under *birta* or *jagir* tenure were nationalized, which meant shifting ownership from feudal landlords to the state. Although the Act was meant to apply across the country, it had major impacts in the Terai since the forests under private ownership in the forms of *birta* or *jagir* prevailed mostly in the Terai (Bhattarai et al., 2002). Given the giant landlords in the Terai were the Ranas, it was not unusual for the Shah king and the political parties alike to snatch forest lands from the Ranas and bring them under government control. These forests along with other state forests all came under the jurisdiction of the Department of Forests, which had been established in 1942 with the technical supervision of British

foresters. Under the *Birta* Abolition Act, the *birta* tenure in the remaining cultivated lands was also officially quashed, converting the tenants to 'land-owners' although the landlord-tenant relationship persisted in practice through several loopholes in the laws as well as the cultural inertia to change in tandem with political change (Ghimire, 1992; Shrestha, 2001; Soussan et al., 1995).

These laws had impacts on the forest cover in the Terai. Since the government first announced it would acquire all the forests under private landholdings that included *birta* and *jagir* tenures, the landowners tried to convert the forested lands to cultivated land by clearing the forests (Bhattarai et al., 2002). They saw this as the only way in which they could keep their control over the land. This immediate reaction, however, did not result significantly in deforestation. The promulgation of the Land Act and *Birta* Abolition Act within the next two years made the *birta* tenure uncertain irrespective of the land cover. Actually, nationalization resulted in changing the ecological and socio-economic landscapes in the Terai in the long run. King Mahendra seized total executive power in 1961 and promulgated the Panchayat System, a so-called 'party-less' regime under the dictatorship of the absolute monarchy. Since opposition forces such as the liberal Nepali Congress Party and the Nepal Communist Party were legally banned, the monarchy with its puppet governments and Legislative body brought about several other laws, policies and programmes that altered the demographic, social, economic and ecological settings in the Terai.

There was a need for a way of governing the vast tracts of forests that were appropriated from the *birta* and *jagir* holders under the government control. The first land related law promulgated by the regime under the King was the 'Forest Act' of 1961. It declared that the forests of Nepal were the property of the government. This legal declaration was reflected in the folklore *'Hariyo ban, Nepalko dhan*' (the green forests are the wealth of

Nepal), which was also sarcastically parodied by the opponents as 'the green forests are the wealth of the king' (Bhattarai et al., 2002:323; Sinha, 2011:445). In order to empower the forest officials, the 'Forest Protection (Special Arrangement) Act' which authorized the foresters in defence to shoot 'forest culprits' was promulgated in 1967. Use of forest products without government permission was prohibited, while almost all people depended on wood fuel for household energy and timber for construction material. This blanket approach to nationalizing forests without considering local needs contributed to the 'illegal' use of forest products by the people for their livelihoods. The Department of Forests was unable to enforce the law partly because it was less equipped with human and other resources in comparison with the vast extent of the forests, and partly but more importantly it was 'impracticable' to prevent people from using forests so tied with their livelihoods and without any alternatives. This situation, therefore, turned 'state forests' into *de facto* open access resources (Karan & Ishii, 1996). The smuggling of timber from the Terai across borders by timber mafias in collusion with corrupt forest officials was also not uncommon (Bhattarai et al., 2002; Soussan et al., 1995).

The forestry and other land related policies and practices were followed by demographic and economic changes in the Terai. The government launched a malaria eradication scheme which suppressed the disease significantly by the early 1960s . Gaige (1975) argues that the suppression of the malaria was one of the most favourable factors allowing the hill people to migrate into the Terai, which was by that time mostly inhabited by the Indian migrants and indigenous communities such as the Tharus. A land reform project was launched through the 'Land Act' of 1964. It fixed a land ceiling of 18.4 ha for each family household in the Terai. The excess land was meant to be appropriated for distribution to the landless. However, using the loopholes of the law, several landed families legally

distributed the land to their family members and relatives to evade the excess land ceiling (Soussan et al., 1995).

The issue of the social integration of the Terai into the mainstream political system was still not resolved despite efforts made by the earlier rulers (Rose & Scholz, 1980). Since 1964, the government had launched several resettlement projects to encourage hill migration into the Terai following the technical recommendation of Israeli experts and under the financial aid of the United States (Ghimire, 1992; Shrestha, 2001). Although the in-migration of hill communities into the Terai (only in Chitawan districtict) was initiated by the government during 1954-1956 , systematic resettlement covering wider areas in the Terai began with the establishment of the Nepal Resettlement Company in 1964. The government also made an appeal for the Nepalese who had migrated to Assam and Burma to return to Nepal and provided lands for these families in the Terai (Ghimire, 1992). These people were also of *Pahadi* origin. The government also provided lands to ex-military families in several places in the Terai mainly on the Nepal-India border. These ex-army personnel were, it was argued, supposed to be loyal to the monarchy and could be utilized to defend the monarchy and the spirit of Pahadi national unity in the Terai (Ghimire, 1992; Soussan et al., 1995). All these 'legitimate' settlements were set up by clearing forests, while even more forests were cleared 'illegally' by migrants mostly from the hills and others from Burma, Assam and northern India (Ghimire, 1992). Some retired politicians of the anti-Rana movement were rewarded by being allocated lands in the Terai under a project supposed to support 'political sufferers' in a bid to gain their support for the absolute monarchy (Sinha, 2011).

During this period the demographic, economic, political and ecological landscapes in the Terai and adjoining Siwalik foothills changed dramatically. The east-west highway was built in the 1970s, mostly through dense forests immediately to the south of the Siwalik hills

across the Terai. A small section of this road was completed in the 1990s in the far west, but almost 80 percent of the road was constructed within the decade of the 1970s. Some north-south roads linking the east-west highway with major towns such as Birtanagar, Janakpur, Birgunj, Bhairahawa and Nepalgunj lying on the Nepal-India border were also constructed. A variety of settlements, business centres and agricultural lands emerged on both sides of the east-west highway replacing the forests through government-sponsored resettlement projects or illegally. Within the four decades, the population of the Terai almost trebled from 2.9 million in 1952 to 8.9 million in 1991.In-migration is offered as one of the major factors to explain this population increase (CBS, 2012a). Some scholars argue that the site of the highway was politically motivated by the monarchy to attract hill people to migrate to the Terai (Jha, 2006).

From the 1970s, several forestry projects were launched mostly in the hills and a few in the Terai. The government initiated the 'Panchayat Protected Forests' and 'Panchayat Forests' in 1979 by amending the Forest Act of 1961. The Panchayat Protected Forests meant the patch of already established forests handed over to the village Panchayat (the political unit at village level) to protect, manage and use sustainably for the benefits of the local unit. The 'Panchayat Forest' on the other hand, meant the plantation forests grown by the Panchayat itself to protect, manage and use sustainably for the benefits of the local unit. This approach was lauded as the initiation of 'community-based' forest management, but people suspected that it was another ploy to gain popularity for the political system of the absolute monarchy, which was a 'Panchayat system' in name itself (Bhattarai et al., 2002). While it partially gained success at project level in some hill districts and was backed by technical and financial support from donor countries such as Australia, UK, Switzerland and Germany, the forests in the Siwalik and the Terai were mostly untouched by this initiative. For this purpose,

a separate project called the 'Terai Community Forestry Project' backed by the FAO and the World Bank was launched during the 1980s. However, the activities of the project were limited to planting seedlings in common land such as along the banks of the rivers, road-sides and irrigation channels and distributing seedlings to farmers. The project could not hand over the existing forests in the Terai to local governments, nor did it form any local institutions or groups to manage the plantation areas. The Forest Product Development Board was established in the mid 1970s. It launched three projects, namely Ratuwamai, Sagarnath and Nepalgunj projects in eastern, central and western Terai respectively. These projects were managed by forestry personnel mostly deputed from the Department of Forests. The projects converted the old-growth Sal forests to *Dalbergia-Eucalyptus* plantations for increasing fuel wood supply and commercial timber with shorter rotation (Bhattarai et al., 2002).

In the mid 1970s, the debate over the Himalayan environmental crisis was heightened internationally. The epicentre of the debate was Nepal's mountains which were presented as being ecologically degraded as a result of inappropriate farming practices, over-population, livestock herding and the clearing of forests. The ecological degradation would contribute further to poverty in the mountains and hills giving rise to natural hazards in the Indo-Gangetic plains (Eckholm, 1976).   This narrative particularly focussed on the farming practices in the mountains of Nepal and their effects on the plains, not only within the same country but also down to India and Bangladesh. It described   a logical sequence of population -environmental nexus. The growth of population on the mountain would compel the inhabitants to destroy the forests for farming to grow more food and rear more livestock to feed the ever-increasing population. While so doing, the farmers practised agriculture on the steep slopes and aggravated landslides and soil erosion, ultimately losing the fertile soil and degrading other local resources such as water. The negative spiral of this causal-chain of

overpopulation-poverty-environmental degradation was hypothesized to continue in a way in which the poor people would become poorer and poorer while the mountain ecosystems would be more and more degraded. The disastrous effects of this degradation were thought to be confined not only to the mountains but also to extend to the southern plains at a sub-continental scale.

Although this narrative of the Himalayan crisis was asserted to be based on 'scientific laws', no evidence of any research or validating facts were presented. Its explanations were mainly based on a neo-Malthusian hypothesis and blatant accusations that the mountain farmers were backward and technologically incompetent (Blaikie & Muldavin, 2004). Consequently, the sceptics of the narrative organized a conference on 'The Himalaya Ganges Problem' in New York in 1986. The narrative was precisely synthesized in some bullet points and was sarcastically called the 'Theory of Himalayan Environmental Degradation' which was declared to be 'dead' at the end of the conference (Ives & Messerli, 1989). The arguments of the Himalayan crisis narrative were challenged with a number of counter narratives. For example, the critiques argued that the high rainfall and mountain-lifting processes played bigger roles in landslides and soil erosion than the land use practices, and that there was also a lack of validating evidence to claim that the mountain farming was environmentally destructive (Blaikie & Muldavin, 2004; Forsyth & Walker, 2008; Guthman, 1997).

The crisis narrative was contested among researchers, but it was used selectively by governments, donor agencies, international NGOs and other actors to legitimize their political and environmental interests and actions in the Himalayas (Blaikie & Muldavin, 2004; Guthman, 1997). The Nepalese government itself was no exception. The hills including the Siwalik as a part of the Himalayas were presented as an ecologically degraded region for

which international aid could be attracted (Guthman, 1997) . A constellation of donor agencies was welcomed to establish plantation and watershed projects in the mountains and hills including the Siwalik. The mountain crisis narrative, which explained mountain ecosystems as a source of benefits as well as costs to the lowlands, was a tool for the government to justify the project interventions only in the hills for the supposed benefit of both the mountains and the plains.

As the mountains and hills were planned to be ecologically rehabilitated through forest conservation and reforestation, migration from the hills to the Terai was taken as a welcomed process, in two ways. First, it would reduce the anthropogenic pressure on the mountain ecosystems since over-population had been explained as one of the major factors responsible for the mountain environmental crisis. Second, this migration would change the demographic equation towards more domination by the hills people in the Terai to achieve the so-called 'Nepalization' process of the Panchayat polity.

Responding to environmental concerns and the need for wildlife protection, the first-ever national park of the country, Chitawan National Park, was declared, covering 96,000 hectares in central Terai. By 1990, four other protected areas (one national park and three wildlife reserves) were declared in the Terai. Altogether, these five protected area systems covered nearly 200,000 hectares, which accounted for nearly 10 percent of the total forests in the Terai. Although this system was lauded as the most desirable approach benefitting the global communities under particular conditions (Hill, 1999), it is criticized for fuelling a series of conflicts at local level over who controls and who has access to the forest resources (Brown, 1998). In order to manage these protected areas, the Department of National Parks and Wildlife Conservation was set up with separate laws and regulations. For the remaining large tracts of forest, the government did not have any site-specific management plans to

regulate the protection, harvest and distribution of forest products. The Department of Forests could neither effectively enforce the protection strategies, nor did it trusted local communities to manage the forests. The traditional users including the indigenous groups and Madhesi communities lost their access not only to the protected areas, but also to the remaining forests since the new settlements emerged as a barrier between their own settlements and the forests. Thus the forestry politics once more contributed to consolidating mountain interests over the Terai.

The historical phase from the 1950s to 1990 witnessed massive social, political and ecological changes in the Siwalik and the Terai. The Siwalik was considered a part of the Himalayan system and subsequently represented as a degraded zone to be entered for ecological restoration. The Terai, on the other hand, was represented as a frontier to be 'nationalized' or more specifically, 'Nepalized'. The Terai was taken as a region to be dominated by the hill cultures under the guise of national unity. As a result, the ethnic politics in the Terai became more prominent than ever before.

4.4 Ethnic politics in the Terai

There are three main ethnic groups in the Terai. The term 'Pahadi' refers to the people who live in or come from the mountain. In other words, they are 'mountain people'. Hill Brahmins and Kshetriyas, who have Nepali language as their mother tongue as well as mountain ethnic groups speaking languages of the Tibeto-Burman family, such as Sherpas, Tamangs, Magars, Gurungs, Limbus, Rais, Newars and Thakalis make up the Pahadi population. Even if they have migrated to the plain region or the Terai, they are still called 'Pahadi' people. The people who live in the plains and have similar culture,, ethnic background and language to those of the people on the Indian side are called 'Madhesi' people. They are sometimes referred to as 'Indian migrants' (Dahal, 1983), but this qualification is politically controversial. The

prominent castes in this group include, but are not limited to, the Yadavs, Kayasthas, Terai Brahmans, Bhumihars, Terai Rajputs, Koiris, Telis, Dusads and Mushahars. They can be linguistically divided into three Hindi-related groups:Awadhi, Bhojpuri and Maithili in western, central and eastern Terai, respectively. The term 'Madhesi' in Nepali comes from 'Madhes' or 'Madhya-desh' which literally means a 'middle land' that lies between the Nepalese hills (on the north) and the Indian border (on the south)(Nayak, 2011; Shrestha, 2001:182). 'Madhes' is interchangeably used with 'Terai'. Some Madhes-based activists argue that the former term refers to a culture, while the latter refers to a topography (Nayak, 2011). The third ethnic group in the Terai are the plains indigenous communities, such as Tharus, Danuwars, Dhimals, Satars and Rajbansis who inhabit the area immediately to the south of the Siwalik hills and along the river banks in the Terai. These indigenous groups do not like to be called 'Pahadi' or 'Madhesi' but simply adivasi (indigenous) groups. .

The ethnic politics emerged in the Terai from 1950s when some Madhesi leaders in the Nepali Congress party defected and formed a separate 'Terai Congress' party. They asserted that the genuine issues of the Madhesi people, such as their rights over land and property, protection of their cultural identities and their inclusion in government employment were not addressed by either the government or the Nepali Congress. However, their party along with other parties was banned in 1960. A separate movement for the Terai was almost non-existent until the mid 1970s. The Panchyat political system under the direct rule of the monarchy imposed the Nepali language, which was the language of the Pahadi people, and declared it the 'national language'. Similarly, the clothes of the Pahadi people were made the formal attire for any official functions and business. This 'Nepalization' process, in the words of Gaige (1975:216)suppressed the possibility of any uprisings in the Terai over ethnic, cultural or other social identity. However, in the mid-1970s, some prominent leaders such as

Ram Raja Prasad Singh in the Terai began clandestinely organizing the Madhesi people to support an identity movement that was also against the monarchy. In the 1980s, the Terai Sadhbhavana Parishad (Terai Welfare Council) was formed by some Madhesi leaders such as Gajendra Narayan Singh. The main motto of this council was to extend collaboration among the Madhesi people across the Terai for their own welfare. However, its implicit agenda was to challenge the discriminatory policies of the government against the Madhesi people. Lobbying for Nepalese citizenship for all Madhesi people was one of the major political agendas of the council. Similarly, protection of the Madhesi cultures was another concern. Nonetheless, the council could not organise massive uprisings since political activities such as protests were totally banned by the government. Whenever such protests erupted, the government repressed them until 1990, often alleging them to be disrupting communal harmony between the Pahadi and Madhesi people.

4.5 Conclusion

The history of the Siwalik and the Terai particularly from 17th century to 1990 is a history of various representations of these regions that suited the interests of the rulers of the time. Until 1769 the Siwalik was conceived as a safe shelter for the petty kings or chieftains of the Terai. From 1769 until 1816, it was presented as a defence barrier for Kathmandu. From 1816 to the 1950s, the region was simply ignored and neglected,and had no strategic importance. From the 1950s until 1990, it was conceived as a part of a degraded Himalayan system.

The history of the Terai, on the other hand, from 1769 to 1990 is the history of the tension between the Kathmandu-centric Pahadi regime and the suppressed Madhesi communities, and this was manifested in economic, social, cultural and political discrimination. This discrimination has resulted in uneven access of the hill and plain people to natural resources and their products such as forests, land, water, irrigation and electricity.

Throughout history and up until recently, there has persisted, by and large, a patron-client relationship between the Pahadi elites and the Terai communities through these discriminatory policies and practices (Hatlebakk, 2007). During the Gorkha expansion and up until the Anglo-Nepal treaty of 1816, the Terai was treated as a defiant region to which the hill elites, mostly military chiefs, were assigned land grants in order to control it. After the Anglo-Nepal treaty and until the 1840s, domination by the hill region was further consolidated by creating another layer of giant landholders from the Pahadi elites, especially from aristocratic families, to administer the tribal and Madhesi cultivators and 'land agents'. This move gave rise to a feudal agrarian system in the Terai. During the early 20th century, the Terai was conceived as a frontier for industrial development but this opportunity did not change the policy of the Kathmandu government, which treated the Terai as a region just to be exploited. From the 1950s to the 1990s, this patron-client relationship still continued, and was augmented by the state-sponsored mass migration of hill people into the Terai.

All these efforts, although subsumed under the motive of 'integrating' the Terai into the nation state, failed to enhance the dignity of the plains people, who were mostly the landless, Dalits and marginal landholders. The policies did nothing to place them socio-culturally or economically on an equal footing with the hill people. Unequal relationships also existed within the Pahadi and Madhesi communities as well, but the inequalities between the Pahadi and Madhesi were culturally entrenched and politically strengthened since the Kathmandu-centric state had historically favoured the former and marginalized the latter, to a large extent, since unification. The public rebellion of 1990, which established a parliamentary democracy, shifted the regime from an absolute monarchy to a pluralistic society. It raised hope in Madhesi and among the indigenous population of the Terai for a more dignified life. How has this new political paradigm resulted in a more balanced linkage

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of the Siwalik and the Terai in terms of resource management and distribution that would , in turn, affect the lives of those populations? I address this query in the next chapter.

Chapter 5: Forestry and Ecosystem Services in the Siwalik and the Terai Since 1990

'Money grows on trees', reported an English-language daily newspaper published in Kathmandu in late 2013 (Sigdel, 2013). The title did not allude to the leaves, fruits, timber or fuel-wood that could be sold to acquire money, nor did it mean that the trees bore money in a literal sense. Instead, it was referring to the concept of 'Payment for Ecosystem Services' (PES) being recently introduced in the forestry sector of Nepal. This title is consistent with initiatives undertaken by various international NGOs in the country. For example, WWF's Nepal chapter introduced Reduce Emissions from Deforestation and Forest Degradation Plus (REDD+) alongside the concept of Payment for Ecosystem Services as a new component under the broader 'Hariyo Ban' Program funded by USAID. This initiative is aimed towards keeping forests intact by paying for ecosystem services including carbon sequestration (WWF Nepal, 2014). Similar other PES projects are being undertaken by a range of international NGOs operating in the environmental sector in Nepal, including the International Union for the Conservation of Nature (IUCN), Cooperative for Assistance and Relief Everywhere (CARE) and the International Centre for Integrated Mountain Development (ICIMOD). The United Nations Development Programme's (UNDP) incorporation of 'Payment for Ecosystems Services' (PES) in its three year plan (2009-2011) for the Western Terai Landscape Complex Projects (WTLCP) was seen as an example of moving towards a monetised approach to watershed management (UNDP Nepal, 2014b). The title of the article and the shifting policies and programmes of the international environmental NGOs imply that the arguments for monitized ecosystems predominate in Nepal's forestry sector in present times.

Ever since the 1990s, ecological arguments have been used to conceptualise the relationship between the Siwalik and the Terai as an upstream-downstream linkage. The upland Siwalik is presented as a forested ecosystem providing a range of benefits to the Terai. This conceptualization makes the forest resources in the Siwalik a contested space of access and control among the various actors including the local communities, government departments and international NGOs. This chapter elaborates on how this relationship between the Siwalik and the Terai has been produced by government agencies, INGOs and multi- and bi-lateral aid programs through policy and the implementation of forestry projects from the 1990s to the present. I first discuss the political changes in Nepal since the 1990s. Second, I elaborate on how forestry sector policies changed following the political changes that impacted on the Siwalik and the Terai. Third, the institutionalization of community forestry on and around the Siwalik is examined. Then I argue how the upstream-downstream linkage was reimposed between the Siwalik and the Terai by which the concept of 'Payment for Ecosystem Services' was constructed. Finally, I discuss how the Siwalik and the Terai and their natural resources including the forests are being considered as one of the key issues in Nepal's state restructuring process.

5.1 Politics since the 1990s

Parliamentary system

Nepal adopted multiparty democracy in 1990 replacing three decade-long non-partisan Panchayat regimes under anabsolute monarchy. While internally the liberal Nepali Congress and a 'United Left Front' made up of seven communist factions jointly led the mass movement, external support from international powers, particularly India and the USA also created substantial pressure for the change (Whelpton, 2005). India did not renew a

commercial treaty with Nepal in 1989 as a consequence of which Nepal faced an embargo on trade through the Nepal India border. This placed great hardship on the Nepalese people, who relied on the import of basic livelihood items including petroleum products, medicines and agricultural inputs via India. The people of the Terai were most affected because the embargo also disrupted the small-scale formal and informal trade of everyday items such as rice, sugar, soap and vegetables in the villages and towns adjacent to the border. This embargo fuelled agitation in various town centres in the Terai such as Bhadrapur, Biratnagar, Janakpur, Birgunj, Bhairahawa and Nepalgunj who aligned themselves with the popular protest of 1990, initially announced by the banned political parties from Kathmandu. The protest compelled King Birendra to lift the ban on the multiparty system following negotiations with the agitating political parties. A new Constitution was issued in the same year which legitimized the multiparty parliamentary system and instated a constitutional monarchy.

Following these political changes, a nationwide parliamentary election was held in 1991 in which the Nepali Congress won a majority of seats in the House of Representatives. The former interim coalition government was replaced by a Nepali Congress government, which ruled until 1995. Despite the strong presence of communists as the main opposition in the parliament, the new single party government adopted a neoliberal approach to politics, theeconomy and the environment, to a large extent, by accelerating privatization or liquidation of various state-owned corporations and enterprises. Neoliberalization became instrumental in expanding already-started projects with the support of the IMF and the World Bank (Guthman, 1997) as well as in taking initiatives in new areas such as agrarian strategies (Sugden, 2009). The private sector was encouraged to engage in not only industrial businesses, but also in service areas such as education and health. Kathmandu became a hub of private colleges, schools, hospitals and other businesses, while several government

industries and firms mostly located in the Terai were liquidated in several phases for their alleged inefficiency and corruption. Terai town centres also grew for private sector businesses but the rural parts in the southern Terai were left far behind in terms of their industrial production and access to education, health and employment (Miklian, 2009; Nayak, 2011; Whelpton, 2005).

In 1994, the first countrywide election for local councils, that is, village, municipality and district-level councils, was held. The Nepali Congress party was also elected to power in most of these councils. Thousands of non-government organizations (NGOs) mushroomed across the country through the direct influence of donor organizations and international NGOs. Donor agencies and international NGOs preferred NGOs as their local partners in implementing their projects instead of being directly involved or working with government units. This, in turn, reduced the roles of both central and local governments in social, economic and environmental activities, resulting in further neoliberalization down to the grass roots level (Whelpton, 2005).

The Maoist uprising

In 1995, the balance of power in the central parliament changed after a mid-term election in which the Communist Party of Nepal (Unified Marxist Leninist) (UML) became the largest party in the House of Representatives while the Nepali Congress party was demoted to second largest party. However, no political parties secured absolute majority. The UML formed a single party government by virtue of being the largest party but it was dissolved within nine months following a no-confidence motion by the opposition parties. The subsequent year saw a series of short term 'coalition governments' which were alleged to be engaged in rampant corruption and creating political instability and an economic crisis throughout the country. The Nepal Communist Party (Maoist) put a 40 point memorandum to

the then government in 1996 and announced an armed guerrilla war against the 'old regime' (Bhattacharya, 2013).

While the Maoist insurgency was going on, a massacre took place in the royal palace in June 2001 in which at least 10 royal family members including King Birendra were killed allegedly by Crown Prince Deependra, who also shot himself to death after the massacre (Whelpton, 2005). Birendra's second brother Gyanendra became the King. After a series of efforts by some human rights activists, a ceasefire was announced followed by talks between the government and the Maoists. However, the government continued its repressive policy against the Maoists in the rural areas as a result of which the Maoists called off the ceasefire and the violent conflicts resumed.

A coalition government led by Nepali Congress leader Sher Bahadur declared a 'state of emergency' in the country in October 2001 to suppress the 'Maoist insurgency' (Bhattacharya, 2013). However, the situation worsened resulting in a more violent civil war in which the people were trapped between the repressive royal military and the armed Maoist guerrillas (Human Rights Watch, 2004). Several ceasefires were announced again and peace talks occurred but each talk ended without any negotiation and the conflicts escalated (Bhattacharya, 2013). In 2005, Gyanendra dissolved the Parliament, ousted the coalition government and formed a puppet 'council of ministers' under his own leadership.

Following the takeover of the government by the King, seven major political parties and Maoist party aligned against the monarchy. This seven-party alliance led a nationwide peaceful protst against the King's take-over, while Maoist party also backed the protests from rural areas clandestinely since it was still tagged as a 'terrorist group' by the Nepalese state (Bhattacharya, 2013). People stepped out in a 19 day-long mass protest across the country in 2006, which compelled the King to step back. The King ultimately came to the negotiation

table and reinstated the dissolved parliament. The newly formed coalition government under Mr G.P. Koirala of Nepali Congress struck a 'Comprehensive Peace Accord' with the Maoist party in order to end the 10year-long civil war. Following this agreement, an Interim Constitution was issued in early 2007 by creating a new *ad hoc* 'Legislative Parliament' comprising all the existing parliamentarians plus new representatives from the Maoists and other fringe political parties.

Post-insurgency Terai opposition movement

No sooner had the Maoist party agreed to participate in a peaceful political process than violent protests erupted in the Terai. The agitators alleged that the Interim Constitution did not address the real problems of the Terai. The protest was initially called by a group called the Madhesi Janahikar Forum (MJF), an advocacy NGO formed by some dissident leaders and cadres from the mainstream political parties such as Nepali Congress, CPN (UML) and CPN (Maoist). More Madhesi leaders and cadres also defected from the mainstream parties during the protests and joined the 'Madhes movement'. When the protests spread across the Terai, three Terai-based factions including MJF (the other two being Nepal Sadbhavana Party and Terai Madhes Loktantrik Party) aligned and formed the 'United Democratic Madhesi Front' (UDMF) to jointly lead the protests. UDMF declared its opposition to both the Government and the Maoist party alike, alleging that bothhad betrayed the Madhesi people in the process of political change (Miklian, 2009).

UDMF justified the Madhes cause by demonizing both the government and the Maoists with two dominant narratives. The first narrative asserted that the Kathmandu government, which had, to a large extent, always been dominated by Pahadi elites, operated a 'colony of torture' in the Terai with continued racial discrimination against the Madhesis at all levels since Nepal as a nation state was founded (Miklian, 2009:4). The second narrative,

which was against the Maoists, contended that the Maoist movement had just utilized Madhesi sentiment during its war against the state but had failed to address the problems faced by the Madhesis when the peace agreement was negotiated (Hatlebakk, 2007; Miklian, 2009; Nayak, 2011). The crux of the distrust lay in the fact that both factions were led by the Pahadis, while the political goal of UDMF was to create an autonomous Madhes province with 'self-determination' for the Madhesi people (Nayak, 2011:645). The Government of Nepal reached agreement with UDMF and announced they would address their demands, but failed to implement their promises, by and large. In particular the demand for the declaration of the whole Terai as an autonomous region ('One Madhes-one province' was their own political slogan) was too ndifficult for the government to meet and also was beyond the constitutional capacity of the interim government. This demand was postponed, to be addressed in the forthcoming 'Constituent Assembly'.

As per the Comprehensive Peace Accord and Interim Constitution, a nationwide general election was held for the 'Constituent Assembly' (herein after 'the Assembly') in 2008. The Assembly had dual functions --to promulgate a new Constitution and to work as a 'Legislative Parliament' during the transition (GON, 2007). MJF, one of the major factions of the UDMF secured the fourth largest number of seats in the Assembly after UCPN (Maoist), Nepali Congress and CPN (UML) in the geographic constituencies. In the Terai region, Madhes-based parties won a majority of the seats in the election. This power balance in the Assembly provided an opportunity for Madhes-based parties and leaders to raise their Madhes cause more forcefully and more legitimately in Kathmandu. Before the election, MJF had put forward a ten-point charter in which one of the major points was to 'guarantee rights on the land, natural resources and biological diversity to the Madhesis' (Nayak, 2011:645).

Other factions of the UDMF also raised similar concerns regarding the access of the Madhesi people to forest and biological resources in the Terai and the Siwalik.

The first session of the Constituent Assembly declared Nepal a 'Federal Republic' by abrogating the monarchy and announcing its commitment to restructuring the nation state into a federal system. Subsequently, the Assembly elected Dr Ram Baran Yadav, a resident of the Terai and the leader of Nepali Congress, the first-ever President of the country. The Assembly, however, failed to issue the new Constitution within its own time frame that had previously been fixed for two years, and was later extended to four years. The first Constituent Assembly was dissolved and a new election was held in November 2013 for another Assembly. In this election, the power equation in the Assembly changed again. Liberal Nepali Congress and CPN (UML) became the first and second largest parties, respectively, while the Maoist party was pushed back into third position, from first position in the first election of 2008.

The Madhes-based parties had suffered a significant loss in position in terms of the number of Assembly members. Between the two general elections, all the major Madhes-based parties, MJF, TMDP and Sadbhavana parties, split into several conflicting groups within themselves. For example, the MJF and TMDP each split into three parties, while the Sadbhavana party broke into four factions. These splinters were not based on ideological differences among the leaders for the Madhes cause, but were overtly based on who would participate in the government. Four coalition governments were formed in four years and the Madhesi parties split each time. These internal conflicts within the Madhesi political force not only created frustration among the Terai people but also overshadowed the Madhes cause with the personal 'benefits and costs' of the Madhesi leaders. The election thus resulted in fewer Madhes-based parliamentarians in the Assembly compared to the first election.

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The Madhes-based political protests had several predictable and unpredictable outcomes that shaped forestry sector policies and programmes in the Siwalik and the Terai. One predictable outcome was the emphasis on the issues of access to and control over forest resources in the Siwalik and the Terai. The Madhes movement claimed that people from the region had lost their access to forest resources and also their right to information about how these resources were being managed. The second predictable outcome was the protests against gravel excavation and stone quarrying in the Siwalik. One of the unpredictable outcomes was a conservation programme initiated by the President to protect both the Siwalik and the Terai. These outcomes introduced a new dimension of ecological conservation, which had not featured prominently in the past when the region had been seen as anagricultural and forest frontier. These outcomes accompanied the changes in forestry sector policies and practices in the post-1990 era.

5.2 Policy shifts in the forestry sector

The Government of Nepal prepared its 'Master Plan for Forestry Sector' in 1989 with the financial and technical assistance of the Asian Development Bank and the Danish Government. It was prepared and endorsed during the Panchayat period, but the Interim Government of Nepal formed after the political change of 1990 accepted it with minor revisions. There were three major reasons for the endorsement of the Master Plan by the new Government. First, the plan was prepared with substantial technical and financial inputs for a long term, a 20 year timeframe. Second, the Interim Government considered the Plan to be a 'technical' tool rather than a political document coming from the Panchayat system, which would otherwise have contravened their own interests. The final and most important reason was that the donors were more interested than the domestic actors in implementing it

(because of their active involvement in preparing it) and thereby the Interim Government was not in a position to confront them. It was finally adopted as a major strategic policy document intended to reshape the 'forestry sector', which was identified as comprisinga combination of forest related resources, activities and institutions. Six primary programmes and six supportive programmes were recognized and proposed in detail to develop the forestry sector in the changing political context (GON, 1989).

The six primary programmes were: 1) Community and private forestry; 2) National and leasehold forestry; 3) Development of wood-based industries; 4) Medicinal and aromatic plants; 5) Soil Conservation and watershed management; and 6) Conservation of ecosystem and genetic resources. The six supportive programmes were: 1) Policy and legal reform; 2)Institutional development; 3)Human resources development; 4) Forestry research and extension; 5) Forest resource information and planning; and 6) Monitoring and evaluation. The Master Plan guided forestry policies in the changing context with the major emphasis on people's participation in forest, watershed and protected area management. Community forestry was recognized as the topmost programme to be implemented across the country.   .

A new Forest Act was issued in 1993 replacing the previous Forest Act of 1961. It incorporated the elements articulated in the Master Plan under the supportive programme of policy and legal reform. In order to implement the new Forest Act, a new Forest Regulation was also promulgated in 1995. Community forestry was recognized as the 'most prioritized programme' of the forestry sector. The new Act recognized the 'user group' as the governing body of community forests as opposed to the old Act that considered the Village Panchayat (Village Council) as the governing unit of Panchayat forests. Amendment was made in protected area related laws as well: local people's participation would be sought in buffer-zones around the protected areas while keeping the core zones under strict government

surveillance (Nagendra et al., 2008). A participatory approach was also adopted for watershed conservation in collaboration with local communities. The community approach to forest resource management originated and spread rapidly in the mid-hills with massive donor support in which the World Bank project was the most extensive in terms of geographic coverage (Kumar, 2002). Community forestry gradually extended to the Siwalik and to the Terai region.

In 2000, the government issued a 'Revised Forestry Policy', which conceptualized the Siwalik and the Terai as the most important ecological and economic frontiers. This revised policy presented the Siwalik as a watershed ecosystem to be 'protected' for the betterment of the lowland Terai. The policy recommended the Siwalik be managed as 'protected forests' (GON, 2000). The whole Siwalik range was conceptualized as 'forests' and this view ignored other complex land-use patterns such as farmlands and settlements in the upland Siwalik. The ecological emphasis on the Siwalik and its importance to the lowland Terai received the most attention in this phase.

5.3 Contestation over community forestry in the Siwalik and the Terai

In 1995, a forest management plan for each of the 20 Terai districts was prepared and approved. The district forest management plans of the Terai delineated the forests in each district into 'production forests', 'protection forests' and 'potential community and leasehold forests'. Large chunks of forests in the Terai were classified as 'production forests' to be managed by the respective District Forest Offices. The strips of forests on the banks of rivers and roads and most of the forests in the Siwalik were prescribed as 'protection forests' where tree harvesting would be restricted. The forests in the Siwalik (the protection forest according to the district management plan) were mostly handed over to local people as community

forests. In the Terai, scattered patches of the forests, degraded forest lands and afforested areas were designated for potential community and leasehold forests to be managed by local people (DOF, 1995).

Despite the approval of and budget allocation for these district management plans, not a single one was implemented, for several reasons. First, the delineation of the three categories of forests was very approximate and did not match the on-the-ground reality. Second, there were some social problems such as forest encroachment and illegal settlements within the boundaries of forests which the management plans did not take into account or simply overlooked. The District Forest Offices alone did not have the capacity to evacuate the areas without full support from other state machinery and political forces such as local administration, police and political parties. Third, the District Forest Offices did not try to fully implement the whole plan comprehensively but started working on a piecemeal basis. Some pro-community forestry lobby groups protested against the management plans labelling them a ploy of the Department of Forests to 'recentralize' forestry decisions. Finally but most importantly, those management plans were not prepared in consultation with local stakeholders but were mostly put together by 'forestry experts' using colonial forestry frameworks such as 'forest working circles' in which the Department of Forests could exercise its monopoly over the management and use of forests. This notion did not match with the newly-enacted Forest Act, 1993 and other new political commitments that emphasized the participation of local people not only in local resource management but also in decision making processes.

A World Bank sponsored study suggested two economically desirable pathways for Nepal to follow to achieve sustainable forest development . The study reported that community forestry was the most beneficial programme in terms of economic and

environmental sustainability from a 'national' point of view (Chakraborty, 2001; Hill, 1999). The report also suggested that Nepal could adopt more 'biodiversity-friendly' management of forest resources such as the under-protected areas systems as alternative approach if global communities were willing to pay for it. No other options were considered sustainable in Nepal according to this study. The report conceptualized Nepal's forest ecosystems as economic stocks that would be either used sustainably to meet the national requirements and/or sold in the forms of biodiversity values on at international market . This conceptualization warned that the country would lose the resources in the long run if either or both of these options were not chosen (Hill, 1999).

The report emphasized community forestry, the financial value of forest products and services and payment for biodiversity conservation as supporting the sustainable development of forest resources in the country. These three elements highlighted in the report were later reflected in the policies and programmes of the forestry sector in Nepal. For example, the total number of community forests up to 2003 was only 2,830 across the country covering a total area of 266,007 ha. By the end of 2011, the total number of CF reached 17,685 covering a total area of 1,652,654 ha; this represented an increase of nearly six hundred per cent within eight years (DOF, 2014). The area covered by different protected areas in 2001 was nearly 22,000 km^2, reaching 34,000 km^2 in 2013 (DNPWC, 2014).

The revised Forestry Policy of 2000 highlighted the importance of the forests in the Siwalik and the Terai and advocated testing different models of forest management including 'collaborative forest management' to promote social integration, economic benefits and ecological integrity through the forests in the Siwalik and the Terai (GON, 2000). In this modality, large chunks of forests were delineated as 'collaborative forests' and managed by the combined efforts of the District Forest Office, local governments and local users. The

revenues from the forests are shared among the central government, local governments and local user groups. However, this modality has not effectively covered all the Terai districts due to several complexities including the coordination problem, disputes over resource distribution and protests from pro-community forestry lobby groups (Bhatta et. all, 2007, Bampton, et al 2007).

At a time when community forestry was the 'most prioritized' programme in the country by law (GON, 1995), the revised Policy tried to limit the community forestry programme in the hills (including the Siwalik) and stop it altogether in the Terai plain. Community forestry in the Terai was presented as a problem rather than a solution for forestry related concerns. The policy placed extra emphasis on both ecological enhancement and economic returns from the forests by inventing and emphasizing the ecological arguments on the Siwalik-Terai linkage. On the one hand, the policy emphasized 'biodiversity conservation' not only within protected areas but also outside protected areas. On the other hand, the contribution of Terai forests to the national economy was also highlighted (Bampton et al., 2007).

Several bilateral and multilateral forestry projects were launched in the Siwalik and the Terai as part of the implementation of the Revised Forestry Sector Policy of 2000. The Livelihood and Forestry Programme (LFP) funded by the UK operated in Kapilvastu, Rupandehi and Nawalparasi districts in Western Terai. The Netherlands-funded Biodiversity Sector Programme for Siwalik and Terai (BISEP-ST) launched its programme in nine districts in Central Terai. The Western Terai Landscape Complex Programme (WTLCP), a multilateral project coordinated by the UNDP operated in Bardia, Kailali and Kanchanpur districts in the far Western Terai. The USAID-funded CARE-Nepal also ran various watershed and forestry programmes in some districts of Western and Central Terai. Terai Arc

Landscape (TAL) was another 'trans-boundary' project that covered the Siwalik and the Terai between the Yamuna River (India) in the west and the Bagmati iver (central Nepal) in the east. These projects emphasized the 'scientific' management of forests and other ecosystems both inside and outside protected areas in the Siwalik and the Terai and sought support from the local communities. Some of these projects such as LFP, BISEP-ST and WTLCP ended in 2013, while others are still running. These projects adopted an ecological vocabulary, using terms such as biodiversity, landscape, corridors and connectivity and thereby contributing to the escalating ecological arguments.

Despite the high number of forest management modalities being promoted and tested, community forestry became the most dominant and contested programme in the Siwalik and the Terai. Proponents of community forestry in the Terai argued that it contributed to stabilizing local institutions, improving forest conditions, enhancing biodiversity and securing tenure rights of forest dependent communities in the region (Chakraborty, 2001; Nagendra, 2002; Nagendra et al., 2008). Others criticized the community forestry emphasis in the region, seeing it as a vehicle for the persistence of elite domination and the further marginalization of already disadvantaged communities (Bampton & Cammaert, 2007; Iversen et al., 2006). Most importantly, the exclusion of the Madhesi people from forest benefits continued to be one of the most crucial issues in community forestry in the Siwalik and the Terai (Bhatta et al., 2007; Satyal Pravat & Humphreys, 2013; Sinha, 2011).

5.4 Reinforcement of the upstream-downstream concept

The concept of an 'upstream-downstream linkage', which originated from the highly controversial Theory of Himalayan Environmental Degradation (discussed in Chapter 4), was reinforced in the context of the Siwalik and the Terai, particularly by international NGOs in

the post 1990s era. Despite the criticism of the Theory, it was still used in the Himalayan countries including Nepal in order to initiate and legitimize various upland conservation projects without questioning the validity and spatial scale of the mountain-plain ecological linkages. This selective utilization of this mountain-plain narrative gave rise to the conceptualization of an upstream-downstream linkage between the hills and the plains (Blaikie & Muldavin, 2004). It justified the logic of investing resources in conservation action in the upland areas presumably for the benefit of the plains. While the 'Himalayan crisis' narrative was declared 'dead' by several critical researchers in 1987 (Blaikie & Muldavin, 2004; Ives & Messerli, 1989), ironically, it received more attention from the 1990s onward in Nepal, taking the form of an 'upstream-downstream' ecosystem linkage. In subsequent years, the linkage between the Siwalik and the Terai was more heavily emphasized than that existing between other regions of Nepal.

Besides the community forestry programme, a number of Siwalik watershed conservation projects were launched from 1991 onwards particularly in the Siwalik (MFSC, 2014). The Churia Forest Development Projects operated from 1991 to 2007 in three districts in Eastern Nepal under the financial and technical support of the German government. This projected emphasized the promotion of community forestry in the Siwalik in order to 'reduce the ecological imbalance of ' the Siwalik (Laubmeier & Warth, 2004:35). The Chure Watershed Management Project was launched from 2000 to 2005 with the technical and financial assistance of the Danish government. A Biodiversity Sector Programme for the Siwalik and Terai (BISEP-ST) was implemented from 2004 to 2011 in Central Nepal. All these projects adopted the 'upstream-downstream' notion between the Siwalik and the Terai and invested resources in the Siwalik for the assumed betterment of both the Siwalik and the Terai.

In 2008, a long term Chure Area Protection Strategy (CAPS) for managing Siwalik ecosystems was prepared. The Nepal chapters of three conservation INGOs, namely WWF, IUCN and CARE were actively involved in drafting this strategy. It conceived the Siwalik as the upstream and the Terai as the downstream and recognized the whole Siwalik-Terai as a 'Churia area'. The strategy highlighted the importance of the Siwalik ecosystems for the downstream Terai and conceptualized the need of the Terai people to contribute to upstream conservation. The Strategy affirms:

> As it (the Siwalik) provides various environmental services to other regions of the Churia area (Dun, Bhabar and Tarai), it should be treated differentially and with priority. Every year, the Tarai region suffers from floods, which originate in the upstream areas of the Churia hills. Most of the Tarai population suffering from floods have yet to understand the underlying causes of floods. Therefore, for the betterment of the people of the Tarai, there is a need to invest in conservation and development programmes in the Churia region. This has to be well understood by the people of the Tarai and they will have to support initiatives accordingly. The present practice of embankment protection in the Tarai can only be a short-term solution (GON, 2008:15-16).

The Ministry of Forests and Soil Conservation later endorsed the strategy, ensuring it became a powerful document to legitimize the representation of the Siwalik as a 'Churia ecosystem' directly affecting the Terai (GON, 2008:6). The document endorsed the discourse that the fate of the Terai was dependant on the Siwalik hill ecosystems. International NGOs, particularly, ICIMOD, CARE Nepal, WWF-Nepal and IUCN-Nepal utilized the Churia Strategy as an avenue for introducing new projects under 'Payment for Ecosystem Services' (ICIMOD, 2012, 2013; Khanal & Paudel, 2012; WWF Nepal, 2014).

In 2010, 'Rastrapati Chure Conservation Programme' (President's Siwalik Conservation Programme) was initiated some two years after the election of the first President in the country. It received its impetus from 2012, gaining the status of one of the

most prioritized national programmes ('p1 programme') of the National Planning

Commission (GON, 2012). The President hails from the Terai and has been vocal in

supporting the conservation discourses related to the Siwalik in various forums since the

initiation of the programme (Republica, 2014a; The Kathmandu Post, 2012). Like CAPS,

the President programme depicts the Siwalik ecosystems as being continuously degraded and

attributes at least 18 anthropocentric problems associated to this degradation (GON, 2012) .

The programme underscores the need for considering the 'upstream-downstream' linkage

between the Siwalik and the Terai while formulating any local level conservation activities.

Likewise, it nominates the watershed as the main unit of management for any activities

under this programme. The major conceptualization of these policy initiatives is consistent

with the concept of the Siwalik as an upstream source of ecosystem services to a watershed

and the Terai as the downstream beneficiary of these services.

5.5 Payment for Ecosystem Services

The big step that Nepal's forestry sector has taken since 2007 is its claim to readiness to

operate 'Reduce Emissions from Deforestation and Forest Degradation plus' (REDD+) under

UN Framework Convention on Climate Change (UNFCCC). This project aims to sell the

carbon credits derived from Nepal's forests in global markets from 2020 onwards if all the

necessary preconditions are met. This project has the ambitious aim of alleviating poverty

through selling forest carbon, but REDD+ itself is such a new global initiative in its very

early stages that it is difficult to ascertain whether or not it will be successful. Concerns such

as the threat to livelihoods of forest-dependent tribal communities and the retrogression of

forestry rights from local to central authorities, have already been raised in regards to

REDD+ (Beymer-ferries and Baset, 2012, Phelps et al. 2010). It is yet to be determined

whether REDD+ can solve the problems of the Terai since it is still preparing the necessary

information, capacities and structures with the financial support of Forest Carbon Partnership Facilities of the World Bank for the the project to start.

Another new step for forest management in the Siwalik and the Terai was the initiation of 'Payment for Ecosystem Services'. While REDD+ covers the entire country and operates in an international PES system, other more localized forms of PES schemes have also been initiated. The local PES systems are in the early stages, but international environmental NGOs have taken the lead in promoting them particularly in the Siwalik and the Terai. The 'upstream-downstream' argument has provided a foundation for piloting these PES systems. Once more, the forest resources in the upland Siwalik are presented as the sources of 'ecosystem services' and the Terai as the 'downstream' recipients of these services (Khanal & Paudel, 2012). While tangible goods such as timber and fuel wood from the forests have been used by the people for many years, more abstract benefits such as biodiversity, watershed conservation and aesthetic features of forests have mostly been brought under 'ecosystem services' in order to establish the PES mechanisms. People have long been relying for their livelihoods on the forests, but PES has brought about a different way of thinking about forest ecosystems simply as a form of money.

IUCN is taking the lead in piloting 'Ecosystem-Based Adaptation' (EBA), a project that constructs 'a mountain ecosystem linking the lowland and high Himalayas' in Nepal. The programme aims at achieving 'sustainable restoration, conservation and management of ecosystems to provide services' for the local people to 'adapt to the impacts of climate change' (UNDP Nepal, 2014a:3). In Nepal, EBA is being implemented in Panchase mountain that intersects Kaski, Syangja and Parbat districts in the Western region. The upstream-downstream scenario is considered important for the flow of ecosystem services from the mountain top to the 22 villages in the lowland. The ultimate ambition of the EBA in Nepal

and elsewhere is to establish a 'Payment for Ecosystem Services' (PES) that can 'change institutions in ways that impact wider society including its adaptive capacity' (Wertz-Kanounnikoff et al., 2011:150).

ICIMOD in partnership with WWF Nepal is taking the lead in establishing Payment for Ecosystem Services mechanism in Sardu-Khola watershed located in Sunsari district in Eastern Nepal. The PES scheme aims to recognize community forests in the Sardu watershed on the Siwalik as upstream ecosystems that provide a range of services including water quality to downstream Dharan municipality. The watershed and 'upstream-downstream' are the two key concepts underpinning this PES pilot. The scheme is underway to bring upland community forestry user groups and Dharan municipality authorities together to negotiate for long term payment schemes (Khanal & Paudel, 2012).

A project called 'Rewarding Upland Poor for Environmental Services' (RUPES) worked in the Kulekhani hydro electricity project in central Nepal. The hydro electricity reservoir was considered a downstream beneficiary of upland community forestry conservation, contributing to reduced siltation in the reservoir. The electricity authority pays 12 percent of its revenues to District Development Committee of Makawanpur, out of which 50 percent is spent on the upland community forestry user groups (Joshi, 2011). A number of studies lauded this activity as an example of PES in Nepal. However, deeper insights into the case study show that the perceived benefits are not consistent with mainstream PES mechanisms around the world. The valuation is not based on the flows of the ecosystems, but on a lump-sum percentage of electricity revenue generated by the electricity authority. This payment followed the provision of the Local Self Governance Act, rather than any PES framework. Moreover, the payment has had no effect on whether the upstream farmers are

conserving or degrading forest ecosystems (Khatri, 2009). Nonetheless, it has been a

pilgrimage site in Nepal for researchers and project initiators alike interested in PES.

5.6 State restructuring

Nepal is undergoing a state-restructuring process. The future of the Terai has been the most

contentious issue in this process. The Terai-based political parties allege the current form of

governance to be a system of 'internal colonization over the Madhesis' and seek to form an

autonomous Madhes region/province across the Terai under a Federal Republic of Nepal

(Nayak, 2011:645). The activists for the Madhes cause campaigned for statehood within a

federal system in which the the whole Terai would be a 'province' or 'state' ('one Madhes, one

Province') (Nayak, 2011). Besides political parties, several underground armed units have

also been active in the Terai in the aftermath of the Terai/Madhes movement of 2007. They

also claim to be working for the rights of Madhesi people although they have been outlawed

by the government. However, the demand of the Madhesi activists/parties to form a separate

Madhes province encompassing the the entire Terai is not free of controversy.

Two major political parties, theNepali Congress and the Communist Party of Nepal

(Unified Marxist Leninist), which won the top first and second positions, respectively, in the

Constituent Assembly election of 2013, do not support a separate Terai province. They hold

the view that each state should be formed with consideration of a balance of ethnic identities,

geographic representations and economic capacities. The Communist Party of Nepal (Unified

Maoist) has changed its policies related to the Terai several times, but it backs the concept of

forming more than one Terai province without including the hill region. The indigenous

communities, mostly the Tharus, have rejected the name 'Madhes' and the formation of a

'Madhes' province in the Terai. Consensus is lacking even among the Madhesi political

parties, which are divided into at least a dozen groups. Despite all these complexities, at the centre of the Madhes cause lies the lack of access of the Madhesi people to natural resources including forests. The Madhesi parties are constantly seeking a constitutional guarantee of their rights over natural resources including forests (Nayak, 2011).

5.7 Conclusion

The political changes since the 1990s have been associated with many ecological changes in the Siwalik and the Terai. The forestry sector, among other things, is still operating in the same paradigm as in the 1990s. This is the neoliberal paradigm, which operates in deregulation and re-regulation in a way that the private sector, such as user groups and NGOs have become powerful in managing and using forest resources through market logics (Guthman, 1997; Harvey, 2006). The user group and NGO approach, however, has failed to address the issue of the exclusion of the Madhesi people from their access to forest resources. In a bid to tackle the issue, Nepal's government has also piloted collaborative forest management in some Terai districts since 2004. However, this new initiative has not been effective in solving the problems faced by the Madhesi people in trying to access their forest resources.

The use of the upstream-downstream linkage and conflicts between the Pahadis and Madhesi people over the ownership, management and use of community forests in the Siwalik have been the major environmental arguments in the Siwalik and the Terai in the post 1990 era. International NGOs in partnership with the Nepalese Government and local NGOs are seeking opportunities to utilize this 'upstream-downstream linkage' in their policies, programmes and practices. These INGOs have started some 'pilot projects' related to 'payment for ecosystem services' in the 'upstream-downstream linkage'. These efforts, still questionable, have affected forestry activities and thereby the livelihoods of forest dependent

communities. What are the everyday practices of local people in the Siwalik and the Terai in connection with watershed, forests and other ecosystems? How far are these practices are consistent or inconsistent with the concept of upstream-downstream and ecosystem services? In the next Chapter, I elaborate on various spatial practices in the Tinau watershed case study area in Western Nepal in order to address these important questions.

Chapter 6: Spatial Practice in the Tinau Watershed

Shankar Thakur (name changed) lives in Bhairahawa. He is a district-level young leader of a Madhes-based political party. When I first met him with the help of a local NGO staff member, he was very welcoming and happy. He offered us a cup of tea each and sat with us for the interview. During the conversation, all of a sudden he became angry when I started talking about the Tinau River and the community forests in the region. He vented: 'The Tinau River is a curse to us, but a boon to the people who excavate sand, boulders and gravel out of it and make a lot of money. The river cuts off our farms in the Terai every year during the rainy season'. Pausing for a while and sipping the tea, he continued: 'I think it is due to the excavation of boulders, sand and other bedding materials from the river during the dry season. The government has prevented excavation north of Butwal but has allowed it only in the southern part. They think that preventing excavation only north of Butwal can save the Terai, but the river has different effects on different people in the district'. I asked him about the community forests. He asked me pointedly: 'What can I say about the forests or community forests? I don't even know what they look like from nearby. If I go to the forests near Butwal or Palpa, the user groups and forest rangers think I have come to steal wood or logs. The forests belong to all of us here, but the user groups and the rangers think I am an outsider. This is all because the forests were divided among user groups living close to the forests. I know these user groups sell the timber and fuel-wood and make money for themselves in the name of community development. But we are also part of the community; we belong to the same district. We are all part of Rupandehi district'.

Thakur's comments about the Tinau River, community forests and the district community draw attention to a number of critical issues. First, his comments challenges the notion that a river watershed is a pre-ordained geographical unit, which can be technically

delineated and managed. Second, it also challenges the definition of 'community', which is often regarded as a 'homogeneous social group'. Thakur's concern about the division between user groups and non-user groups within the community poses a serious question about what exactly the 'community' in 'community forestry' really means. Third, in Thakur's understanding, the focus of the use of forests is on timber, fuel wood and other tangible products, which challenges the conception of using forests as a source of more abstract benefits such as carbon, biodiversity and hydrological functions, commonly known as 'ecosystem services'. Fourth, the ownership of community forests is complex, and Thakur does not consider they belong to the user groups but to the whole nation. Fifth, forests are very important resources for the livelihoods of the people in the Terai, but their access to these resources has been forcefully denied. Finally, forests and watersheds together have comprised a space of contestation among different social groups and political actors. Understanding people's everyday practices is an important step toward deciphering how socio-natural systems interact and give rise to tensions among local social groups over a watershed.

In this Chapter, using the Lefebvrian idea of 'spatial practice' or 'perceived space' (Lefebvre, 1991:38) , I describe social practices in three different locations in the Tinau watershed: in Dobhan, a village in Palpa district at the higher elevation; in Butwal municipality at mid-elevation; and in Bhairahawa municipality at the low elevation of the Tinau watershed. The flows and links interacting between the three locations are then mapped in order to understand the complete scenario of the spatial practice over the whole watershed. A summary conclusion is also provided.

The source of the Tinau River lies in the Siwalik in Palpa district of Western Nepal. Two streams join at some point, and become the Tinau. The river flows about 45 km from

north to south through two districts, Palpa and Rupandehi, then further south into the Indian state of Uttar Pradesh. Butwal and Bhairahawa are two urban municipalities located on the river. Three different altitudinal locations in the Tinau watershed, Dobhan village at high elevation (average 600m above msl), Butwal municipality at mid elevation (average 200m above msl) and Bhairahawa municipality at low elevation (average 100m above msl), were selected for this study (Map 6.1). Dobhan village lies in Palpa district, while Butwal and Bhairahawa are town municipalities in Rupandehi district.

6.1 Spatial practice in Dobhan

Part of the Siwalik liesmostly in Palpa district and constitutes the upland area of the Tinau watershed. The hills are almost covered with forests while the settlements and farm lands lie on the banks of the Tinau. Dobhan village is and one of these settlements and lies about 8 km north of Butwal. According to the latest census, the total population of Dobhan Village Development Committee (VDC), which is a local government unit at village level, is 6,872 , and the total number of households is 1436 (CBS, 2012b).
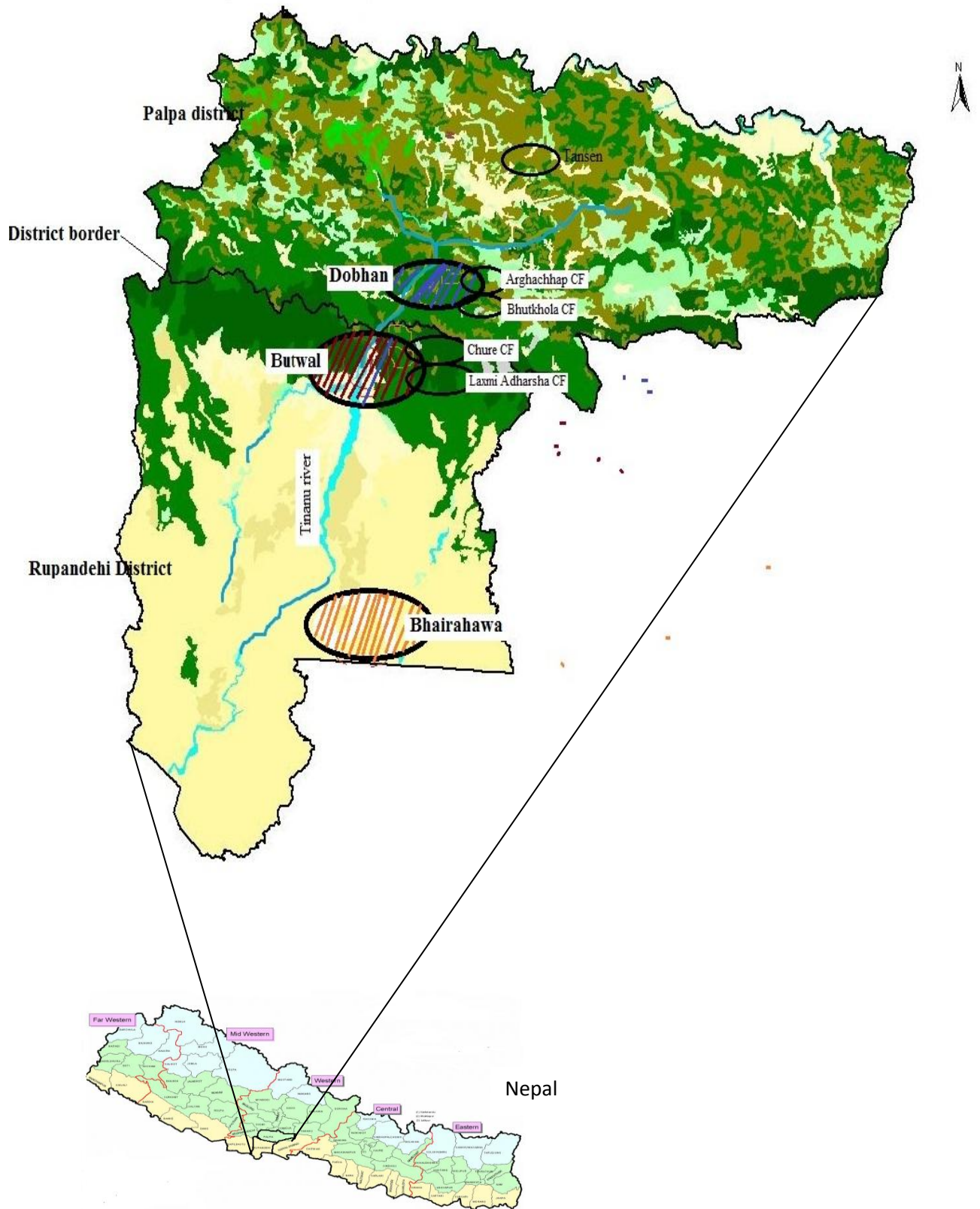
Map 6.1: Relief map showing Palpa and Rupandehi districts with the Tinau River and the case study sites

Dobhan has a rural agrarian economy which is typical of upland villages in the Siwalik.. The land-use pattern in Dobhan includes forests, highways, water bodies, farm land, agro-forests, barren public land, grazing areas and settlements (Map 6.2). About 80 per cent of the population are subsistence farmers. They have terraced their private agricultural lands to retain rainwater, soil and organic matter. They grow maize and millet in the upland area (locally known as '*bari*'), with paddy and wheat in the plain (locally known as *khet*) near the river. The land is tilled by ploughs in the plain, while they dig the soil with spades on the sloping terraces. Vegetables are grown mostly in their kitchen gardens. Since it is a net food deficit area, the local people buy additional food and vegetables from Butwal and Bhairahawa. They keep cattle (cows and buffalos) for milk and goats for meat. They used to graze these domestic animals in the forests, but stall feeding has become normal practice these days. Fodder is mainly supplied from nearby forests, but also supplemented by trees grown on the bunds of their farm lands. Each household has some poultry, mainly chickens for domestic consumption. Two households have established commercial poultry farms. The major source of household energy for heating and cooking is fire-wood, which they mostly collect from nearby forests.

About five percent of the households are engaged in shop-keeping. Some of them run local tea-stalls, while some other run grocery shops. About 20 per cent of the villagers travel to Butwal and Bhairahawa every day to work in offices, factories, shops, attend education institutions or engage in other businesses. They sell vegetables, logs, poultry and dairy products in Butwal and Bhairahwa. For administrative matters, such as buying and selling land or getting permission for harvesting forest products, they visit Tansen, the administrative headquarter of Palpa district, which lies about 25 km north-east of Dobhan. In order to travel to Butwal, Bhairahawa or Tansen, they use the Siddartha highway, which passes through

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Dobhan. They purchase rice, agricultural inputs, processed foods, finished furniture,

electronic devices and other manufactured products from Butwal and Bhairahawa directly or

through retailers. Landslides on the banks of the Tinau are common. Government agencies

have constructed check dams, retaining walls and breast walls on the banks of the Tinau

River as well as on highway sides. These practices are undertaken periodically by

government agencies.
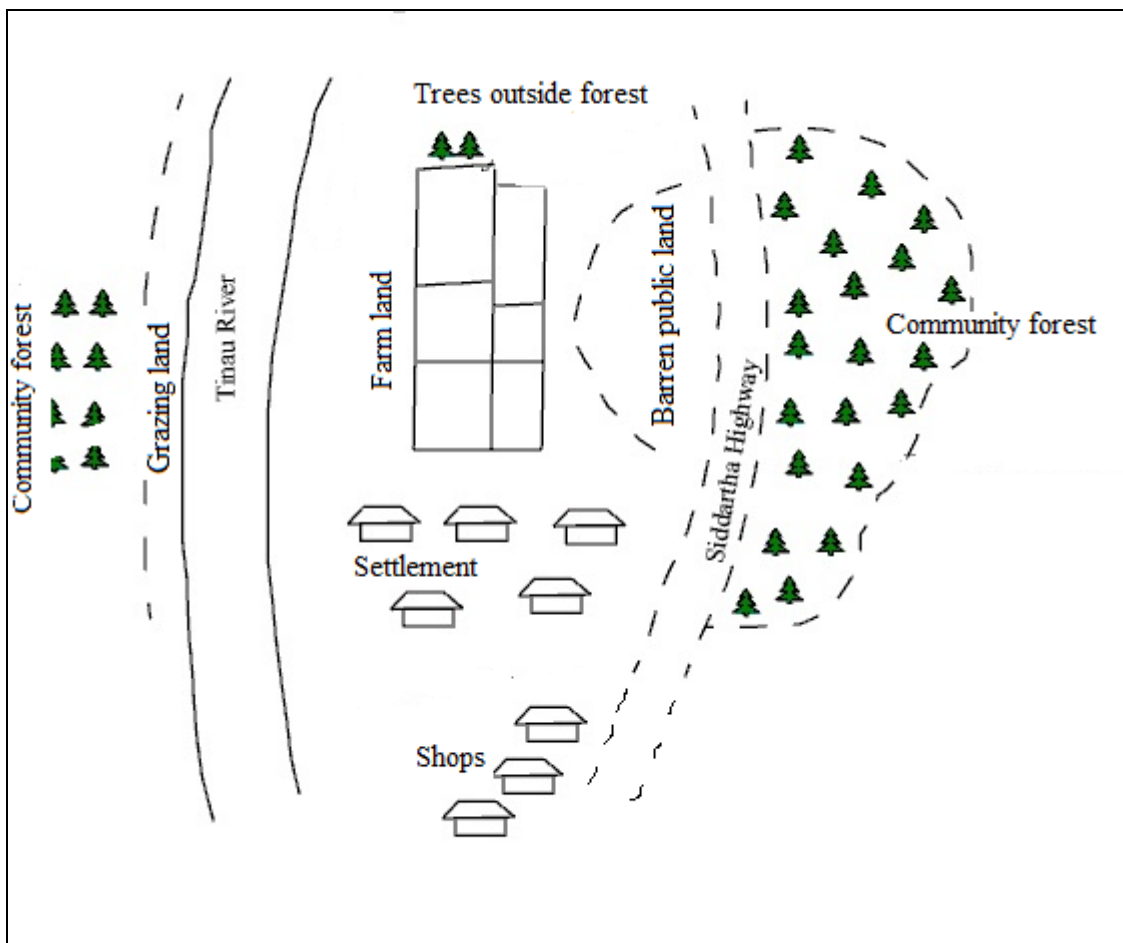
Map 6.2: Sketch-map of typical land-use pattern in Dobhan village of Palpa
(Source: Focus group discussion in Dobhan in 2011).

Forest resources make up the major part of the economy in Dobhan. The people

collect logs, fuel-wood, fodder, leaf-litter, bamboo, broom grass, wild mushrooms, wild

vegetables (such as fern shoots), wild fruits (such as Indian gooseberries), wild nuts (such as

chestnuts) and medicinal plants from th forests for both domestic and commercial uses. The major forest type in Dobhan is moist, deciduous broadleaved forest. Sal (*Shorea robusta*) is the dominant tree species in the typical forest in Dobhan. Although many of the trees have multiple uses, some species are mostly used for particular purposes. For example, sal is mainly used for constructing houses, particularly for making frames for windows and doors in concrete buildings, as well as pillars in wooden houses. Due to its strength and durability, sal has been the most expensive timber across Nepal for the last decade or so. Other major species from Dobhan forests used for timber include Indian laurel (*Terminalia tomentosa),* haldu (*Adina cordifolia),* Nepalese alder *(Alnus nepalensis),* cotton tree *(Bombax ceiba),* red cedar (*Toona ciliata*), black rosewood (*Dalbergia latifolia*), European nettle tree (*Celtis australis*), needlewood (*Schima wallichii*), siris (*Albizia* species), Ceylon oak (*Schleichera oleosa*) and axle-wood (*Anogeissus latifolia*). Some of these tree species such as sal, black rosewood, red cedar and Indian laurel are also used for making high-quality furniture, while Nepalese alder and cotton tree are used for making veneer and plywood.

Villagers use leaves of certain tree species as fodder for their cattle. The major fodder species in Dobhan include tanki or purple bauhinia (*Bauhinia purpurea*), koiralo or paper mulberry (*Bauhinia variegata*), gayo (*Bridelia retusa*), wild Himalayan cherry (*Prunus cerasoides*), kutmiro (*Litsea polyantha),* coral tree or faledo (*Erythrina variegata),* khanayo *(Ficus cunia),* pakhuri *(Ficus glaberrima*) and khasreto *(Ficus hispida).* Fodder is mostly gathered in the forests but some villagers grow fodder trees on the bunds of their farm terraces. Trees or wild plants have also been used by Dobhan inhabitants for traditional medicine purposes. These species include myrobalan (*Terminalia bellirica*), yellow myrobalan (*Terminalia chebula*), Indian gooseberry or amla (*Emblica officinalis*), stone apple or bael (*Aegle marmelos*), khair (*Acacia catechu*) and tree turmeric (*Berberis aristata*).

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In Dobhan, some trees are also used for cultural and religious purposes. Those trees are often called 'sacred trees' in the Dobhan area similar to other parts of the country. These trees include the sacred fig or peepal (*Ficus religiosa*), banyan tree (*Ficus bengalensis*), weeping fig (*Ficus benjamina*), bael (*Aegle marmelos*), dumri (*Ficus racemosa*) and 'flame of the forest' (*Butea monosperma*). Peepal, banyan, and weeping fig are planted around temples. The leaves of the bael tree are used to worship Lord Shiva. Sal leaves are woven to make leaf-plates, on which food is eaten during religious functions and rituals.

Each household is involved in at least one village forestry group, known as a 'Community Forestry User Group' (CFUGs) under the Forest Act, 1993. A CFUG is a group of households which is authorized to sustainably develop, manage and use a patch of forest handed over by the respective District Forest Office . The forest patch which is handed over to the CFUG is called a 'community forest' (CF). In Dobhan village, there are 33 CFs covering a total of nearly 4,000ha (DFOP, 2012). In order to gain insights into the community forestry activities, which have been a major part of spatial practice in Dobhan, I have selected two CFs and their respective CFUGs as samples. These are Arghachhap CF and Bhutkhola CF.

Arghachhap community forest and its user group

Arghachhap community forest was handed over by the District Forest Office in Palpa to the local people in 2000. Most of the forest lies in the northern part of the Siwalik. The settlements and farmlands mostly lie between the forest and the Tinau River (Map 6.3). Altogether 43 households from ward number 6 of Dobhan village development committee of Palpa make up Arghachhap CFUG. The total area of the forest is 113.11 ha. The operational plan for this CF was renewed and updated for a third time in 2011. The farmers collect logs,

poles, twigs, fuel-wood, grass, fodder, leaf-litter, wood for agricultural implements, as wel as medicinal herbs from most of the forest. Trees are harvested twice a year in December and February for logs, whereas fuel-wood, fodder and leaf-litter are collected more frequently following the schedule set out in their operational plan. In one prticular small patch which covers approximately one fifth of the total CF area, they do not carry out any harvesting activities at all. They have kept it as a 'conservation block' from which they do not collect any forest products. Likewise, they do not harvest trees for up to 50 meters on either side of the Siddhartha highway, the Tinau River and other creeks. Mr Krishna Pandey, one of the founding leaders of Arghachhap CF justifies these restrictions on harvesting in some areas. He argues:

> *We have kept some areas in the forest undisturbed for birds and wild animals. The remaining four blocks are sufficient for us to collect logs, fuel-wood, fodder, leaf-litter and other forest products. Some species of plants are protected in this block. We do not know how many species of plants are found in our forest. If trees and shrubs are harvested indiscriminately across the forest, some of the species may disappear permanently. Trees and shrubs are not harvested along the roadside and riverside to retain the land intact so that less land slips onto the road or into the river.*

Almost 90 per cent of the people in Arghachhap CFUG are subsistence farmers. They pay a nominal price for logs and fuel-wood when they use it within their CFUG. When they have excess timber and fuel-wood from their CF, they sell these products outside the CFUG. The money they generate from these internal and external sales and other sources is collected in the communal fund of the CFUG. Leaf-litter, fodder and wood for agricultural implements are provided free of cost to the members of the CFUG.
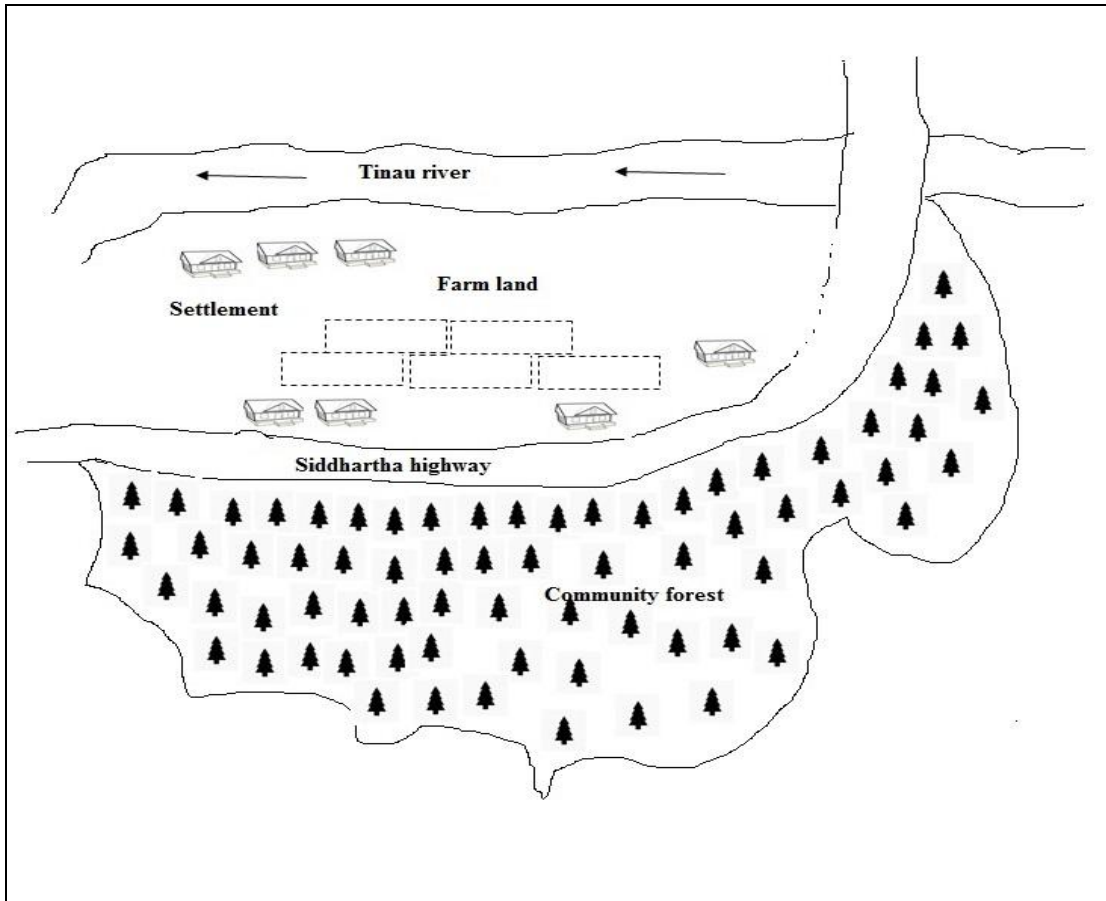
Map 6.3: Sketch map of different land-use patterns in Arghachhap CF (Source: Focus group discussion in Dobhan in 2011).

The communal fund of the CFUG is spent on three major activities.First, they spend about 25 percent of their total income on forest-related activities, such as planting, weeding, pruning, thinning and harvesting trees in the forests. Second, some of the fund is spent on community development activities, such as drinking water and small irrigation schemes. Finally, some of the fund is provided to economically marginalized households to improve their livelihoods. Altogether, 14 households of a total 43 have been classified as economically marginalized and special arrangements have been made for these households. These marginalized households have been provided with financial support from the CFUG fund in order to keep pigs and goats to enhance their livelihoods.

Figure 6.1: Photo of broom grass and Cinnamon cultivated in Arghachhap CF
(Source: Author, 2011)

The farmers have planted 'broom grass' *(Thysanchaena maxima)* and cinnamon (*Cinnamomum tamala*) in their community forests mostly along the Siddhartha highway on the banks of the Tinau. Bamboo clumps have been grown in the CF as well as in th farmers' private lands. The bark of the cinnamon tree, the flowers of broom grass and bamboo culms are mostly sold outside the CFUG. The local people protect the sources of streams and rivulets that feed into the Tinau River. They have kept the vegetation intact by controlling tree harvest around the streams. Fishing in the Tinau River is also regulated. The local people are allowed to collect fish manually, but using poison in the river is not allowed. Stones and sand are collected from the Tinau River for domestic use in construction work, but commercial excavation has not yet taken place in the Tinau in this area.

Bhutkhola community forest and its user group

Bhutkhola community forest and its user group lie in ward number 5 of Dobhan village development committee. The user group was registered in 1997 and the forest was officially handed over to the CFUG as a community forest in 1998. This CF is situated in the south-east of the Butwal-Tansen section of the Siddartha Highway (Map 6.4). The total area of the CF is 85ha. There are 39 households in the Bhutkhola CFUG. About 60 per cent of the households in this CFUG are farmers, while approximately 20 per cent have shops such as tea stalls and grocery shops. The remaining 20 per cent of the population is engaged in employment including in schools, factories, NGOs and government offices in Dobhan, Butwal or Bhairahawa.

Unlike Arghachhap CFUG, about 20 percent of the households in this CFUG use LPG for heating and cooking. However, they supplement the household energy needs with fuel-wood that comes from their community forest. They harvest only dead, dying and deformed trees from their CF. Only about 50 per cent of the households have cattle and goats. Grazing is not prohibited in the CF, but farmers prefer stall feeding to grazing. Fodder is mostly collected from the forests, but is supplemented by trees grown in their private farm lands. They also use grass from both forest and their farmland to feed the cattle. A small creek, called Chidiya khola flows from this forest. Butwal Municipality draws drinking water from this creek under an agreement with the Dobhan village development committee.
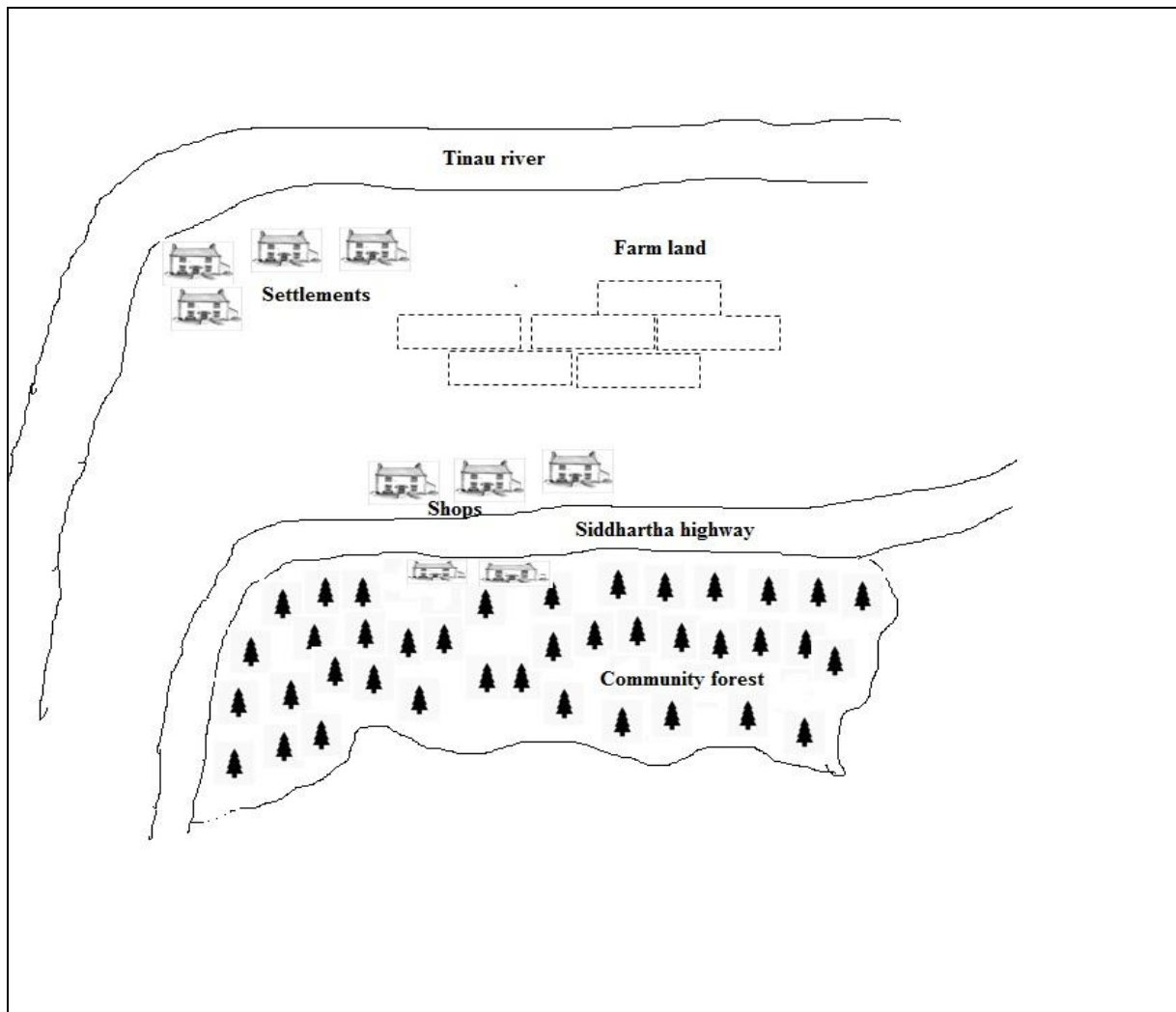
Map 6.4: Sketch map of land-uses in Bhutkhola CF area (Source: Focus group discussion in Dobhan in 2011)

The CFUG members collect fuel-wood, fodder, grass, leaf-litter and twigs free of charge. They have to pay for logs at a rate decided by the CFUG general assembly. However, economically poor households among the members buy logs at a subsidized rate. There are 12 households identified as economically poor. They buy logs at a rate 50 per cent cheaper than that fixed for other households. Surplus logs and fuel-wood are sold outside the CFUG in an open bidding process. Like in Arghachhap CF, they do not harvest trees on the banks of rivers, roadsides and sacred places. They have also kept nearly one fifth of the CF area as a 'conservation block' from which they do not harvest any forest products at all.

The spatial practice or daily life of the people in Dobhan thus revolves around their rural subsistence economy. About three quarters of the population is engaged in farm-based activities including forestry, agriculture, livestock and poultry. Surplus logs, fuel-wood and non-timber forest products are sold in Butwal or Bhairahawa. Collective action in forest management through community forestry is one of the major characteristics of the Dobhan socio-natural system. There are also some retail shops in Dobhan village where people sell and buy mostly consumable items. These items are first bought from Butwal or Bhairahawa by the retailers and sold in Dobhan. Nearly one fifth of the population works as employees in Butwal and Bhairahawa. To travel to the outside, people first use the Siddhartha Highway that passes through Dobhan along the Tinau River. Thus the people's everyday life in Dobhan is directly connected to Butwal and Bhairahwa through the movement of people, commodity flows and natural resources.

6.2 Spatial practice in Butwal

Butwal is one of the oldest municipal cities in Nepal. It lies in Rupandehi district. The municipality was established in the early 1960s. The total population of the municipality is approximately 100,000 (Butwal Municipality, 2012) with an annual population growth of nearly four percent (MLD, 2012). It has a semi-urban economy in the northern and southern parts but with business and industrial areas in the centre. The Siddhartha Highway runs north to south across the middle of Butwal parallel to the Tinau River. The east-west highway, the longest highway of Nepal, also crosses from east to west through the centre of Butwal. It is surrounded by forests in the east and west (Map 6.5). For administrative matters, such as acquiring citizenship, buying and selling land and property, people visit the government offices in Bhairahawa to the south. The majority of the people in Butwal have emigrated from neighbouring hill areas. Some people have dual residence in both their hill villages and in

Butwal. Manufacturing industries, commercial activities, agriculture, tourism and forestry contribute the major part to the economy and daily life in Butwal.

Butwal is often called an industrial municipality. There is an industrial estate in the south-eastern part of the municipality, where nearly 200 factories are operating. Plastic ware, galvanized iron-sheeting, metalware, textiles, fruit beverages, plywood and furniture are some major products manufactured in Butwal. About 20 percent of Butwal's population is employed in the industrial sector. There are around 2000 shops, about 50 hotels and 250 restaurant across Butwal. Nearly 25 percent of the total population is employed in the trading sector (MLD, 2012). The transport industry also plays small but important roles in advancing the urban industrial economy of the municipality.
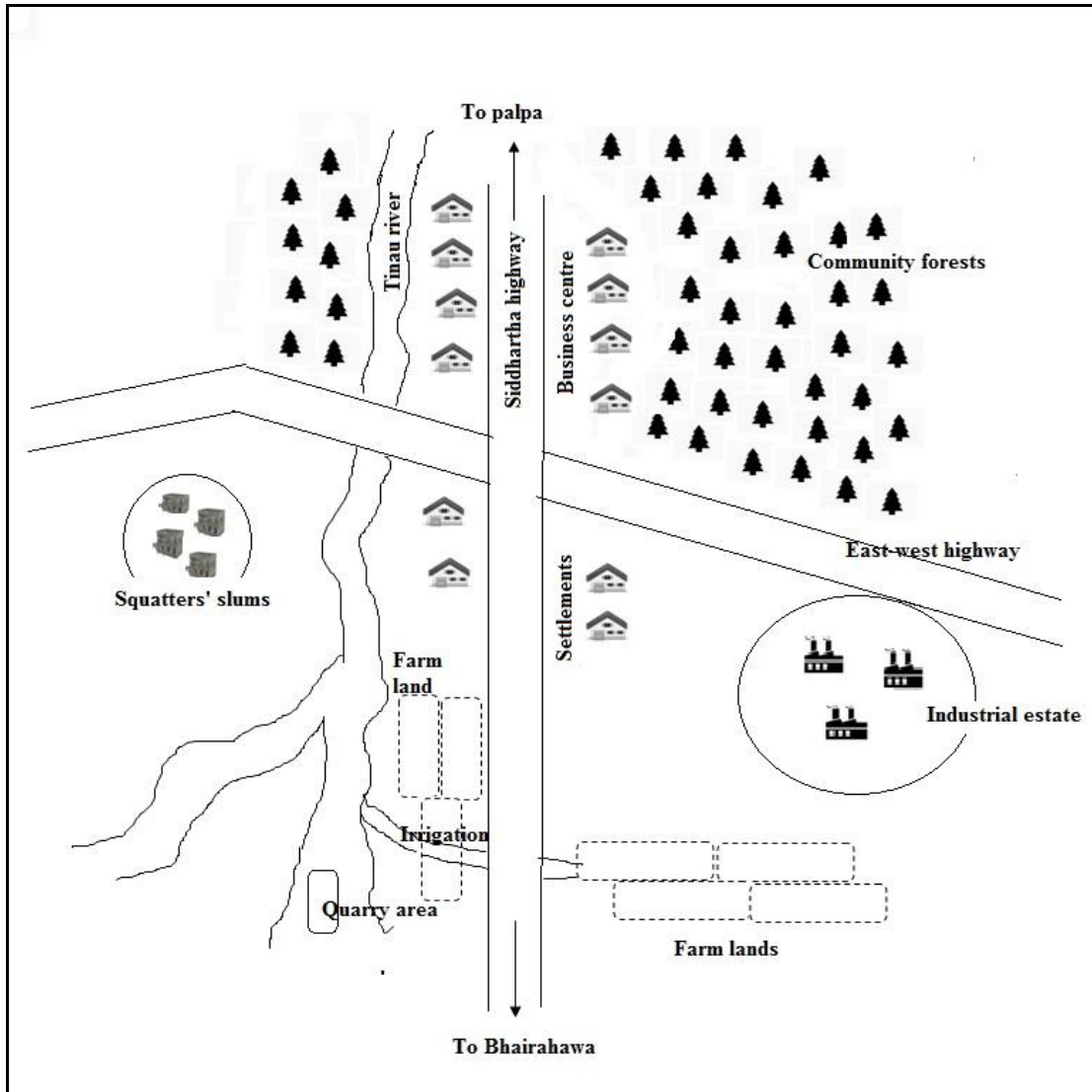
Map 6.5: Sketch map of different land-uses in Butwal (Source: Focus group discussion in Butwal in 2011)

Agriculture is another sector that contributes substantially to the Butwal economy.

Nearly 30 percent of the population is engaged in agriculture and livestock farming. These

farmers are mostly in the northern and southern parts of Butwal. Maize, paddy, wheat and

mustard oilseed are their major crops. Kitchen garden is common in the northern and

southern parts. People use water from the Tinau River for three main purposes drinking water,

irrigation and electricity. The main source of drinking water for Butwal is the Tinau River

and its tributaries that originate from the Siwalik. Butwal has been using the water of the

Tinau from a water supply system built in the 1940s and later renovated in 1960s (Poudel,

2012). The river is also a source of irrigation for the farm lands in the southern part of

Butwal. The farmers have a history of more than 175 years use of the of community

irrigation system. There are two major irrigation systems, namely Sorha mouja (16

settlements) and Chhattis mauja (36 settlements) channels. These irrigation systems were

originally developed by the indigenous Tharu community (Poudel, 2012). Both irrigation

systems were later expanded and are still in operation, covering more than 5000 ha of the

communal area (Poudel, 2012).

Excavation of sand, boulders and pebbles is common in the Tinau River in the south

of Butwal. The District Development Committee and District Forest Office issue permits to

contractors for collecting these materials from the river. Some of the excavated materials are

sold to Butwal and Bhairahawa, while most of these items are exported to the bordering

Indian state of Uttar Pradesh. This excavation contravenes the interests of environmental

lobby groups who think that it damages the natural flow of the river. Local people and these

environmental lobby groups in Butwal have protested against the excavation at times, but the

activity continues despite those protests. The effects of excavation in the Tinau have been

reported as being disastrous in the area to the south of Butwal. A recent report in a daily

newspaper attributes seveal disasters to the excavation activities:

> Just three years ago, the flood in the Tinau River broke a 370-meter embankment, which was
> built at a cost of over 25 millions, sweeping away as many as six houses in Buddhanagar area
> of Butwal. ...[M]ining of stone-gravel continues along the Tinau River. Local contractors obtain
> periodic licenses from the District Development Committee (DDC) of Rupandehi to extract
> stones-gravels. But, they often go beyond the limit set by the Rupandehi DDC. As the
> haphazard stone-gravel mining continues, the DDC officials have turned a blind eye to it
> (Republica, 2014b:06/02/2014)

Nearly 50,000 people from across the country pass through Butwal every day. About five percent of them visit Butwal for tourism purposes. Some historical sites such as the remains of the royal palace of the Sen dynasty and some newly-built parks in the forest area attract tourists. Siddhababa temple on the northern side of Butwal is another religious place where hundreds of internal and external tourists visit every day. Students from the neighbouring hilly region come to Butwal to obtain a higher education. There are 26 primary schools, 23 secondary schools, six technical institutes and five university campuses (MLD, 2012). About 25 percent of the municipal population, called sukumbasi (landless squatters), live in slums. These people are mostly unemployed and make their living through the informal sector, such as occasional wage labour, tricycle pulling, illegal sand and gravel collection and so on. The slum dwellers agitate time and again demanding permanent and legal settlements (Butwal Municipality, 2012) .

Environmental awareness activism is also a part of the Buwal socio-natural system. Local environmental NGOs, Butwal Municipality, media people, women's groups and businesspersons are engaged in these activities. The NGOs are mainly involved in 'environmental awareness' campaigns, about issus such as the environmental effects of open defecation in the river system, the need for conserving forests on the banks of the river, coordination among different stakeholders and agencies, and the need for proper management of human settlements considering the Tinau ecosystems. Butwal Municipality has coordinated with central government agencies, such as the Department of Water-Induced Disaster Prevention to control floods and soil erosion from the Tinau. In some areas, the banks of the Tinau have been planted with bamboo. Local FM radio stations and newspaper also transmit news and views about the protection of the Tinau environment.

Forestry makes up a substantial part of the livelihoods of the people living in northern Butwal. They collect logs, fuel-wood, fodder and leaf-litter from nearby forests. They keep livestock such as buffalos, cows and goats. The dominant tree species is the Sal (*Shorea robusta*). Nearly 80 percent of the trees in the forests of Butwal are sal. Like in Dobhan, these people are involved in community forestry activities. There are altogether 9 community forests in and around Butwal. These 9 groups have created an informal network for coordinating actions related to forest and watershed activities. I selected two community forests, Chure Community Forest and Laxmi Adarsha Community Forest as samples for this study in order to understand their spatial practice in detail. These two forests adjoin each other (Figure 6.2).

Chure community forest and its user group

The total area of Chure forest is 199.5 ha. There are 1350 households from ward number 5 of Butwal municipality involved in the CFUG. The forest was officially handed over to the local community in 1997 pursuant to the Forest Act of 1993. Nearly 70 per cent of the households which are members of the CFUG are subsistence farmers. The other 30 per cent are employed in the industrial sector, in trading centres, government offices, in education and other service sectors. The CFUG restricts grazing inside the forest but farmers can collect fodder from the forest. Nearly 80 per cent of the people use LPG as household energy for cooking and heating; the remaining 20 per cent still use fuel-wood. Those households which need fuel-wood are listed in the register of the CFUG and are allowed to collect fuel-wood for their household use, but not for commercial purposes. The CFUG sells logs to outsiders in an open bidding process and deposit the money in the CFUG fund.

Some local environmental NGOs also conduct activities in this CF. These NGOs help the CFUG in conducting meetings, assemblies and participatory decision making processes. Environmental activism, such as a campaign against open defecation, a campaign for the proper management of municipal wastes and a campaign for clean drinking water, is also a part of CFUG activities in coordination with the NGOs. The CFUG has banned any kind of quarrying operations within its CF. They have built a fence around the CF on the side of the Siddhartha Highway to regulate entry into the forest.

Figure 6.2: Community forest areas photographed from Tinau river bridge in Butwal (Source: Author, 2011)

Laxmi Adharsha

The Laxmi Adarsha Community Forest also lies in northern Butwal. The members of this CFUG come from ward number 6,7, and 8 of Butwal municipality. The total area of the forest is 259.5 ha. There are 400 households included in its user group. The forest was handed over to the local group in 1997. Nearly 60 percent of the households are involved in agriculture and livestock rearing. They collect fodder and grass from the forest to feed their domestic animals. The other 40 per cent are employed in several different sectors. Nearly 25 per cent of the households use fuel wood as energy for heating and cooking. There is some conflict between households over the ways in which the forest products are used. Those households which use fuel-wood for energy and fodder for their livestock demand access to the forests for subsistence use within the CFUG . The relatively better-off households which depend on electricity and LPG for household energy want to keep the forests for aesthetic purposes or to sell the timber at a higher price to boost the group's income. Negotiation takes place in their general assembly or executive committee meetings. In order to meet the demand of the households which need forest products for their livelihoods, the group decided to open up the forests once a fortnight and the households collect fuel-wood during this time.

The CFUG has constructed its own office building within the boundary of the CF. The building is used for CFUG office purposes and conducting meetings and workshops. Some of the economically poor households of the CFUGs have been allowed to cultivate non-timber forest crops such as grasses, bamboo and broom grass within the CF area for income generation and livelihood support. Logs from the forest are sold outside the CFUG in an open bidding process. This CFUG also charges entry fees to outsiders for visiting their CF.

The daily life of people in Butwal is conducted in an urban industrial economy combined with agriculture, forestry and tourism. Collective actions in forestry and other environmental activities are common in the peripheral area. People directly depend on and are also depended on by the socio-natural systems of Palpa and Bhairahwa in their everyday life and practices. The Tinau River along with the Siddartha Highway plays an important role in shaping the lives of the Butwal socio-natural system that also interacts with those of Palpa and Bhairahawa.

6.3 Spatial practice in Bhairahwa

Bhairahawa was declared a municipality in the early 1970s. Its official name is 'Siddharthanagar municipality', but local people call it 'Bhairahawa' more often than its official name. The population of the municipality is nearly 50,000 with around 8000 households (MLD, 2012). Unlike Butwal, the annual rate of population growth is only 2.4 percent, almost the same as the national average. It is the administrative headquarters of Rupandehi district. All the district level government offices of Rupandehi, such as the District Forest Office, the District Soil Conservation Office, the District Agriculture Office and the District Administration Office are situated in this municipality. It does not have a separate industrial estate like Butwal, but there are around 50 manufacturing industries scattered across the town. The middle part of the town is a trading centre. There are nearly 1500 shops and about 100 small and large hotels operating there. Nearly 70 percent of the population live from agriculture, while 30 percent of the population is engaged in shopkeeping, commerce and industrial employment. There are 30 primary schools, 10 secondary schools, two technical institutes and two university campuses. There are two public hospitals. Bhairahawa is connected with Butwal to the north and Sunauli (a border city) to the south by the Siddhartha Highway (Map 6.6). One highway goes to Kapilvastu,

west through Lumbini, the birth place of Lord Budhha. The Tinau River has been a source of income for some families, especially for labourers and gravel contractors. The gravel and sand collected from the Tinau are exported to nearby Uttar Pradesh state in India.

Bhairahawa is a 'gateway' to Lumbini, the birthplace of Lord Buddha (MLD, 2012). It has a domestic airport, and there are plans to develop it into a 'regional airport' of South Asia. Nearly 70 per cent of the population are members of the Madhesi community, while 30 per cent are migrants from the hill areas. Bhairahawa and its surrounding villages are considered a part of 'Madhesh'.
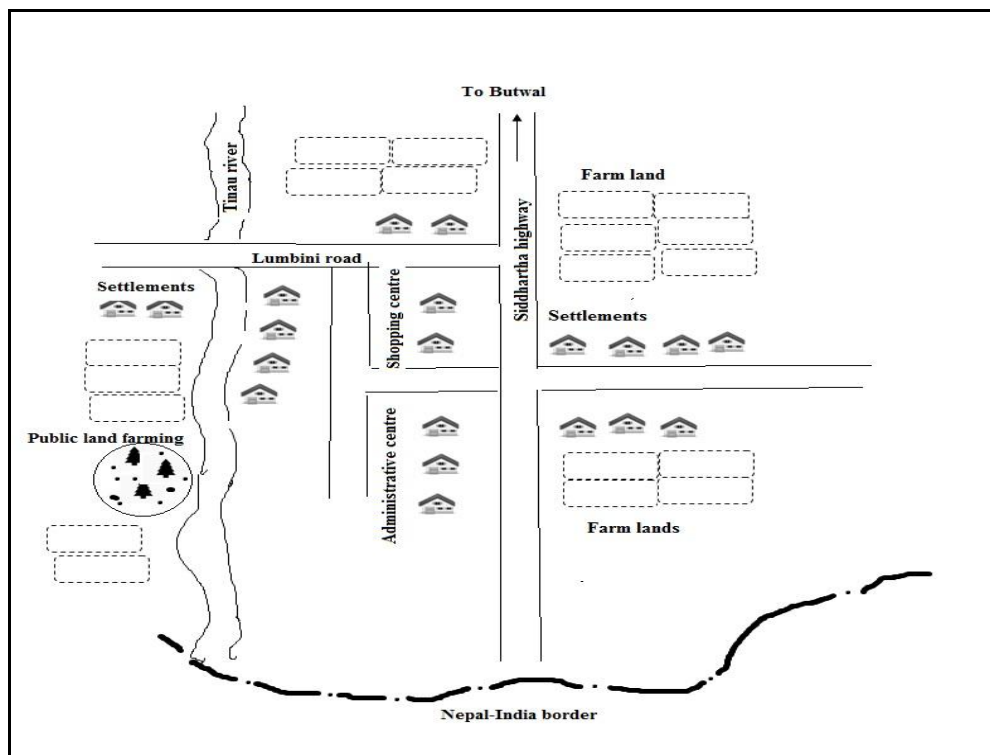
Map 6.6: Sketch map of different land-uses in Bhairahawa (Source: Focus group discussion in Bhairahawa in 2011)

Although Bhairahawa has been officially declared a 'municipality' or 'city', it is semi-urban. Its periphery resembles more a rural than an urban area and has an agrarian economy. The major agricultural crops produced in the area are rice, wheat, mustard oilseed and lentils. The peri-urban households keep a large number of cattle, such as buffalos and cows. Goat

keeping is also common. Lift irrigation activities by individual farmers are common in and around Bhairahwa. A large-scale lift irrigation project, the Marchawar Lift Irrigation, covering nearly 6000 ha of command area is also in operation in the west of Bhairahawa. Likewise, the Bhairahawa-Lumbini Ground-water Irrigation Project supplies irrigation to the farmlands east of Bhairahawa (Poudel, 2012). Some farmers have been organized into 'public land management groups'. They cultivate trees and agricultural crops on public land that was previously barren (Figure 6.3). These households are mostly landless or marginal landholders. Therefore, they support their livelihoods through these public land management activities.

Figure 6.3: Public land farmers near Bhairahawa working in their public agro-forestry farm
(Source: Livelihood and Forestry Programme)

People living in the villages west of Bhairahawa are organized into a Collaborative Forest Management Group. Their collaborative forest lies some 20 km north from Bhairahawa along the east-west highway. There is only one collaborative forest in the

district. It is managed by a collaboration between the local people, the District Forest Office and the local government (mainly village development committees and district development committee). The total area of the forest is 1200 ha, but its users number 25,000. The revenue from the forest is distributed among the collaborative forest user group, local governments and the Department of Forests. Unlike in the community forests, where only households close to the forest are included in the CFUG, this collaborative forest user group involves as many households as are interested in the district regardless of the distance of their households from the forest.

Bhairahawa lies in the border area between Nepal and India, therefore thousands of people travel to and from Bhairahawa every day. People of Bhairahwa and surrounding area travel to Sunauli, the border trading centre on the Indian side to buy various household items such as sugar, salt, soap and cloth. Likewise, the people on the Indian side also visit Bhairahawa in order to purchase Nepalese products and Chinese items. Aggregate, pebbles and sand excavated in the Tinau River are transported through Bhairahwa to India every day. About 500 trucks are used to transport these materialsand nearly 7000 people are directly or indirectly employed in this quarry business. Flooding is a chronic problem. Embankments, bamboo plantations and check dams are some common remedial activities practised along the banks of the Tinau River to control flooding in the areas surrounding Bhairahwa.

The everyday life of people in Bhairahawa is characterised by an urban and administrative setting in the centre and a rural agrarian economy in the periphery. On the one hand, the urban system is connected to Butwal and Palpa to the north, and the formal and informal border economy is found to the south. The economy is also influenced by tourism in Lumbini. Major collective activities are conducted in collaborative forestry and public land management in which the people living in the west of Bhairaha are mainly engaged.

6.4 Links and flows of socio-natural systems in the Tinau watershed

The three places in the Tinau watershed--Dobhan, Butwal and Bhairahawa--are spatially connected through the routes and networks of people's movement and commodity flows (Figure 6.4). Forestry, agriculture, agro-forestry, highways and other routes, industrial estates, administrative centres, settlements, trading centres and the riverine areas are the spatial arrangements that are connected through the networks of people and products across the watershed.

As it has been described earlier, Dobhan village has a forest-based economy. Logs, fuel-wood, broom grass and medicinal herbs are sold from the community forests in Dobhan and brought to Butwal and Bhairahawa. Vegetables and poultry are also produced in this village and transported to the southern municipalities. Drinking water is siphoned off from Chidiya creek to Butwal for everyday use. Surplus dairy products, particularly milk from households, are collected in Dobhan and sold in Butwal. Some people commute to Butwal and Bhairahawa for employment, commercial activities and education every day. The forest products, agricultural produce and people thus move from the socio-natural system of Dobhan to those of Butwal and Bhairahawa.

Butwal generates manufactured products, agricultural produce and forest products. These items are consumed in Butwal but also flow to Dobhan and Bhairahawa. Some raw materials derived from Dobhan are processed in Butwal and redirected to Dobhan and
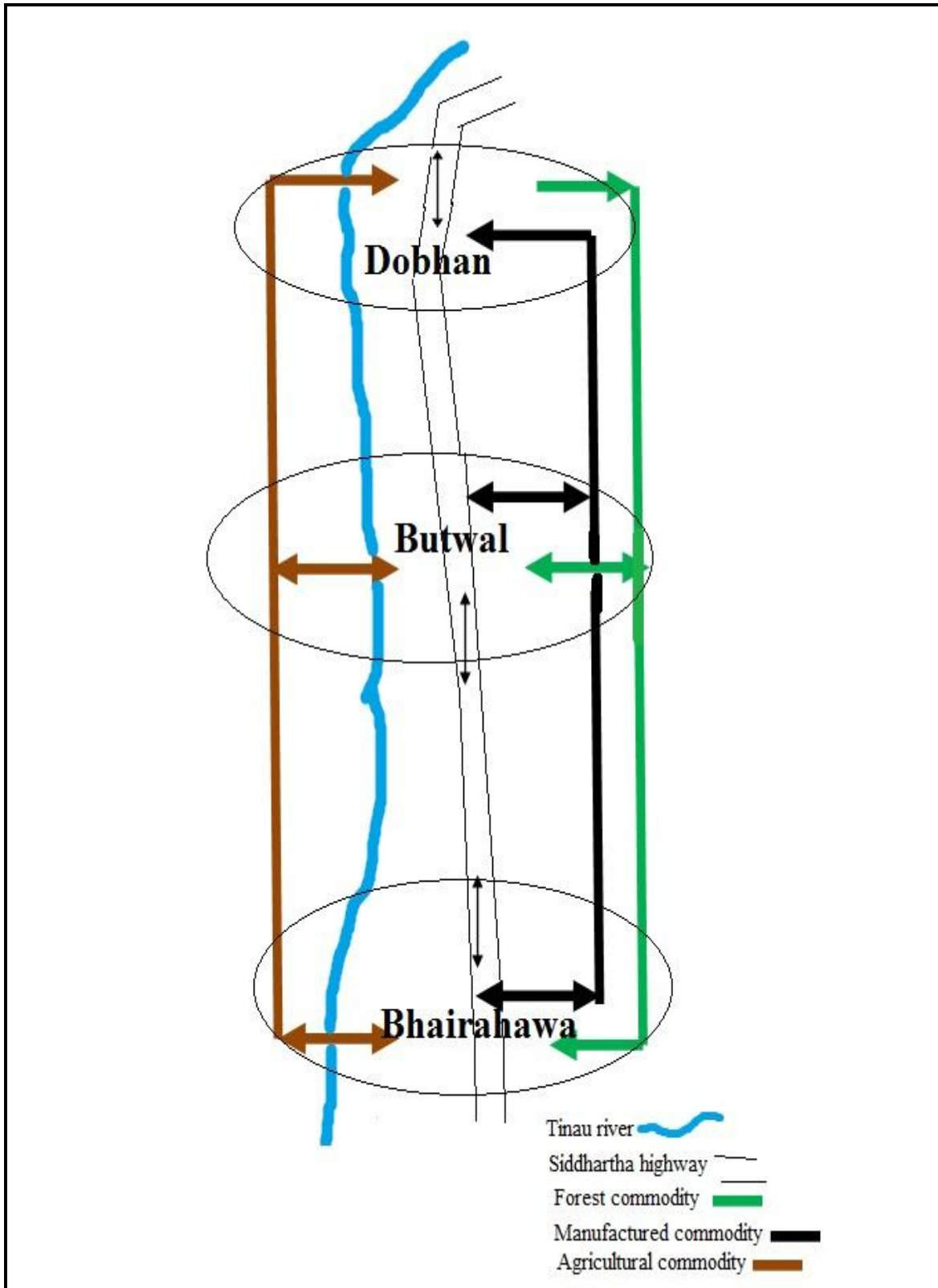
Figure 6.4: A conceptual diagram of people's movement and commodity flows in the Tinau watershed (Source: Author)

Bhairahwa. For example, the logs bought from Dobhan are sawn up and made into furniture in Butwal and subsequently sold to Dobhan and Bhairahawa. The community forest groups in Butwal sell logs directly to Bhairahawa. Some people in Butwal move to Dobhan for business, while they move to Bhairahawa for education, business and employment every day. Thus the people and products flow from the socio-natural system in Butwal to those of both Dobhan and Bhairahawa.

The socio-natural system of Bhairahawa also interacts with those of Butwal and Dobhan through commodity flows and the movement of people. It generates agricultural commodities in particular, which are also used in Butwal and Dobhan. Similarly, it also performs in the border economy through the importation of finished products and the export of raw materials and Chinese items. Those imported finished products flow to Butwal and Dobhan. Tourism is another area in Bhairahawa that connects it with Butwal. Thus the three places are connected in both ways, socially, economically and ecologically over the watershed through people's everyday practices.

6.5 Conclusion

The spatial practice in the Tinau watershed suggests that it has several interacting socio-natural systems created by people through their collective and individual actions. The people perceive three spatial entities--Dobhan, Butwal and Bhairahawa-- as ecosystems that form a vital space for their livelihoods and spatial practices. Their own mapping of the flows shows how they see them as interlinked socio-natural ecosystems. The watershed is a large system containing the spatial arrangements of forests, agro-forests, mountains, riverine areas, human settlements, trading centres and industrial areas connected through the networks of people's movements and commodity flows. He forest ecosystem in the Siwalik is an important but only small component of the large watershed system. What becomes evident from

understanding the spatial practice is that despite their location at different points along the river, the people do not see their activities in the watershed as 'upstream' and 'downstream'. The two-way flows of commodities produced in different socio-natural ecosystems over the watershed pose a serious question about the concept of 'unidirectional' flow of ecosystem services from the upland Siwalik to the lowland Terai.

In this chapter, I have examined and described how different social groups produce and understand the ecosystems as interacting socio-natural systems over a watershed through their daily lives or spatial practice. In the following chapter , I discuss how the dominant epistemic communities, such as the government departments, international NGOs and local government have 'conceptualized' or 'represented' the Tinau watershed in their policies, programmes and practices.

Chapter 7: Representations of the Tinau Watershed

Three decades ago, an evaluation document jointly prepared by expatriate and Nepalese experts on behalf of the then Tinau Watershed Project recapitulated that the project aimed to :

> [D]evise, test, implement, extend and evaluate a strategy to slow down, halt and, if possible, to reverse the economic and ecological decline in the Tinau watershed, and to develop the experience, skills and expertise required to deal with the problems of economic and ecological degradation in the hills of Nepal on a broader basis (Baumgartner et al., 1985:5).

The Tinau Watershed Project started in Palpa district in 1979, supported by the Government of Switzerland and the Federal Republic of Germany. The project area covered 22 village development committees (which were then called Village Panchayats) in Palpa district. As its name suggests, the project aimed to tackle the 'economic and ecological' degradation in the Tinau watershed as a whole. However, in reality, it was limited to just 22 villages in Palpa. These 22 villages in the hilly area were assumed to represent the whole watershed. The project documents did not provide any justification for why it selected only the villages in Palpa for the Tinau watershed. There may have been two reasons for limiting the boundary of the project. The first is that the lowland areas were simply not defined as part of the watershed. A second reason could be an assumption that targeting the hilly region would automatically yield positive flow-down effects for the lowland areas. It is likely that the latter assumption prevailed, because it reflects the arguments presented in the prevailing theories about 'Himalayan degradation'.

The Tinau watershed project was terminated in the early 1990s. However, the representation of the watershed conceptualized by this project has continued, albeit in a new form of 'upstream-downstream linkage' and the flow of 'ecosystem services' from the Siwalik to the Terai. This representation has become a powerful tool used by government agencies,

international NGOs and donor-funded projects to justify their environmental actions in the Siwalik for the supposed benefits to the Terai. The representations of the Tinau watershed as a set of upstream ecosystems in policies, programmes and actions of these powerful entities have implications for the reshaping of the ecological, economic and social relationships between people and communities in this space.

In this Chapter, I elaborate on how the Tinau watershed has been represented or conceptualized in the policies, programmes and environmental schemes of powerful entities. I focus on the representations of 'watershed' produced by three constellations of epistemic communities:1) government agencies; 2) bilateral aid agencies and INGOs; and 3) local NGOs. I examine the discourses that they use in representing the Tinau watershed as a hill-centred ecosystem through various plans and schemes developed for the management of the Tinau watershed. The chapter concludes by highlighting the contradictions between the spatial practice and the representations of the Tinau watershed.

7.1 Epistemic communities and representations

There are at least three major constellations of epistemic communities that have conceptualized the Tinau watershed in three different forms or 'representations'. The epistemic communities, however, are not static entities, but flexible alliances of people or social groups with similar positions in defining the boundary of watershed space and the ways in which the socio-natural ecosystems in the watershed are managed. The first constellation involves agencies of the Government of Nepal, particularly the Ministry of Forests and Soil Conservation, its subsidiary departments and district level organizations. Forestry and soil conservation officers, service-providing experts, engineering technicians and planners working for the government bureaucracy make up this epistemic community. The second epistemic community is made up of bilateral aid agencies and conservation

INGOs working in Nepal. They have adopted an international wave of payment-based ecosystem management as a tool to exercise their power over the local and regional natural resources. The third constellation is made up of local NGOs particularly those based in Butwal. The NGO community has also gained support from Butwal municipality and local journalists. Other interest groups, such as the Madhesi community in Bhairahawa and community forestry user groups have either provided support or opposed the three broader epistemic communities, depending on their interests and the issues important to them.

7.1.1 Government representations

The government epistemic community often claims to take into account the 'scientific' definition of the watershed boundary as the basis for its management. This community broadly defines a watershed as 'the area of land where all of the water that is under it or drains off of it goes into the same' body of water, such as a river (USEPA, 2014:1). According to this view, the watershed is a fixed geographic location with a permanent boundary. In line with this perspective, the government agencies have classified 51 major sub-watersheds in Rupandehi district including that of the Tinau (DFCCR, 2009). In this classification, the Tinau watershed is represented in the metaphor of 'upstream-downstream' in which only the upstream is considered important to be conserved for the supposed benefits to the downstream. Consequently, only the upland area in the Siwalik is taken into consideration as though only it were the watershed, and not the part in the Terai, which is simply regarded as being part of the 'downstream' . Map 7.1 drawn by an expert influenced by this government conceptualization is an example of how the Tinau watershed is delineated as lying only in the Siwalik region where the southernmost part lies in Butwal, thus ignoring the whole Terai.
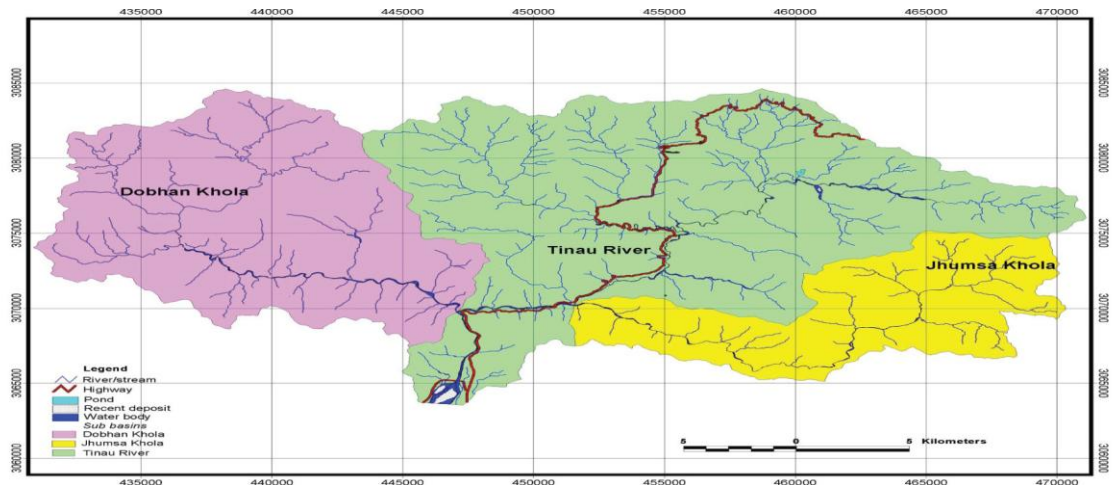
Map 7.1: The boundary of the Tinau watershed conceptualised by experts in line with government policies (Source: Poudel, 2012:24).

The representation of the Tinau watershed as an upland Siwalik area is connected to a series of government policies and actions that aim to protect the watershed in the 'upstream' hilly area of the Siwalik so that the Terai areas can derive environmental benefits. This representation depicts the Siwalik as an *ecological frontier* and the Terai as a *socio-economic frontier*. The former needs to be cared for and conserved so that the latter can be adopted as a space for economic growth.

Government representations of the Tinau watershed are reflected in three programmes: community forestry, Churia Area Conservation Strategy (CAPS) and President Siwalik Conservation Programme. While the whole upland Siwalik was to be conserved, the first government attempt to impose its authority was through the community forestry programme. Although community forests are meant to be managed by the local community, the active role of the technical forestry officials in guiding the plan and practice is officially authorized and enforced. Each community forest is mapped with GPS coordinates in the operational plan and then the map is compartmentalized into different blocks. For example, the Arghachhap community forest and Bhutkhola community forest (discussed in Chapter 6) each has five

blocks in its plan. The community forestry users schedule their silvicultural operations in the blocks assigned in the plan instead of in the whole forest area at one time. The forest rangers estimate the 'growing stock' per block in terms of the species, number of trees and total volume. Based on the growing stock and 'mean annual increment', they prescribe the 'annual allowable cut', which is the total volume of the logs to be harvested from the given block per year. Each community forest has also set aside a block for 'biodiversity and watershed conservation', where no harvest is undertaken at all (DFOP, 2010, 2011). The emphasis of the government in conserving the Siwalik through community forestry alludes to its emphasis on the upstream area of the Tinau watershed. The community forestry thus simply becomes one of the vehicles by which the government imposes its representations of the Tinau watershed as 'upstream'.

The upstream-downstream linkage is also articulated in the government's Chure Area Programme Strategy (CAPS). This strategy represents the entire Siwalik hills as upstream and the entire Terai as downstream (GON, 2008). This strategy highlights the cause and effect relationship between the ecological conditions of the Siwalik and the human lives and property in Terai. The prosperity or poverty of the Terai is assumed to be in direct correlation with the conservation or degradation of the Siwalik ecosystems. Thus, this strategy also provides a broader framework for the government's representations of the Tinau watershed in terms of an 'upstream-downstream' linkage.

The President Siwalik Conservation Programme is the most recent effort that also reflects the government representations of the Tinau watershed through the lens of upstream-downstream. This programme highlights the values of the Siwalik ecosystems to the survival of the Terai (GON, 2012). Since it is an overarching program implemented across the Siwalik, the conservation actions are imposed throughout the region including the Tinau

watershed. Through this programme, the government requires that the community forests in the Siwalik limit their tree harvest to a minimum and mention the provision of the Siwalik Programme in their operational plans.

The District Forest Office Palpa and Rupadendehi revised the operational plans of the community forests lying in the Siwalik to bring them in line with the watershed conservation agenda of the President Siwalik Programme. More recently, under the programme, the government declared the entire Siwalik region in the country as an 'Environment Conservation Zone' and established a high level ' Rastrapati Chure-Tarai Madhes Conservation Development Committee ' to oversee the programme (Shahi, 2014). As the name suggests, the programme indirectly considers the upstream-downstream concept through 'Chure-Terai Madhes' in which the fate of the 'Terai' or 'Madhes' is linked with the ecological condition of the Siwalik. Along with the declaration of the 'Environment Conservation Zone', the government has prohibited 'all activities amounting to deforestation, wildlife loss, and excavation of minerals, sand and boulders' in the Siwalik (Shahi, 2014:6).

The government representations of the Tinau watershed are mainly characterised by the binary concept of the Siwalik and the Terai which is exhibited in the form of 'upstream-downstream'. The watershed is reduced to upstream, categorizing the Terai as simply downstream to be used as a space for economic growth and exploitation. The government has imposed its representations mainly through community forestry, CAPS and PSCP.

7.1.2 INGOs and bilateral agencies' representations

The government's emphasis on the territorialisation of the Siwalik and the Terai into 'upstream' and 'downstream' has laid the foundation for international NGOs and bilateral donor agencies to conceptualize the Siwalik as a source of ecosystem services. These

agencies have used the government categories and programmes as a vehicle to represent the upstream and downstream through the lense of ecosystem services. In this representation of the watershed, the upland is abstracted as an upstream 'forest ecosystem' generating various 'ecosystem services' and the lowland is presented simply as the 'downstream' recipient of those services. The government considers the Siwalik as an upstream ecosystem, but it does not clearly articulate those ecosystems in terms of 'services'. The INGOs and donor agencies, however, consider the ecosystems as a set of 'services' available for the downstream. These agencies draw on the government's representations of community forestry, and echoing the government's metaphor, categorize upstream-downstream and Siwalik conservation efforts by overlaying the international ideas of 'ecosystem services' and 'payment for ecosystem services' in order to represent the watershed.

Figure 7.1 is a conceptual diagram developed by the International Centre for Integrated Mountain Development (ICIMOD) to conceptualize the PES mechanism in an upstream-downstream context. In this scheme, the upland area is presented as upstream with the 'forest' ecosystem providing the flow of 'ecosystem services' to the lowland area or 'downstream'. Parallel to the flow of the river, the flow of the ecosystem services is conceived as unidirectional from the upland to lowland. The town in the lowland, on the other hand, is paying the upland forest managers for the ecosystem services. Various other INGOs including WWF Nepal, IUCN Nepal and CARE Nepal have followed this model in order to initiate PES projects in various parts of the country (ICIMOD, 2013; Khanal & Paudel, 2012; UNDP Nepal, 2014b). Piloting PES by paying the upland community forestry user groups on behalf of the 'service' recipients is the usual practice initiated in PES (ANSAB, 2013).

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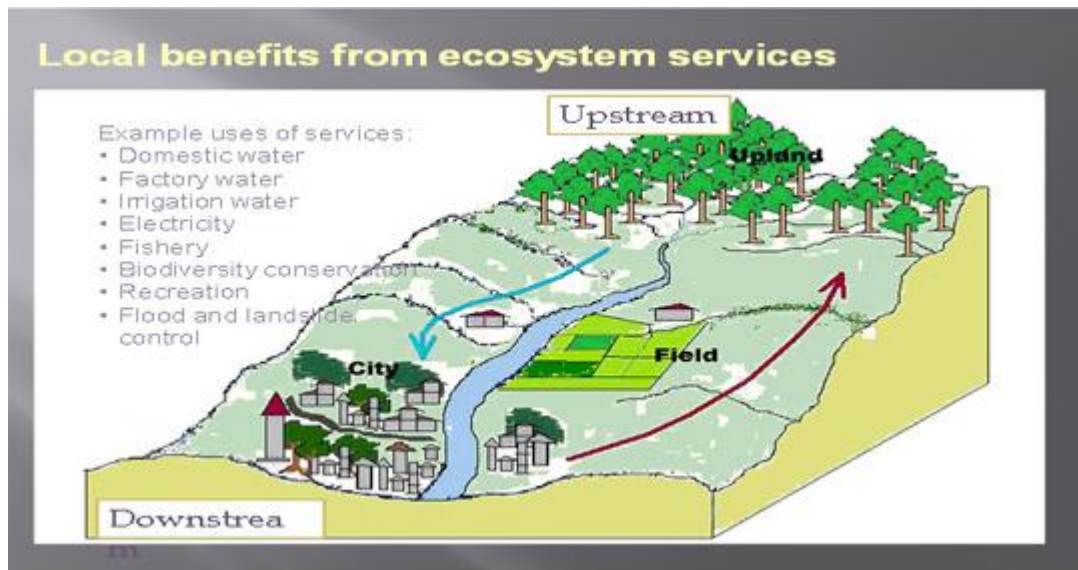
Figure 7.1: Conceptual diagram of PES developed in Nepal (Source: ICIMOD, 2013:1).

The map in Figure 7.2 is a general model adopted by the INGOs working in the environment sector in Nepal. In the particular context of the Tinau watershed, the DFID-funded Livelihood and Forestry Programme (LFP) compartmentalized the whole Rupandehi district into three blocks, which is tantamount to representing it as 'upstream' and ' downstream'. The upland Siwalik is highlighted as the forested area and the downstream is divided into two parts -- middle and southern (Map 7.2).

The project has emphasized upstream-downstream, ecosystem services and PES as crucial tools for watershed conservation, sustainable forest management and biodiversity conservation in the district which includes the Tinau watershed. In order to achieve these environmental missions, LFP envisioned it would 'encourage payment for ecosystem services underpinned by the concept of upstream watershed and downstream area' (DFCCR, 2009:18). Under its environmental strategy, LFP also emphasized the initiation of 'payment for ecosystem services at local, national and international level' and promised that it would

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'promote the PES-related studies and practices' founded on the upstream-downstream concept in the district (DFCCR, 2009:15).
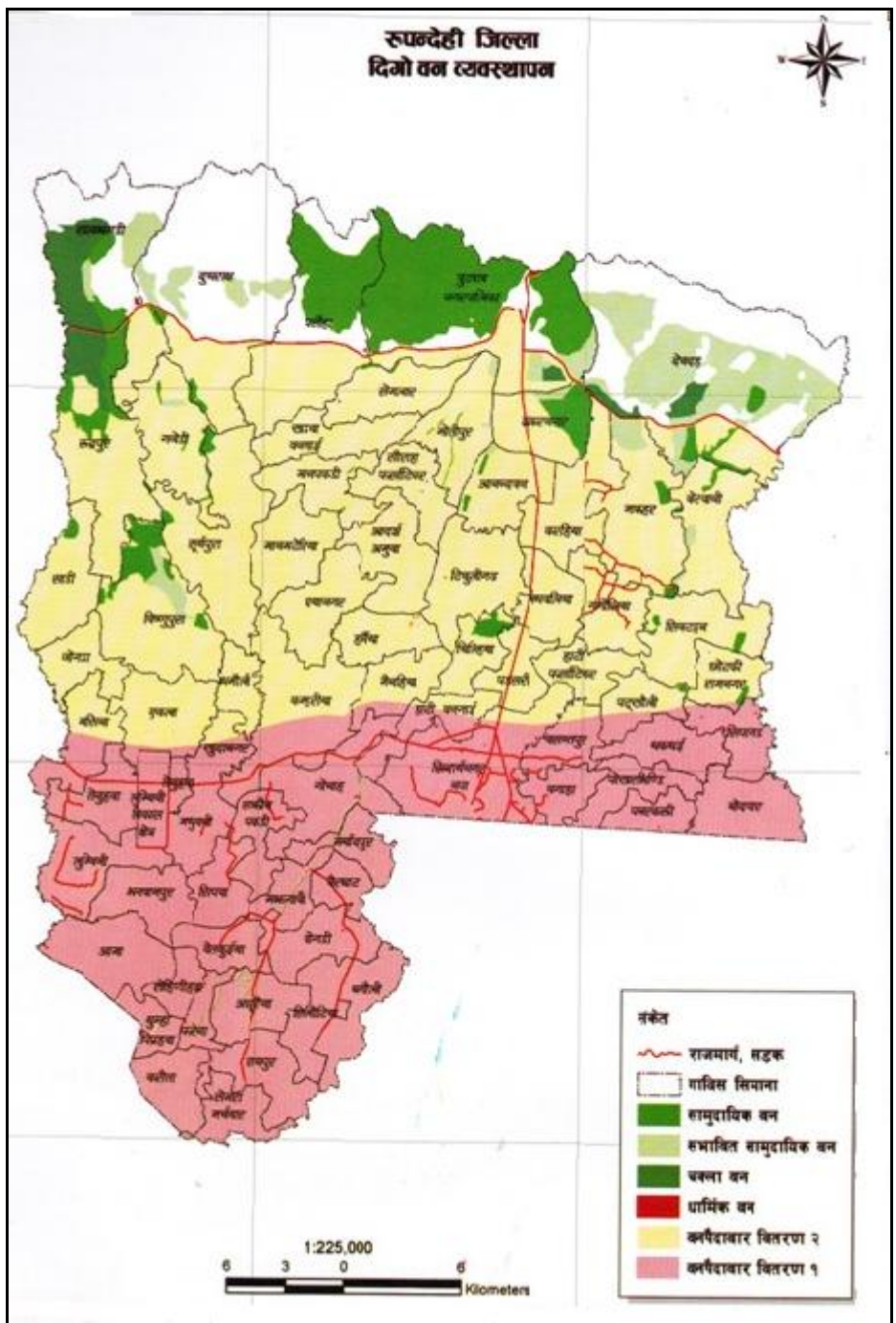
Map 7.2: Compartmentalization of the Tinau watershed in terms of 'ecosystem services'

(Source: DFCCR, 2009:14, published in Nepali)

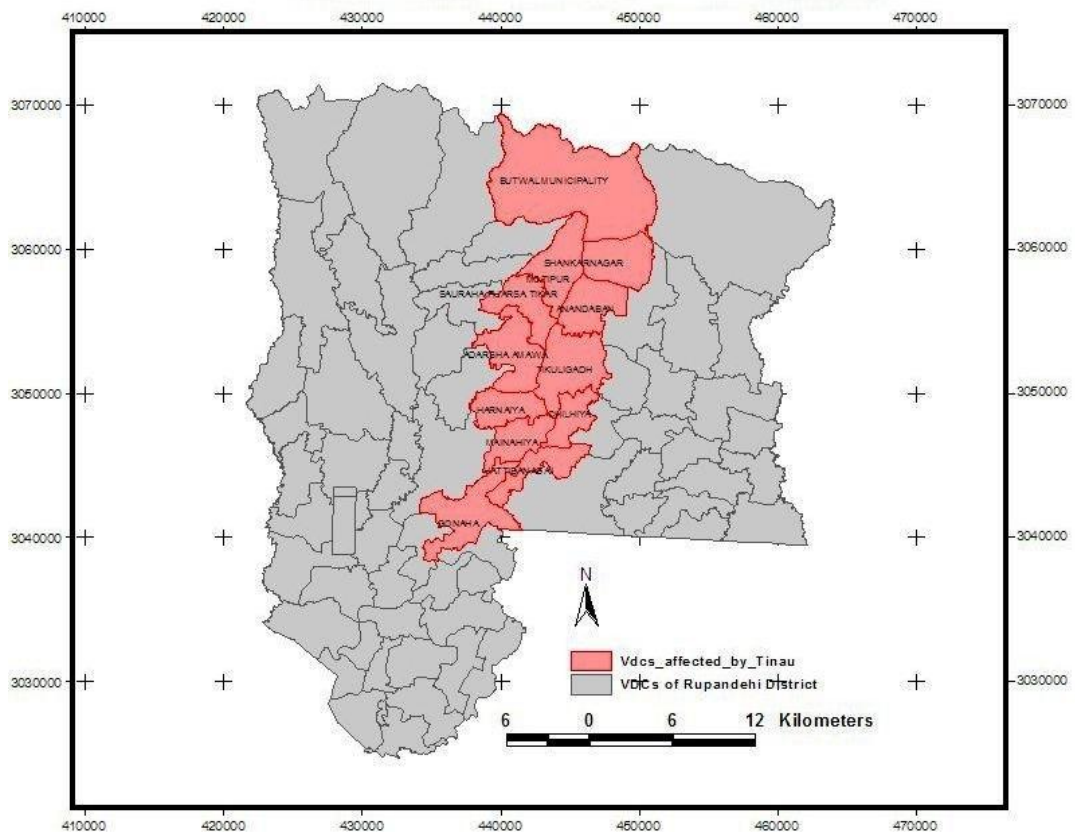The representations of the Tinau watershed by INGOs and donor agencies have been influenced by the neoliberal concept of commodifying and monetizing watershed ecosystems. These agencies invoke sustainable watershed management by introducing payment for upstream forest conservation. On the one hand, they utilize existing community forest user groups in the upland as viable institutions that are able to produce ecosystem services from forests. On the other hand, they employ the concept of upstream-downstream by conceptualizing the lowland as a potential buyer of these services. The INGO representations thus become a modified version of community forestry and upstream-downstream relations within the international debates of ecosystem services and their payment.

7.1.3 Local NGOs representations

The local NGOs particularly those based in Butwal have been active in defining the Tinau watershed in different ways . Instead of using terminology such as 'watershed' or 'ecosystem services', they interpret and refer to the Tinau river ecosystem as the 'Tinau corridor'. A Butwal-based NGO, Indreni Rural Development Centre took the lead in developing a 'Tinau Corridor Master Plan' in consultation with other local NGOs, environmentalists, local media persons and municipality officers. For this Master Plan, they developed the map provided in Map 7.3. The area shaded pink is the area fo which the Master Plan has proposed several environmental activities to be implemented for the river and its corridor conservation and development.

This representation considers the banks of the Tinau river in the section from Butwal to Bhairahwa as the most important part to be managed. Instead of undertaking a hydrological survey and producing a map, this group has taken into account the boundaries of the adjoining 'village development committees' and two municipalities on the banks of the Tinau

river as the area for intervention. The boundary of the watershed within this conceptualization

merges with the boundaries of the local government units that intersect the Tinau river from

Butwal in the north to Bhairahawa in the south. The selection of the boundaries of the local

government units was justified by the argument that these areas were 'most' affected by the

Tinau river (IRDC, 2009).

Map 7.3: NGO representation of the Tinau watershed (Source: IRDC, 2009)

The NGO representations of the Tinau watershed highlighted the middle reaches of

the river. What is interesting here is that the upland portion of the 22 villages in Palpa, that

were considered the most substantial part of the watershed in the government and INGO

representations, were excluded from the Tinau map. The villages lying in the south of

Bhairahawa were also not taken into consideration. This NGO epistemic community, thus, has further complicated the spatial relationships by interjecting the concept of 'midstream' in the Tinau watershed.

7.2 Contradictions of representations

The representations of the Tinau watershed by the three different epistemic communities have given rise to contradictions in understanding the boundary of the watershed and the scope for resource management that have generated political differences in the local communities. In government representations, the discussion is about one watershed but actually creates a divide between putting Siwalik against the Terai. The INGO representations are taking the divide and reinforcing the division within the watershed by setting up buyer-seller relationship. The local NGOs are introducing the category of 'midstream' and further complicating buyer-seller equation and the Siwalik-Terai divide.

The three powerful representations of the Tinau watershed have marginalized in particular the lowland community who could raise their voices for more equitable access to natural resources. These representations have also confined the scope of community forestry to technical calculations of ecosystem goods and services. The community forestry program, otherwise, could have potentially been developed as a space for accommodating the lowland community within the mainstream political process.

The interest groups within communities are thus further fragmented because they have no alternative political space to make their voices heard. They thus align themselves with one of these key players who control representations of the Tinau watershed. In this process, the community forestry user groups (CFUGs) in the Siwalik team up with the District Forest Office as long as the latter provides leverage to the CFUGs to exercise their

power to access to forest resources . The CFUGs also support the government's focus investing resources in the upland by which they are economically empowered. But at the same time, the CFUGs have confronted the central Government in connection with the President Siwalik Conservation Programme, which restricted tree harvesting in the entire Siwalik.

CFUGs have, to some extent, displayed an ambivalent position when it comes to the INGO conceptualization of the upstream-downstream, ecosystem services and PES. On the one hand, CFUGs have supported the idea of 'upstream-downstream' since it acknowledges the contribution of community forestry in enhancing forest resources. On the other hand, they disagree with the idea of conserving forests for more abstract benefits at the expense of the material use of the forests for their livelihoods. In regards to the NGO conceptualization of the Tinau watershed, the CFUGs were divided into two groups: the CFUGs in Palpa opposed the NGO Master Plan, while the CFUGs in Butwal supported it.

People from Bhairahawa oppose the government conception of community forestry, which, they claim, has excluded them entirely from 'community' participation in community forestry. programmes. However, they do support the government in President Siwalik Conservation Programme, which limits the economic activities in the Siwalik. They support the idea that community forestry is regulated by the government so that resources are available to lowland communities (Nightingale & Ojha, 2013; Satyal Pravat & Humphreys, 2013).   They also align with the District Forest Office in the 'District Forest Coordination Committee', which is a platform of district-level forestry stakeholders and recognizes . The platform recognizes the Madhesi community as a one of the key stakeholders in forest and watershed management in Ruapndehi district (DFCCR, 2009).   When it comes to INGO conception of the Tinau watershed, the Madhesi community has strong reservations over

valuing the forests in terms of more abstract benefits, such as watershed and carbon. They also strongly oppose the idea of payment for ecosystem services. This social group partly supports the NGO conception of the Tinau corridor since it highlights the need for river bank protection from flooding in the lowland Terai (IRDC, 2009).

The three dominant conceptions of the Tinau watershed have, thus, given rise to further conflicts among upland, midland and lowland communities.

7.3 Conclusion

The contradictions generated by the different representations of the epistemic communities - government agencies, INGOs and local NGOs in the Tinau watershed- not only generate conflicts but also draw attention to the primacy accorded by local communities to spatial practice. Their emphasis on spatial practice challenges the representations of the Siwalik-Terai, upstream-downstream and PES. The government representations highlight the community highlights the political notion of frontiers between the upland Siwalik and the lowland Terai. It does not, however, show the categories for monetary evaluation and payment schemes. The INGOs are injecting neoliberal ideas of commodifying nature by espousing the existing government policies of community forestry and upland-lowland division. They do not look at national or local priorities, but exercise their own 'developmentalist authority' (Nightingale & Ojha, 2013:38; Ojha et al., 2014:4) to impose international ideas of sustaining a watershed through generating its own money. The representations of the local NGO, which try to limit the watershed to an existence in between the upland and lowland, also stand at odds with the spatial practice performed in different locations of the watershed.

The different forms of representations discussed here suggest that the values and meanings of watershed ecosystems are defined by the government or 'experts', not by the people who perceive the effects of and live directly in the watershed ecosystems. Then, how does the primacy of spatial practice lead social groups from Dobhan, Butwal and Bhairahawa to negotiate and redefine the watershed and values of natural resources within it? I discuss these dimensions of the watershed in the next chapter.

Chapter 8: The Alternative Space of the Tinau Watershed

The Tinau River gives us water. We produce timber and fuel-wood from our forests. The forests supply water to the river. The people in the Terai excavate stones, pebbles, gravels and sand from the river. They also use the water from the Tinau for irrigation. We consume or sell the agricultural crops produced in the Terai. The people in Palpa and Rupandehi all depend on the Tinau iver for theirlivelihoods and economy (Mr Hari Bahadur Magar, a CFUG leader from Dobhan).

The people in Dobhan, Butwal and Bhairahawa are emotionally connected to the Tinau River and its watershed. The people are connected to one another through social relations, economic activities, employment and other livelihood requirements. The cooperation among them is key to sustaining life and livelihoods. But how this cooperation is strengthened depends completely on their own collective decisions rather than any externally imposed ideas (Mr Basu Devkota, a CFUG leader from Butwal).

We are very happy to work together with the community forestry user groups. We want timber and fuel-wood at a reasonable price. More than that, our concern is being excluded from access to not only forests but also to information about what is happening in the community forests. This is actually an issue about belonging to the watershed community. A large council representing people over the whole watershed would be a starting point for forging the collaboration (Mr Vijay Pandey, a resident of Bhairahawa).

Common resources, belonging and cooperation were the three key concerns raised by groups from Dobhan, Butwal and Bhairahawa. These concerns, as discussed in the preceding chapter, have emerged in response to the fragmentation, conflicts and opportunistic alignments that have arisen from the ways the Tinau watershed is represented by the dominant players. The concerns raised in the quotes above allude to the desires of people

from each of those locations to articulate an alternative space for the Tinau watershed that is imbued with a sense of emotional bonding and belonging, with symbols and values that are meaningful to them. To borrow Lefebvre's concept of space, the views expressed in these quotes are arguing for new 'representational spaces' that can produce alternative spatial configurations and meanings of the watershed (Lefebvre, 1991:39).

In this Chapter, I discuss the different elements of the 'representational spaces' that people from Dobhan, Butwal and Bhairahawa describe in relation to the the Tinau watershed. I bring forth different ideas and values assigned by local people to the watershed boundary, watershed management, forests, ecosytems and to the neoliberal buzzwords such as 'stakeholders' and 'payment for ecosystem services' that are currently fashionable among forest and watershed authorities.

8.1 The workshop as a space for discussion and negotiation

In order to understand the different values and meanings of the Tinau watershed as a whole, I invited participants from Dobhan, Bhutwal and Bhairahawa to take part in a workshop organized in Butwal in December 2011. The participants came from diverse backgrounds. The people from Dobhan belonged to several community forestry user groups. Half of them were women. Those who participated from Butwal, on the other hand, were NGO activists, local journalists, shop-keepers, businesspersons and municipality officers. One third of this group were also women. The participants from Bhairahawa comprised district level political leaders, farmers, NGO activists, members of public land management groups, collaborative forestry users and forestry and soil conservation officers. All of them were men. As I had already met most of them during individual interviews and focus group discussions, they were familiar with the broader theme that was going to be discussed in the workshop. Individually, some of the participants did not know one another particularly when they were

from other locations. For example, the participants from Bhairahawa knew one another, but they did not know those from Dobhan or Butwal. Therefore, the workshop started with introductions of the participants to one another.

I hired a professional facilitator to run the workshop so that I could observe the discussions and note the key points. The discussions were also audio-recorded with the consent of the participants. When the workshop session started, with the permission of the participants, each group was separately oriented to summary points of their focus group discussions that had taken place earlier in the respective locations-- one each in Dobhan, Butwal and Bhairahawa. These summary points included how they had delineated the Tinau watershed, what they thought were the activities related to Tinau watershed, how they valued forests, who they thought were the actors in the community forests and how they perceived the economic valuation of forest ecosystems. These points reminded them of the positions they held when they were in their own location-specific focus group discussions. Then each of these thematic areas was presented in the workshop one by one to see to the extent to which the points raised in one focus group discussion overlapped with or diverged from those raised in another focus group. The participants were asked to interact in relation to the presentations on whether they agreed or disagreed and whether they would like to put forward new ideas. When the floor was open, there were a series of heated discussions on each thematic agenda.

8.2 The localized view of the watershed: a fluid boundary

The facilitator of the workshop first presented a map with the boundary of the Tinau watershed delineated by the group from Dobhan. The boundary had been circled around the section of the Tinau River located in the Siwalik (Map 8.1). Mr Shankar Thakur from Bhairahawa was curious about why they had delineated only the upland area as the

watershed, while the river also flowed down to the Terai. A member of the Arghachhap

community forestry group replied that they had placed the area covering 22 villages in Palpa

within the boundary. When the facilitator further quizzed them about why they had selected

those 22 villages, the same member clarified that these were the villages considered by the

Tinau Watershed Project as the watershed of the Tinau River. Another member of the same

CFUG, who also works in

Butwal as a school teacher

justified that the area they had

encircled played key roles in

conserving the sources of the

Tinau River. He added that the

people in these villages had

been told by government and

project authorities that only

upland areas formed the

watershed of a river.
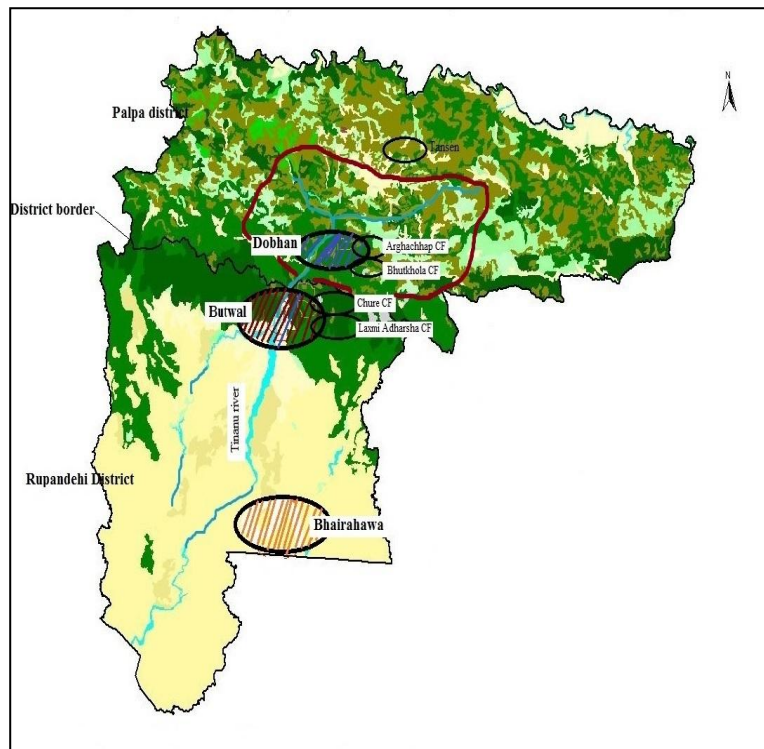
Map 8.1: Boundary of the Tinau watershed delineated by the people from Dobhan

Next, the facilitator

presented the watershed

boundary map prepared by the Butwal group. They had circled the boundary of the Tinau

watershed around the river section from Dobhan in the north to the middle part of Rupandehi

district in the south (Map 8.2). Participants from both Dobhan and Bhairahwa questioned this

demarcation. An NGO activist, who was also involved in preparing the Tinau Corridor

Master Plan, contended that the middle part of the Tinau River was most important in linking

the Siwalik and the Terai. He also argued that this section was largely degraded due to water

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pollution, unchecked quarrying activities and human settlements on the banks to which more attention had to be paid when the watershed was taken into account. A member of the Laxmi Adarsha community forestry user group added that the section of the map that they circled as the Tinau watershed included forests, farmland, rural areas, urban areas and tourist areas which represented everything in the watershed, and hence this area needed to be focused on.

Finally, the boundary map of the Tinau watershed prepared by Bhairahwa group was presented. They had demarcated a larger area than that drawn by other groups, but the boundary circled only the area south of Butwal (Map 8.3). Before anyone had asked a question, one of the participants from Bhairahawa clarified that they had demarcated those areas which were most affected by flooding. He also asserted that government officials and NGO
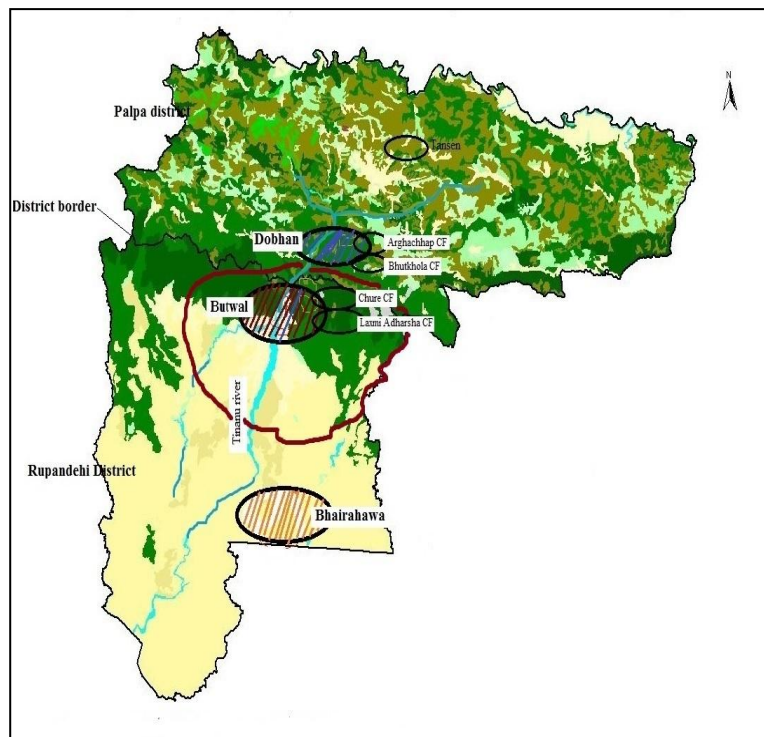
Map 8.2 Boundary of the Tinau watershed drawn by the focus group from Butwal

activists always paid attention to the upland or midland, while they were also equally concerned about the effects of the Tinau and its watershed. He added that if the people in Bhairahawa did not emphasize the lowland, it would be overlooked when decisions were made about watershed management.

The maps generated a vigorous debate among the participants. The people from Dobhan repeatedly emphasized that the people from Butwal and Bhairahawa needed to

recognize the upland portion as the most important part of the Tinau because that was the source of the river. The people in Butwal, on the other hand, underlined the importance of the middle part in mediating between the upland and the lowland. The people from Bhairahawa countered the positions taken
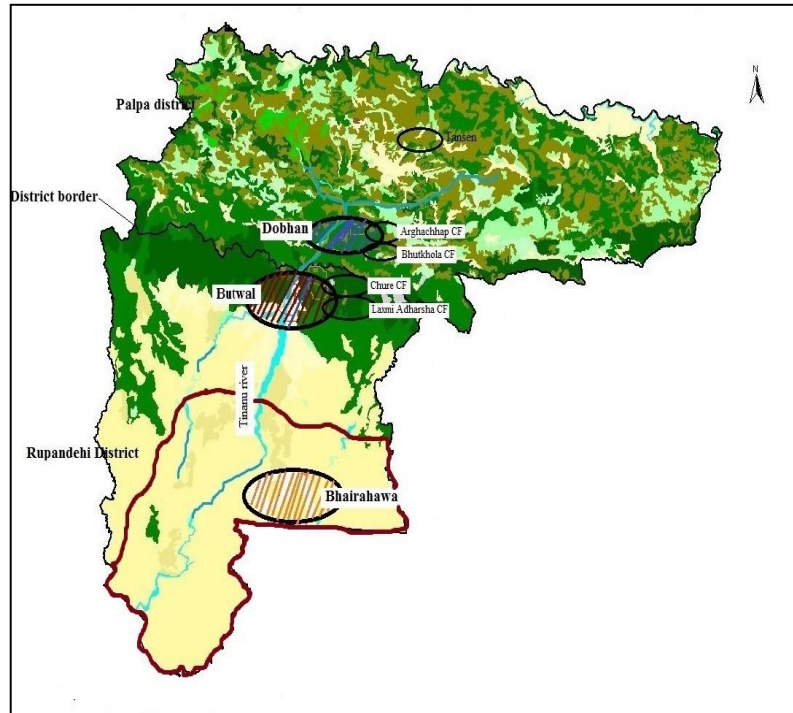
Map 8.3: Boundary of the Tinau watershed drawn by Bhairahawa group

by Palpa and Butwal, and accused both of them of overlooking the most productive agricultural land. They further emphasised that water would drain into the Tinau not only from the Siwalik but also from the Terai. So, they dismissed the idea that the upland was the only source of water for the Tinau.

In the middle of the discussion, an officer working in Butwal municipality interrupted. He agreed that each of the groups had its own valid points to justify their arguments. However, he suggested that the discussion would be never-ending if they merely stuck to their own positions. He proposed a group exercise to make another boundary map that would be agreeable to all the participants. This proposal was accepted, and was accompanied by enthusiastic applause. Then the facilitator provided the same map showing the Tinau River but without the boundaries drawn by the focus groups. The exercise was to delineate the boundary of the Tinau watershed that they could work on as a collective group.

8.3 The watershed boundary reconceptualised

The mapping exercise was not easy. The people from Dobhan were particularly unyielding, while those from Butwal and Bhairahawa were more flexible. Mr Vijay Pandey, a participant from Bhairahwa proposed that if all three areas within the boundaries drawn by the three groups were taken into consideration for the watershed, it would be agreeable to the Bhairahawa group. He added that they would have no problem particularly if the lowlands were included within the larger boundary. Mr Deepak Shah, an NGO activist from Butwal agreed with Mr Pandey and further argued that water would drain into the Tinau not only from the upland but also from the midland and lowland Terai. Mr Hari Bahadur Magar from Dobhan enquired about the purpose of redefining the watershed.
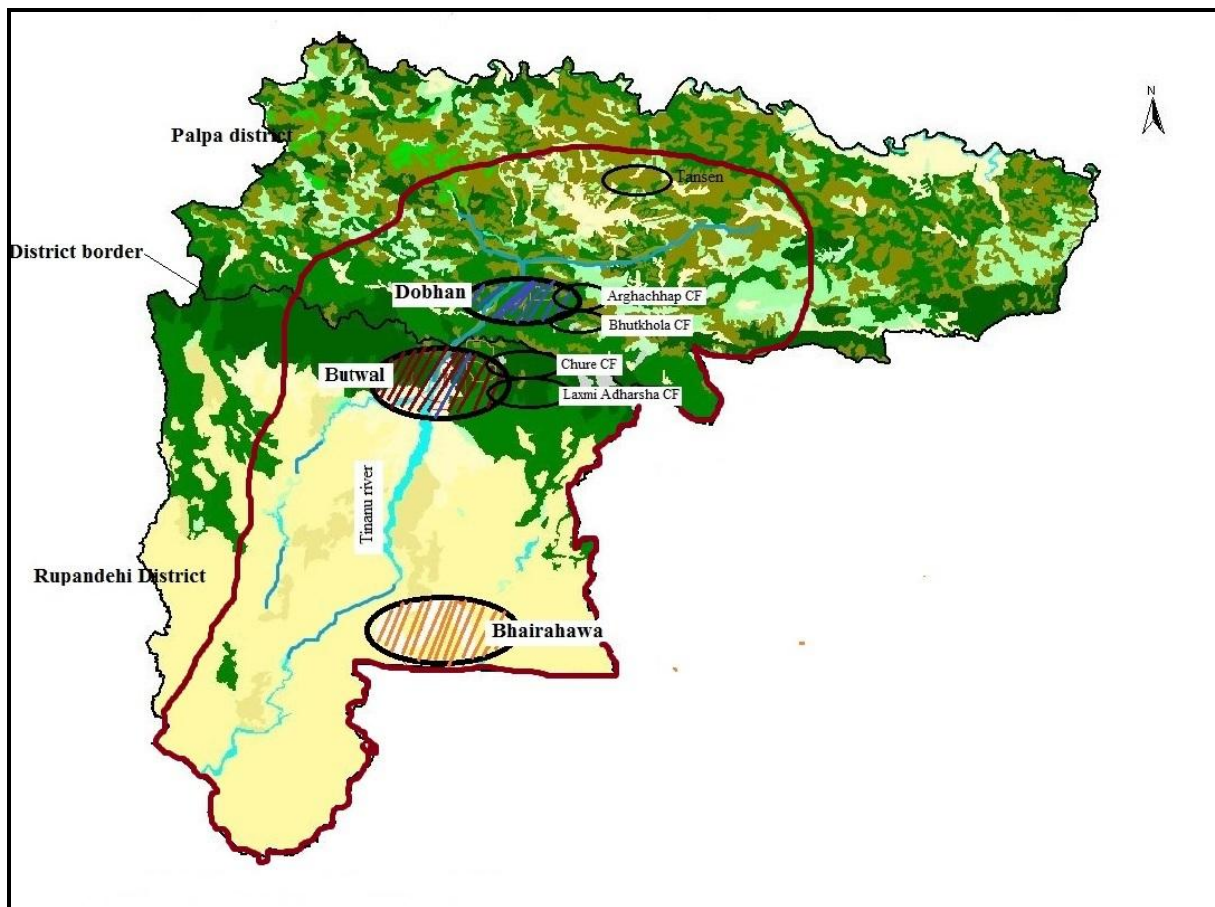
Map 8.4: The negotiated boundary of the Tinau watershed agreeable to all stakeholders

The municipality officer, who had originally proposed the group exercise, clarified that the Tinau River was common to all three groups and therefore the watershed boundary should also be common to all. The Dobhan person looked at the sub-engineer of District Soil Conservation Office, who was observing the group discussion silently. The sub-engineer replied that he would not intervene in the negotiations with his technical knowledge. However, he reminded them that the watershed of a river should be one, not many. This point, 'one watershed for one river', was agreed unanimously. Then the participants from Dobhan added a condition: they had no problem considering the midland and the lowland as the part of the watershed as long as the contribution of the community forestry in conserving the source of the river was recognized. The other participants supported this idea. Finally, they drew a larger, more inclusive boundary with a marker pen around the Tinau River on the map, extending from Tansen in Palpa in the north to the Nepal-India border in the south (Map 8.4).

In this new drawing, the categories of upstream, midstream and downstream were all subsumed within a single space with a watershed boundary agreeable to all participants. The inclusion of Tansen, the district administrative headquarters of Palpa, within the watershed boundary was a new idea. The Dobhan people had not included it in their focus group map. A participant from Dobhan explained that when the new boundary was created, it encircled Bhairahwa, the district headquarter of Rupandehi. The entire land within the new boundary would be looked after by government offices both from Palpa and Rupandehi. When they had a boundary circling 22 villages in Palpa, it was understood that they would be looked after by Palpa officers. However, when the parts of the two districts overlapped, the inclusion of the headquarters of both districts was necessary for coordinated activities.

The participants, in particular those from Bhairahwa, appreciated the workshop facilitator for making the discussion fruitful and respecting the views of all people across the watershed. Mr Basu Devkota from Butwal reiterated that the new watershed boundary recognized that all the people and natural resources in Palpa and Rupandehi were connected to one another. The facilitator replied that the new boundary of the watershed encompassing the three locations had provided opportunities for the participants to discuss how the area could be managed as a whole. In the next step, the participants started interacting about different activities that were important to carry out in order to manage the watershed properly.

8.4 Watershed management

Watershed management is often 'tied up with the power of the technocrats' (Elden, 2004:189). However, the term 'watershed' or 'watershed management' had been internalized by local communities and they had more than one idea about how to manage a watershed. Unlike the official technocratic discourse of watershed management in terms of building check-dams, afforestation and maintaining vegetation cover at source, the groups from Dobhan, Butwal and Bhairahawa brought to the workshop different perspectives regarding the conservation and management of the Tinau watershed. The people of Dobhan focused on controlling landslides, continuing community forestry and enhancing livelihoods of the local people as the main components of watershed management. Other activities they mentioned were the proper maintenance of crop terraces to control landslides and avoiding the use of chemical fertilizers and pesticides to reduce the risk of water pollution. A participant from Bhairahawa raised questions about the relationship between the watershed management and the livelihoods of the local people. A shop-keeper from Bhutkhola community forestry user group explained that if the livelihoods of the people were not enhanced, they would have no

time to think about and work for watershed conservation. Mr Hari Bahadur Magar, a founding member of Arghachhap community forestry said:

We have disbursed a part of user group funds for livelihood improvement of poor households in Arghachhap. These households have kept goats with that money and they have also planted broom grass in a small patch allocated for them inside the community forest. They earn money out of these activities and at the same time help in community forestry activities.

The continuation of community forestry for watershed conservation created heated discussions. Mr Shankar Thakur from Bhairahawa argued that harvesting trees from the forests had substantially increased in the Siwalik since community forestry was initiated. He added that he did not believe community forestry had contributed to conserving the watershed. The user group members, however, countered his arguments by emphasizing that they had harvested within the limits prescribed by the forestry technicians in their operational plans. They also underlined that the availability of poles, saplings and seedlings had increased markedly in the community forests and the vegetation cover was now denser than before due to the restrictions placed on grazing and the regulation of fuel-wood collecting. They argued that they would be ready to discuss how much they extract every year and how the forestry officers control their activities. Ms Rupa Magar, who was also a 'social mobilizer' working for an INGO in Dobhan showed a copy of the recently-renewed operational plan of Bhutkhola community forest and pointed out:

In Bhutkhola community forest, the total number of saplings and seedlings together in 2006 was 5,340 per hectare on an average, but they increased to 8,205 per hectare in 2011. The number of poles increased from 339 to 412 per hectare on average during the same period of time. But the number of trees decreased from 103 to 76 per hectare. The trees were cut down on the recommendation of the range post. The poles will soon grow into trees and the saplings will

grow into poles, and the canopy will be even denser. The inventory was undertaken by the forest rangers, not by local people.

Using official data and documents, it seemed she wanted to prove that the vegetation cover had been continuously increasing in the community forests. The participants from Bhairahawa, however, raised further questions about the harvesting of trees, and who benefitted from it.

The Butwal participants tried to seek a middle way to mediate the discussion. They presented lists of the activities they were carrying out in Butwal for watershed management. The NGO activists from Butwal took the lead in the interactions. Mr Deepak Shah from a local NGO argued:

Besides community forestry, there are more other activities that are important for watershed management. Here in Butwal, we are campaigning against open defecation, sewage disposal into the Tinau and unchecked excavation of sand, pebbles and boulders from Tinau. Regular maintenance of the bridge over the Tinau is also crucial. We are also trying to form a network between the upland and lowland people to work together for the health of the Tinau. They are all parts of the Tinau watershed management.

A leader of the Chure community forestry group in Butwal added that they were taking care of the streams and rivulets that flowed through their community forest and drained into the Tinau. He argued that they had placed a ban on harvesting trees within 50 metres of the streams.

The Bhairahwa group discussed controlling quarry operations in the Tianu, the practice of agro-forestry on public lands, the improvement and regular maintenance of irrigation canals and the enhancement of collaborative forest as the key activities undertaken for the Tinau watershed.

Mr Vijay Pandey from Bhairahawa said:

> *As you people from Dobhan emphasize community forestry and landslides, we focus on what resources are available in the Terai and on flood control. We have plenty of barren public and institutional lands in the Terai where we can plant seedlings to grow new forests. We have started communal agro-forestry on these public lands, but it is necessary to expand it on all available public lands. Irrigation should be included in the Tinau watershed management. The construction and maintenance of check-dams and embankments to control flooding should not be overlooked.*

The people from Bhairahawa emphasized that collaborative forest management initiated by the forestry department, in which about 25,000 peoplefrom Siwalik to Bhairahawa were involved, should also be considered a part of watershed management. 'Why not Lumbini?' added Ramu Tiwari, a member of a public land agro-forestry group from the western part of Bhairahawa. While they had already included Lumbini, the birth place of Lord Buddha, within the boundary of the watershed, everybody in the workshop agreed that it should also be included within the scope of Tinau watershed management.

Overall, the participants from Dobhan placed much more emphasis on forests, farms, water sources and community-based resource management as the key activities of watershed conservation and management. The participants from Butwal paid most attention to 'environmental campaigns' such as awareness raising, control of open defecation, waste management, preservation of greenery and a complete ban on the extraction of boulders, stones and soil from the river. The participants from Bhairahawa were most concerned about flood control, irrigation canal management and plantations on both private and public lands. These activities were complementary to one another in managing the whole watershed. At the end of the discussion on this theme, the participants agreed that all of these activities as listed by the three groups were important in the management of the whole watershed. They

agreed that cooperation was vital among the people in Dobhan, Butwal and Bhairahawa to ensure that all these activities were undertaken in the watershed.

The discussion then turned to the issues involved in valuing forests.

8.5 Valuing forests

Since the participants agreed that forests would be one of the integral parts of watershed management, the main objective of valuing forests was to understand how local people valued the forests and whether these values were similar or opposed to those prevalent in the international discourses of forest ecosystem services. Each of the three groups was asked to prepare a list of benefits that forests would provide them. The discussion led the groups to focus on specific products and/or environmental-social benefits.

In the first step, a group presentation was delivered by the Dobhan people. They maintained that the forests supplied them withlogs, fuel-wood, fodder, leaf-litter and medicinal herbs. They added that they use these products for their household needs and that they could also sell them to earn money. The forests would produce raw materials for forest-based industries and enterprises, such as timber, furniture, plywood and Ayurvedic medicines. They also listed a clean environment, soil conservation, biodiversity, tourism and poverty reduction as additional benefits of forests.

Next, the NGO members, journalists and municipality officers spoke for the group from Butwal. They had a longer list than Dobhan but they mainly focused on the environmental and social benefits of forests. They valued forests from aesthetic, tourism, religious, educational and conservation points of view. Timber, fuel-wood and other forest products were given second priority for this group. They talked about carbon sequestration, a clean environment, watershed conservation, biodiversity and habitats for wildlife as the

values of forests. The NGO representatives argued that community forests had extra value over other forests managed by the government or individuals. They claimed that the community forestry had contributed to establishing new rural institutions that could be used to integrate forest conservation, community development and poverty reduction. This group used very specialized terms such as biodiversity, wildlife habitat and carbon sequestration. One of the participants admitted that they had been influenced by the training sessions conducted by government offices and INGOs such as the District Forest Office and the Soil Conservation Office, the Livelihood and Forestry Programme and Terai Arc Landscape.

The people from Bhairahawa focused on timber and fuel-wood. They also pointed out that some of the tree species had a religious symbolism that had different values from those of timber and fuel-wood. Vijay Pandey from Bhairahawa explained that they wanted the forests to be protected in the Siwalik for the benefit of the whole Terai. He added that livestock, farming and forests were connected to one another directly or indirectly. Therefore, he stressed that while forests are valued, the values of farms and livestock also needed to be discussed in relation to the forests.

Following this discussion, the next issue that they considered was whether and how these values of forests might be expressed in monetary terms.

8.6 Pricing the values of the forests

Once the different groups had identified the different forest benefits to human society, they were requested to identify which of these benefits could be valued in monetary terms. The respondents achieved a degree of unanimity that some forest benefits could be valued in monetary terms but that many benefits could not be expressed in terms of money. Overall, the respondents agreed on the valuation of four main streams of benefits. First, they argued

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that forest products, such as timber, fuel-wood, medicinal plants, leaf litter and wild fruits could be exchanged for money. The second benefit that they felt could be valued in monetary terms was recreation and tourism by levying fees on visitors entering the forests. NGO participants argued that some community forests in Butwal had developed parks inside the forest and they charged fees to visitors. Finally, some people mentioned that they had heard about putting a price on carbon, but could not understand how this was something that could be bought and sold by people in the watershed.

The participants agreed that many benefits could not be valued in terms of price. Mr Deepak Shah posed some rhetorical questions:

> *How can you quantify and price the religious importance of a wedding ceremony between the Banyan (Ficus bengalensis) and Peepal (Ficus religiosa) trees that are celebrated in forests by Hindus? How can the importance of Bael fruit or stone apple (Aegle marmelos) trees be priced by Newar communities who have a unique tradition of marrying their girl children with the Bael fruit as a compulsory ritual (famously known as Bael Bibaha)? If you try to price these values, people will protest.*

The participants commented that forests were associated with many religious imageries and metaphors. The values were too complex to be represented in economic terms. Ms Pushpa Bhusal from Butwal argued:

> *There are many cultural, traditional and religious values in forests. We respect and worship forests and trees as Vanaspati Devata (Vegetation God) according to the Yajur Veda. Many tribal communities worship forests as Van Devi (Forest Goddess). 'Pancha Pallava' , the leaves of five tree species, namely Peepal (Ficus religiosa), Banyan (Ficus bengalensis), Sami (Ficus benjamina), Dumri (Ficus racemosa) and Mango (Mangifera indica) are integral for any ritual in Hindu communities. These are the values in belief, not in utility.*

The workshop facilitator tried to delve into different aspects of monetization. He referred to the 'contingent valuation method' and asked a a hypothetical question of Mr Pathak, who lives in Bhairahawa. He presented a scenario that the forests in the Siwalik provided many benefits to the Terai including flood control. In that situation, he asked how much would Mr Shankar Pathak be willing to pay for the benefits he received from the forests in the Siwalik. Mr Pathak answered:

The benefits you are talking about are invaluable. I have no capacity to pay for flood control or biodiversity conservation. You cannot measure how much flood was controlled by forests. They cannot be bought and sold like timber or fuel-wood. I want the forests in the Siwalik to be conserved for both forest products and environmental-social benefits. But I cannot price and pay for all those environmental and social benefits.

Farmers from Dobhan argued that there was an institutional benefit derived from forming community forestry user groups which could not be valued in monetary terms. The user group helped local people to establish a relationship with government offices, NGOs and local governments. It was through the forestry group that they mobilized money and other resources to improve community infrastructure such as rural roads and drinking water. Women were mobilized to participate in forest management. They claimed that community forest groups enabled these institutional activities, which could not be given monetary values.

The discussions around monetary values of forests proved to be difficult and most of the participants wanted to move on to talk about alternative management of the watershed. Community forestry was a sore issue for the Bhairahawa group. They kept drawing attention to the fact that CFUGs monopolized the benefits of community forests. This led to the group focusing on the issue of stakeholder involvement in community forestry.

8.7 Stakeholders of the community forests

The facilitator asked the group to identify all the stakeholders in community forestry. The respondents defined 'stakeholders' as the individuals or organizations directly involved in the management of community forests. Within this definition, those individuals and organizations that helped community forestry user groups achieve their forest management objectives were also included as stakeholders. There were three broader perspectives among the respondents.

Each of the groups from Dobhan, Butwal and Bhairahawa delivered their presentation on the actors/stakeholders of community forests. The Dobhan people identified four organizations: the community forestry user group, the community forest coordination committee, the district forest office and range posts and finally the Terai Arc Landscape Programme. These people recognized only forestry-related institutions as stakeholders in the community forests.

The Butwal group had a longer list of stakeholders. In addition to forestry-related organizations, they also included environmental NGOs, the Butwal municipality, women's groups, security forces such as the police and army, the division of water-induced disaster management, the soil conservation office, the district development committee and political parties as the stakeholders or actors in community forestry activities. However, the farmers from Dobhan did not agree with the Butwal presentation. They argued that the security forces and municipality had nothing to do with community forestry. The presenter from Butwal clarified that when the trees are cut down illegally, the security forces intervene to stop illegal felling. It meant, according to him, they have some stake in the community forests. Likewise, he justified that Butwal municipality had supported community forests around Butwal

financially and it had also promoted its image as a 'clean and green municipality' advertising the aesthetic beauty of community forests around Butwal.

The presenter from Bhairahawa listed the forest office, soil conservation office, District Administration Office, village development committees/municipalities, local NGOs, international NGOs, the community forestry user group and all the people in Palpa and Rupandehi as the key stakeholders/ actors of the community forest. On behalf of the group, he argued that the forests belonged first to the government and not to CFUGs, and therefore, the government agencies were the key actors. He further argued that the user groups received the authority to manage and use forests that were previously protected by the government agencies.

Each group thus prescribed a different configuration of stakeholders in community forestry. No-one accepted that the community forestry user groups were the sole stakeholders of community forestry. They agreed that any discussion of community forestry had to include all the actors as stakeholders. This meant that there were many stakeholders who would claim ownership, rights and responsibilities over community forests. Before the discussion, the people in the lowland Terai had been considered simply citizens of the country, or at most indirect stakeholders of the community forests in the Siwalik, but after the discussion they were also considered the stakeholders in community forests.

The discussion then moved on to the issue 'Payment for Ecosystem Services' (PES), in which the question of who pays whom for what services was debated.

8.8 Who pays whom for what?

In the beginning of this discussion, the facilitator explained that various proposals were being put forward for 'Payment for Ecosystem Services'. He further clarified that the community

forests in the upland had been presented as the sources of ecosystem services that would flow to the lowland. In that scenario, the people who had contributed to producing these forest ecosystems were supposed to be paid. The facilitator then opened the discussions to the floor. In this session, the participants spoke one at a time and expressed their views about PES. First, Mr Laxman Lamsal from Bhutkhola CFUG opined:

> *We have changed a sparse shrubland to dense forest through community forestry. If there had been no community forest, the land would have been bare without any trees or vegetation by this time. Perhaps the forest would have been encroached by the land mafia and distributed for agriculture or settlements by now. I suppose we have worked not only for the people in the community forestry user groups, but also for all the people beyond the group. If we are paid for this contribution, that would be good.*

Mr Lamsal's argument sparked tension between community forestry users and the people from Bhairahawa. Mr Ram Shah, a member of the public land forestry group from Bhairahawa countered:

> *If we have to pay for the community forests without any substantial benefits such as timber and fuel-wood, it will be unfair for us. It will be like the same situation as when we have to pay to the bank to keep our money without giving us any interest. The forest that is under CFUG control now used to be the nation's property. In that situation, it also belongs to us. Then the money should be paid not only to the CFUG, but also to us.*

The debate continued. The community forestry users were divided into pro-PES and anti-PES, while the people in Bhairahwa were completely against the concept. The NGO activists, municipality officers and journalists from Butwal tried to find a middle way that would address the interests of both parties. Mr Karun K.C., a leader from Chure CFUG added:

> *Our aim is not to exploit forest products but conserve forests for future generations. We are also conserving forests for those people who are not involved in community forestry user*

groups. If we have contributed our time and labour to managing and conserving the forests, obviously other people who have benefitted from forest conservation need to recognize our contribution.

Mr K.C.'s argument was milder than Mr Lamsal's. He did not directly mention monetary payment, but expected recognition of the contribution made by CFUGs to producing forest benefits for the wider society. However, Mr Ramji Mahato, a political party representative from Bhairahawa challenged the idea and argued:

The forests in the Siwalik are national forests, not a private forest belonging to any individual or a small group. These should be managed through a collective approach including all the people from the Siwalik down to the Nepal-India border because people living in the lowland have no forests nearby. Obviously the people living nearby should have more responsibilities for managing and conserving forests and thereby more rights to get direct access to forest products. But we the people living in the Terai should have some identity, a recognition that these forests also belong to us. Formation of a large council that would include all the forestry stakeholders is more important than talking about payment or recognition of CFUGs.

Mr Mahato belonged to a political party that represented the interests of the Terai region. He proposed a large group or council as a forum in which all the representatives of key forestry stakeholders could participate to decide about not only forests but also other common resources in the Tinau watershed in a collective way. His arguments shifted the tenor of the discussion away from pro and anti-PES to more peripheral issues.

During this discussion, Ms Rupa Magar from Dobhan introduced the programme called REDD+ (Reduce Emissions from Deforestation and Forest Degradation) initiated by the government. She wondered if REDD+ was a form of PES and if so, how the PES in this system worked. A forest ranger from Palpa elaborated on the programme. He clarified that it was an international PES system in which forests are conserved to absorb carbon dioxide from the atmosphere and the forest owners are paid for this carbon absorption. He added that

the government of Nepal had started the REDD+ project and some INGOs were piloting payments in clusters of community forests on a watershed basis in three districts.

The community forestry leaders from both Dobhan and Butwal, however, claimed that they were not aware of the programme. All of a sudden, a participant from Bhairahawa raised a question about why the government was trying to provide subsidies to only community forestry users from one way or another. He contended that if REDD+ money is available in Nepal, all citizens have rights over the money paid. He was surprised that INGOs were piloting payment only too community forestry user groups. He suggested that there were many stakeholders in community forestry, and therefore, paying only user groups would be unfair. The REDD+ issue sidetracked the discussion from that of resource management in the Tianu watershed. So, the facilitator reoriented the participants to focus on forestry in the Tinau watershed.

Returning to Mr Mahato's proposal for collective management of the Siwalik forests, Mr Krishna Pandey from Arghachhap CFUG added:

> *I do not think we manage forests for ecosystem services. We manage forests for our own purposes. These include timber, fuel-wood, fodder, leaf-litter and medicinal plants. If biodiversity has been improved in our forests, we do not mean to sell it. If forests protect watershed, that is an unintended outcome of our forest management. We never meant to transact the idea of watershed conservation for money. The concept of 'PES' brings conflicts between the CFUG and the Terai people. We need to seek ways in which we can cooperate with each other.*

The CFUG members could not reach unanimity about PES schemes. Those who were excited about the concept also had no idea how to establish a mechanism for payment. In the meantime, Mr Raju Tiwari, a member of the public land forestry group of Bhairahawa, posed a question:

The Terai is considered a 'bread basket' of the country. We have also afforested barren public land and converted it to agro-forests. Why aren't you talking about paying the Terai farmers for their cultivation and producing grain? Why aren't you talking about paying public land forestry groups in the Terai? Community forestry is not the only area which has contributed to the watershed and to the people. Why aren't you talking about our exclusion from the community forestry user group?

Mr Tiwari's argument made the atmosphere more serious. A discussion was started revolving around recognition, cooperation and contribution instead of payment. Ms Sarala Pradhan from Chure CFUG   proposed:

I do not think the Terai people should be excluded from the CFUGs. They need to be included in the group because they are also citizens of this country. If we have surplus forest products, the people down south should be given priority to buy these products at cheaper rates if not for free. We did not introduce the concept of PES. It was introduced by INGOs and donors through local NGOs. I do not think this will solve the problem of the division between the Siwalik and the Terai people.

The discussion gradually became milder and more friendly. The CFUG members who were claiming payment also seemed reluctant to continue the 'payment' debate. Mr Hariraj Ghimire, a journalist from Butwal tried to reconcile the tension and advised :

Money is not the issue. Nor is it the issue of forest products. I think we are more concerned about how the social, economic and ecological relationships between the Siwalik and the Terai people can be accepted and established. If we accept the importance of both Siwalik forest conservation and the Terai economy and that they are interrelated to each other, we need to cooperate with one another. We have recently seen that we live in the same watershed and we are responsible for working together for the management of the common watershed. Payment is not a form of cooperation. It divides people into upstream and downstream and into the relationship of 'sellers' and 'buyers', which has nothing to do with collaboration or cooperation.

Agreeing with Mr Ghimire, Mr Sanjay Pandey added:

There are already some examples of cooperative action in the forestry sector at district level. We have a collaborative forest in Rupandehi where 25,000 people from the Siwalik to Bhairahawa are participating in managing a forest patch of 1200ha. We also have a District Forest Coordination Committee led by the District Forest Office, where we meet once every three months to discuss different forestry related matters. We all are part of the same Tinau watershed as we have jointly delineated. We need to build a wide group of stakeholders from Palpa to Bhariahawa to act collectively for the management of forests, water, public lands, irrigation and quarries at watershed level.

All the participants agreed with Mr Pandey, who also proposed that continuing community forestry was not a problem. He stressed that the main problem arose when the people in the lowland Terai were regarded as 'external' to community forestry. The CFUG leaders also agreed that they should be more accommodative in terms of providing benefits to the Terai people and seeking support from them. The participants from Butwal promised that they would continue the discussions among the forestry and watershed stakeholders in the future so that different collective activities could be initiated.

It was already 5 o'clock in the evening. Mr Shah from Butwal stood up and said that the workshop was really helpful in identifying different issues around forests and watershed management. He said that a similar workshop could be organized for political leaders and Constituent Assembly members to seek common ideas about state restructuring. Since the distribution of benefits from natural resources was one key agenda item for the state-making process in Nepal, Mr Shah reiterated that such workshops need to be continued in future.

Following Mr Shah's remarks, the facilitator summarised the key points that were discussed during the day and closed the workshop.

8.9 Conclusion

The discussions in the workshop challenged the powerful discourses prevalent in forestry and watershed management. The interactions also confronted the binary lens of mountains versus Terai adopted by the state authorities over time. Amidst the discussions and debates, the workshop participants not only argued over their differences in their ideas of watershed, community forestry and ecosystem services, but also negotiated with one another within these notions. Participants brought forth various proposals on watershed boundary, watershed management, community forestry, the stakeholders of thhe forests, ecosystem services and PES based on their lived experiences.

The participants rworked on redefining the boundary of the watershed, which proved to be the basis of negotiations for all other issues including upstream-downstream, ecosystem services and payment for ecosystem services. Different forms of the fluid boundaries of the watershed that had been internalized by the local actors were transcended, and they arrived at a single boundary that encompassed a much wider area that was agreeable to all stakeholders. The upland, midland and lowland were no longer fragmented locations, but were realized as socio-natural systems connected to one another within the same watershed system. The Tinau watershed was no longer a 'problem shed' (Cohen & Davidson, 2011:4) but an avenue for seeking an alternative space agreeable to all stakeholders. Rather, the upstream-downstream view of the watershed became problematic. The activities proposed by people from Dobhan, Butwal and Bhairahawa were not contradictory but complementary in the overall management of the Tinau watershed.

The workshop participants valued the nuanced benefits of the forests. Some of the benefits were material, but some of them were cultural, spiritual, religious, educational, traditional, social and institutional. Participants showed an inability to quantify and price

these immaterial benefits. Similarly, community forests were not considered isolated entities. They were connected to socio-natural systems in two ways: resource-resource relation and resource-people relation. The community forests were directly linked with farms, livestock, river and mineral resources across the watershed. At the same time, they were linked with a wide range of actors and their networks in addition to CFUGs in the forms of direct actors, stakeholders, mediators, regulators and negotiators. The ownership of the community forest was seen as complex as opposed to the idea of PES promoters that CFUGs can be paid for ecosystem services. However, the lowland people were not critical of the community forestry *per se*, but the ways in which they had been completely excluded from access to forest resources and decision process were problematic.

PES was placed under severe scrutiny. The forest was but a part of the larger watershed. Forest goods and services, quarry products, agricultural crops, urban employment and irrigation were all considered parts of the watershed. Participants agreed that the upland people also benefited from the lowland agriculture and urban production. Ecosystem services did not mean only forest ecosystem services in isolation. The upland people also used the same ecosystem services, which were not exclusively isolated for selling to the lowland or elsewhere. PES becomes increasingly difficult to implement as the the number of stakeholders of community forests increases. While these complexities persist, how can the producers be segregated from the users of the ecosystem services so exclusively as to recognize them as 'sellers' and 'buyers'? The question of who pays whom for what services becomes absurd.

The participants proposed some alternative avenues that rose above the simplified ideas of upstream-downstream, isolated community forestry and PES. The official dominant discourses were problematized and more accommodative forms of alternative spaces were

proposed. The participants jointly valued an integrated commons, collective actions and a sense of belonging across the watershed as more important than the divisions inherent in the notions of upstream-downstream and PES.

Chapter 9: The Tinau Watershed as Commons

I return to the Merchant-Poet tale that I started out with in the introduction to this thesis. When the two were quarrelling over the payment for the aroma of the curry, the village headman intervened to reconcile their differences. He asked each of them separately to make a list of things that they shared every day besides the aroma. Bringing them together, he first asked the merchant to go through his list of shared items. The merchant listed the roof, the passageway, the bathroom, the front and backyards and the well. The headman asked the poet if he agreed with the merchant. The poet replied in the positive. Then the headman enquired whether the poet had any other shared items that he would like to add. The poet told that the list the merchant had prepared was accurate but that he interpreted it differently. The headman asked the poet to read through his list. The poet enumerated the house, the earth, the air, the sky, the source of the water they used, the sunlight, the beauty of the flowers in the front yard and the village as the common things that they shared every day. The headman looked at the merchant and asked if he agreed with the poet. The merchant replied in the positive. The village headman asked if the merchant paid separately for each of the things he shared with the poet. He replied in the negative.

The headman counselled them and said, 'Look, there are so many things that have utility in your lives and that you share with one another every day. You cannot separate out all of the things and charge money for each of them. Some of them are naturally provided, while some of them are produced by people. You do not pay for all of them, but you share them with each other. You need to understand that you are sharing a house, which provides a space to share many other things. You both belong to the same place and hence share things between you. There are many things which can't be bought at any price, but you can value them and enjoy these things in common'.

This story provides the context for my research, which has explored how the materiality and meanings of watershed, community forestry, ecosystem services and PES have been produced in the Tinau watershed. What I discovered in the process was that the conceptual division between mountains and the plains was a fundamental and integral factor that has shaped the socio-natural materiality of all these things.

9.1 Mountain-plains divide

The key issue or central finding emerging from my research is of the production of a divide between mountain and plain and its use in the reinforcement and reproduction of political domination of the mountain identity over the plains. This unequal relationship has persisted since Nepal was founded as a nation state in the middle of the 18th century. Until the 1950s, this unequal relationship continued in different forms of feudal agrarian configurations in which the hill elites extracted resources from peasantry in the Terai. From the 1960s up until the 1990s, the hill identity became predominant by reinforcing the cultural, economic and ecological importance of the hills over the Terai. The most recent version that reproduces this unequal relationship operates through the imposition of the upstream-downstream metaphor on the watershed and forest ecosystems through the introduction of the term 'Payment for Ecosystem Services'. The question that arises from this recognition is how this binary relationship of unequal power might be transformed to become a more inclusive, respectful and equitable relationship in the context of forestry and watershed management.

On the face of it, the upstream-downstream concept has attempted to formalise the relationship between the mountains and the plains using ecosystem concepts. But the relationship it presents has a political-ecological reality that exercises unidirectional power in representing the primacy of the hills over the Terai. The watershed was defined purely as an 'upstream' entity, but the 'downstream' areas were seen as external to this conception of the

watershed despite the fact that they were part of the same space. The representations of the watershed in the form of PES reproduce the unequal power relationship between the Terai and the mountain regions, by proposing monetary payments that would again transfer resources from the former to the latter. The representations of the Tinau watershed conceptualized by the government and donor funded agencies fragmented the watershed into upstream and downstream using a narrow concept of 'ecosystem' and then used this as the justification for setting up a PES program where upland areas were to be paid for the services they provided to the plains. This kind of conceptualization of the watershed not only ignored the reality of the Tinau watershed as a socio-natural space produced by the activities of thhe people in the region, but also contributed to further tensions among the social groups in the Siwalik and the Terai.

While the merchant-poet parable is useful for thinking about the relevance of PES, it may not be as appropriate for thinking about the unequal political relationships between the mountains and the plains that have been reproduced in different ways over a long period of time. However, it may be worthwhile to consider some of the advice that the headman gave the merchant and the poet, and see how it might offer alternative ways of transcending the mountain-plain divide that persists in the context of economic, social, and environmental policy making in Nepal.

9.2 Commons, collective actions and belonging

The workshop organized in Butwal for this study showed that there are possibilities for managing common resources by collective action. Once the participants started talking about different aspects of watershed, their different perspectives were revealed. However, they began to respect each others' views and attempted to negotiate common understandings.

They identified the commonalities that existed between them and pointed out the dominant representations that had created differences among them in relation to watershed, forests and other ecological resources. The participants expressed their willingness to negotiate common understandings for those issues which have been conceptualized by dominant players as though they were naturally different. The workshop showed the possibilities that the social groups can redesign the boundary of the watershed in ways that accommodate the values of a wider socio-cultural ecosystem encompassing all parts of the watershed. Participants recognised that the scale of the watershed was not rigid or predetermined, but could be expanded to respect the interests of all the stakeholders. They realised that they could seek new ways of enhancing common resources, collective action and a sense of belonging.

The Lefebvrian framework used in this thesis shows that possibilities for radical change emerge from the contradictions between spatial practice and representations of space. A radical alternative space of the Tinau watershed, defined in terms of a shared commons, collective action and a sense of belonging, emerged both from spatial practice and from contesting the dominant representations of the watershed. The spatial practices of the three locations of the Tinau watershed included the multi-directional flows of activities, resources, values, damages, benefits and aspirations that made up a larger socio-natural system encompassing both Siwalik and Terai. However, the dominant representations of the watershed by the government and international agencies imposed the notion of a 'unidirectional' flow of ecosystem services from 'upstream' to 'downstream'. Furthermore, the cracks between the spatial practice and the representations of space also provided an alternative space to reimagine and re-create the watershed in the form of a commons, produced by collective action and a wider sense of belonging.

The alternative space envisioned for the Tinau watershed contradicts the logic of PES. Clearly, the issue of assigning monetary value to some resources and 'payment' *per se* is not being questioned. Most people recognise that they indeed rely on this understanding for their livelihoods today. However, what is under question is whether every dimension or component of a living world needs to be separated out and its value defined in monetary terms for the purpose of transactions between people. As the mediating headman in the parable pointed out, there are many things which are shared among people that cannot be bought or sold. Even if buying and selling occur in relation to some discrete goods and services, these transactions require understanding, cooperation and respect between the buyers and sellers. The complexities of common resources such as watershed and ecosystems that require collective action   for cooperation between social groups cannot be resolved by setting up a market for buying and selling ecosystem goods and services.

9.3 Beyond PES

PES appears to be an economically rational approach that could create incentives for land owners to conserve ecological resources according to the payments they receive for doing so. It is based on the assumption that the natural ecosystem can itself generate its own money for its sustainability by selling its own services. This assumption may seem simple and elegant and provide the basis for developing economic models that produce equilibrium solutions for ecosystem management. However, the reality of translating such abstract solutions into practice is far from elegance. In most cases, it creates confusion and disagreement over who pays whom for what services, or worse, is imposed by the force of those in power who justify their actions in the name of global or national interest. In reality, the buyers and sellers conceptualized by the PES scheme within a watershed share a socio-natural commons space comprising multiple ecosystems that are interlinked and cannot be compartmentalised into

discrete units. It is impossible in reality to segregate upland 'forest ecosystems' from other ecosystems in the watershed. Forcing some people to pay for commons 'services' to others within the same shared watershed space is unlikely to deliver a win-win solution for ecosystem sustainability. In contrast, it is more likely to contribute to greater degradation of natural resources and create further conflict and division between communities in the Terai and the mountains.

PES schemes have been conceptualized at three different scales in Nepal--watershed, national and global. At the watershed level, they are being piloted by employing 'upstream-downstream' as the main basis for defining the buyers and the sellers of ecosystem services. At the national level, PES is seen as a market-based approach for pursuing sustainable forest management and conservation. At a global level, PES is conceptualized through the country's participation in REDD+ as a means of attracting international financial investment in forest management from carbon markets

However, as this study shows, people from the Tinau watershed have questioned the upstream-downstream, Siwalik-Terai divide, and have offered alternative ways of managing the watershed ecosystems as commons. They have shown themselves capable of defining those resources that can be priced and regulated by market mechanisms and those that need to be managed by collective action. They have argued over and recognised that collective action is far more important for sustaining the lives and livelihoods of communities in the watershed than monetary payments for ecosystem 'services' that reinforce the unequal power relationships between them. In the Tinau watershed, local social groups have signalled some alternative ways in which the common resources can be conserved and managed sustainably. First, the watershed is considered as a larger space containing various socio-natural systems that are connected to one another and which accommodate different interest groups and

actors who have a stake in decisions about the watershed. Second, different forms of ecosystems in addition to forest ecosystems are taken into account as complementing one another. For example, the resources generated from selling timber, medicinal herbs and quarry products can be used to protect other ecosystems and their components such as wetlands, streams, sacred places, endangered flora and fauna that cannot be valued in monetary terms. Third, the contributions of all the social groups, irrespective of the altitude at which they are located, are respected as a part of collective actions and their belonging to the watershed. Finally, the unequal relationship between the Siwalik and the Terai, which is culturally entrenched and politically reproduced, is confronted in order to create an alternative space which is based on a fair and dignified relationship between the two regions.

The Nepalese government's participation in REDD+ may appear beneficial because it is attempting to attract international financial investment for sustainable development and resource management in the Himalayas. However, given the persistence of the mountain-plain divide and the unequal power relationship between the two, any payment derived from this scheme is likely to reinforce these unequal relationships and deepen the divide. Several pilot projects that have been initiated under the rubric of REDD+ in Nepal are focused on how the earnings from this scheme can benefit CFUGs in the mountains and are not spread across all the watershed areas that encompass the mountains and the plains.

The insights into the alternative space offered by the participants of the Tinau watershed workshop can also shed light on Nepal's ongoing state restructuring process. Some of these classic divisions between the Siwalik and the Terai are actually being questioned at national level. The state restructuring process can also be informed by the on-the-ground realities of how the people of hills and plains can negotiate for cooperation through the logic of common resources, collective action and a sense of belonging.

Ultimately, watershed management cannot be reduced to techno-scientific engineering fixes or implemented by establishing payments for ecosystem services. It is rather the meaningful participation of the social groups at watershed, sub-national and national level that can produce an alternative space agreeable to all the political stakeholders. As this thesis shows, the Tinau watershed offers a useful starting point, not an endpoint, for seeking an understanding of common resources, collective action and a sense of belonging that transcends the mountain-Terai divide and creates an alternative common future for the people of Nepal.

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Glossary of Nepali words used in the text

Adivasi	Indigenous
Bari	Farm land in the upland area
Birta	Land granted by the state to nobles or government officers
Chure	Local name for the Siwalik hills
Guthi	Land owned by cultural or religious organizations
Jagir	Land granted by the state to government employees as an emolument
Janapad	A city state
Khet	Farm land in the plain area
Kipat	Land owned by a tribal group in Nepal's hills, the system was abolished in 1960s
Madhes	Flat land lying between the Siwalik hills and the Nepal-India border; also used to denote the Terai with cultural rather than physiographic connotations
Madhesi	An inhabitant of Madhes
Muluki	Civil, pertaining to the law of the land
Pahad	Hill, mountain
Pahadi	Person from the hills or mountains
Pancha mahabhuta	Five basic constituents of all life forms and the world according to Hindu scriptures: earth, water, air, fire and sky
Pancha pallava	Leaves of five sacred tree species, used by Hindus in worship and rituals

Panchayat	Name given to the political system in Nepal between 1961 and 1990 under the absolute monarchy; different levels of political institutions were also named after the system, such as village level government (Gaun Panchayat), district level government (Jilla Panchayat) and national legislature (Rastriya Panchayat)
Patwari,	An official who kept records on the ownership of land in the *zamindari* system (q.v.)
Prakriti	Nature
Raikar	Land owned by the state
Raja	King
Sawal	Act, law, rule
Siwalik	Himalayan foothills, the southernmost ranges of the Himalayan mountain system
Terai	Flat land lying between the Siwalik hills and the Nepal-India border, used to denote both geographic and cultural connotations
Zamindar	Landlord; feudal landholder who could have his land cultivated by peasants and collect tax from them; this system prevailed in Nepal until the 1950s
Zamindari	The system of feudal landholding